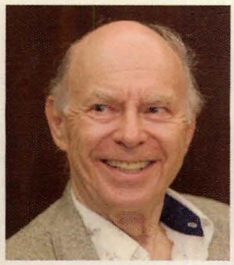
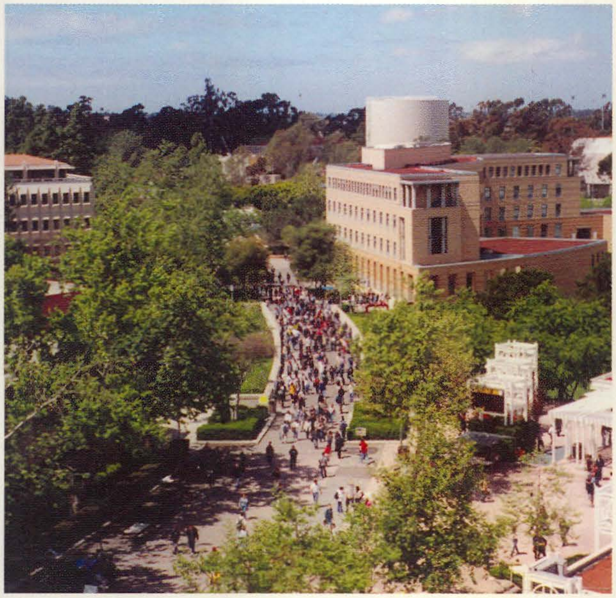
UCIrvine

UNIVERSITY OF CALIFORNIA, IRVINE

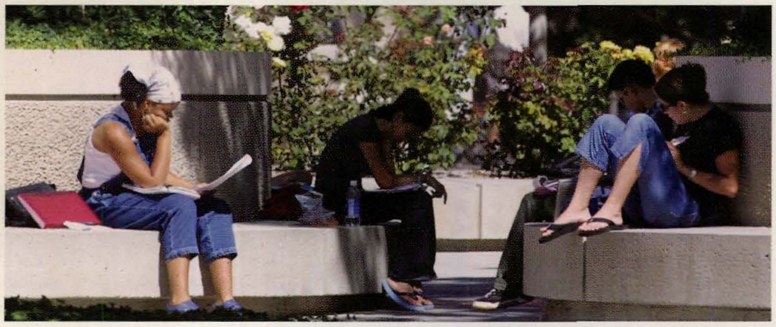




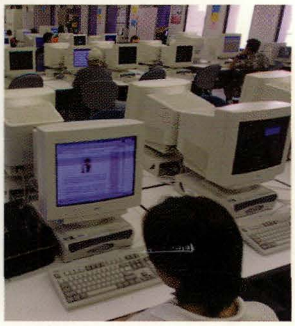









UNIVERSITY OF CALIFORNIA · IRVINE · 40 YEARS


2005–06 GENERAL CATALOGUE

Academic Calendar

Consult the Registrar's Web site (http://www.reg.uci.edu) and the *Catalogue* for detailed information on enrollment procedures and late service fees. The registration process consists of two steps: payment of fees and enrolling in classes. (Medical students should consult the School of Medicine Office of Admissions calendar.)

Fall Quarter, 2005

Quarter Begins	Sept. 19 (Mon.)
Academic Advising and Orientation	Sept. 19–22 (Mon.–Thur.)
Instruction Begins	Sept. 23 (Fri.)
Veterans' Day Holiday	Nov. 11 (Fri.)
Thanksgiving Holiday	Nov. 24–25 (Thur.–Fri.)
Instruction Ends	Dec. 2 (Fri.)
Final Examinations	Dec. 5–9 (Mon.–Fri.)
Quarter Ends	Dec. 9 (Fri.)
Christmas Holiday	Dec. 23–26 (Fri.–Mon.)
New Year Holiday	Dec. 30–Jan. 2 (Fri.–Mon.)

Winter Quarter, 2006

Quarter Begins	Jan. 4 (Wed.)
Academic Advising and Orientation	Jan. 4–5 (Wed.–Thur.)
Instruction Begins	Jan. 6 (Fri.)
Martin Luther King Jr. Holiday	Jan. 16 (Mon.)
Presidents' Day Holiday	Feb. 20 (Mon.)
Instruction Ends	Mar. 17 (Fri.)
Final Examinations	Mar. 20–24 (Mon.–Fri.)
Quarter Ends	Mar. 24 (Fri.)

Spring Quarter, 2006

Quarter Begins	Mar. 29 (Wed.)
Academic Advising and Orientation	Mar. 29–30 (Wed.–Thur.)
Cesar Chavez Day Holiday	Mar. 31 (Fri.)
Instruction Begins	Apr. 3 (Mon.)
Memorial Day Holiday	May 29 (Mon.)
Instruction Ends	June 9 (Fri.)
Final Examinations	June 12–16 (Mon.–Fri.)
Commencement	June 17–18 (Sat.–Sun.)
Quarter Ends	June 17 (Sat.)

Summer Sessions, 2006

Session I	June 26–Aug. 3 (Mon.–Thur.)
10–Week Session	June 26–Sept. 1 (Mon.–Fri.)
Independence Day Holiday	July 4 (Tues.)
Session II	Aug. 7–Sept. 13 (Mon.–Wed.)
Labor Day Holiday	Sept. 4 (Mon.)

The ***UCI General Catalogue*** is available in alternative formats, including Braille, large print, cassette tape, and computer disk, for persons with print disabilities. Information is available from the Disability Services Center; telephone (949) 824-7494 (voice), 824-6272 (TDD).

How to use the *Catalogue:* See page 16.

How to obtain the *Catalogue:* Copies of the *2005–06 UCI General Catalogue* are available in person for $6 (plus tax) from the UCI Bookstore. Catalogues also are available by mail: California, $13; continental U.S., $15; Alaska and Hawaii, $18; international destinations, $22. Prices include tax and first-class or equivalent mailing. Checks, or International Money Orders, payable in U.S. dollars, should be made payable to UC Regents, and sent to the University of California, Irvine, UCI Bookstore, Attn: Customer Service Department, 210-B Student Center, Irvine, CA 92697-1550. For credit card purchases, call the UCI Bookstore at (949) 824-BOOK. To order via e-mail, send an inquiry to books@uci.edu.

The *Catalogue* also is available for reference (1) on the World Wide Web at http://www.editor.uci.edu/catalogue/, (2) in most California public libraries, (3) in the library or counseling center of most California high schools and colleges, and (4) in the libraries of some universities, colleges, and educational counseling centers throughout the world.

On the cover: Images of UC Irvine in 1965 and founding Chancellor Daniel G. Aldrich, Jr, *(right center)*, together with today's images documenting the campus' extraordinary growth. Another campus notable is Professor Irwin A. Rose *(upper left)*, UCI's 2004 Nobel Laureate in Chemistry. See page 5 for more information about UCI's 40 years of innovation.

Cover photographs: Paul Kennedy, provided courtesy of the UCI Communications Office; UCI Design and Construction Services; the Office of Academic Affairs; and Nancy Gould.

Visit UCI on the World Wide Web at http://www.uci.edu/.

2005–06 GENERAL CATALOGUE

UNIVERSITY OF CALIFORNIA, IRVINE

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University of California, Irvine

2005–06 General Catalogue, Volume 39

The *UCI General Catalogue* is published annually in July by the University of California, Irvine, University Editor's Office, 435 Administration Building, Irvine, CA 92697-1010.

The *UCI General Catalogue* constitutes the University of California, Irvine's document of record. While every effort is made to ensure the correctness and timeliness of information contained in the *Catalogue*, the University cannot guarantee its accuracy. Changes may occur, for example, in course descriptions; teaching and administrative staff; curriculum, degree, and graduation requirements; and fee information. Contact the individual academic program or administrative office for further information.

Printed on recycled paper with soy-based ink.

INTRODUCTION

THE UNIVERSITY OF CALIFORNIA

The University of California (UC) was chartered as the State's only Land Grant College in 1868. Throughout its first decades, the University's development was strongly influenced by leading educators and scholars from various parts of the country. Supported by the State and many generous benefactors, the University was responsive to the needs of California while progressing on a steady climb toward eminence in academic and scientific achievement.

Today the University system includes 10 campuses: Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, San Francisco, Santa Barbara, and Santa Cruz. Among the campuses there are five medical schools, three law schools, a school of veterinary medicine, and professional schools of business administration, education, engineering, oceanography, and many others. The collections of the more than 100 UC libraries are surpassed in size on the American continent only by the Library of Congress collection.

The University is one of the world's largest and most renowned centers of higher education and includes more than 201,000 students. The faculty is internationally noted for its distinguished academic achievements and includes 23 Nobel laureates. National Academy of Sciences membership numbers 346, greater than any other college or university system. One of the University's unique resources is its roster of University Professors. This title is reserved for certain distinguished faculty members who are recognized internationally as scholars and teachers.

The University maintains a variety of research facilities, agricultural field stations, and extension centers in more than 100 locations throughout California. Public services include medical and dental clinics, information services for agricultural and urban populations, and a broad program of continuing education. Under contract with the U.S. Department of Energy, the University manages the Lawrence Berkeley, Lawrence Livermore, and Los Alamos national laboratories. Other major research facilities include the Air Pollution Research Center, Space Sciences Laboratory, Lick Observatory, White Mountain Research Station, and Scripps Institution of Oceanography, among many others.

Governance. Under the State constitution, governance of the University is entrusted to The Board of Regents. The Regents appoint the President of the University, and with the President's advice, the officers of the University.

Authority in academic matters is delegated by The Regents to the Academic Senate, which consists of faculty and certain administrative officers. The Academic Senate determines academic policy for the University as a whole, sets conditions for admission and the granting of degrees, authorizes and supervises courses and curricula, and advises the University administration on faculty appointments, promotions, and budgets. Additionally, each campus has a divisional Academic Senate.

The President is executive head of the total institution. Each campus has a Chancellor as its chief administrative officer. Students participate in policy-making at both the campus and University-wide levels.

The names of University Professors, Regents, Officers, and Chancellors are presented in the Appendix.

THE IRVINE CAMPUS

The University of California, Irvine (UCI) opened in 1965 with 116 faculty and 1,589 students. Since then, UCI programs, faculty and graduates have achieved distinction in virtually every discipline.

Two Nobel Prizes in 1995 for founding faculty F. Sherwood Rowland in Chemistry and the late Frederick Reines in Physics helped to secure UCI's position among the leading American research universities. In 2004, Irwin A. Rose, Department of Physiology and Biophysics, became UCI's third Nobel Laureate (chemistry). UCI has been ranked prominently along with much older universities for excellence in the arts and humanities, earth system science, management, social sciences, technology, and information systems.

For quality of educational experience and caliber of faculty, UCI consistently ranks among the nation's best public universities, and among the top 50 universities overall. Election to the American Association of Universities (AAU), a group of 60 of the most distinguished research institutions, is another indication of UCI's stature in the academic community.

As a research university, UCI challenges students at every level, both academically and personally. While research is critical to graduate education, the research environment also opens up new educational experiences for undergraduates. Students have access to faculty at the forefront of their fields, and they also have opportunities to participate directly in faculty research projects. In addition, to empower students for the future in an information-focused society, UCI has integrated computer technology throughout the curriculum and campus life.

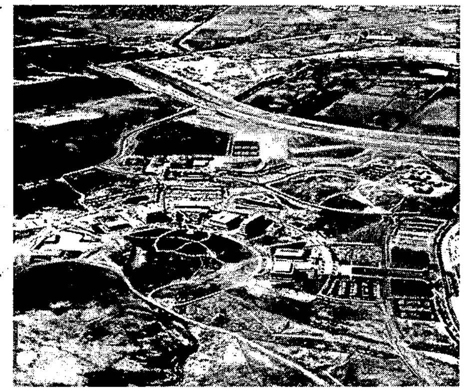
UCI is committed to the discovery and transmission of knowledge. It makes available to its 24,960 students (19,990 undergraduate, 3,820 graduate, and 1,150 health science students and medical residents and fellows) the education, skills, and credentials which provide the basis for lifelong personal and professional growth.

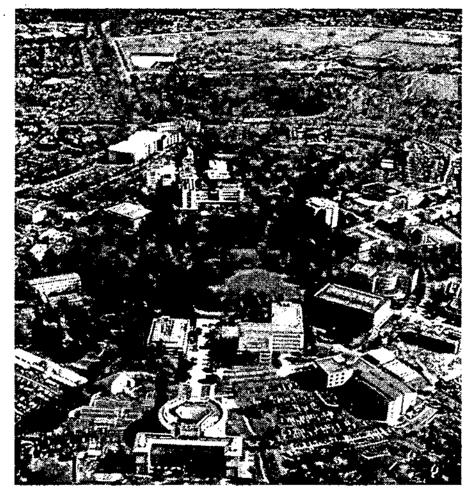
UCI's education and research missions are fulfilled in its academic units, which are described briefly below, and in its formal research units, which are described in the Research and Graduate Studies section.

The **Claire Trevor School of the Arts** teaches the creative as well as the academic and critical dimensions of the arts. It is concerned with the vitality of the arts in society. Faculty energies are directed toward the refinement, enhancement, and encouragement of students' artistic and creative talents and toward the development of the students' understanding of related theory and history. The School offers programs which emphasize extensive studio and workshop experiences, essential theoretical and historical background studies, and exercises in criticism. There are 1,130 students in the School, including 1,000 undergraduate and 130 graduate.

The **School of Biological Sciences** is one of the campus' larger academic units, with 3,580 students (3,300 undergraduate and 280 graduate). Faculty research areas include neural plasticity and behavior (which in part encompasses the development of the nervous system, memory, response to injury, and degenerative brain diseases such as Alzheimer's); the nature of cell-cell interactions; pattern formation; the elucidation of ecological conditions and evolutionary histories that have been the driving forces in organism design and functional diversity; the organization and expression of genes; biomolecular structure; molecular pathogenesis; human mitochondrial genetics; and cell biology.

WELCOME TO UCI





Celebrating 40 years of innovation, the University of California, Irvine combines the strengths of a major research university with the bounty of an incomparable Southern California location. Since its opening in fall 1965, UCI has become internationally recognized for efforts that are improving lives through research and discovery, fostering excellence in scholarship and teaching, and engaging and enriching the community.

As one of the top-ranked public universities in the nation for both undergraduate and graduate education, UCI attracts greater numbers of high-achieving students each year, many of whom remain in the local area as part of a talent-rich workforce. UCI's academic preparation programs are raising the level of achievement for the area's K-12 students, and vibrant campus life has made UCI a cultural magnet, drawing the community to its arts, lectures, and intercollegiate athletic events, as well as its vast library collections.

UCI's research innovations are a powerful generator of fundamental knowledge and of economic growth and jobs in the region, contributing to one of the highest standards of living in the nation. University faculty and students cooperate with industry to create some of society's most important medical advances, new communications technologies, new businesses, cleaner air and water, and safer, more efficient transportation systems.

UCI Medical Center is now rated one of the nation's best hospitals in several specialty areas, and a new university hospital to be completed in 2009 will further transform health care in the region with state-of-the-art medical technologies and the expertise of physicians, researchers, and health care professionals who are among the best in their fields.

As UCI's fortieth year begins, the campus community bids farewell to Chancellor Ralph J. Cicerone as he leaves to become President of the National Academy of Sciences. During Chancellor Cicerone's 16 years at UCI—as founder of the Department of Earth System Science, Dean of the School of Physical Sciences, and, for the last seven years, as Chancellor—the campus has made great strides in its capacity to benefit students and the lives of people in Orange County and beyond through education, community involvement, research innovations, and contributions to economic growth.

With the goal of becoming a flagship UC campus and one of the nation's very best universities, UCI has embarked on a strategic-planning process that will ensure the campus continues to inspire excellence as it fulfills its research, teaching, and public service missions in the decades ahead.

The **Department of Education**, with 270 students, offers graduate degree programs and credential programs for current and prospective teachers and administrators in California's public elementary and secondary schools, as well as an undergraduate minor in Educational Studies. At the heart of the Department's mission is a commitment to understand and deliver the kinds of educational transformations needed in today's world, a theme implemented in five main areas of research: language, literacy, and culture; learning, instruction, and assessment; teacher education and development; information and communication technologies in education; and educational policy and leadership and their social contexts.

The **Henry Samueli School of Engineering,** with 2,900 students (2,230 undergraduate, 670 graduate), focuses on the analysis and design of physical systems applying modern scientific principles to the development of technology for society. The major research disciplines are aerospace, biochemical, biomedical, chemical, civil, computer, electrical, environmental, materials science, and mechanical engineering. Research areas include biochemical and bioreactor engineering, earthquake engineering, water resources, transportation, parallel and distributed computer systems, intelligent systems and neural networks, image and signal processing, opto-electronic devices and materials, high-frequency devices and systems, integrated micro and nanoscale systems, fuel cell technology, fluid mechanics, combustion and jet propulsion, materials processing, robotics, and modern control theory.

The **School of Humanities** faculty have been repeatedly honored for their teaching and scholarly excellence. Included in the faculty's more than 100 research specialties are literary criticism, film studies, philosophical analysis, historical inquiry, art history, East Asian languages and literatures, and bilingual education. The faculty also participate in programs that cut across disciplinary boundaries in African American Studies, Asian American Studies, Latin American Studies, and Women's Studies. At the core of the educational mission of the humanities is the goal of imparting to students critical tools of analysis, ways of seeing, knowing, explaining, describing, and understanding, that will allow them to comprehend the world around them. The School has 2,460 students, including 2,040 undergraduate and 420 graduate.

The **Donald Bren School of Information and Computer Sciences** (ICS) has 1,650 students (1,360 undergraduate and 290 graduate). Faculty are actively engaged in research and teaching in the design of algorithms and data structures; embedded computer systems; networked and distributed systems; systems software; mobile computing; artificial intelligence; data mining; multimedia; databases and information retrieval; computer graphics and visualization; large-scale data analysis; biomedical informatics and computational biology; urban crisis response; Internet and ubiquitous computing; advanced technology for software and information systems; computer-supported cooperative work and human-computer interaction; digital arts and embodied interaction; managerial and social aspects of computing technology; and statistics and statistical theory.

Interdisciplinary Studies programs provide students with opportunities to pursue subject areas which derive from the interaction of different disciplines such as Chicano/Latino Studies, History and Philosophy of Science, and Transportation Science.

The Paul Merage School of Business faculty research and teach in traditional management fields including organizational behavior, information technology, finance, marketing, international business, managerial economics, new ventures, accounting, decision sciences, operations management, strategy, public policy, and health care management. They also focus on how the implementation and integration of technology, combined with information management, are changing the way business is conducted. The School has 260 students in the M.B.A. and Ph.D. programs; 640 in the Executive M.B.A., Health Care Executive M.B.A., and Fully Employed M.B.A. Programs; and 300 in the undergraduate minors in Management and Accounting.

The **School of Physical Sciences** has a student body of 1,320 (910 undergraduate and 410 graduate). Researchers in the School are conducting investigations in atmospheric chemistry (including the discovery of the adverse impact of human-made chlorofluorocarbon compounds on the earth's ozone layer), biogeochemistry and climate, synthetic chemistry, laser spectroscopy, condensed matter physics, elementary particle physics, plasma physics, and pure and applied mathematics and mathematical physics.

The **School of Social Ecology**, a multidisciplinary unit established in 1970, is unique to UCI. The School's central objectives are the application of scientific methods to the analysis and resolution of societal problems, and the development of theory and knowledge pertinent to social, behavioral, environmental, and legal phenomena. Among issues of long-standing interest are crime and justice in society, social influences on human development over the life cycle, and the effects of the physical environment on health and behavior. There are 2,800 students in the School, including 2,560 undergraduate and 240 graduate.

The **School of Social Sciences,** with 4,970 students (4,640 undergraduate and 330 graduate), is the largest academic unit at UCI. The faculty, many of whom are nationally recognized, have expertise in a wide range of specific social science topics, for example, the mathematical modeling of perception and cognitive processes; the economic analysis of transportation; the examination of the impact of society's political system on its economy; the study of social structure and values in different cultures through a rigorous scientific methodology; and the exploration of authority structures and inequality in society.

The **College of Health Sciences** includes the newly recognized Programs in Pharmaceutical Sciences and Public Health, and the well-established School of Medicine. The School of Medicine has 1,150 students (390 medical, 610 resident-physicians and fellows, and 150 graduate) and offers one of the country's largest residency training opportunities in primary care and internal medicine and houses some of the most advanced equipment in medical imaging and laser medicine available in the world. The faculty conduct innovative research in the following areas of emphasis: bioethics, biomolecular structure, oncology, cardiovascular and pulmonary diseases, geriatric medicine, immunology, molecular and human genetics, the neurosciences, and perinatology.

Academic Goals

UCI offers programs designed to provide students with a foundation on which to continue developing their intellectual, aesthetic, and moral capacities. Programs and curricula are based on the belief that a student's collective University experience should provide understanding and insight which are the basis for an intellectual identity and lifelong learning.

An important aspect of UCI's educational approach is the emphasis placed on student involvement in independent study, research, and the creative process as a complement to classroom study. Independent research in laboratories, field study, participation in writing workshops, and in arts productions are normal elements of the UCI experience. In many departments, special programs and courses which involve students in original research and creative activities are integrated into the curriculum.

UCI provides an atmosphere conducive to creative work and scholarship at all levels, to exploring the accumulated knowledge of humanity, and to developing new knowledge through basic and applied research. Along with these objectives, UCI has a serious commitment to public service. The campus generates research expertise which may be applied to regional and national social issues, and provides humanistic understanding of the problems facing society.

Academic Structure

UCI's instruction and research programs focus on fundamental areas of knowledge, and at the same time provide for interdisciplinary and professional study through the Claire Trevor School of the Arts, School of Biological Sciences, Department of Education, The Henry Samueli School of Engineering, School of Humanities, Donald Bren School of Information and Computer Sciences, Interdisciplinary Studies, The Paul Merage School of Business, School of Physical Sciences, School of Social Ecology, School of Social Sciences, and the College of Health Sciences.

The Office of Academic Affairs has responsibility for all programs of instruction and research. Along with the Office of Research and Graduate Studies and the Division of Undergraduate Education, Academic Affairs reports directly to the Executive Vice Chancellor. Matters of educational policy, including approval of programs, courses, and grades, are the responsibility of the Irvine Division of the Academic Senate.

UCI Student Affairs supports the University's academic mission from outreach to alumni participation. Student Affairs offers comprehensive programs and services to advance co-curricular learning, foster student leadership, enhance the quality of student life, and promote the general welfare of the campus community.

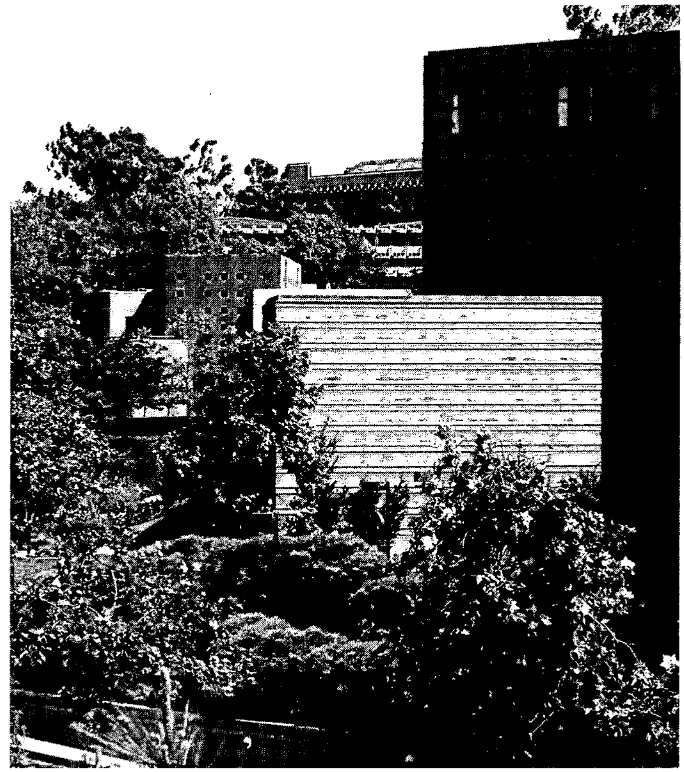
The Division of Undergraduate Education provides leadership in developing policies and programs for the improvement of undergraduate education in such areas as general education, retention, advising, curricular development, undergraduate scholarship and research activities, international education, academic internship, grant proposals, assessment, improvement of instruction, and improvement of instructional space. Undergraduate Education also administers programs and services affecting undergraduate education which require campus-level attention and coordination and which do not come under the direct authority of the heads of academic units or the Irvine Division of the Academic Senate.

The Vice Chancellor for Research and Dean of Graduate Studies has general administrative responsibility for graduate research and education. In the area of research, the Vice Chancellor is responsible for research policy development, implementation, and oversight. In the area of education, the Dean of Graduate Studies serves as the graduate dean for all graduate students and is responsible for admissions, graduate academic affairs, graduate student financial support, and diversity programs.

Accreditation

UCI is a member of the Western Association of Schools and Colleges (WASC). The campus is fully accredited by the Senior Commission of WASC. This accreditation requires periodic review in accord with WASC policies and standards. Further information is available from WASC, 985 Atlantic Avenue, Suite 100, Alameda, CA 94501; telephone (510) 748-9001.

In addition, the undergraduate degree program of the Department of Chemistry is accredited by the American Chemical Society; the credential programs of the Department of Education are approved by the California Commission on Teacher Credentialing (CCTC); the undergraduate majors in Aerospace, Chemical, Civil, Computer, Electrical, Environmental, Materials Science, and Mechanical Engineering offered by the Departments of Chemical Engineering and Materials Science, Civil and Environmental, Electrical Engineering and Computer Science, and Mechanical and Aerospace Engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology; the M.S. program in Genetic Counseling is accredited by



the American Board of Genetic Counseling; The Paul Merage School of Business is accredited by AACSB International—The Association to Advance Collegiate Schools of Business; the M.D. program of the UCI School of Medicine is accredited by the Liaison Committee of the Association of American Medical Colleges and the American Medical Association; and the Master of Urban and Regional Planning program is accredited by the National Planning Accreditation Board.

Office of Equal Opportunity and Diversity

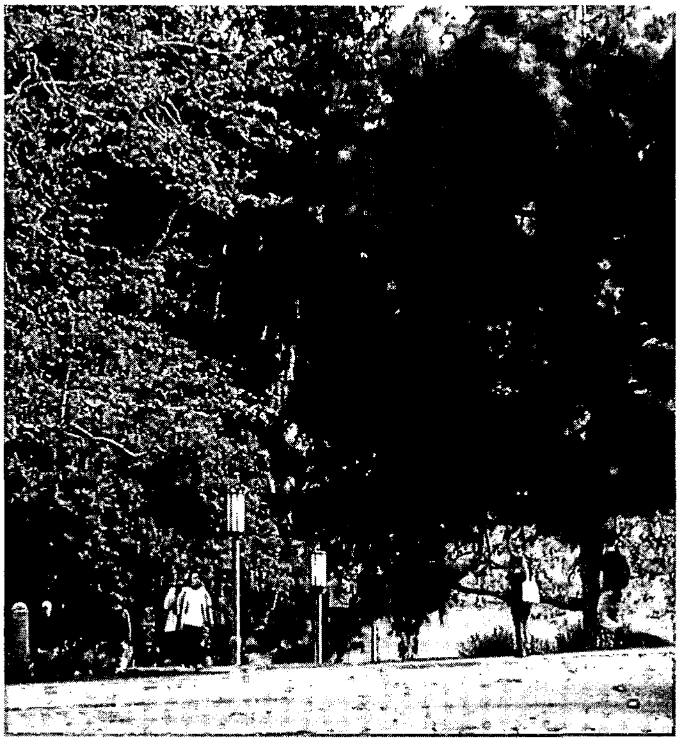
The Office of Equal Opportunity and Diversity (OEOD) provides consultation services and training programs to the UCI campus and the UCI Medical Center on the interpretation and application of both UCI policies and Federal and State laws regarding equal opportunity and diversity. It also develops and monitors UCI's Affirmative Action Plan for staff and faculty as required by Federal regulations.

OEOD investigates and provides assistance to UCI students, faculty, and staff in resolving complaints of discrimination and sexual harassment. OEOD also offers a variety of staff and faculty career development programs and workshops on diversity, cross-cultural communication, sexual harassment prevention, and conflict resolution in a diverse workplace to promote awareness, create organizational change, and provide support for the University's commitment to diversity.

OEOD is located in 4500 Berkeley Place; telephone (949) 824-5594 (voice), 824-7593 (TDD). See the *Catalogue's* Appendix for UCI's Nondiscrimination Policy Statements.

Office of the University Ombudsman

The University Ombudsman is available to assist students, faculty, staff, and visitors with problems they may encounter while on the UCI campus. The University Ombudsman responds to individual grievances or group petitions by hearing complaints; clarifying issues; making appropriate on- and off-campus referrals; and providing a confidential, impartial, and informal setting for conflict



negotiation. The Ombudsman Office also manages the Campus Mediation Program in which trained volunteer mediators provide free, confidential mediation services for the campus community. The Office is located in 437 Administration Building; telephone (949) 824-7256.

The Campus Setting

UCI's location combines the cultural and economic resources of an urban area with access to Southern California's spectrum of recreational, scenic, and entertainment venues.

Fifty miles south of Los Angeles, five miles from the Pacific Ocean, and nestled in 1,489 acres of coastal foothills, UCI lies amid rapidly growing residential communities and the dynamic international business environment of Orange County and the surrounding region.

The famed sailing and surfing beaches of Newport, Laguna, and Huntington are a short bike ride from campus, while hiking trails, desert camping, or mountain resorts for snow boarding and skiing are within two-hour's travel distance from Irvine. The campus itself is a natural arboretum of native species, as well as trees and shrubs from all over the world. Adjacent to the campus, the San Joaquin Marsh serves as a natural classroom or peaceful refuge, with trails for viewing the rich diversity of wildlife.

A full roster of intramural sports and recreation events helps to fill the daily fitness needs of students, along with UCI's Anteater Recreation Center. This 92,000-square foot, state-of-the-art facility includes a pool, gymnasiums, racquetball courts, weight room, and jogging track. UCI is also an NCAA Division I campus that competes in men's and women's intercollegiate athletics.

Across Campus Drive, and linked by a pedestrian bridge, an area of shops and restaurants also features a movie theatre complex, post office, and other services. Complementing UCI on-campus sports and cultural events throughout the year is the vigorous Orange County arts and entertainment environment. It offers everything from small venues for bands and performers to galleries, museums, the Irvine Barclay Theater, Orange County Performing Arts Center, and Pacific Symphony. And within a one- to two-hour drive are the metropolitan attractions of Los Angeles and San Diego.

With plenty of land for growth, UCI is building to accommodate greater numbers of students, as well as to provide the most updated classroom and laboratory space. Projects planned or under way include an arts complex renovation with plaza designed by famed artist/architect Maya Lin, a multipurpose science and technology building, a medical science research building, and expanded student housing. On the west campus, the 180-acre University Research Park is attracting private companies such as America Online, Canon Information Systems, and Cisco Systems, that agree to collaborate with UCI faculty and students on internships, research, and other programs.

Due to the high caliber of UCI faculty and scholarship, the campus is home to national organizations including the National Fuel Cell Research Center and the Western Center of the American Academy of Arts and Sciences, and is a major site for the nationwide cancer genetics research network. For its range of services and research, UCI's Chao Family Comprehensive Cancer Center is the county's only cancer facility designated "comprehensive" by the National Cancer Institute. UCI is noted in fact for its strengths in cancer and neuroscience research, much of which takes place at UCI Medical Center. Located in the City of Orange, 13 miles to the north, the Medical Center is the primary teaching and research hospital for the UCI School of Medicine.

Bus transportation makes travel convenient between the campus, UCI Medical Center and major housing areas, shopping centers, and recreation locales. In addition, the campus and surrounding communities are designed for bicycle traffic with trails connecting UCI with student housing and the coast.

CELEBRATE UCI

On Saturday, April 22, 2006, UCI will host its annual open house, Celebrate UCI. Among the day's events are the Wayzgoose Medieval Fair, housing and campus tours, and lectures and presentations, including information about admissions, academic programs, and financial aid. Additional information is available from the Office of the Dean of Students; telephone (949) 824-5182.

Instructional and Research Facilities

UCI LIBRARIES

Gerald J. Munoff, **University Librarian**
World Wide Web: http://www.lib.uci.edu/
(949) 824-6836

Established in 1963 as one of the founding academic units on campus, the UCI Libraries bring people together to facilitate the creation and sharing of new knowledge in all disciplines across campus. The Libraries support the information needs of students, faculty, staff, and community members through the Libraries' Web site and at four library facilities: the Langson Library, the Science Library, and the Gateway Study Center on the UCI campus, and the Grunigen Medical Library in Orange. The UCI Libraries have more than 2.4 million volumes and subscriptions to more than 25,000 journals, as well as a growing array of manuscripts, visual materials, and microforms, in both electronic and print formats.

ANTPAC (the Libraries' online catalog) provides information about books, periodicals, and other library materials at UCI. My ANTPAC provides a wide variety of personalized electronic services such as automatic customized searches of UCI holdings and online renewals of library materials. Document Delivery Service (DDS) is another popular personalized service for UCI faculty, graduate students, and administrative staff. Eligible DDS users may request delivery and pickup of UCI Libraries and Interlibrary Loan (ILL) books at no charge and may acquire photocopies with the use of a recharge account. In addition, the MELVYL® Catalog, available via the UCI Libraries Web site (http://www.lib.uci.edu) connects users at UCI with the vast resources of the University of California library system. Expedited loans and digital desktop delivery services facilitate exchange of valuable research materials between UC libraries, and traditional interlibrary loan services open the scholarly resources of the world to the campus community.

The UCI Libraries conduct an active instruction program to help researchers become familiar with rapidly changing information resources and technologies. More than 18,000 students attended training sessions last year. The program focuses on the development of lifelong skills in information discovery and use, including instruction on the expert use of scholarly resources related to specific academic disciplines, as well as a general orientation to the Libraries.

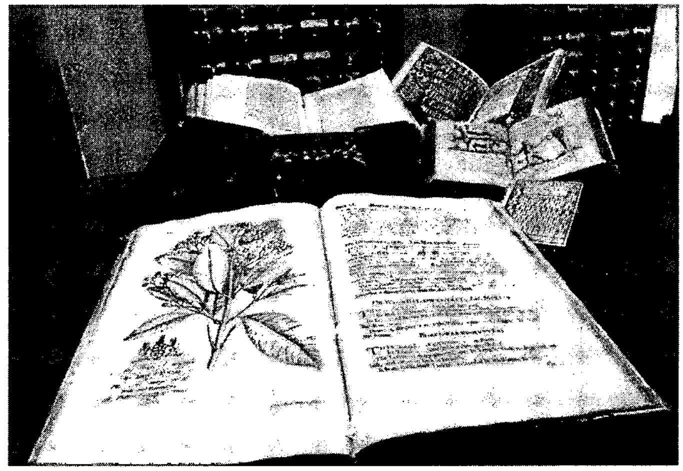
Nearly 500 desktop computers are available for general use in the four library buildings, and wireless access is available throughout all library facilities. The Langson Library features a state-of-the-art Multimedia Resources Center (MRC at http://mrc.lib.uci.edu) with multimedia production software and video equipment, a Technology-Enhanced Classroom (TEC) for hands-on learning, and quiet areas for concentrated study. The Science Library features the Interactive Learning Center (ILC at http://ilc.lib.uci.edu) also with a computer laboratory, an instruction center, a digital media production laboratory, and group study rooms. The Grunigen Medical Library provides two computer technology facilities featuring an instructional laboratory and an Information Technology Center (ITC at http://itc.lib.uci.edu).

The Library Gateway Study Center, adjacent to the Langson Library, and the Science Library Study Center provide comfortable study space 24 hours a day during prefinals and finals weeks, and 19.5 hours a day during the quarter.

Reserve Services offers access to both electronic and print collateral reading materials that have been selected by the faculty. Reserve services for print materials are available at the Langson Library and the Science Library Loan Desks. Media reserve materials are located in the MRC and the ILC.

The Reference Desk on the first floor of the Langson Library provides research assistance and information on topics in the arts, humanities, social sciences, education, and business and management. Specialized resources for government information are also located here. The first floor of the Langson Library also provides an area containing assistive technology and study aids for students supported through UCI's Disability Services Center. The Current Periodicals/Newspapers reading room on the second floor of the Langson Library houses current issues of humanities and social science journals, foreign and domestic newspapers, a variety of popular magazines for recreational reading, and back issues of newspapers and journals on microform. The Library Copy Center (third floor of the Langson Library) provides conveniently located copiers for patron use in all libraries (Langson, Science, and Grunigen Medical) or patrons may leave materials to be copied for a fee. A card system is used for photocopies and printing jobs from networked public work stations. Copy card dispensers are available in all libraries.

The Department of Special Collections and Archives holds the Libraries' non-circulating collections of rare books, manuscripts, photographs, maps, pamphlets, and other materials notable for their age, value, fragility, provenance, or uniqueness. Contemporary materials are collected in selected subject areas in order to build and preserve specialized research collections. Important collections include: the Regional History and Literature Collection, emphasizing Orange County; the Critical Theory Archive, containing the



papers of Jacques Derrida and other distinguished theorists; the Dance and Performing Arts Collections, highlighting the history of dance in Southern California; the personal papers of eminent UCI faculty members, including Nobel Laureate Frederick Reines; the René Wellek Collection of the History of Criticism; and the literary papers of notable authors such as Kenneth Millar (pseudonym Ross Macdonald), Kathleen Raine, and Donald Heiney (pseudonym MacDonald Harris). Other collections emphasize Thomas Mann, orchids and horticulture, British naval history, fine printing, and the book arts. Significant collections of small press poetry and political pamphlets are also held.

The University Archives is the official repository for records having permanent value in documenting the history of UCI, including publications, manuscripts, photographs, and other records of administrative and academic units, student organizations, and campus support groups.

The Southeast Asian Archive documents the experiences of post-1975 Cambodian, Hmong, Laotian, and Vietnamese refugees and immigrants. The archive includes materials relating to the exodus from the homeland, resettlement in the United States, community development, and history and culture of Southeast Asians in the U.S., with a special focus on Orange County and California. The archive contains materials in both Vietnamese and English, including books, dissertations and theses, refugee orientation materials, reports from government and private agencies, periodicals, newspaper clippings, audiovisual materials, and manuscripts.

The Science Library houses the science, medicine, and technology collections including material in the fields of astronomy, biology, chemistry, computer science, Earth system science, engineering, mathematics, medicine, and physics. The Science Library provides more than 2,000 individual study spaces, faculty and graduate reading rooms, more than 50 group study rooms, and an extended-hours study center. In the Reference Room on the second floor, expert staff is available for research assistance and consultation, and computer workstations provide access to a vast array of electronic journals, research databases, and other Internet resources.

Located at the UCI Medical Center in Orange, the Grunigen Medical Library serves the information and research needs of the Medical Center and supports the teaching activities of the School of Medicine. Its collection includes approximately 50,000 volumes and over 600 clinical serial subscriptions.

NETWORK & ACADEMIC COMPUTING SERVICES

Network & Academic Computing Services (NACS) provides telephone, network, and computing services in support of research and education at UCI. NACS provides central computing services, computer laboratories, departmental and research-group support services, and campuswide technical coordination. The campus network infrastructure maintained by NACS provides connectivity on campus and to the Internet. Wireless and mobile wired network access is available in select areas of the campus as part of the UCInet Mobile Access project.

UCI's Electronic Educational Environment (EEE) is a campuswide collaboration including NACS, the Office of the Registrar, the UCI Libraries, and the Division of Undergraduate Education. As part of EEE, NACS provides Web-based course tools and resources for instructors and students including course Web site space, course mailing lists, and instructional technology training. NACS maintains the EEE Web site located at http://eee.uci.edu/.

NACS provides Educational Access (EA) accounts for all students, and E4E accounts for all faculty and staff. These accounts are provided for e-mail and Internet access.

Approximately 70 MS-Windows computers are available 24 hours a day in computer laboratories on the first floor of the Engineering Gateway building. All common MS-Windows applications are available, as well as certain mathematical software and statistics packages. Computer peripherals including scanners and printers are available. While school is in session, NACS student consultants are on duty in Room E1140 to provide assistance to those using the facilities.

An additional 96 Windows computers are located in the Multipurpose Science and Technology (MST) Building, and are available for drop-in use when not scheduled for classes. NACS also operates "NACS@HIB," a drop-in instructional laboratory in the Humanities Instructional Building. This laboratory has 30 Windows computers and is open to students of any major. Finally, NACS co-administers computer labs in the Gateway Study Center, the ArtsTEC laboratory in the Claire Trevor School of the Arts, and the Instructional Technology Center (ITC) in Social Sciences Tower.

NACS offers a variety of additional services. For more information see the NACS Web site at http://www.nacs.uci.edu/. Offices are located in the Engineering Gateway Building, Room E2130, and in the University Research Park, 5201 California, Suite 150. The NACS Help Desk may be reached by sending e-mail to nacs@uci.edu or by calling (949) 824-2222.

UCI ECOLOGICAL PRESERVE

The 60-acre UCI Ecological Preserve consists of several small hills and surrounding flatlands bearing remnants of coastal sage scrub flora and associated fauna. The Preserve is located on the campus and is set aside for teaching, research, and use by the campus community. Additional information is available from the Office of Natural Reserves; telephone (949) 824-6031. Publications and species lists are available at http://nrs.ucop.edu.

NATURAL RESERVE SYSTEM

The University of California manages and maintains a system of 34 Reserves that are representative of the State's habitat and geographic diversity. These serve as outdoor classrooms and laboratories for students, faculty, and staff, and are intended primarily for purposes of education and research. For further information about the Natural Reserve System, visit http://nrs.ucop.edu.

UCI has primary responsibility for two Reserves: the San Joaquin Marsh Reserve and the Burns Piñon Ridge Reserve. Additional information is available from the Manager; telephone (949) 824-6031.

San Joaquin Marsh Reserve

The San Joaquin Marsh Reserve, one of the last remaining marshes in Southern California, is a 202-acre wetland adjacent to the UCI campus. The Marsh consists of a series of freshwater ponds and their attendant aquatic flora and fauna, and is especially known for its rich bird life, both resident and migratory. Researchers and observers have recorded 263 species of birds in the Reserve, a major stopping point on the Pacific Flyway. For further information, visit http://nrs.ucop.edu.

Burns Piñon Ridge Reserve

The Burns Piñon Ridge Reserve is located near the town of Yucca Valley in San Bernardino County. It is a 306-acre parcel of high-desert habitat representing an ecotone between montane and desert biota, with mixtures of Joshua tree, piñon pine, and juniper woodland. The Reserve has a dormitory and research station, as well as primitive camping facilities, and is used primarily for overnight field trips and research by faculty and students from the School of Biological Sciences. For further information, visit http://nrs.ucop. edu.

UCI ARBORETUM

The UCI Arboretum is a botanical garden developed and managed by the School of Biological Sciences. It contains areas planted with floras adapted to climates similar to those of Southern California. The Arboretum maintains a large collection of plants native to Southern California and Baja California as well as South African monocots. The Arboretum provides materials and space for research and teaching needs and its collections are also used as an educational resource for the community at large. Volunteers and other interested parties are encouraged to participate in Arboretum activities. The Arboretum is open to the public 9 a.m. to 3 p.m., Monday through Saturday; call (949) 824-5833 for additional information.

LASER MICROBEAM AND MEDICAL PROGRAM

The Laser Microbeam and Medical Program (LAMMP) was established at UCI in 1979 as a national user facility providing a unique set of laser microbeam biotechnologies to individual researchers. LAMMP functions as a research, training, and service facility, and provides interaction between the laser industry and the academic biomedical optics community. LAMMP provides laser microbeam technologies for optical manipulation and functional imaging of living cells, and for developing noninvasive systems for monitoring and imaging physiology in living tissue. The program is conducted in the Beckman Laser Institute and is funded through the Biotechnology Resources Program of the National Institutes of Health. Additional information is available from the LAMMP coordinator at (949) 824-8367 and online at http://www.bli.uci.edu/lammp/.

UCI MEDICAL CENTER

UCI Medical Center, the only university hospital in Orange County, offers a full scope of acute- and general-care services including cardiac surgery, cancer, organ transplantation, pediatrics, neurosurgery, and trauma. Located in the City of Orange, 13 miles from the UCI campus, UCI Medical Center has more than 400 specialty and primary care physicians. UCI Medical Center is building a new university hospital, planned for completion in early 2009. The seven-story hospital will have 191 beds, 13 operating rooms, and an interventional procedure room. Additionally, private patient rooms will allow family members to stay overnight. For more information about the new hospital, visit http://www.ucihealth.com/newhospital.

University Children's Hospital at UCI Medical Center is devoted to the care of children from before birth through adolescence. Perinatologists are available for the expert management of high-risk pregnancies, and UCI Medical Center has the most sophisticated neonatal unit in the county to care for critically ill newborns. The Medical Center houses a 24-hour emergency department and is designated as Orange County's only Level I Trauma Center—the most comprehensive for the treatment of life-threatening injuries. The Chao Family Comprehensive Cancer Center offers a full range of cancer therapies and research programs, including laser and radiation therapy, endoscopic ultrasound, and immunotherapy.

As part of its focus on family and preventive health, UCI Medical Center has five neighborhood health centers located throughout Orange County, including Anaheim, Irvine (on the UCI campus), Orange, Santa Ana, and Westminster.

UCI Medical Center also serves as the principal clinical facility for the School of Medicine's teaching and research programs. For additional information or to schedule an appointment, call toll free (877) UCI-DOCS or visit http://www.ucihealth.com.

UCI CENTER FOR OCCUPATIONAL AND ENVIRONMENTAL HEALTH

In 1980 the University established occupational health centers in Northern and Southern California for the purpose of training occupational health professionals, conducting research on occupational health issues, and providing clinical evaluation of workers/patients for work-related disease. The Centers have strong ties to the UC Schools of Medicine and Public Health.

The Irvine Center is comprised of UCI health professionals. Faculty research is concerned with identification of causal association between disease and occupational exposure as a basis for prevention of occupational disease and injury. The Center's primary areas are occupational medicine, toxicology, epidemiology, and environmental health sciences, and it houses a referral clinic, facilities for research and teaching in industrial hygiene and toxicology, and study space for residents in occupational medicine and other graduate students. For additional information, call (949) 824-8641.

ADDITIONAL FACILITIES

Information about many other UCI research and instructional facilities and programs is available in the academic unit sections and the Research and Graduate Studies section of this *Catalogue,* as well as online at http://www.uci.edu/instruction.html.

University Advancement

University Advancement is responsible for creating awareness, building relationships, and generating support for UCI's teaching, research, and public service missions. This is accomplished through strategic efforts made by University Advancement's "Centers of Excellence," which include alumni relations, community and government relations, health sciences advancement, and development. These combined efforts provide a bridge between the University and the community, promoting a climate of understanding, access, and support. For additional information, contact University Advancement at (949) 824-8696.

The Office of Alumni Relations and the UCI Alumni Association are committed to serving, connecting, and engaging alumni to advance the University. UCI's 80,000 alumni have taken the wisdom and education they received and have had a tremendous impact within the spheres of science, art, literature, politics, business, education, and beyond. Many alumni give their time and resources to their alma mater by providing financial contributions, returning to campus as speakers, and volunteering to serve on various boards and committees. For additional information, contact the Alumni Association at (949) 824-2586.

The Office of Community and State Government Relations is responsible for enhancing public understanding and support of UCI and the University of California. The program works to ensure that the University's mission and legislative and budgetary objectives are given due consideration by elected officials and the general public. Community and State Government Relations provides leadership for building effective and enduring relationships with community leaders, public policy makers, and other members of the public to increase the visibility and prominence of UCI's research, teaching, and service mission. For additional information, contact Community and State Government Relations at (949) 824-5227.

Health Sciences Advancement creates awareness, builds relationships, and generates support for health sciences initiatives at the University. One such initiative is the construction of UCI Medical Center's new hospital in Orange. The new facility, planned for completion in early 2009, will accommodate advanced health care technology and will strengthen UCI's ability to provide specialized medical and surgical treatments to the citizens of Orange County and beyond. For additional information, contact Health Sciences Advancement at (949) 824-6136.

In an era of decreasing State support to the University of California, the importance of private support is greater than ever. The Office of Development, in conjunction with the UCI Foundation, raises private funds from individuals, corporations, and foundations for the University. UCI's development program works hand-in-hand with UCI schools and programs to secure major gifts to support faculty priorities; assists donors who wish to include UCI in their wills or estate plans through gift planning; and secures a large number of annual gifts through the Chancellor's Club and Annual Fund. In addition, numerous support groups offer affiliation with academic units, athletics, and student programs. For additional information, contact the Office of Development at (949) 824-5709.

UCI ACADEMIC SENATE DISTINGUISHED FACULTY

SUE PIPER DUCKLES

Daniel G. Aldrich Jr. Distinguished University Service Award, 2004-05

Associate Dean for Faculty Development, School of Medicine, and Professor of Pharmacology

Sue Piper Duckles was born and educated in Oakland, California. She received a B.A. in Philosophy from UC Berkeley in 1968 and a Ph.D. in Pharmacology from UC San Francisco in 1973. After postdoctoral studies at UCLA, she was appointed Assistant Professor in Residence in 1976. In 1979 she joined the Department of Pharmacology at the University of Arizona, subsequently moving to UCI in 1985 where she joined the Department of Pharmacology. Since 1968 she has been married to Lawrence Duckles. They have two sons, Ian and Galen. In 2004 Ian Duckles received a Ph.D. in Philosophy from UCI. Galen Duckles teaches and coaches water polo and track at University High School in Irvine.

Professor Duckles' research interests focus on the unique properties of the cerebral circulation. She is currently investigating the effects of estrogen and testosterone on the function of the cerebral circulation. Her work demonstrates that the vasodilator function of the endothelium is enhanced after estrogen exposure, but suppressed by testosterone. Chronic estrogen treatment increases the vasodilator function of cerebrovascular endothelium, via both genomic and non-genomic actions, effects that are mediated by the alpha form of the estrogen receptor. Estrogen and testosterone also affect the vascular inflammatory response with important implications in cerebrovascular disease, such as stroke. When animals are pre-treated with estrogen, the vascular inflammatory response is sharply suppressed. In contrast, prior treatment with testosterone augments this response. Similarly, in a rodent stroke model, the increase in vascular cyclooxyenase-2 is markedly suppressed in estrogen-treated animals. All of these actions of gonadal steroids on the cerebral circulation may contribute to the well-known gender differences in incidence and severity of stroke.

Professor Duckles also devotes considerable time to service and administrative activities. She has chaired and been a member of numerous committees and task forces at all levels, and from 1990 to 1992 served as Chair of the UCI Academic Senate. From 1993 to the present she has served as Associate Dean for Faculty Development in the School of Medicine where she has developed innovative programs to support the career development of junior faculty, including Strategic Planning sessions to assist beginning faculty to set and revise short- and long-term goals. Many of the programs she developed were subsequently incorporated into the UCI National Science Foundation (NSF) ADVANCE Program, where they have contributed to the recruitment, promotion, and retention of women faculty across the campus. Professor Duckles served as equity advisor for the NSF program in its first two years at UCI.

Professor Duckles has also been an active leader at both the national and international levels. She served as President of the Western Pharmacology Society, President of the American Society for Pharmacology and Experimental Therapeutics (ASPET), and as a member of the Board of Directors and Vice President for Science Policy for the Federation of American Societies for Experimental Biology (FASEB). In 2000 she became founding Chair of the Editorial Board for a new ASPET publication, *Molecular Interventions*. Professor Duckles currently serves as Secretary-General of the International Union of Pharmacology.

JONATHAN LEE FENG

Distinguished Assistant Professor Award for Research, 2004-05

Associate Professor of Physics

I was born in Ann Arbor, Michigan, but spent most of my childhood in the San Francisco Bay Area. As an undergraduate at Harvard I started in mathematics. Halfway through, however, I became more fascinated by the power of advanced mathematics to describe the universe than by the advanced mathematics itself. When a prominent math professor warned me that "mathematicians spend most of their life working by themselves, so you better not mind that," I switched to physics.

Upon graduation I went to Cambridge University as a Marshall Scholar to study cosmology under Stephen Hawking. When I got there, however, I found that I was not the only one with that idea, and Hawking typically picked his students based on performance in the Cambridge exams. I spent the next two years studying a wide variety of topics for these exams, traveling in Europe, and playing trumpet in orchestras and brass ensembles at the rate of a concert a week. Ironically, when Hawking finally called me in to offer me a position, I had my heart set on returning to the U.S. and instead headed to Stanford to get a Ph.D. in theoretical particle physics.

I now study topics that combine my early interests in cosmology and particle physics. These fields might appear to be completely different, with one concerned with the universe as a whole, and the other concerned with its smallest building blocks. We live at a remarkable time, however. In recent years, our most powerful telescopes have weighed the universe and determined that the known particles make up only five percent of its mass, providing the strongest evidence to date for new particles. At the same time, our most powerful microscopes, in the form of giant particle colliders, now recreate conditions that existed in the universe just a fraction of a second after the Big Bang, providing a window on the early history of the universe. Studies of the universe at the largest- and smallest-length scales are therefore now intimately connected. In collaboration with other faculty, postdocs, and graduate students, I am investigating a number of subjects that exploit this synergy, including dark matter, dark energy, supersymmetry, and extra dimensions.

SVETLANA JITOMIRSKAYA

Distinguished Mid-Career Award for Research, 2004-05

Professor of Mathematics

Professor Jitomirskaya's biography is available via the UCI Academic Senate's Web site at http://www.senate.uci.edu/.

DAVID P. KIRBY

Distinguished Assistant Professor Award for Teaching, 2004-05

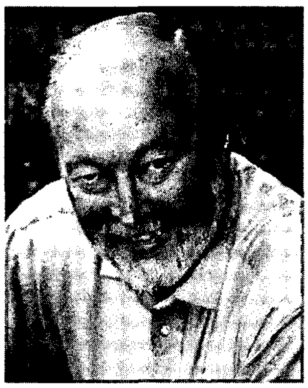
Associate Professor of Physics

I was born in Cambridge, England, and spent my first eight years moving around England with brief stints in Mexico and Iran. I then moved to Toronto, Canada, and quickly lost my British accent. I stayed in Toronto through my undergraduate degree, in math and physics, where I had my first taste of research and got hooked on the broad array of challenges that experimental particle physics offers. Earlier, I had been torn between careers in music and physics.

I moved to Caltech for graduate school, but only spent two years in Pasadena before moving to the European Particle Physics Lab (CERN), near Geneva, Switzerland. Fortunately, that was enough time to meet my future wife, Anne, a fellow graduate student. We both spent the next four years at CERN, collaborating with about 500 other physicists to analyze the debris from collisions of electrons and positrons (anti-electrons) accelerated to almost the speed of light, using a detector about the size of a house packed with custom-built sensors and electronics. Large collaborations and apparatus are one of the hallmarks of my field.

After getting married, starting a family, and completing my Ph.D. in Europe, I returned to California as a postdoc at Stanford University to work on a similar particle physics project, called BABAR, at the Stanford Linear Accelerator Center (SLAC). The ultimate goal of BABAR is to shed new light on one of the least understood aspects of particle physics: Why does the universe contain more matter than antimatter today?

I came to UCI three years ago, continuing my work on BABAR, and got my first real taste of teaching. Like many assistant professors, I found this to be a humbling but invigorating experience. In my second year at UCI, I was fortunate to have the opportunity of finally combining my interests in music and physics in creating a new course for non-science majors that covers the physical foundations of the production (by musical instruments), transport (via sound waves), and perception (through the electromechanics of the ear and brain) of musical sound.



DONALD G. SAARI

Distinguished Faculty Award for Research, 2004-05

Director of the Institute for Mathematical Behavioral Sciences and UCI Distinguished Professor of Economics and Mathematics

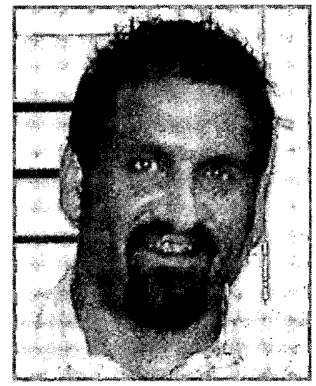
I grew up in the beautiful Upper Peninsula of Michigan. To see where, find the part of Michigan that is above Wisconsin; my hometown is on the thumb sticking into the frigid waters of Lake Superior. By its location, you can appreciate why in the midst of winter, where we could have 400 inches of snowfall, people would bundle up and drive south to warm up in, say, Green Bay or Minneapolis. Reflecting the advantages of the region, much of my youth was spent skiing, camping, scouting, sailing, acting in class plays, involved in athletics, exploring abandoned mines; i.e., a great time! As an undergraduate at Michigan Technological University I had a triple major—social life, campus politics, and athletics, but with a strong minor in mathematics. While I always had high grades, it took graduate school (Purdue) to totally turn me on to academics—so much so that I would fall in love with whatever mathematics topic I happened to be studying at the moment; well, until the next term when I discovered still another topic! So, for me, being an academic was, and is, like being a kid in a candy store. I finally settled on dynamics where my thesis analyzed the collision orbits of the Newtonian N-body problem. The best thing I ever did in life happened in graduate school: I met, fell in love, and married Lillian (Kalinen), another Finnish-American. We have two married daughters, Katri and Anneli, and five grandchildren.

Lillian and I moved to New Haven for my postdoctoral position in the Yale University Astronomy Department. A year later I joined the Mathematics Department at Northwestern University where I served as department chair and became the first Pancoe Professor of Mathematics. Much of my early research (that continues) centered on dynamical issues such as the evolution of the universe. This raises a question: how does a "physical scientist" become a "social scientist"? In my case, by teaching and chatting with bright graduate and undergraduate students from economics where I discovered and became fascinated by the challenges of economics and the social sciences. Motivated by many conversations with students and faculty from the social sciences, my research shifted to emphasize dynamics, such as the "Invisible Hand" story, and to modify dynamical concepts to address concerns from the social and behavioral sciences. Professor Duncan Luce invited me to spend a term at UCI where he started recruiting me. I became intrigued by the innovative, high-powered research being done here at the Institute for Mathematical Behavioral Sciences and the School of Social Sciences, so after three decades at NU, in July 2000, Lillian and I moved to UCI.

I am the Chief Editor of the *Bulletin of the American Mathematical Society* and on editorial boards of several journals on analysis, dynamics, economics, and decision analysis. I am a member of the National Academy of Sciences, a Guggenheim Fellow, the past chair of the U.S. National Committee of Mathematics, chair of the U.S. delegation to the 2002 general assembly of the International Mathematical Union, and a member of several National Research Council committees. My honorary doctorates come from Purdue, Université de

Caen, and Michigan Technological University. I am particularly proud of receiving over 10 awards for teaching, being honored (twice at Northwestern) by students as a "Most Influential Professor," and my 20-year service as "Santa Claus" for departmental Christmas parties.

GEORGE E. TITA



Distinguished Assistant Professor Award for Teaching, 2004-05

Assistant Professor of Criminology, Law and Society

I grew up in the shadows of a steel mill in a small town in Western Pennsylvania and attended the University of Pittsburgh. As a student of Soviet history and Eastern European Studies, I learned from professors who genuinely cared about extracting their students' best efforts. I am most indebted to William Chase and the late Robert G. Colodny who opened my eyes to critical thinking, inspired me to challenge conventional wisdom, and awoke my intellectual curiosity. I dedicate a significant amount of credit for making me worthy of this award to my earliest mentors.

After graduation I headed to the Johns Hopkins School of Advanced International Studies in Washington, D.C. My goal was to work in the area of U.S.-Soviet relations, but I was struggling with learning the Russian language. I left school and spent several years living in D.C. and working in various blue- and white-collar jobs. I witnessed and experienced the social and economic struggles of many inner-city inhabitants. Then it occurred to me: I didn't need to help repair U.S.-Soviet relations—I needed to help repair our urban centers.

I entered Carnegie Mellon University H. John Heinz III School of Public Policy and Management to pursue an M.S. in economic development and policy, hoping to become a program director or policy analyst dealing with issues of urban decline. However, after conducting real social science research with the faculty, I realized that in order to make lasting impacts on such urban maladies as concentrated poverty, unemployment, and crime, one must first understand the root causes of such problems. Under the expert tutelage of Jacqueline Cohen and Alfred Blumstein, I conducted an ecological study of gangs and their impact on levels of crime in local communities and received rigorous methodological training and a greater appreciation for asking appropriate questions and designing defensible research designs.

Prior to joining UCI, I spent two years at the RAND Corporation directing a National Institute of Justice-funded gun-violence reduction program in the Boyle Heights neighborhood of Los Angeles. Currently, I am working with a team from RAND, Harvard, Northeastern University, and UC Davis along with representatives from local, state, and federal agencies to devise interventions to disrupt L.A.'s illegal gun markets. In addition to various professional societies, I am a member of the National Consortium on Violence Research, a center funded by the National Science Foundation to advance basic scientific knowledge about the causes and factors contributing to interpersonal violence.

Because of the profound impact that conducting real social science research had on me, I demand that my students move beyond classroom learning at every opportunity. In my Geographic Information Systems course, students join work teams and conduct analysis for a local client. I also enjoy sponsoring undergraduates in directed studies courses. There is no shortage of talented undergraduates at UCI. The "problem" for academics wanting to engage them is that competition for their talents is fierce. Many students who pursue a professional or business graduate degree do so without being exposed to the the full breadth of research activities that consume much of an academic's life. While it remains unclear whether any of my undergraduate research assistants will eventually pursue a graduate degree in the social sciences, I only hope that their exposure to conducting research and analyzing the social world will engage their intellectual curiosity and inspire them, in the same way that my mentors engaged and inspired me.

PREADMISSION MATTERS

OFFICE OF ADMISSIONS AND RELATIONS WITH SCHOOLS

The mission of the Office of Admissions and Relations with Schools, a division of Student Affairs, is to: (1) optimize UCI's undergraduate enrollments by implementing Academic Senate, universitywide, and campus policies for the selection and admission of new freshman and transfer students; and (2) stimulate and advance cooperative educational relationships between UCI and California schools and colleges. The Office works to improve the preparation of prospective students for higher education and to promote their access to and success at UCI.

Additional information about the services listed below is available from the Office; telephone (949) 824-6703; World Wide Web: http://www.admissions.uci.edu/.

Undergraduate Admissions

Staff are involved in monitoring applications and admission targets, in collecting and evaluating personal and academic data to select and admit new undergraduate students, in establishing students' permanent UCI academic record, and in evaluating for transfer credit course work taken in other colleges and universities by new and continuing students.

Intersegmental Relations

Staff are involved in: (1) promoting liaison and curricular articulation between UCI and California Community Colleges; and (2) various educational organizations designed to facilitate regional cooperation (South Coast Higher Education Council, Southern California Intersegmental Articulation Council).

School and College Relations

Staff: (1) advise prospective students, their parents, teachers, counselors, and school administrators regarding academic programs, admission requirements, and admission selection, and assist them with UC application and enrollment processes; (2) increase public awareness by making presentations to schools, colleges, and the community regarding UCI and the University of California, and by creating publications which explain admissions policies and procedures, academic options, housing, financial aid, and student life opportunities; (3) provide general information on UC admissions and programs for all UC campuses; (4) interpret University policies and procedures specific to undergraduate enrollment; (5) assist prospective transfer students and community college faculty and staff; (6) participate in activities and projects designed to enhance the academic success of students; and (7) sponsor an Academic Talent Search to identify gifted and high-ability sixth- through tenth-grade students and to design activities to prepare them for the University and promote their academic success.

On-Campus Services

Staff: (1) host programs for prospective students and educational groups; (2) offer activities for applicants such as Explore UCI and the Campus Experience program (spring); (3) maintain an honors outreach program for high-achieving prospective UCI students including the UCI Academic Talent Search; (4) inform UC and UCI administrators and faculty of developments in California schools and community colleges; and (5) provide consultative services to campus departments wishing to provide programs for schools and colleges or special recruitment for specific majors or programs.

Transfer Student Services

Transfer Student Services (TSS), a component of the Office of Admissions and Relations with Schools, provides advice and guidance to prospective UCI transfer students. Staff regularly visit Southern California community colleges and meet with prospective transfer students to discuss admission requirements, academic planning and preparation, and UCI lower-division major and general education requirements. Articulation agreements, which identify how community college courses may be used to fulfill lower-division UCI degree requirements, are facilitated through TSS. Articulation agreements may be viewed on the World Wide Web at http://www.assist.org/.

CAMPUS TOURS

Student-led tours of the campus are conducted weekdays at noon, except during academic recesses; Saturday tours are offered during October, November, and April only. To confirm tour dates, times, and parking instructions and to arrange tours for school groups of 10 or more during the regular academic year, call (949) 824-4636 or visit http://www.campustours.uci.edu.

HOW TO USE THE CATALOGUE

Because the *UCI General Catalogue* must be prepared well in advance of the year it covers, changes in some programs and courses inevitably will occur. The selection of courses to be offered each quarter is subject to change without notice, and some courses are not offered each year. The *WebSOC, Searchable Schedule of Classes,* available on the Registrar's Office Web site (http://www.reg.uci.edu) shortly before registration begins each quarter, provides more current information on courses, instructors, enrollment procedures and restrictions, class hours, room assignments, and final examination schedules. Students should consult the appropriate academic unit for even more up-to-date information. (Admission to UCI does not guarantee enrollment in any particular course.)

Presentation of information in the *Catalogue* is divided into five main concepts, as detailed in the Table of Contents: (1) Introduction to UCI, (2) Preadmission Matters, (3) Information for Admitted Students, (4) Research and Graduate Studies, and (5) Academic Programs.

Included in the academic unit sections are the following kinds of information: (a) brief descriptions of the areas that are covered in each school or program and a brief statement of the educational philosophy and orientation of the unit; (b) lists of faculty members, the institutions from which they received their highest degrees, and their areas of interest; (c) requirements for undergraduate majors and minors and graduate degrees; (d) additional areas of study referred to as concentrations, specializations, or emphases; (e) advice about planning a program of study, and other information relevant to the academic progress and experience of students majoring in fields within each school or program; and (f) courses offered.

Course Listings

Undergraduate courses are classified as lower division (numbered 1–99) and upper division (numbered 100–199). Courses numbered 200 and above are graduate or professional courses. Lower division usually refers to freshman-sophomore courses, upper division to junior-senior courses. However, junior and senior students may take lower-division courses, and freshmen and sophomores may normally take upper-division courses when upper-division standing

UNDERGRADUATE AND GRADUATE DEGREES

Degree Title	Degree [1]
Aerospace Engineering	B.S.
African American Studies	B.A.
Anthropology	B.A., M.A.[3], Ph.D.
Applied Ecology	B.S.
Art History	B.A.
Arts and Humanities	B.A.
Asian American Studies	B.A.
Biochemistry and Molecular Biology	B.S.
Biological Sciences	B.S., M.S.[2], Ph.D.
Biomedical Engineering	B.S., M.S., Ph.D.
Biomedical Engineering: Premedical	B.S.
Business Administration	M.B.A.
Chemical and Biochemical Engineering	M.S., Ph.D.
Chemical Engineering	B.S.
Chemistry	B.S., M.S.[3, 4], Ph.D.
Chicano/Latino Studies	B.A.
Chinese Language and Literature	B.A.
Civil Engineering	B.S., M.S., Ph.D.
Classical Civilization	B.A.
Classics	B.A., M.A.[3], Ph.D.[5]
Comparative Literature	B.A., M.A.[3], Ph.D.
Computer Engineering	B.S.
Computer Science	B.S.
Computer Science and Engineering	B.S.[6]
Criminology, Law and Society	B.A., M.A.S., Ph.D.
Dance	B.A., B.F.A., M.F.A.
Developmental and Cell Biology	B.S.
Drama	B.A., M.F.A.
Drama and Theatre	Ph.D.[7]
Earth and Environmental Sciences	B.S.
Earth System Science	M.S.[3], Ph.D.
East Asian Cultures	B.A.
East Asian Languages and Literatures	M.A.[3], Ph.D.
Ecology and Evolutionary Biology	B.S.
Economics	B.A., M.A.[3], Ph.D.
Education	Credential Programs
Educational Administration and Leadership	Ed.D.[8]
Electrical and Computer Engineering	M.S., Ph.D.
Electrical Engineering	B.S.
Elementary and Secondary Education	M.A.T.
Engineering	B.S., M.S., Ph.D.
English	B.A., M.A.[3], M.F.A., Ph.D.
Environmental Analysis and Design	B.A.
Environmental Engineering	B.S.
Environmental Health Science and Policy	M.S., Ph.D.
Environmental Toxicology	M.S., Ph.D.

Degree Title	Degree [1]
European Studies	B.A.
Film and Media Studies	B.A.
Fine Arts	M.F.A.
French	B.A., M.A.[3], Ph.D.
Genetic Counseling	M.S.
Genetics	B.S.
German	M.A.[3], Ph.D.
German Studies	B.A.
Global Cultures	B.A.
History	B.A., M.A., Ph.D.
Humanities	B.A.
Humanities and Arts	B.A.
Informatics	B.S.[6]
Information and Computer Science	B.S., M.S., Ph.D.
International Studies	B.A.
Japanese Language and Literature	B.A.
Linguistics	B.A.[9]
Literary Journalism	B.A.
Management	Ph.D.
Materials Science and Engineering	M.S., Ph.D.
Materials Science Engineering	B.S.
Mathematics	B.S., M.S.[4], Ph.D.
Mechanical and Aerospace Engineering	M.S., Ph.D.
Mechanical Engineering	B.S.
Medicine	M.D.
Music	B.A., B.Mus., M.F.A.
Networked Systems	M.S., Ph.D.
Neurobiology	B.S.
Pharmacology and Toxicology	M.S.[3], Ph.D.
Philosophy	B.A., M.A.[3], Ph.D.
Physics	B.S., M.S.[3], Ph.D.
Planning, Policy, and Design	Ph.D.
Plant Biology	B.S.
Political Science	B.A., Ph.D.
Psychology	B.A., Ph.D.
Psychology and Social Behavior	B.A., Ph.D.
Social Ecology	B.A., M.A., Ph.D.
Social Science	B.A., M.A.[10], Ph.D.
Sociology	B.A., M.A.[3], Ph.D.
Spanish	B.A., M.A., Ph.D.
Studio Art	B.A., M.F.A.
Transportation Science	M.S., Ph.D.
Urban and Regional Planning	M.U.R.P.
Visual Studies	M.A.[3], Ph.D.
Women's Studies	B.A.

[1] Degrees: B.A. = Bachelor of Arts; B.F.A. = Bachelor of Fine Arts; B.S. = Bachelor of Science; B.Mus.= Bachelor of Music; Ed.D. = Doctor of Education; M.A. = Master of Arts; M.A.S. = Master of Advanced Study; M.A.T. = Master of Arts in Teaching; M.F.A. = Master of Fine Arts; M.S. = Master of Science; M.B.A. = Master of Business Administration; M.D. = Doctor of Medicine; M.U.R.P. = Master of Urban and Regional Planning; Ph.D. = Doctor of Philosophy. Titles of degrees may not correspond exactly with specific fields of study offered; see the Index and the academic unit sections for information.

[2] Emphasis at the graduate level is on study leading to the Ph.D. degree; the M.S. degree may be awarded to Ph.D. students after fulfillment of the appropriate requirements. However, students may apply directly to the M.S. concentration in Biotechnology and in Ecology and Evolutionary Biology.

[3] Emphasis at the graduate level is on study leading to the Ph.D. degree; the master's degree may be awarded to Ph.D. students after fulfillment of the appropriate requirements.

[4] In addition to the regular M.S. degree program, a program coordinated with the Department of Education leads to an M.S. degree and a Teaching Credential.

[5] UCI, UCR, and UCSD joint program.

[6] Admission will be available to junior-level transfer students effective fall 2006.

[7] UCI and UCSD joint program.

[8] UCI and CSU Fullerton, Long Beach, Los Angeles, and Pomona joint program.

[9] Admission to this program is not available in 2006–07.

[10] Emphasis at the graduate level is on study leading to the Ph.D. degree; the M.A. degree may be awarded to Ph.D. students after fulfillment of the appropriate requirements. However, students may apply directly to the M.A. program in Social Science with a concentration in Demographic and Social Analysis; the M.A. program in Social Science with a concentration in Mathematical Behavioral Sciences is also available to applicants who are in a Ph.D. program at another institution.

NOTE: Although UCI is authorized to grant the following degrees, admission to these programs is not available: Arts Interdisciplinary, B.A.; Business Administration, M.B.P.A.; Comparative Culture, B.A., M.A., M.A.T., Ph.D.; Educational Administration (joint program with UCLA), Ed.D.; Educational Technology Leadership, M.A.; Geography, B.A.; Health Psychology, Ph.D.; Human Development, Ph.D.; Public Administration, M.B.P.A., M.P.A.; Radiological Sciences, M.S., Ph.D.; Russian, B.A.; Spanish, M.A.T.; Urban and Regional Planning, Ph.D.

is not a prerequisite and when any other prerequisites have been met. A course has no prerequisites unless indicated.

Courses with sequential designations (for example, 1A-B-C) normally indicate multiple-quarter courses; *except as noted, each course in a sequence is prerequisite to the one following.* The letter L following a number usually designates a laboratory course. The letter H preceding a number designates an honors course.

The (4) or (4-4-4) designation following the course title indicates the quarter unit credits toward graduation. Some courses give other than four units of credit; for example, two, five, or a range from one to 12.

The notations F, W, S, or Summer after the course number and title indicate when the course will be offered: fall, winter, or spring quarter, or summer session.

When a course is approved for satisfaction of the UCI breadth requirement, the breadth category is indicated by a Roman numeral in parentheses at the end of the description. However, courses which have been approved to fulfill the upper-division writing requirement are *not* designated in this *Catalogue.* Rather, they are designated in the quarterly *WebSOC, Searchable Schedule of Classes* with a W following the number. Students should refer to the *WebSOC* link at http://www.reg.uci.edu for a complete listing of approved upper-division writing courses.

UNDERGRADUATE MAJORS, MINORS, AND ASSOCIATED AREAS OF STUDY

Students are urged to become informed of and understand all requirements concerning their intended majors, minors, and associated areas of study. Special restrictions apply to some majors and minors; for example, some minors require formal application or declaration by students, others may be completed without such formalities. Information about the programs listed below may be found in the academic unit sections of the *Catalogue.*

Undergraduate majors are offered in all of the bachelor's degree programs on the list of degree titles; the degree programs are referred to as majors in the following list. In association with these majors, UCI offers a number of minors, concentrations, specializations, and emphases.

A **minor** consists of a coordinated set of courses (seven or more) which together take a student well beyond the introductory level in an academic field, subject matter, and/or discipline but which are not sufficient to constitute a major. An **interdisciplinary minor** consists of courses offered by two or more schools or programs. Generally, all minors are available to all students, with the following exceptions: (1) students may not minor in their major, and (2) students may not complete certain other major/minor combinations that are expressly prohibited, as noted in the *Catalogue.* Minors are listed on a student's transcript but not on the baccalaureate diploma.

A **concentration** is a program of interdisciplinary study consisting of courses offered by two or more schools or programs. Concentrations are similar to minors in that they require fewer units of work than majors do, and the area of concentration appears on the student's transcript but not on the baccalaureate diploma. Concentrations are taken in combination with a major in one of the schools or programs offering the concentration.

A **specialization** is a program of study which enables students to focus on courses in a particular field within a major. The area of specialization pursued appears on the student's transcript but not on the baccalaureate diploma.

An **emphasis** is a program of study within a major which emphasizes a specific area of the discipline. Emphases usually have a defined course of study and are not listed on the transcript nor on the baccalaureate diploma.

In addition, the Campuswide Honors Program, various major-specific honors programs, and Excellence in Research programs are available. See the Division of Undergraduate Education section for information.

CLAIRE TREVOR SCHOOL OF THE ARTS

Majors:
- Arts and Humanities
- Dance
  - Specializations (B.F.A. only):
    - Choreography
    - Performance
- Drama
- Music
  - Emphases (B.A. only):
    - Analysis
    - History
    - Jazz
    - Performance
  - Specializations (B. Mus. only):
    - Bassoon
    - Clarinet
    - Composition
    - Contrabass
    - Flute
    - French Horn
    - Harp
    - Jazz Instrumental
    - Lute and Guitar
    - Oboe
    - Percussion
    - Piano
    - Saxophone
    - Trombone
    - Trumpet
    - Tuba
    - Viola
    - Violin
    - Violoncello
    - Voice
  - Special String Performance
- Studio Art
  - Specialization: Game Culture and Technology

Minors:
- Digital Arts
- Drama
- Studio Art

Concentration: Medieval Studies (in combination with any major in the Claire Trevor School of the Arts or the School of Humanities)

SCHOOL OF BIOLOGICAL SCIENCES

Majors:
- Biochemistry and Molecular Biology
- Biological Sciences
- Developmental and Cell Biology
- Ecology and Evolutionary Biology
- Genetics
- Neurobiology
- Plant Biology
- Applied Ecology (offered jointly with the School of Social Ecology)

Minor: Biological Sciences

DEPARTMENT OF EDUCATION

Minor: Educational Studies

THE HENRY SAMUELI SCHOOL OF ENGINEERING

Majors:
- Aerospace Engineering
- Biomedical Engineering
  - Specialization: Biophotonics
- Biomedical Engineering: Premedical
- Chemical Engineering
  - Specializations:
    - Biochemical Engineering
    - Environmental Engineering
    - Materials Science
- Civil Engineering
  - Concentrations:
    - Computer Applications
    - Engineering Management
    - Infrastructure Planning
    - Mathematical Methods
  - Specializations:
    - General Civil Engineering
    - Environmental Hydrology and Water Resources
    - Structural Engineering
    - Transportation Information and Control Systems
- Computer Engineering
- Computer Science and Engineering (offered jointly with the Donald Bren School of Information and Computer Sciences)
  - Tracks:
    - Algorithms
    - Artificial Intelligence
    - Embedded Systems
    - Parallel Computing
- Electrical Engineering
  - Specializations:
    - Electro-optics and Solid-State Devices
    - Power Electronics and Power Systems
    - Systems and Signal Processing
- Engineering
- Environmental Engineering
- Materials Science Engineering
  - Specialization: Electronics Processing and Materials
- Mechanical Engineering
  - Specializations:
    - Aerospace Engineering
    - Energy Systems and Environmental Engineering
    - Flow Physics and Propulsion Systems
    - Mechanical Systems, Design, and Computation

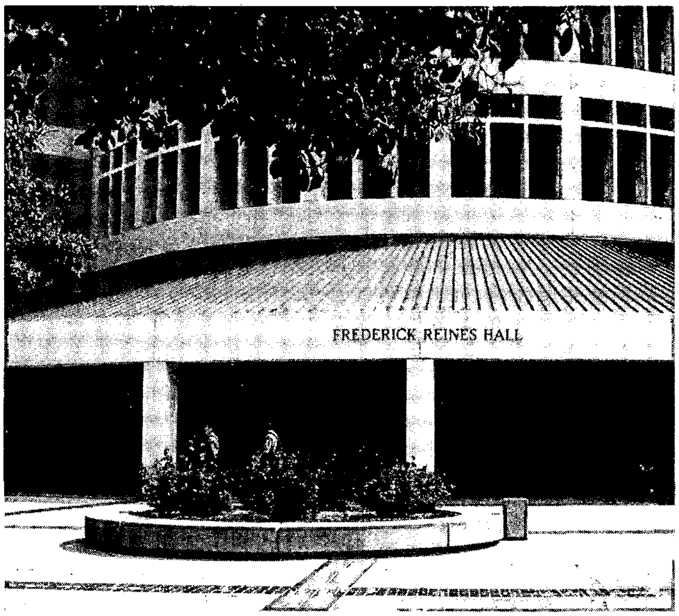
Minors:
- Biomedical Engineering
- Materials Science Engineering

SCHOOL OF HUMANITIES

Majors:
- African American Studies
- Art History
- Asian American Studies
- Chinese Language and Literature
- Classical Civilization
- Classics
  - Emphases:
    - Greek
    - Latin
    - Linguistics
- Comparative Literature
- East Asian Cultures
- English
  - Emphases:
    - Creative Writing
    - Literary Criticism
- European Studies
  - Emphases:
    - British Studies
    - Early Modern Europe
    - Encounters with the Non-European World
    - French Studies
    - German Studies
    - Italian Studies
    - Medieval Studies
    - The Mediterranean World: Past and Present
    - Modern Europe (1789–Present)
    - Russian Studies
    - Spanish-Portuguese Studies
- Film and Media Studies
- French
- German Studies
- Global Cultures
  - Emphases:
    - Atlantic Rim
    - Hispanic, U.S. Latino/Latina, and Luso-Brazilian Culture
    - Locating Africas (Nation, Culture, and Diaspora)
    - Locating Asias (Nation, Culture, and Diaspora)
    - Locating Europes and European Colonies
    - Pacific Rim
    - Inter-Area Studies
- History
- Humanities and Arts
- Humanities (Interdisciplinary)
- Japanese Language and Literature
- Literary Journalism
- Philosophy
- Spanish
  - Emphases:
    - Language and Culture
    - Literature and Culture
- Women's Studies

Minors:
- African American Studies
- Art History
- Asian American Studies
- Asian Studies
- Chinese Language and Literature
- Classical Civilization
- Comparative Literature
- English
- European Studies
- Film and Media Studies
- French
- German Studies
- Global Cultures
- Greek
- History
- Humanities and Law
- Italian Studies
- Japanese Language and Literature
- Latin
- Latin American Studies
- Philosophy
- Portuguese
- Queer Studies
- Religious Studies
- Russian Studies
- Spanish
- Women's Studies

Concentration: Medieval Studies (in combination with any major in the Claire Trevor School of the Arts or the School of Humanities)



DONALD BREN SCHOOL OF INFORMATION AND COMPUTER SCIENCES

Majors:
- Computer Science
- Computer Science and Engineering (offered jointly with The Henry Samueli School of Engineering)
  - Tracks:
    - Algorithms
    - Artificial Intelligence
    - Embedded Systems
    - Parallel Computing
- Informatics
- Information and Computer Science
  - Specializations:
    - Artificial Intelligence
    - Computer Systems
    - Implementation and Analysis of Algorithms
    - Information Systems
    - Networks and Distributed Systems
    - Software Systems

Minors:
- Informatics
- Information and Computer Science

INTERDISCIPLINARY STUDIES

Major: Chicano/Latino Studies

Minors:
- Chicano/Latino Studies
- Global Sustainability
- History and Philosophy of Science
- Native American Studies

THE PAUL MERAGE SCHOOL OF BUSINESS

Minors:
- Accounting
- Management

3-2 Program: Available to outstanding undergraduates in all majors*

* School of Engineering majors should contact their academic counselor.

SCHOOL OF PHYSICAL SCIENCES

Majors:
- Chemistry
  - Concentrations:
    - Biochemistry
    - Chemistry Education
- Earth and Environmental Sciences
- Mathematics
  - Concentration: Mathematics for Economics
  - Specializations:
    - Applied and Computational Mathematics
    - Mathematics for High School Teaching
    - Statistics
- Physics
  - Concentrations:
    - Applied Physics
    - Biomedical Physics
    - Computational Physics
    - Philosophy of Physics
    - Physics Education
  - Specialization: Astrophysics

Minors:
- Earth and Atmospheric Sciences
- Mathematics

SCHOOL OF SOCIAL ECOLOGY

Majors:
- Criminology, Law and Society
- Environmental Analysis and Design
- Psychology and Social Behavior
- Social Ecology
- Applied Ecology (offered jointly with the School of Biological Sciences)

Minors:
- Criminology, Law and Society
- Environmental Analysis and Design
- Environmental Design
- Epidemiology and Public Health
- Psychology and Social Behavior
- Urban and Regional Planning

SCHOOL OF SOCIAL SCIENCES

Majors:
- Anthropology
- Economics
- International Studies
- Linguistics (Admission is not available in 2006–07.)
- Political Science
- Psychology
- Social Science
  - Specializations:
    - Multicultural Studies
    - Public and Community Service
    - Research and Social Policy
    - Social Sciences for Secondary School Education
- Sociology

Minors:
- Anthropology
- Conflict Resolution
- Linguistics
- Political Science
- Psychology
- Sociology

AREAS OF GRADUATE STUDY

For information about any area of graduate or professional study, including the precise title of the degree conferred, consult the *Catalogue's* academic unit sections.

Claire Trevor School of the Arts

Accompanying
Acting
Arts Computation Engineering
Choral Conducting
Composition and Technology
Dance
Design and Stage Management
Directing
Drama
Drama and Theatre
Guitar/Lute Performance
Instrumental Performance
Jazz Instrumental/Composition
Orchestral Conducting
Piano Performance
Studio Art
Vocal Performance

School of Biological Sciences

Anatomy and Neurobiology[1, 2]
Biological Chemistry[1, 2]
Biological Sciences
Biotechnology
Developmental and Cell Biology[2]
Ecology and Evolutionary Biology
Experimental Pathology[1, 2]
Microbiology and Molecular Genetics[1, 2]
Molecular Biology and Biochemistry[2]
Neurobiology and Behavior
Neuroscience[3]
Physiology and Biophysics[1, 2]
Protein Engineering Science[4]

Department of Education

Educational Administration and Leadership
Elementary and Secondary Education
Multiple Subject Instruction (elementary)[5]
Single Subject Instruction (secondary)[5]
Bilingual Crosscultural, Language, and Academic Development (BCLAD) Emphasis in Spanish[5]
Preliminary Administrative Services[5]
Professional Clear Administrative Services[5]

The Henry Samueli School of Engineering

Arts Computation Engineering
Biomedical Engineering
Chemical and Biochemical Engineering
Civil Engineering
Computer Graphics and Visualization
Computer Networks and Distributed Computing
Computer Systems and Software
Electrical Engineering
Environmental Engineering
Materials Science and Engineering
Mechanical and Aerospace Engineering
Networked Systems[6]
Protein Engineering Science[4]

Footnotes are listed on the next page.

School of Humanities

Asian American Studies[7]
Art History[8]
Chicano/Latino Literature
Chinese Language and Literature
Classics
Comparative Literature
Creative Nonfiction
Creative Writing: Poetry or Fiction
Critical Theory
East Asian Cultural Studies
East Asian Languages and Literatures
English and American Literature
Feminist Studies[9]
Film and Media Studies[8]
French
German
Greek
History
History of Gender and Sexuality
Humanities
Japanese Language and Literature
Latin
Philosophy
Spanish
Spanish Literature
Spanish-American Literature
Translation Studies
Visual Studies

Donald Bren School of Information and Computer Sciences

Artificial Intelligence
Arts Computation Engineering
Computer Algorithms and Data Structures
Embedded Systems
Informatics
Informatics in Biology and Medicine
Information Access and Management
Information and Computer Science
Knowledge Discovery in Data
Networked Systems[6]
Statistics
Systems

Interdisciplinary Studies

Networked Systems[6]
Transportation Science

The Paul Merage School of Business

Business Administration
Management

School of Physical Sciences

Chemical and Materials Physics
Chemistry
Earth System Science
Mathematics
Physics
Protein Engineering Science[4]

School of Social Ecology

Criminology, Law and Society
Demographic and Social Analysis
Environmental Analysis and Design
Environmental Health Science and Policy
Planning, Policy, and Design
Psychology and Social Behavior
Social Ecology
Urban and Regional Planning

School of Social Sciences

Anthropology
Cognitive Sciences
Demographic and Social Analysis
Economics
Games, Decisions, and Dynamical Systems
Logic and Philosophy of Science
Mathematical Behavioral Sciences
Neuroscience[3]
Political Psychology
Political Science
Psychology
Public Choice
Social Networks
Social Science
Sociology
Transportation Economics
Transportation Science

School of Medicine

Anatomy and Neurobiology[1, 2]
Biological Chemistry[1, 2]
Environmental Toxicology
Experimental Pathology[1, 2]
Genetic Counseling
Medical Residency Programs
Medical Scientist Program (M.D./Ph.D.)
Medicine
Medicine/Business Administration[10]
Microbiology and Molecular Genetics[1, 2]
Neuroscience[3]
Pharmacology and Toxicology
Physiology and Biophysics[1, 2]
Program in Medical Education for the Latino Community (PRIME-LC)

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[1] School of Biological Sciences and School of Medicine joint program.
[2] Combined program in Molecular Biology, Genetics, and Biochemistry.
[3] Interdepartmental program.
[4] Available in conjunction with the Ph.D. programs in Biological Sciences, Chemistry, and Engineering.
[5] Credential program.
[6] Donald Bren School of Information and Computer Sciences and The Henry Samueli School of Engineering joint program.
[7] Available in conjunction with selected graduate programs. Contact Asian American Studies for information.
[8] Graduate program in Visual Studies.
[9] Available in conjunction with selected graduate programs. See the Women's Studies section of the *Catalogue* for information.
[10] School of Medicine and Paul Merage School of Business program.

MAJORS AND CAREERS

Choosing a Major

Many students select their University major, the field of study which represents their principal academic interest, at the time they fill out their *University of California Undergraduate Application for Admission and Scholarship.* Some students, however, are not ready to choose a major at the time they apply, and still others may wish to change to a different major after they have enrolled.

In preparation for choosing a major, students need to familiarize themselves as much as possible with UCI and its academic programs. Entering students are exposed to a wide range of areas of study, and it is not unusual for students to become enthusiastic about academic disciplines previously unfamiliar to them. At UCI a number of traditionally separate academic disciplines have strong interrelationships, so that the academic environment is influenced by broad interactions among disciplines. As a complement to classroom study, UCI encourages its students to become involved in a variety of educational experiences such as independent study, laboratory research, field study, writing workshops, computing, and arts productions. Such experiences can help students identify additional areas of interest.

The *UCI General Catalogue* is a good place to find specific information about programs available and requirements. Students are encouraged to talk to academic counselors and faculty advisors and to go to any department to learn more about its programs of study, its requirements for graduation, and possible enrollment limitations. (Some majors are impacted, that is, more students apply than can be accommodated. See the Undergraduate Admissions section for information.) While advisors may not be familiar with all fields, they can suggest ways to investigate other areas of study and be helpful in planning a lower-division program which will keep several options open. Courses and workshops designed to assist students in choosing a major are offered by the UCI Career Center, the Division of Undergraduate Education, and some of the academic units.

All students are required to choose a major by the time they reach junior status. It is important to look well ahead to this decision and to think about it carefully during the freshman and sophomore years. When considering possible majors, students should keep in mind that some major programs require quite specific preliminary study. At the same time, excessive early concentration could reduce a student's options and could cause the student to need more than four years to obtain the baccalaureate degree. Furthermore, courses required for graduation need to be considered. For these reasons, it is desirable for students to plan their programs carefully and thoughtfully, seeking a balance between exposure to a variety of academic areas and completion of courses which are prerequisite to a major under consideration. A qualified student interested in two areas of study may graduate with a double major by fulfilling the degree requirements of any two programs. Certain restrictions may apply; students should check with their academic advisor.

Each school has its own standards for change of major, and some majors are impacted, as indicated above. Once a student selects a major, or decides to change majors, the student should visit the academic counseling office for their prospective major to obtain current information about prerequisites, program planning, and policies and procedures. In addition, a form called the Undergraduate Petition for Change of Major must be completed. The form is available from academic counselors and the Registrar's Office. All schools with exceptional requirements have major-change criteria approved by the Academic Senate and published on the Division of Undergraduate Education Web site at http://www.due.uci.edu/Change_of_Major.html. Students changing majors may meet the approved major-change criteria of the unit they wish to enter that are in place at the time of their change of major or those in effect up to one year before.

Undecided/Undeclared Students

Students who enter the University as freshmen or sophomores may be uncertain about which major they should choose and may not feel ready to declare their major or even to identify their interests with a particular school. Such students participate in the Undecided/Undeclared Advising Program which is administered by the Division of Undergraduate Education. The goal of this program is to help students make the best informed and most rational choice of a major that is possible. All students at UCI are required to choose their major by the time they reach junior status.

To make a good decision about what major to declare, students should know what programs UCI offers and have some experience with them, have a good knowledge of their own abilities and interests, have clear educational goals, and have a good sense of their vocational goals and of the academic programs at UCI that will provide appropriate preparation. Students in the Undecided/Undeclared Advising Program receive quarterly individualized staff counseling that helps them explore the variety of course offerings on campus, become more aware of their own interests and abilities, formulate sound educational goals, and learn how to prepare for graduate education and/or possible careers. Students also meet with faculty.

To assist students in choosing a major, the program has created a required course designed to expose undecided/undeclared students to a variety of opportunities and resources available to them, and to introduce students to each of the schools and majors offered. In addition, students learn about research and career opportunities within different disciplines. Call (949) 824-6987 for more information.

Courses in Undergraduate Education

University Studies 1 Freshman Experience (2). An introduction to the freshman experience. An overview of the University's aims and resources. Exploration of skills necessary for academic success. Attention is also paid to questions of personal development and career choices. Formerly University Studies 1A.

University Studies 2 UCI—Majors (2). A systematic exploration of UCI's undergraduate majors. Required of Undecided/Undeclared freshmen, but open to all freshmen as space permits. Formerly University Studies 1B.

University Studies 3 Mini-Seminars (1). Designed primarily for freshmen as an introduction to scholarly inquiry. Each section is taught by a faculty member from one of the academic disciplines and presents interesting and challenging topics representing the instructor's interest. Students participate in discussions, presentations, and projects. Some sections may be graded Pass/Not Pass only. May be taken for credit three times.

University Studies 5 Freshman Seminar (2). Same description as University Studies 3.

University Studies 40 Personal Success and Global Perspective (0). Furthers students' understanding of crucial personal and global issues and develops skills necessary for success in applying for prestigious scholarships and in graduate/professional studies. Seminar course with oral presentations, discussions, and written statements receiving particular emphasis. Two units of workload credit only. Prerequisites: minimum 3.7 GPA, sophomore standing; must submit writing sample and receive consent of instructor.

University Studies 50 International Opportunities Program Study Abroad (12). Approved study at a foreign institution through the International Opportunities Program. To enroll, a student must submit a completed and approved International Study Advance Contract to the Center for International Education (CIE). Contact CIE for complete information. May be taken for credit four times.

University Studies 175 Methods and Application in Small Group Instruction (4). Explores various theories and methods of learning and development and their practical application in small group settings. Peer tutors receive instruction in the design, implementation, and evaluation of an effective learning environment for undergraduate students. Prerequisite: employment as a tutor for the Learning and Academic Resource Center. Formerly University Studies 198.

University Studies 184 UC Center Sacramento Research Seminar (4). Develops an understanding of policy analysis and the policy and political process in California. Students write a research-based policy analysis on a topic related to their areas of academic interest and/or issues addressed at their internship sites in Sacramento. Corequisite: University Studies 185. Prerequisite: selected for UC Center Sacramento Program. May be taken for a total of eight units.

University Studies 185 UC Center Sacramento Internship (4 to 8). Supervised internship (24–40 hours per week) in Sacramento government, nonprofit, or private institution consistent with student's interest. Corequisite: University Studies 184. Prerequisite: selected for UC Center Sacramento Program. Pass/Not Pass only. May be taken for a total of 16 units.

University Studies 186 Sacramento Elective (4). Elective course offered by the UC Center Sacramento Program. Topics vary each quarter. Prerequisite: selected for UC Center Sacramento Program. May be taken for credit twice.

University Studies 190 Teaching Seminar: Theory and Practice (2). For students selected to be discussion leaders for University Studies 1 and 2. Models of teaching, developmental theory applied to college freshmen, curriculum development. Practice of teaching techniques and group management skills. May be taken for credit twice.

University Studies 192 Group Project for Discussion Leaders (4). For discussion leaders for University Studies 1 and 2. Weekly discussion group training for leading effective groups in addition to evaluations of weekly discussion sections and completion of a special project on issues of freshman development. Prerequisite: consent of instructor.

University Studies 194 The Washington Seminar (4). Interdisciplinary seminar examines and explores unique aspects (e.g., governmental, cultural, political, the arts, historical, media related) of Washington, D.C. Core course mandatory for all participants in Washington D.C. Center Program. Prerequisite: selected for Washington D.C. Center Program. Same as Social Science 192.

University Studies 195 Washington D.C. Center Internship (4 to 8). Supervised internship (20–40 hours per week) in Washington, D.C. government, nonprofit, or private institution consistent with student's interest. Corequisite: University Studies 194. Prerequisite: selected for Washington D.C. Center Program. May be taken for a total of 16 units.

Preparation for Graduate or Professional Study

Undergraduate students should keep the possibility of future graduate or professional study in mind as they plan their academic programs, and they should discuss their career goals with their advisors. Students who have an idea of the direction in which they would like to go should familiarize themselves with the basic requirements for postbaccalaureate study and keep those requirements in mind when selecting courses. Furthermore, students should supplement their undergraduate programs by anticipating foreign language or other special requirements at major graduate schools and by intensive work in areas outside their major that are of special relevance to their intended graduate work. Students should consult the graduate advisor or academic counselor in the academic unit corresponding to their area of interest and visit the UCI Career Center which offers a number of services useful to those considering graduate or professional study.

General information for prospective graduate students is available on the Office of Graduate Studies Web site (http://www.rgs.uci.edu/grad/), while information about UCI's graduate education policies and procedures is available in *The Manual of the Irvine Division of the Academic Senate* (http://www.senate.uci.edu).

Preprofessional Preparation

LAW

Law schools want to produce lawyers to serve the entire legal spectrum (for example tax, criminal, entertainment, or immigration law), and this requires a wide range of academic backgrounds. Law schools look less for specific areas of study than they do for evidence of academic excellence. A good record in physics or classics, for example, will be preferred over a mediocre record in history or political science. Most law schools give equal preference to students from all academic disciplines. Courses that help develop writing and analytical skills (logic, writing, mathematics, research methods, and statistics, for example) build skills that are the key to doing well on the Law School Admissions Test (LSAT) and succeeding in law school and the legal profession.

UCI offers a number of law-related courses that students in any major may take. The School of Humanities offers a Humanities and Law minor, emphasizing courses that require critical reading and analysis, and courses that focus on theoretical and applied analytical perspectives on ethical, political, and social issues relevant to the law. The School of Social Sciences offers courses in the study of law, international relations, and economics of law and recommends that students take some political science courses as well. The School of Social Ecology offers many law-related courses in both substantive law (such as environmental and criminal law) and in law and society and criminal justice, and offers its majors the opportunity to apply theories learned in the classroom to actual problems through its field study program.

Students should know that law schools look closely at five aspects of a student's application: grades, LSAT results, the applicant's statement of purpose, in-depth letters of recommendation, and extracurricular activities and law-related work experience. Students should be aware that not everyone who applies is admitted to law school. One consideration in selecting an undergraduate major is alternative careers should one's goals change.

MEDICINE AND OTHER HEALTH-RELATED SCIENCES

Although health science educators strongly recommend that students obtain a bachelor's degree prior to admission to the health sciences, there is no preferred major. Many UCI students who plan to enter the health professions major in Biological Sciences because much of the basic course work for that major is also required for medical school admission; however, students may major in any academic field as long as they also take the courses required by professional health science schools. The minimum amount of undergraduate preparation required includes one year each of English, biology with laboratory, general chemistry with laboratory, organic chemistry with laboratory, physics with laboratory, and college mathematics, especially calculus and statistics, as well as one semester (or two quarters) of biochemistry. Courses in cell biology, developmental biology, genetics, molecular biology, physiology, comparative anatomy, vertebrate embryology, and computer science are recommended. In addition, some health sciences schools have certain nonscience course requirements or recommendations, for example, English and/or a foreign language. Facility with the Spanish language is very helpful in California medical schools and in other areas of the United States with large Hispanic populations.

Although many factors ultimately are considered when reviewing applicants for admission, admission committees look carefully at: college grade point average (science and nonscience grades are evaluated separately, and evidence of improvement in work during the undergraduate years is important); results of the Medical College Admission Test (MCAT) and other aptitude examination scores; the student's personal essay and/or personal interview; in-depth letters of recommendation; practical clinical experience in the health sciences, whether paid or volunteer, which is regarded favorably as an indication of exposure to and interest in the health sciences; extracurricular activities which demonstrate the applicant's ability to interact successfully with others; and research experience, especially in a biological, medical, or behavioral science.

Since medical programs cannot accommodate all qualified applicants and competition for entrance is keen, it is important to keep in mind alternative career opportunities should one not be accepted to a health science school, or should one decide to pursue instead one of the expanding number of health-related programs now available.

BUSINESS/MANAGEMENT

The contemporary executive or manager must be a creative thinker, make complex decisions, and have the ability to perceive and participate in the full scope of an enterprise while understanding its role in the economy. Effective management requires leadership ability, strong problem-solving skills, the ability to successfully deploy and manage information technologies, effective oral and written communication skills, analytical skills, an understanding of global economic trends, and a basic knowledge of behavioral processes in organizations.

Although UCI does not offer an undergraduate degree in business, The Paul Merage School of Business offers a minor in Management as well as a minor in Accounting as a supplement to any undergraduate major. The Management minor can provide students with a broad understanding of management theory and practice and may be helpful to students in determining whether they wish to pursue a career in business or management or undertake graduate-level study in management. The Accounting minor provides undergraduates with all accounting courses necessary to sit for the CPA examination. It also prepares students for careers in the accounting field or for graduate-level study.

Students can also supplement their major course work to develop the skills needed for business and management by taking electives such as calculus, statistics, economics, psychology, sociology, computer science, and political science, and are encouraged to take intensive course work in the culture, history, geography, economy, politics, and language of specific foreign countries.

For admission purposes, the majority of graduate schools of business look at five areas: grades, scores on the Graduate Management Admission Test (GMAT), the applicant's statement of purpose, in-depth letters of recommendation, evidence of leadership in school and community activities, and work experience. Substantive work experience is becoming an increasingly important prerequisite for many programs.

Students from a variety of undergraduate disciplines including liberal arts, social sciences, physical or biological sciences, computer science, and engineering are encouraged to apply to UCI's Paul Merage School of Business.

Career Opportunities

UCI's academic units which offer undergraduate education leading to the bachelor's degree provide students with opportunities to explore a wide range of interests leading to a career choice or to further education at the graduate or professional level. The lists which follow show the varied career areas pursued by UCI graduates. Any major can lead to a number of careers. Additional discussions of careers are presented in individual academic unit sections.

Arts Career Areas

Acting, Advertising, Animation, Arts Administration, Art Therapy, Broadcasting, Choreography, Composition, Conducting, Conservation/Restoration, Consulting, Criticism, Curating, Digital Arts Production, Direction, Environmental Design, Instrument Repair/Tuning, Interior/Industrial Design, Journalism, Librarianship, Lighting, Marketing, Medical Illustration, Performance, Photography, Physical Fitness, Printing, Production, Publicity, Public Relations, Publishing, Set/Stage/Costume Design, Stage Management, Teaching, Tourism, Visual Resources Management, Writing.

The exceptionally talented Claire Trevor School of the Arts graduate may choose to become a professional actor, art historian, artist, dancer, or musician. However, there are many other careers to explore in numerous arts-related areas, or the graduate may wish to combine part-time professional performance with supplemental work. The field of arts administration is an increasingly important career area, offering opportunities to work with opera and dance companies, repertory theatre companies, museums, state and local arts councils, community arts organizations, and arts festivals.

Biological Sciences Career Areas

Bioanalysis, Biochemistry, Biomedical Engineering, Cell Biology, Chiropractic Medicine, Dentistry, Developmental Biology, Dietetics, Environmental Management, Forestry, Genetic Engineering, Health Administration, Industrial Hygiene, Marine Biology, Medical Technology, Medicine, Microbiology, Nurse Practitioner, Occupational Therapy, Oceanography, Optometry, Osteopathy, Plant Biology, Pharmacology, Pharmacy, Physicians' Assistant, Physical Therapy, Podiatry, Public Health, Quality Control, Research, Sales, Speech Pathology, Teaching, Technical Writing and Editing, Veterinary Medicine.

The health field is one of the fastest-growing career areas in the country. Work sites may include private corporations, educational institutions, hospitals, health care complexes, private foundations, city and county governments, state agencies, the federal government, and many others.

Engineering Career Areas

Aerospace, Biochemical, Biomedical, Biotechnology, Chemical Engineering, Communications, Computer Architecture, Computer Engineering, Computer Software, Control Systems, Digital Signal Processing, Earthquake Safety, Electric Power, Electronics, Electro-optics, Environmental Control, Environmental Engineering, Flood Control, Geotechnical, High-Speed Image Processing, Hydraulics, High-Frequency Devices and Systems, Land Development and Urban Planning, Manufacturing Engineering, Materials, Process Control, Propulsion and Power, Public Works, Reliability, Robotics, Structures, Traffic, Transportation, Water Resources, Water Supply.

These are some areas for employment available to UCI engineering graduates. Career paths typically involve one or more of the following: design, research and development, manufacturing or

construction, operations, consulting, applications and sales, management, or teaching. At UCI they will have had the choice of Aerospace, Biomedical, Biomedical: Premedical, Chemical, Civil, Computer, Computer Science and Engineering, Electrical, Environmental, Materials Science, or Mechanical Engineering, as well as a general program in Engineering. However, they will frequently find challenging positions in related areas such as industrial engineering, for which their general and specialty course work at UCI, followed by formal or informal, on-the-job training will qualify them. Approximately half of UCI's Engineering graduates obtain advanced degrees from UCI or other universities, and almost all engage in continuing education to keep abreast of advances in technology. Many Engineering graduates build on their engineering background and enter graduate programs to obtain degrees in the fields of administration, law, medicine, physics, or mathematics.

Humanities Career Areas

Advertising, Banking, Broadcasting, Business, Counseling, Communications, Diplomacy, Education, Film and Television, Foreign Service, Government Service, Human Resources, Insurance, International Relations, Journalism, Law, Library Science, Management/Administration, Marketing, Personnel, Politics, Public Administration, Public Relations, Publicity, Publishing, Research, Retail Sales, Screenwriting, Social Welfare, Teaching, Technical Writing, Tourism, Translating/Interpreting, Writing.

Diverse career fields available to Humanities graduates include entry-level positions in both the public and private sectors or professional-level opportunities combining the degree with further specialization. Humanities graduates may also elect to enter professional programs such as law, library science, medicine (with proper prerequisites), or public administration. Business and industry utilize Humanities graduates for management training programs in banking, retail sales, and insurance. Graduates with special skills in oral and written communications may look to positions with newspapers, advertising agencies, public relations firms, radio and television stations, and publishing houses.

Technical writers are currently in demand, particularly those who have had some preparation in engineering, computer science, and the sciences. Opportunities for graduates fluent in foreign languages exist in government, business, social service, counseling, foreign service, and international trade, among others.

Information and Computer Science Career Areas

Applications Programming, Computer-Aided Design, Computer Animation, Computer Architecture, Computer Networks, Computer Simulation, Computer Systems Design, Databases, Information Systems Design and Consulting, Embedded Systems, Management Information Systems, Multimedia Applications, Parallel and Distributed Systems, Software Design and Development, Software Management and Maintenance, Supercomputing, Systems Administration, Systems Analysis and Design, Systems Programming.

Graduates of the Donald Bren School of Information and Computer Sciences pursue a variety of careers. Many graduates specify, design, and develop a variety of computer-based systems comprised of software and hardware in virtually every application domain, such as aerospace, automotive, biomedical, consumer products, engineering, entertainment, environmental, finance, investment, law, management, manufacturing, and pharmacology. ICS graduates also find jobs as members of research and development teams, developing advanced technologies, designing software and hardware systems, and specifying, designing, and maintaining computing infrastructures for a variety of institutions. Some work for established or start-up companies while others work as independent consultants. After a few years in industry, many move into management or advanced technical positions. Some ICS students also use the undergraduate major as preparation for graduate study in computer science or another field (e.g., medicine, law, engineering, management).

Physical Sciences Career Areas

Actuarial Science, Aerospace, Analytical Chemistry, Applied Physics and Chemistry, Astrophysics/Astronomy, Bioscience, Computers, Energy Science, Electronics, Engineering Applications, Environmental Science, Food Chemistry, Forensic Chemistry, Geoscience, Inorganic Chemistry, Instrumentation, Laboratory Science, Lasers, Materials Science, Medicine, Nuclear Science, Optical Devices, Organic Chemistry, Pharmacology, Physical Chemistry, Plasma Physics, Quality Control, Radiation Science, Radiology, Solid State Devices, Space Science, Statistics, Teaching.

Graduates of the School of Physical Sciences have backgrounds appropriate to a variety of areas in research, teaching, and management. Career opportunities for physical scientists are found in federal, state, and local government as well as in private industry. Chemists may work in research and development and in jobs dealing with health, pollution, energy, fuel, drugs, and plastics. Water districts, crime labs, and major chemical and oil companies are also good resources for employment. Earth and Environmental Sciences majors will find employment in areas such as hazardous waste treatment, resource extraction, pollution remediation, and as consultants to government and high-technology fields. Mathematics graduates find employment in both government and the private sector in such technical fields as operations research, computer programming, marketing research, actuarial work, banking, retail management, and scientific research. Physics graduates find professional positions in education, research and development, and in the electronic and aerospace industries. Possible careers include science teaching and writing, computer and electrical engineering, device and instrumentation development, nuclear and reactor physics, environmental and radiological science, laser and microchip development, astronomy, and geophysics.

Social Ecology Career Areas

Administration, Air Quality Control, Architecture, Biostatistics, Clinical Psychology, Corrections/Probation, Counseling, Education Support Services, Environmental Design, Environmental Planning and Consulting, Epidemiology, Government Service, Health Service, Hospital Administration, Housing Development, Law, Management/Administration, Mental Health, Program Coordination, Psychology, Public Health Research, Public Relations, Real Estate/Development, Research and Research Design, Social Service, Teaching, Urban Planning, Urban Sociology, Water Quality Control.

Graduates of the School of Social Ecology may hold positions as urban planners, environmental consultants, juvenile probation officers, counselors, elementary and secondary school teachers, legal aides, coordinators of juvenile diversion programs, social workers, mental health workers, special education teachers, or architectural consultants. Many School of Social Ecology graduates have used their training to enter graduate programs and obtain degrees in the fields of law; clinical, community, social, developmental, and environmental psychology; public health; public and business administration; environmental studies; urban planning; social welfare; criminology; and the administration of justice.

Social Sciences Career Areas

Banking, Correction/Probation, Counseling, Environmental Analysis, Finance, Foreign Service, Government Service, Health Services, Human Services, Industrial Relations, International Affairs, Labor Relations, Law, Library Science, Management/Administration, Marketing, Personnel, Psychology, Public Relations, Publishing, Real Estate, Research, Sales, Statistical Analysis, Teaching, Writing.

Business and industry often look to social science graduates to fill positions in management, finance, marketing and advertising, personnel, production supervision, and general administration. In the public sector, a wide variety of opportunities are available in city, county, state, and federal government. Teaching is a frequently chosen career at all levels from elementary school teacher to university professor. In addition, many graduates enter professional practice, becoming lawyers, psychologists, researchers, or consultants in various fields.

SPECIAL PROGRAMS

ACCESS UCI and Summer Session Enrollment

Exceptional high school students have two options for enrolling in UCI classes without formal admission to the University:

UC Irvine Extension's ACCESS UCI program is ideal for well-prepared high school seniors who have exhausted the curriculum available in high school and who are looking for advanced-level course work, or for students who are seeking an enrichment course or course work not available at their high school. For information, call (949) 824-5414; e-mail: unex-services@uci.edu; World Wide Web: http://unex.uci.edu/courses/access/general.asp.

UC Irvine Summer Session is another option for highly qualified high school seniors to enroll in regular UCI courses. For further information, contact the UCI Summer Session Office at (949) 824-5493; e-mail: summer-session@uci.edu; World Wide Web: http://summer.uci.edu.

Admission and enrollment in courses either through ACCESS UCI or UC Irvine Summer Session does not constitute admission to UCI as an entering freshman student. See the Undergraduate Admissions section of this *Catalogue* for information about applying to UCI and the formal admission process.

Educational Opportunity Program

The Educational Opportunity Program (EOP) is designed for students with promising academic ability and potential despite a low-income or educationally disadvantaged background. EOP is based primarily on family income level, and all students served by the program must be California residents, with the exception of American Indian students.

Admission. Counselors in the Office of Admissions and Relations with Schools visit high schools and community colleges throughout California and meet with prospective students, parents, teachers, counselors, and school officials to discuss the admission and financial aid processes, housing, and the academic opportunities available at UCI.

Prospective students indicate their interest in being considered for EOP services on the *UC Undergraduate Application for Admission* and must provide the information requested. Application fee waivers are available for low-income applicants who meet the eligibility criteria.

Housing. UCI guarantees on-campus housing to all new single undergraduates under the age of 25 who meet the housing application deadline.

Center for Educational Partnerships

In 1996 UCI established the Center for Educational Partnerships to advance cooperative educational relationships among UCI and California schools, community colleges, and four-year colleges and universities. In collaboration with the academic deans and UCI faculty, the Center, and its School-University Partners, offer academic outreach programs for K–12 and community college students. Innovative teacher professional development is provided through the UCI faculty and California Subject Matter Projects in the Arts, Reading and Literature, History and Social Science, Mathematics, and Science Projects. The Early Academic Outreach Program, MESA (Mathematics, Science and Engineering Achievement), the Saturday Academy in Mathematics, and Upward Bound programs offer academic-year and intensive summer programs aimed at improving preparation of students from under-served groups for success in higher education. COSMOS (the California State Summer School for Mathematics and Science) and the Gifted Students Academy, recruiting throughout California and the nation, challenge even the most accomplished young scholar.

The Orange County Transfer Consortium, composed of the County's nine community colleges, sponsors programs designed to increase the transfer rate to UC and UCI, and to identify potential K–12 teachers from among potential community college transfers through its UCI TEACH program. Together with Santa Ana College, the nationally recognized Summer Scholars Transfer Institute is offered each summer on the UCI campus.

National collaborations for discipline-specific and interdisciplinary initiatives for curriculum reform, professional development, and student academic services include the Ford and Kellogg Foundations, the U.S. Department of Education (GEAR UP), and the National Science Foundation Mathematics and Science Partnership.

The Center is the lead for the National Science Foundation/University of California Alliance for Minority Participation in Science, Engineering and Mathematics (CAMP), a program offering faculty-directed research and mentoring opportunities for undergraduates, and a pathway to graduate and professional schools. The Center employs UCI students who serve as residential assistants for the UCI summer programs, higher education coordinators in high schools who provide college preparation advising, tutors assisting K–12 teachers in mathematics and reading instruction, and staff assistants for data entry and database design. The Center also provides undergraduate and graduate opportunities for research in evaluation. Through SAGE Scholars (Student Achievement Guided by Experience), created in 1999 by the UC Office of the President, the Center works with local businesses to offer paid multiyear internships to talented and highly motivated UCI students related to their field of study.

For additional information about the Center for Educational Partnership's programs, services, publications, and research and employment opportunities, contact CFEP at (949) 824-7482; e-mail: only@uci.edu; World Wide Web: http://www.cfep.uci.edu.

Student Academic Advancement Services

Student Academic Advancement Services (SAAS), a unit of the Division of Undergraduate Education, provides support services to students who are first-generation college students or low-income students, as well as disabled students (those with physical and/or learning disabilities). The goal of SAAS is to help students earn their University degree. See the Division of Undergraduate Education section of the *Catalogue* for additional information.

Graduate Diversity Programs

The University of California believes that a diverse student and faculty population is integral to academic excellence. It is critical to promoting the lively intellectual exchange and the variety of ideas and perspectives that are essential to advanced scholarly research. The University remains committed to expanding outreach, recruitment, and retention efforts. Through the Office of Graduate Studies' diversity programs, steps are taken to increase the participation of diverse groups of Americans who have been disadvantaged in obtaining graduate education in the United States. See the Research and Graduate Studies section of the *Catalogue* for additional information.

Medical Student Support Programs

The School of Medicine's Office of Admissions and Outreach is designed to meet the challenges of California's changing demographics and to contribute to the School's goal of achieving a broad spectrum of diversity in the student population, and ultimately, in the medical profession. The office plays a major role in the recruitment and retention of targeted socioeconomically disadvantaged students who have the potential of service to the medically underserved communities in California. See the School of Medicine section for additional information.

EXPENSES AND FEES

Estimated Expenses for California Residents

The range of estimated nine-month expenses, including fees, books and supplies, room and board, and miscellaneous expenses for California-resident students attending UCI during the 2005–06 academic year are shown below; fees are subject to change.

Expenses for students living off campus vary depending upon number of roommates, location of apartment, amenities, and other factors. Graduate student expenses assume two students sharing a two-bedroom apartment. All other on- and off-campus estimates are based on two students sharing a bedroom. Figures are based on annual surveys and are intended only as a guide in computing average expenses.

Student Status	Living Arrangement	Estimated Nine-Month Expenses [1]
Undergraduate	On campus	$ 20,975
	Off campus	20,690
	At home	16,095
Graduate	On campus	24,170
	Off campus	29,560
	At home	17,860
M.B.A. (new students)		
	On campus	52,155
	Off campus	54,506
	At home	45,295
Fully Employed Program		39,055
Executive Program		59,295
Health Care Executive Program		54,830
First-Year Medical [2] (10 months)	On campus	38,895
	Off campus	40,665
	At home	30,535

[1] Student expense detail is available from the Office of Financial Aid and Scholarships and from the School of Medicine Financial Aid Office. Expenses are subject to change and do not include the Nonresident Tuition Fee.

[2] Estimated expenses for second-, third-, and fourth-year medical students are available from the School of Medicine Financial Aid Office.

Fees

All fees, tuition, and charges are subject to change without notice, and the University may impose additional fees. Consult the Registrar's Web site at http://www.reg.uci.edu for the most up-to-date information.

Excess Unit Fee. New California resident freshmen matriculating at UCI fall 2005 and thereafter may be subject to additional fees and denied State financial aid if (1) they seek to enroll beyond the twelfth quarter of attendance and (2) they have completed more than 110 percent of the units required for their major. Transfer students may be subject to the same additional fees, but on a time schedule and unit limit adjusted to reflect their work prior to matriculation at the University of California. Further information will be posted on the Web sites of the Offices of the Registrar, Financial Aid and Scholarships, and Financial Services as it becomes available.

Undergraduate Student Fees for Academic Year 2005–06 [1]	Resident	Nonresident
University Registration Fee	$ 735.00	$ 735.00
Educational Fee	5,406.00	5,922.00
Associated Students Fee	54.00	54.00
UCI Student Center Fee	142.50	142.50
Bren Events Center Fee	69.00	69.00
Recreation Center Fee	264.00	264.00
Campus Spirit Fee	99.00	99.00
UG Student Health Insurance Fee	705.00	705.00
Nonresident Tuition	—	17,304.00
Total	$ 7,474.50	$ 25,294.50

[1] Student fees are based on three quarters of attendance.

Graduate Student Fees for Academic Year 2005–06 [1, 2, 3]	Resident	Nonresident
University Registration Fee	$ 735.00	$ 735.00
Educational Fee[4]	6,162.00	6,429.00
Associated Graduate Students Fee[5]	27.00	27.00
UCI Student Center Fee	142.50	142.50
Bren Events Center Fee	69.00	69.00
Recreation Center Fee	264.00	264.00
Grad. Student Health Insurance Fee	1,995.00	1,995.00
Nonresident Tuition	—	14,694.00
Total	$ 9,394.50	$ 24,355.50

[1] Student fees are based on three quarters of attendance. Second- and third-year medical students attend four quarters; summer quarter fees of $2,042.50 or $2,392.50 (pending a decision by The Regents regarding Educational Fees when the *Catalogue* went to press) for these medical students are not included in this table.

[2] The fee level shown does not include the Professional School Student Fee. The fee for M.D. students is $13,440. All M.D. students pay an additional fee of $61 for Medical Student Disability Insurance. The fee for M.B.A. students will be $14,276 or $15,246 for residents (pending a decision by The Regents when the *Catalogue* went to press) and $14,276 for nonresidents.

[3] These fees are not applicable to self-supporting programs such as the Executive, Health Care Executive, and Fully Employed M.B.A. programs and the M.A.S. in Criminology, Law and Society in the School of Social Ecology. Contact the respective School for fee information.

[4] The Educational Fee will be $5,357 or $6,407 (pending a decision by The Regents when the *Catalogue* went to press) for students in The Paul Merage School of Business and M.D. students.

[5] The Associated Graduate Students Fee is $42 for students in The Paul Merage School of Business and $57 for M.D. students.

Payment of Fees

Fees for each quarter are due and payable in advance within deadlines published in the Quarterly Calendar with Deadlines on the Web at http://www.reg.uci.edu. A student will not be officially enrolled in classes or receive any University benefits until fees are paid in full, with the exception of students who are participating in the PACE Plan. The PACE Installment Plan allows students to spread the quarterly costs of fee payment over a three-month period. A fee is charged for this privilege. Information about PACE is available from Campus Billing Services, 109 Administration Building; telephone (949) 824-2455.

For information on how to cancel or withdraw from UCI, see the sections on Fee Refunds and on Enrollment and Other Procedures.

The **University Registration Fee** is $245 per quarter. The full fee is required of all students regardless of the number of courses taken. This fee, which must be paid at the time of registration, is a charge to each student for services which benefit the student and which are complementary to, but not a part of, the instructional programs. No part of this fee is refundable to students who do not use all or any of these services. Graduate students studying out of the State may be eligible to pay one-half of the Registration Fee.

The $100 advance deposit on the Registration Fee (this deposit is known as the Undergraduate Acceptance of Admission Fee), required of new undergraduates, is applied to the full fee when the student registers. Continuing and returning students are required to pay all outstanding fines and other debts, in full, before they pay their Registration Fee for an upcoming term.

M.D. students are required to pay the full Registration Fee for each fall, winter, and spring quarter, and a reduced Registration Fee of $80 for each summer quarter.

The **Educational Fee** is $1,802 per quarter for full-time resident undergraduate students; $2,054 per quarter for full-time resident graduate students; $1,974 per quarter for full-time nonresident undergraduate students; and $2,143 per quarter for full-time nonresident graduate students. For students in The Paul Merage School of Business and M.D. students, the fee will be $1,786 per quarter for the fall and winter quarters and $1,785 for the spring quarter, or $2,136 for the fall and winter quarters and $2,135 for the spring quarter (pending a decision by The Regents when the *Catalogue* went to press). M.D. students are required to pay the full Educational Fee for each quarter in which they enroll, including the summer quarter. The summer quarter Educational Fee level will be the same as that of the previous spring quarter.

The **Associated Students Fee** is $18 per quarter for undergraduates, $9 per quarter for graduates, $14 per quarter for students in The Paul Merage School of Business, and $19 per quarter for M.D. students. The fee is administered by the Associated Students of UCI, the Associated Graduate Students, The Paul Merage School of Business Student Association, and the Associated Medical Students, respectively. These funds provide social activities, lectures, forums, concerts, and other activities at either a reduced charge, or no charge, to UCI students. The fees are required of all students.

The **UCI Student Center Fee** is $47.50 per quarter. The fee is required of all students regardless of the number of courses taken. The fee is used to pay the debt service on revenue bonds sold to finance the construction costs of the UCI Student Center.

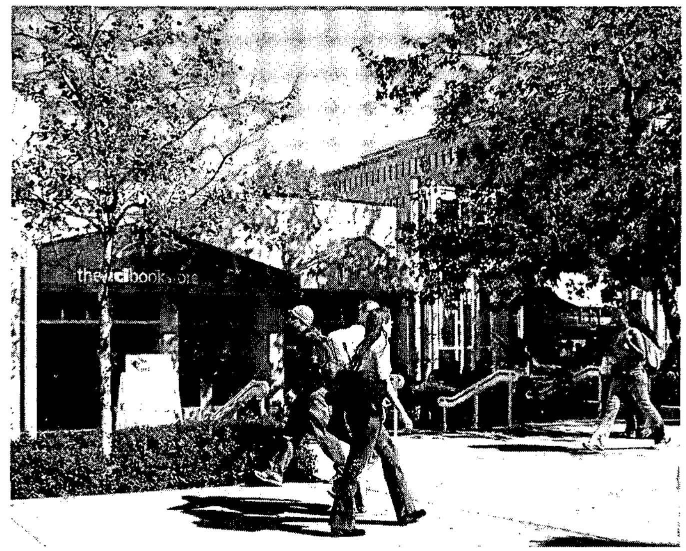
The **Bren Events Center Fee** is $23 per quarter. The fee is required of all students regardless of the number of courses taken or units carried. The fee is used to pay the debt service on revenue bonds sold to finance the construction costs of the Bren Events Center.

The **Recreation Center Fee** is $88 per quarter. The fee is required of all students regardless of the number of courses taken or units carried. The fee is used to pay the debt service on revenue bonds sold to finance the construction costs of the Student Recreation Center and Athletics facilities improvements.

The **Campus Spirit Fee** is $33 per quarter. The fee is required of all undergraduate students regardless of the number of courses taken or units carried. The fee is used to support Athletics and Campus Spirit Programs.

The **Undergraduate Student Health Insurance Fee** is $705 annually. The annual fee is charged over three quarters, fall, winter, and spring, $235 per quarter, to provide 12-month coverage from September through August. The fee is required of all undergraduate students regardless of the number of courses taken or units carried. The fee is used to provide undergraduate students with health insurance. If students provide evidence of comparable coverage from another source, participation in the mandatory plan may be waived.

The **Graduate Student Health Insurance Fee** is $1,995 annually. The annual fee is charged over three quarters, fall, winter, and spring, to provide 12-month coverage from September through August. The fee is required of all graduate and medical students regardless of the number of courses taken or units carried. The fee is used to provide graduate and medical students with health insurance.



If students provide evidence of comparable coverage from another source, participation in the mandatory plan may be waived.

The **Medical Student Disability Insurance Fee** is $61 annually. The entire annual fee is charged for the fall quarter and is required of all medical students.

The **Professional School Student Fee** is required of M.D. students and M.B.A. students, regardless of the number of courses taken. The fee for M.D students is $4,481 for fall quarter, $4,480 for winter quarter, and $4,479 for spring quarter. The fee for M.B.A. resident students will be $4,759 for the fall and winter quarters and $4,758 for the spring quarter, or $5,082 per quarter (pending a decision by The Regents when the *Catalogue* went to press). The fee for M.B.A. nonresident students is $4,759 for the fall and winter quarters and $4,758 for the spring quarter.

A $500 advance deposit on the Professional School Student Fee is required of all new M.B.A. students upon their acceptance of admission. This deposit is nonrefundable.

Reduced-Fee Part-Time Study Program

Undergraduate and graduate students on approved part-time status (enrollment in 10 units or less per quarter for undergraduates and in eight units or less per quarter for graduate students) pay the full University Registration Fee and one-half the Educational Fee. Those part-time students who have been determined to be nonresidents of the State of California are assessed one-half the Nonresident Tuition, in addition to the full Registration Fee and one-half the Educational Fee. Part-time students pursuing a professional degree are assessed one-half the Professional School Student Fee. Students seeking part-time status must obtain the approval of the appropriate academic dean. Part-time status can be granted only for reasons of occupation, health, or family responsibilities. Part-time status lapses at the end of each academic year; therefore, a student must reapply each year that part-time status is desired. See the Registrar's Web site for more information.

Exemption from Fees

A student who is a child, spouse, or registered domestic partner of a resident law enforcement officer or fire fighter killed in active duty shall be exempted from nonresident tuition and fees in accordance with Section 68120 of the Education Code of the State of California. In accordance with Section 32320 of the Education Code of the State of California, a student may be exempted from mandatory systemwide fees but shall not be exempted from nonresident tuition fees if: (a) the student is the child or dependent of a veteran of the United States military who has a service-connected disability or who has been killed in service; (b) the student is the dependent of a member of the California National Guard who, while in active service of the State, has acquired a service-connected disability or has been killed in service; or (c) the student is the surviving spouse (who has not remarried) or registered domestic partner (who has not married or registered as a domestic partner) of a member of the California National Guard who, while in active service of the State, has acquired a service-connected disability or has been killed in service. A nonresident student who meets the requirements of Section 68130.5 of the Educational Code of the State of California regarding attendance and graduation from a California high school shall be exempt from paying nonresident tuition.

Miscellaneous Fees (subject to change without notice)

Application Fee[1, 2]	
Undergraduate	$ 55.00
International Undergraduate	65.00
Graduate[3] and Medical	60.00
International Graduate[3] and Medical	80.00
Application Fee for Readmission[1]	
Undergraduate	$ 55.00
International Undergraduate	65.00
Graduate	60.00
International Graduate	80.00
Advancement to Candidacy for Ph.D.	65.00
Duplicate Diploma	22.00
Duplicate Diploma, School of Medicine	75.00
Filing Fee (graduate programs)	119.00
Graduate Special Library Borrowing Privileges (per year, nonrefundable, renewable)	50.00
M.B.A. Acceptance of Admissions Deposit[1]	500.00
Transcript of Record (per copy)	6.00
Undergraduate Acceptance of Admission Fee[1] (applied toward University Registration Fee)	100.00
Verification of Student Status (per copy)	6.00

[1] Nonrefundable in all cases.

[2] The fee entitles an applicant to apply to one UC campus. Applicants who are applying to more than one campus must pay the fee for each campus selected.

[3] The Application Fee for The Paul Merage School of Business is $110.00

Service Charges (subject to change without notice)

Changes in Class Enrollment after Announced Dates (each transaction)	$ 3.00
Credit by Examination (each petition)	5.00
Late Payment of Registration Fees	50.00
Late Enrollment in Classes	50.00
Returned Check Collection	25.00
Student Parking Permits[1]	
Commuter, annual (July–June)	396.00
Commuter, quarterly	99.00
Resident, quarterly	150.00

In addition, students may be assessed a course materials fee. Consult the online *WebSOC, Searchable Schedule of Classes* for courses requiring the fee and the fee level.

[1] UC parking systems are, in accordance with Regents policy, self-supporting auxiliary enterprises receiving no State appropriations. See http://www.parking.uci.edu/ for fee levels of other types of parking permits. Prices shown are for 2004-05 and are subject to change for 2005-06.

CALIFORNIA RESIDENCE AND THE NONRESIDENT TUITION FEE

All students who have not lived in California with the intent to make California their permanent home for more than one calendar year prior to the residence determination date for each quarter or semester they propose to attend the University must pay the Nonresident Tuition Fee. The residence determination date is the day instruction begins at the last of the University of California campuses to open for the quarter, and for schools on the semester system, the day instruction begins for the semester.

Laws Governing Residence

The rules regarding residence classification for tuition purposes at the University of California are governed by the California Educational Code and implemented by the Standing Orders of The Regents of the University of California. Under these rules adult citizens and certain classes of non-citizens can establish residence for tuition purposes. There are particular rules that apply to the residence classification of minors.

Who Is a Resident?

Adult students (at least 18 years of age) may establish residence for tuition purposes in California if they are a U.S. citizen, a permanent resident or other immigrant, or a nonimmigrant who is not precluded from establishing a domicile in the U.S. This includes nonimmigrants who hold valid visas of the following types: A, E, H-1, H-4, I, K, L, O-1, O-3, R, or V.

To establish residence a student must, immediately prior to the residence determination date:

1. Be physically present in California for more than one calendar year, *and*
2. Must have come to California with the intent to make California the permanent home. For example, physical presence within the state of California solely for educational purposes does not constitute the establishment of California residence regardless of the length of stay.
3. Students under 24 years of age whose parents are not residents of California will be required to meet the Financial Independence requirement in order to be classified as a resident for tuition purposes.

Residence cannot be derived from a spouse or parents.

Requirements for Financial Independence

The financial independence requirement will not be a factor in residence determination if the student meets one of the following criteria:

1. The student's parents are residents of California.
2. At least 24 years of age by December 31 of the calendar year of the term for which resident classification is requested.
3. Veteran of the U.S. Armed Forces.
4. A ward of the court or both parents are deceased.
5. Has legal dependents other than a spouse or registered domestic partner.
6. A married or registered domestic partner student, a graduate student, or a professional student who was not claimed as an income tax deduction by parents or any other individual for the tax year immediately preceding the term for which resident classification is requested.
7. An unmarried undergraduate student, not claimed as an income tax deduction by parents or any other individual for the two tax years immediately preceding the term for which resident classification is requested, who can demonstrate self-sufficiency for those years.
8. Reached the age of majority in California while his/her parents were residents of this state *and* the California resident parents leave the state to establish a residence elsewhere *and* the student continues to reside in California after the parents' departure.

NOTE: Financial independence is not a factor in residence status for graduate student instructors, graduate student teaching assistants, research assistants, junior specialists, postgraduate researchers, graduate student researchers, and teaching associates who are employed 49 percent or more of full time in the term for which resident classification is requested.

Establishing Intent to become a California Resident

Relevant indicia that contribute to the demonstration of a student's intent to make California the permanent home include, but are not limited to, the following: registering to vote and voting in California elections; designating a California permanent address on *all* records (i.e., school, employment, military); obtaining a California Driver License or California Identification Card; obtaining a California vehicle registration; paying California income taxes as a resident (including taxes on income earned outside California from the date California residence was established); maintaining a California residence in which personal belongings are kept; licensing for professional practice in California; and the *absence* of these indicia in places other than California during any period for which residence in California is asserted.

General Rules Applying to Minors

The residence of the parent with whom an unmarried minor (under the age of 18) lives is the residence of the unmarried minor. When the unmarried minor does not live with either parent, the residence of the unmarried minor is that of the parent with whom the unmarried minor last lived. An unmarried minor may establish his or her own residence when both parents are deceased and a legal guardian has not been appointed unless the unmarried minor is a minor non-citizen who is precluded by the Immigration and Nationality Act from establishing domicile in the U.S. *The residence of an unmarried minor who has a parent living cannot be changed by the unmarried minor's own act, by the appointment of a legal guardian, or by the relinquishment of a parent's right of control.*

Specific Rules Applying to Minors

1. **Parent of Minor Moves from California.** If the California resident parent(s) of an eligible minor moves from California, the minor will be entitled to resident classification as long as the minor enrolls full-time in a California public postsecondary institution within one calendar year of the parent's departure, and remains physically present in California. This classification will continue until the minor has attained the age of majority and has resided in California for the minimum time required to become a resident. The Financial Independence requirement does not apply to this situation.
2. **Self-Supporting Minor.** Minor students who are U.S. citizens or eligible non-citizens may be eligible for resident classification if documentation of physical presence, intent to be a California resident, and self-support through the student's own employment or credit is provided for the entire calendar year prior to the residence determination date.
3. **Two-Year Care and Control.** Minor students who are U.S. citizens or eligible non-citizens may be eligible for resident classification if they have lived with and been under the continuous care and control of an adult or series of adults other than a parent for not less than two calendar years. The adult or series of adults must have been responsible for care and control for the entire two-year period and must be California residents for 366 days prior to the residence determination date of the term for which resident classification is requested.

Exemptions from the Nonresident Tuition Fee

Students for whom any of the following conditions apply may be eligible for an exemption from the Nonresident Tuition Fee.

1. **Member of the military, dependent spouse, registered domestic partner, or child.** A student on active duty as a member of the United States military stationed in California, and their spouses or registered domestic partner, and dependent children. An undergraduate who is the natural or adopted child, stepchild, spouse, or registered domestic partner who is the dependent of a member of the U.S. Armed Forces, stationed in California on active duty, may be entitled to an exemption from the nonresident tuition. Graduate and professional school students are entitled to this exemption until the student has resided in the state for the minimum time necessary to become a resident (366 days).
2. **Child, spouse, or registered domestic partner of a faculty member.** To the extent that university funds are available, a student who is the unmarried, dependent child under the age of 21 or the spouse or registered domestic partner of a University of California faculty member who is a member of the Academic Senate.
3. **Child, spouse, or registered domestic partner of a University employee.** A student who is the unmarried, dependent child under the age of 21 or the spouse or registered domestic partner of a full-time employee of the University of California who is permanently assigned to work outside the state of California (i.e., Los Alamos National Laboratory).
4. **Child, spouse, or registered domestic partner of a deceased public law enforcement or fire suppression employee.** A student who is the child, spouse, or registered domestic partner of a deceased public law enforcement or fire suppression employee, who was a California resident and was killed in the course of law enforcement or fire suppression duties.
5. **Dependent child of a California resident.** A student who has not been an adult resident for more than one year and is the natural or adopted, dependent child of a California resident who has been a resident for more than one year immediately prior to the residence determination date. The student must also maintain full-time attendance in a California public postsecondary institution.

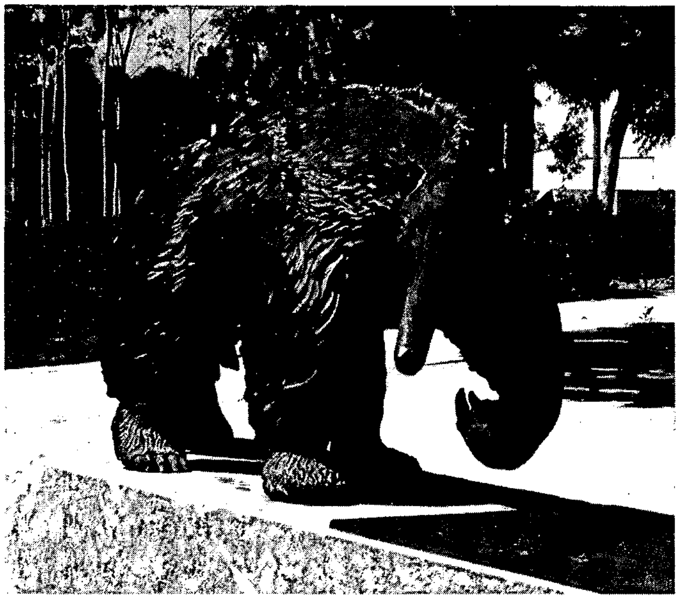
6. **Graduate of a California school operated by the Federal Bureau of Indian Affairs (B.I.A.).** A student who is a graduate of a California school operated by the B.I.A. (i.e., Sherman Indian High School) and who enrolls at the University of California.
7. **Employee of California public school district.** A student holding a valid credential authorizing service in California public schools and employed by a school district in a full-time certificate position.
8. **Student athlete in training at U.S. Olympic Training Center, Chula Vista.** An amateur student athlete in training at the U.S. Olympic Training Center in Chula Vista, until the student has resided in California the minimum time necessary to become a resident.
9. **Graduate of California high school.** A student who attended high school in California for three or more years (9th grade included) and graduated from California high school (or attained the equivalent).
10. **Congressional Medal of Honor recipient.** An undergraduate student under age 27 who is the recipient of the Congressional Medal of Honor or a child of a recipient who at the time of his or her death was a California resident.
11. **Surviving dependents of 9/11 terrorist attacks.** Undergraduate students who are the surviving dependents of a California resident who was killed in the 9/11/01 terrorist attacks of the World Trade Center, the Pentagon Building, or the crash of United Airlines flight 93.

Temporary Absences

If a nonresident student is in the process of establishing a domicile in California and returns to his or her former home during noninstructional periods, the student's presence in California will be presumed to be solely for educational purposes and only convincing evidence to the contrary will rebut this presumption. *Students who are in the State of California solely for educational purposes will not be classified as residents for tuition purposes regardless of their length of stay in California.*

If a student who has been classified as a resident for tuition purposes leaves California temporarily, the absence could result in the loss of California residence. The burden of proof is on the student to demonstrate through documentation that he or she (or the parents if the student is a minor) did nothing inconsistent with a claim of continuing California residence during a temporary absence. Steps that should be taken to retain California residence include, but are not limited to:

1. Continue to use a California address on all records (educational, employment, military, among others).
2. Continue to satisfy California tax obligations. A student claiming California residence is liable for payment of income taxes on his or her total income from the date he or she begins to establish residence in California, *including* income earned in another state or country.
3. Retain a California voter's registration and vote by absentee ballot.
4. Maintain a California Driver License, California Identification Card, and vehicle registration in California. If it is necessary to change the driver's license or vehicle registration, it *must* be changed back to California in the time prescribed by law.



Change in Resident Classification

Continuing students who are classified as nonresidents for tuition purposes, and who believe that they will be eligible for resident status for an upcoming quarter, must submit a Petition for Resident Classification to the Office of the Registrar *in order to have their residence status changed before they submit* their registration fee payment for the applicable quarter. Students must initiate all changes of status before the registration deadline of the quarter for which they want to be reclassified. (Specific deadline dates are listed on the Registrar's Web site.) Students are strongly encouraged to submit their petition at the earliest possible date in order to expedite the review process. As long as submission deadlines are met, students may be allowed a period of time no later than the end of the quarter to provide any additional documentation required for residence determination.

Incorrect Classification

Any student found to be incorrectly classified as a resident is subject to nonresident classification and to payment of all previously unpaid Nonresident Fees. If a student has concealed information or furnished false information, and was classified incorrectly as a result, the student is also subject to University discipline. Resident students who become nonresidents of California must immediately notify the UCI Residence Deputy.

Inquiries and Appeals

Inquiries regarding residence requirements, determination, and/or recognized exceptions should be directed to the University of California, Irvine, Residence Deputy, Registrar's Office, 215 Administration Building, Irvine, CA 92697-4975, telephone (949) 824-6129, or to the Principal Legal Analyst, Residence Matters, 1111 Franklin Street, 8th Floor, Oakland, CA 94607-5200. *No other University personnel are authorized to supply information relative to residence requirements for tuition fee purposes.*

This summary is *not* a complete explanation of the law regarding residence classification. Additional information is available from the Office of the Registrar. Changes may be made in the residence requirements between the publication of this statement and the relevant residence determination date. Any student, following a final decision on residence classification by the Residence Deputy, may appeal in writing to the Legal Analyst within 30 days of notification of the Residence Deputy's final decision.

Fee Refunds

Student Fee Refunds

Students who pay fees for a regular academic quarter and then decide to withdraw from the University must submit a Cancellation/Withdrawal form to the Registrar's Office after obtaining the signatures of their academic dean and, for undergraduate students, the University Ombudsman. Medical students must submit the form to the Curricular Affairs Office in the School of Medicine. This form serves two purposes: (1) a refund of fees, if applicable; and (2) automatic withdrawal from classes.

The effective date of withdrawal is used in determining the percentage of fees to be refunded. This date is normally the date that the student submits the form to the appropriate Dean/Ombudsman for approval and is designated by that Dean/Ombudsman. It is presumed that no University services will be provided to the student after that date. Registration fees are refunded as follows.

Students should bear in mind that the "first day of the quarter" often is several days prior to the "first day of instruction."

New Undergraduate Students. Through the first day of instruction, fees are refunded in full, except for: (1) the $100 Undergraduate Acceptance of Admission Fee, and (2) the Undergraduate Student Health Insurance Fee. (The Undergraduate Student Health Insurance Fee is refunded only if the Cancellation/Withdrawal form is submitted *prior to the first day of the quarter.)*

After the first day of instruction, the refund of the Registration Fee, Educational Fee, Associated Students Fee, UCI Student Center Fee, Bren Events Center Fee, Recreation Center Fee, Campus Spirit Fee, and Nonresident Tuition Fee (if applicable) is prorated as shown in the chart.

Continuing and Returning Undergraduate and New, Continuing, and Returning Graduate Students. Through the first day of instruction, fees are refunded in full, except for: (1) a $10 service charge, and (2) the Student Health Insurance Fee. (The Student Health Insurance Fee is refunded only if the Cancellation/Withdrawal form is submitted *prior to the first day of the quarter.)*

A refund of the Medical Student Disability Insurance Fee (if applicable) may be requested.

The refund of the Registration Fee, Educational Fee, Professional School Student Fee (if applicable), Associated Students or Associated Graduate Students Fee, UCI Student Center Fee, Bren Events Center Fee, Recreation Center Fee, Campus Spirit Fee, and Nonresident Tuition Fee (if applicable) is prorated as shown.

Calendar days, beginning with the first day of instruction	Refund
1	100 percent
2–7	90 percent
8–18	50 percent
19–35	25 percent
over 35	no refund

Claims for a refund of fees must be presented during the fiscal year (July 1 to June 30) in which the claim is applicable. Refund checks are issued by the Accounting Office and are mailed to the student generally two to four weeks after the official notice of withdrawal is initiated.

Students who are receiving financial aid and withdraw from UCI during a quarter will have all or part of the fee refund credited to the appropriate financial aid fund. Any cash disbursements, other than work-study, that a student received may also require repayment. The refund amount for new students who receive Title IV Federal financial assistance and withdraw during their first term at UCI is calculated as shown below (subject to change). Students withdrawing who received loans must schedule an exit interview with the Financial Services Office at (949) 824-7081.

Calendar days, beginning with the first day of instruction	Refund
1	100 percent
2–7	90 percent
8–14	80 percent
15–21	70 percent
22–28	60 percent
29–35	50 percent
36–42	40 percent
over 42	no refund

Housing Refunds

UCI Housing Contracts provide students with complete housing refund policies.

FINANCIAL AID

Lack of funds need not be a barrier to attending UCI; over 60 percent of UCI's enrolled students receive some form of financial aid. Students who demonstrate that they need financial assistance in order to attend may be eligible for scholarships, grants, loans, and/or work-study awards through the Office of Financial Aid and Scholarships. In addition to awarding aid on the basis of financial need, some scholarships are awarded on the basis of academic excellence. Information regarding the application process, deadlines, and financial aid programs for undergraduate, graduate, and medical students may be found in the *2005–06 Financial Aid Handbook,* which is available online at http://www.ofas.uci.edu/.

Free Application for Federal Student Aid (FAFSA/Renewal Application and FAFSA on the Web). To obtain financial aid, new and continuing students must file the FAFSA, FAFSA on the Web (FOTW), or the Renewal Application and submit the necessary supporting documents each year. The FAFSA is available at high schools, local colleges and universities; at the UCI Office of Financial Aid and Scholarships; and on the Web at http://www.fafsa.ed.gov/. Renewal applications are mailed to current financial aid recipients starting in mid-November and continuing through the end of December. Students are encouraged to apply as early as possible after January 1. The priority deadline to file the FAFSA/FOTW/Renewal Application for loans, work-study, and most grants is March 2. All other supporting documentation should be submitted to the Office of Financial Aid and Scholarships by May 1 for priority consideration.

The University expects the student and the parent (or spouse) to contribute toward the educational costs to the extent possible. For dependent students, an analysis of the FAFSA and supporting documents determines the amount a student and the student's parents can be expected to contribute toward the cost of the student's education. For independent students, the analysis determines the amount a student and, if applicable, a spouse, can contribute to the cost of the student's education. Income, assets, size of family, and the number of family members in college (excluding parents) are the major factors considered in the analysis. Assets include, but are not limited to, equity in real estate other than family residence; stocks, bonds, and other securities; business equity; and cash, savings, and checking accounts. Income includes wages, salaries, interest, dividends, and nontaxable income such as Social Security, Veterans' benefits, and foreign income.

All undergraduate financial aid applicants are required to apply for a Pell Grant, and eligible California residents are required to apply for a Cal Grant. The application deadline for Cal Grants is March 2 for the following academic year.

Special Expenditures. Financial aid recipients who are in need of money for special expenditures (beyond the cost of books and basic supplies associated with certain courses of study) may make an appointment to see a financial aid counselor to explore the possibility of a budget extension, based on the availability of funds. Examples of such special expenditures include special equipment for students with disabilities and computer purchases.

Eligibility Requirements

Federal financial aid programs are subject to regulations that define the criteria students must meet to qualify and maintain eligibility for those programs. The regulations state that a student must: (1) be a U.S. citizen or an eligible noncitizen of the U.S.; (2) be accepted for admission to the University; (3) be enrolled in good standing at the University; units taken through the University Extension program are not counted toward half- or full-time enrollment; (4) demonstrate financial need (except for William D. Ford Federal Direct Unsubsidized Loans and Federal PLUS loans); financial need is the difference between the reasonable, approved expenses of attending UCI and all available resources, including the expected contribution from parents, the student, and any outside aid; (5) maintain satisfactory academic progress for financial aid, as outlined below; (6) be registered with the Selective Service if the student is a male at least 18 years old, born after December 31, 1960, and not on active duty with the armed forces; (7) not owe a refund on a federal grant or be in default on a federal educational loan.

Once a student meets the above criteria, disbursement of financial aid funds is made only if the student does not have outstanding debts owed to UCI.

UCI POLICY ON SATISFACTORY ACADEMIC PROGRESS FOR FINANCIAL AID

Undergraduate and Graduate Students

In defining student eligibility for financial aid, the Higher Education Act Amendments of 1986 state that a student must maintain "satisfactory progress in the course of study the student is pursuing, according to the standards and practices of the institution at which the student is in attendance." Federal regulations of May 1982 state that each institution shall establish, publish, and apply "reasonable standards" for assuring that every student receiving need-based financial aid should maintain "satisfactory progress in his/her course of study." Final Federal regulations, published October 6, 1983, state that "in order to receive student financial aid under the programs authorized by Title IV of the Higher Education Act, a student must be maintaining satisfactory progress in the course of study he or she is pursuing according to the standards and practices of the institution in which he or she is enrolled."

Satisfactory Academic Progress Requirements for Financial Aid

The following requirements for satisfactory academic progress for receipt of financial aid apply to all applicants for any financial aid awards administered by the UCI Office of Financial Aid and Scholarships. These requirements are separate and distinct from UCI's policy regarding satisfactory academic progress.

1. **Grade Point Average (GPA).** All financial aid recipients must be in compliance with the following minimum cumulative GPA requirements at the conclusion of the spring quarter of each academic year: Undergraduates: first year, 1.85; second year, 1.90; third year, 1.95; fourth year, 1.975; fifth year, 2.00; graduate students: 3.0; medical students: academic performance requirements to pass course.

2. **Units** (Undergraduate and Graduate) and Clock Hours (Medical Students). All financial aid applicants must comply with the following minimum cumulative unit or clock-hour requirements.

Undergraduates:

Year	Units/ Quarter	End of Year Total	Cumulative Total
1	8 *	24	24
2	9 *	27	51
3	12	36	87
4	15	45	132
5	16	48	180

Graduate Students: Completion of at least 8 units per quarter.
Part-time Students: Completion of at least 6 units per quarter.

Medical Students—Regular Curriculum Clock-Hours:

Year	End of Year Total	Cumulative Total
1	783	783
2	740	1,523
3	2,080	3,603
4	1,540	5,143

Medical Students—Extended Curriculum Clock-Hours:

Year	End of Year Total	Cumulative Total
1	392	392
2	391	783
3	740	1,523
4	1,040	2,563
5	1,040	3,603
6	1,540	5,143

* These requirements are separate from enrollment requirements for specific financial aid programs. Contact the Office of Financial Aid and Scholarships for more information.

NOTE: Undergraduate and graduate students who enroll in more than the minimum number of units required per quarter in the first and second years will have the additional units carried forward for the cumulative total.

3. **Quarter Limits for Eligibility.** All financial aid applicants exceeding the following quarter limits will be ineligible for financial aid consideration. Students will not be granted additional quarters of eligibility solely by reason of changing their field of study or pursuing more than one major.

Undergraduate students:

1. Entering freshmen are eligible for all types of financial aid for a total of 15 quarters of academic year attendance.

2. Advanced standing transfer students will have transcripts from previous postsecondary institutions evaluated to determine the number of remaining quarters of financial aid eligibility at UCI.

3. Students acquiring a second bachelor's degree will have up to six quarters of additional financial aid eligibility for a maximum of 21 quarters of undergraduate attendance.

Graduate students:

1. California educational credential students: four quarters of academic year attendance.

2. Master's degree designed for completion in:
   a. three quarters: five quarters of academic year attendance.
   b. six quarters: eight quarters of academic year attendance.
   c. nine quarters: eleven quarters of academic year attendance.

3. Ph.D. students may be eligible for financial aid for up to 21 quarters of academic-year attendance following the completion of their baccalaureate degree (whether or not they received financial aid during the 21 quarters).

Medical students:

1. Incoming students in their first year of attendance will be eligible for financial assistance for a total of four years.

2. Students who have been approved for Extended Curriculum will be eligible for financial assistance for a total of six years.

Unit Evaluation

1. **Remedial courses.** *Required* remedial courses will count toward the undergraduate, graduate, and medical student minimum unit/clock-hour requirement of the satisfactory academic progress policy for financial aid.

2. **Grade evaluation.** As defined below, units for the following grades *will not* be counted toward meeting the minimum unit/clock-hour requirement.

Undergraduate and graduate students: F (Failure), I (Incomplete), NP (Not Pass), U (Unsatisfactory), W (Withdraw), NR (No grade reported), Repeat courses (Repeat of a D grade or higher; repeat of an advanced standing or high school course). *Medical students:* F (Failure), NR (No grade reported), Repeat courses (Repeat of a D grade or higher).

3. **Incomplete courses—medical students.** Clock-hours for a grade of Incomplete (I) will be counted toward satisfactory academic progress for the quarter/quintile during which the student took the course. If the student fails to meet the requirements for removing the I and the I becomes a grade of F, the clock-hours for that course will be deleted retroactively from the student's satisfactory academic progress record.

4. **Courses in progress—medical students.** Clock-hours for courses In Progress (IP) will be counted toward satisfactory academic progress during the first quarter/quintile of a course requiring more than two quarters/quintiles for completion. Should the student fail to receive a passing grade, after the course has been completed the clock-hours for that course will be deleted retroactively from the student's satisfactory academic progress record.

Deficiencies in Satisfactory Academic Progress and Their Effect on Receiving Financial Aid

The requirements for undergraduate and graduate student satisfactory academic progress stated above are monitored each quarter and at the end of each academic year. Students who fail to maintain satisfactory academic progress will have their financial aid eligibility affected in the following manner.

1. Quarterly totals—unit and GPA
   a. Cumulative GPA below the minimum required total:

Students are placed on Satisfactory Academic Progress probation for the remainder of the academic year. They are able to receive financial aid funds for that academic year but the GPA deficiency must be cleared by the end of spring quarter of that academic year or the end of summer session. Eligibility for the following academic year will be dependent upon clearing the GPA deficiency. Note: GPA deficiencies must be cleared at a University of California campus.

   b. Unit deficiencies:

i. Enrolled in less than the minimum units required but at least six per quarter. Students are placed on Satisfactory Academic Progress probation for the remainder of the academic year. They are able to receive financial aid funds for that academic year but the unit deficiency must be cleared by the end of spring quarter of that academic year or the end of summer session. Eligibility for the following academic year will be dependent upon clearing the unit deficiency.

ii. Enrolled in less than six units per quarter. Students are placed on Satisfactory Academic Progress probation for the remainder of the academic year. They are able to receive campus-based financial aid funds for that academic year but the unit deficiency must be cleared by the end of spring quarter or the end of summer session. Eligibility for the following academic year will be dependent upon clearing the unit deficiency.

2. Academic year totals—units and GPA. The Office of Financial Aid and Scholarships will verify the cumulative totals for units and GPA after the conclusion of spring quarter. Students who have unit and/or GPA deficiencies will be required to make up the deficiency prior to receiving any future financial aid funds, including funds that would be used for payment of fees.

3. Quarter limits of eligibility. At the end of each quarter students will be notified by the Office of Financial Aid and Scholarships if they are nearing the quarter limit of eligibility for financial aid. The notice will indicate how many quarters of eligibility remain. Students also will be notified when they have completed the maximum number of quarters of eligibility for financial aid.

Satisfactory Academic Progress Appeals

After failure to maintain satisfactory academic progress, a student will be considered for financial aid only when one of the following conditions has been met: (a) sufficient units/clock-hours have been completed and/or the minimum cumulative GPA requirement has been satisfied, or (b) it is established through the financial aid appeals process that the student encountered some type of extenuating circumstances during the quarter(s) in question which hindered academic performance (e.g., prolonged hospitalization, death in the family).

Appeals Procedure

Students wishing to appeal must submit the UCI Financial Aid Appeal Request Form (available from the Office of Financial Aid and Scholarships); a letter to the Office of Financial Aid and Scholarships stating their reasons for failing to meet the unit, clock-hour, or GPA progress requirements, and whether or not they have solved their difficulties; and any other requested documents. Undergraduate and graduate students may seek the assistance of the University Ombudsman in the preparation of appeals. Medical students may seek the assistance of the Associate Dean of Student and Resident Affairs in the preparation of appeals. They may also be required to submit a degree check, course plan, or letter from their dean.

Undergraduate Students—All relevant material will be presented to the Financial Aid Appeals Board (the Board is composed of Financial Aid professional staff). Once material has been reviewed, the Board will decide whether eligibility for aid will be reinstated. In the event the Board decides not to accept an appeal, the student will be given the right to a personal interview with the Board. If the student decides to exercise this right, a final recommendation based upon the interview and written material will be made by the Board and forwarded to the Director of Financial Aid and Scholarships for a final decision.

Graduate Students—Appeals are reviewed by (1) the Graduate Advisor of the student's advanced degree program and (2) the Dean of Graduate Studies, who will make the final recommendation to the Director of Financial Aid and Scholarships for a final decision.

Medical Students—All relevant materials will be presented to the Committee on Promotions and Honors. If the Committee, after consideration of the appeal, determines that the appeal should be approved, its decision will be forwarded to the School of Medicine Director of Financial Aid, and aid will be reinstated. In the event the appeal is denied by the Committee, the student will be given the right to a personal interview with the Committee. The Committee will forward the final decision to the School of Medicine Director of Financial Aid for implementation.

UCI POLICY ON EXCESS UNITS

Under the Partnership Agreement with the State of California, the University has made a number of commitments including the following: new California resident freshmen matriculating at UCI fall 2005 and thereafter may be subject to additional fees and denied State financial aid if (1) they seek to enroll beyond the twelfth quarter of attendance and (2) they have completed more than 110 percent of the units required for their major. Transfer students may be subject to the same additional fees, but on a time schedule and unit limit adjusted to reflect their work prior to matriculation at the University of California. Students who are approaching the threshold may be notified by the Office of Financial Aid and Scholarships regarding the potential loss of UC State funds. However, final determination will be made by the UC Office of the President based on specific degree requirements. Only credits earned at a University of California campus or through the Education Abroad Program, the UCDC Academic Internship Program, or the University of California Center in Sacramento are used in the calculation of this limit. Advanced Placement, International Baccalaureate, extension course work, and transfer credit earned at a non-UC institution are not used to determine eligibility. If an aid recipient does exceed the 110 percent threshold, the recipient will be retroactively billed for any UC State funds received during the academic year.

UCI OFFICE OF FINANCIAL AID AND SCHOLARSHIPS STUDENT WITHDRAWAL POLICY

Students who withdraw from UCI prior to completing 60 percent of the period for which they received federal financial aid will be subject to both the UC Fee Refund Policy and the Federal Return of Title IV Funds policy. Title IV Funds are federal funds awarded to a student to meet educational expenses. Examples of Title IV Funds include: Pell Grants, Federal Supplemental Educational Opportunity Grants (SEOG), Federal Direct Loans, and Federal Perkins Loans.

Cancellation of Enrollment. Students who cancel their registration or have their registration cancelled by the University prior to the first day of classes will be invoiced for all financial aid disbursed on their behalf.

The full text of this official policy is available on the Office of Financial Aid and Scholarships Web site at http://www.ofas.uci.edu/.

Any student contemplating withdrawing from the University should contact the Office of Financial Aid and Scholarships to speak with a financial aid counselor concerning the financial ramifications of withdrawing.

Students who are receiving a Cal Grant should also contact the Office of Financial Aid and Scholarships to discuss the ramifications of withdrawing on their Cal Grant status. Students should check with their financial aid counselor on how they may be able to re-establish a quarter of eligibility for their Cal Grant.

Scholarships

Scholarships are awarded on the basis of academic ability, achievement, and promise. They do not require repayment. Although a few honorary scholarships are awarded on the basis of academic excellence alone, many also require that an applicant demonstrate financial need. UCI offers students with proven high academic achievement and leadership potential three top honors awards: Regents', Alumni Association, and Chancellor's Achievement. The scholarships have stipends which range from $1,000 to $9,000; or, in the case of Regents' Scholarships, may provide an amount up to full demonstrated need.

Entering Freshman and Transfer Students

Students who are entering UCI in the fall must complete the *UC Application for Undergraduate Admission and Scholarships* and submit the application by November 30. The Office of Financial Aid and Scholarships automatically collects information about applicants' scholarship qualifications. Applications that meet the requirements are reviewed by the Board on Undergraduate Scholarships, Honors, and Financial Aid. Information about the Alumni Scholarship is available in the *UC Application for Undergraduate Admission and Scholarships,* however separate application is required for the Alumni Scholarship.

Restrictive Endowment Scholarships

Eligibility requirements for Restrictive Endowment Scholarships vary greatly and are restricted in terms of such student characteristics as geographic location, family background, academic major, and career goals. For the most part, these scholarship awards are based on the student's established financial need. All UCI students will be considered for Restrictive Endowment Scholarships based upon information from the *UC Application for Undergraduate Admission and Scholarships* and their current academic records.

Regents' Scholarships

Regents' scholarships, among the highest honors conferred upon UC students, are awarded on the basis of academic excellence and exceptional promise. Undergraduate students are eligible upon graduation from high school or transfer from community college. Medical students are eligible during any year of their study in medical school. The scholarship is awarded both as an honorarium and a stipend. It may be renewed for an additional one or three years depending on the year of appointment, provided the student completes an average of 12 units per quarter and maintains a grade point average of at least 3.25. The honorarium is awarded without reference to financial need. The amount of the stipend will vary depending on the student's established financial need.

Chancellor's Achievement Scholarships

Chancellor's Achievement Scholarships are offered to students entering their freshman year and transfer students who show evidence of high scholastic achievement. The scholarship may be renewed for an additional one or three years depending on the year of appointment, provided the student completes an average of 12 units per quarter and maintains a grade point average of at least 3.00. The scholarship is awarded without reference to financial need.

National Merit Scholarships

UCI is a sponsor of the National Merit Scholarship. Recipients are selected from a list of finalists who selected UCI as their first college choice on the National Merit Scholarship Application.

ROTC Scholarships: See the Supplementary Educational Programs section.

Grants

Grants are awarded on the basis of financial need. There is no repayment requirement. A student's financial aid award includes grant funds whenever regulations, UCI policies, and funding levels permit.

Federal Pell Grant is the largest federally funded grant program and provides up to a maximum of $4,050 for the 2005–06 academic year. To be eligible, applicants must be U.S. citizens or eligible noncitizens, be enrolled as undergraduates, have not previously received a bachelor's degree, and demonstrate financial need. Students must use the FAFSA to apply for this grant.

Cal Grant A is a State-funded scholarship program which currently provides awards to be applied to the payment of University fees. In 2005–06 Cal Grant A awards will pay up to $6,141. To be eligible, applicants must be California residents and demonstrate financial need. Students must use the FAFSA and GPA Verification Form to apply for Cal Grant A. The filing deadline for new applicants is March 2 for the following year.

Cal Grant B is a State-funded grant program which provides awards up to a maximum of $1,551 in 2005–06 during the student's first year and $1,551 plus $6,141 toward fees during subsequent years. To be eligible, applicants must be California residents, demonstrate financial need, and be entering college or not have completed more than one quarter of college work. Students must use the FAFSA and GPA Verification Form to apply for Cal Grant B. The filing deadline for new applicants is March 2 for the following year. *NOTE: Students may not receive both Cal Grant A and Cal Grant B. If offered both, the Office of Financial Aid and Scholarships recommends taking Cal Grant B over Cal Grant A.*

Federal Supplemental Educational Opportunity Grant (FSEOG) provides grant aid for U.S. citizens and eligible noncitizens who are undergraduate students and have demonstrated financial need. These federal grants range from $100 to $4,000 per year, depending upon financial need.

UCI Grant is funded by The Regents of the University of California and by the State of California and provides grant aid for full-time students who demonstrate financial need. The amount awarded depends upon financial need and funding levels.

Loans

Loans are often part of a financial aid award. They provide recipients with an opportunity to defer the cost of their education by borrowing when needed and paying later. However, loan recipients must pay interest on the amount borrowed. The deferment and cancellation provisions for the loans listed below are contained on the promissory note each recipient must sign and also may be obtained from the Office of Financial Aid and Scholarships.

A student's loan responsibility, prior to acceptance of the loan, is to understand the terms of the loan. After accepting the loan, the recipient must repay the loan in accordance with the repayment schedule, advise the Office of Financial Aid and Scholarships upon leaving UCI; participate in an exit interview; and provide the Financial Services Office with a current address after leaving UCI. In case of death or total disability, outstanding loan obligations may be canceled upon presentation of official confirming documents.

Federal Perkins Loan provides long-term federal loans for U.S. citizens and eligible noncitizens. The amounts awarded vary, depending on financial need, but cannot exceed $4,000 annually for undergraduates and $6,000 annually for graduate students. Cumulative totals for the full term of college attendance may not exceed $20,000 as an undergraduate and $40,000 as a graduate student. No interest is charged nor is repayment required while the borrower is enrolled in at least one half of the normal academic load. Interest of five percent a year begins nine months after the borrower ceases to be enrolled or is enrolled less than half-time, and repayment must be completed within a 10-year period.

University Loan, funded by The Regents of the University of California, provides long-term loans to full-time students who demonstrate financial need. The maximum amount for an academic year is $3,000. Interest of five percent a year begins six months after the student ceases to be enrolled at least half-time, and repayment must be completed within ten years. Two cosigners are required.

William D. Ford Direct Loan Program

Subsidized William D. Ford Federal Direct Loan, processed through the U.S. Department of Education and UCI, is available to undergraduate, graduate, and medical students who are U.S. citizens or eligible noncitizens, and who demonstrate financial need. During an academic year, the maximum a student may borrow is: $2,625, freshmen; $3,500, sophomores; $5,500, juniors and seniors; $8,500, graduate and medical students. Both a guarantee and origination fee will be deducted from the amount of the loan prior to issuing the check.

Interest rates: The federal government pays interest during the deferment period for Subsidized Direct Loans. Interest rates are variable, adjusted annually, for loans to new borrowers with first disbursements on or after July 1, 1998, and before June 30, 2003, based on 91-day Treasury Bill plus 1.7 percent during in-school, grace, and deferment periods; and 2.3 percent during repayment, capped at 8.25 percent. Borrowers will be charged a 3 percent origination fee. See http://www.ofas.uci.edu/ for current as well as historic loan rates.

Cumulative maximums: Dependent, undergraduate, $23,000; independent, undergraduate, $46,000; graduate and medical students, $65,500 (includes undergraduate loans). Deferment period before repayment: Six months after ceasing to be enrolled at least half-time. Full repayment: Up to 10 years.

Unsubsidized Federal Direct Loans have the same terms and conditions as the Federal Direct Loan, including the aggregate loan limits, interest rate, and repayment. During an academic year the maximum a dependent student may borrow is $2,625, freshman; $3,500, sophomore; $5,500, juniors and seniors. Independent students may borrow an annual maximum of: $6,625, freshmen; $7,500, sophomores; $10,500, juniors and seniors; $18,500, graduate and medical students. These maximum amounts include any amount borrowed under the Subsidized William D. Ford Federal Direct Loan program. However, the loan is not based on need. Students may borrow an amount equal to the cost of attendance less any estimated financial assistance up to the annual loan limits in effect at the time the loan is disbursed. Students must first apply for the Federal Direct Loan prior to consideration for the Unsubsidized Federal Direct Loan. There is no interest subsidy for this loan; students pay the interest charged while enrolled at UCI. Students may receive both subsidized and unsubsidized Federal Direct loans but the total may not exceed the loan limits. Borrowers with both types of loans may have a single repayment schedule.

Interest rates: Variable, adjusted annually, for loans to new borrowers with first disbursements on or after October 1, 1992, based on 91-day Treasury Bill plus 3.10 percent, capped at 8.25 percent. Borrowers will be charged a 3 percent origination fee. See http://www.ofas.uci.edu/ for current as well as historic loan rates.

Cumulative maximum: Dependent, undergraduate, $23,000; independent, undergraduate, $46,000; graduate and medical students, $73,000 (includes undergraduate loans). Deferment period before repayment: Interest accrues immediately and may be paid monthly or quarterly. Students also may request that the lender add the interest to the principal balance. Repayment of principal begins six months after ceasing to be enrolled at least half-time. Full repayment: Up to 10 years. Minimum payment: $50 per month.

Federal Direct Parent Loans for Undergraduate Students (FPLUS) are designed to assist parents of dependent undergraduate students who are unable to demonstrate financial need for campus-based funds. Parents are eligible to borrow up to the cost of education for the academic year less any estimated financial aid each academic year on a student's behalf. The loan is limited to parents who do not have adverse credit histories as defined by regulation.

Interest rate: Variable, adjusted annually, based on a 52-week Treasury Bill plus 3.1 percent not to exceed 9 percent. Borrowers will be charged a 3 percent origination fee and an insurance premium of 1 percent. See http://www.fao.uci.edu/ for current as well as historic loan rates.

Cumulative maximum: None. Deferment period before repayment: 60 days from day of final check disbursement for loan period. Full repayment: Up to 10 years.

Loans for Disadvantaged Students and Primary Care Loans are available to medical students. Contact the School of Medicine Financial Aid Office for information.

Emergency loans are made from an emergency student loan fund made possible through various philanthropic individuals and organizations. Undergraduate, graduate, and medical students who have experienced unanticipated financial problems of a temporary nature may borrow up to $300 without interest or service charge. Emergency loans must be repaid within 30 days after disbursement or by the end of the academic quarter, whichever occurs first. Applications are available in the Office of Financial Aid and Scholarships or at the School of Medicine Financial Aid Office. This loan is not based on demonstrated financial need.

Federal College Work-Study

The Federal College Work-Study Program offers eligible students who demonstrate need an opportunity to pay for their living and educational expenses as they occur. By participating in the Federal College Work-Study Program, students can reduce the amount of the loan to be repaid after leaving school. Medical students must obtain the approval of the Associate Dean of Student and Resident Affairs prior to obtaining work-study employment. Students awarded work-study have the choice of obtaining a work-study job either on campus or off campus at an approved nonprofit agency. A variety of work opportunities are available, and such part-time work experience can be a valuable asset when seeking employment after graduation. Students eligible for work-study will be notified as such via their UCI Financial Aid award notification. Specific information regarding the terms and conditions of work-study employment will be available with the award notification.

Veterans Work-Study Program is available only to U.S. military veterans and their eligible dependents, and members of the Selected Reserve and National Guard. Positions are limited. Separate applications and detailed information are available from Veterans Services, telephone (949) 824-6477.

Additional Aid for Graduate and Medical Students

Most graduate fellowship programs are administered by the Office of Research and Graduate Studies. Graduate students should contact the Office, 102 Administration Building; telephone (949) 824-4611. Medical students should contact the School of Medicine Financial Aid Office, 106 Medical Education Building, telephone (949) 824-6476.

Aid for Students with Disabilities

All forms of student financial aid are available to eligible students with disabilities. Interested students should follow the regular financial aid application procedures and should notify the Office of Financial Aid and Scholarships of any additional expenses they may incur because of a disability. Supporting documentation must be provided.

Student Employment

The UCI Career Center, located in the Student Services I building, assists UCI students in obtaining part- or full-time employment during the academic year and summer vacation. Financial aid recipients who have been awarded work-study also may obtain on-campus or off-campus job referrals in the Center. Students may easily access all job listings using their student I.D. number via the Career Center's Web site at http://www.career.uci.edu/.

UNDERGRADUATE ADMISSIONS

The Office of Admissions and Relations with Schools is responsible for the admission of new undergraduate freshman and transfer students. Inquiries may be addressed to the Office of Admissions and Relations with Schools, 204 Administration Building, University of California, Irvine, CA 92697-1075; telephone (949) 824-6703; World Wide Web: http://www.admissions.uci.edu/. The Office is open from 8 a.m. to 5 p.m., Monday through Friday.

The information on admission to UCI presented below is organized as follows:

Categories of Application
Admission as a Freshman Applicant
Admission as a Transfer Applicant
Nonresident Admission Requirements
Admission of International Students
Advanced Placement Credit
Application Procedures

Categories of Application

An **undergraduate** applicant is a student who wishes to complete a program of study leading to a Bachelor of Arts, Bachelor of Music, or Bachelor of Science degree.

A **freshman** applicant is a student who has graduated from high school or has completed a California Certificate of Proficiency, an equivalent proficiency examination from another state, or the General Educational Development (GED) Certificate, but has not enrolled in a regular session of any collegiate-level institution. Summer sessions immediately following graduation are excluded in the determination of freshman status.

The University considers a **transfer** applicant as a student who has completed high school and who has been a registered student in a regular session of a college or university. Students who meet this definition cannot disregard their college record and apply as freshmen. To be considered as a **California community college transfer** applicant to UCI, a student must have completed at least 30 semester units/45 quarter units at one or more California community colleges.

A **nonresident** applicant is a student whose legal permanent residence (as determined by the University) is outside of the State of California. Nonresident applicants are generally required to pay Nonresident Tuition and must also present a higher grade point average than is required of California residents. Refer to the Nonresident Admission Requirements section for further information.

An applicant for **readmission** is a student who was formerly registered and enrolled at UCI and who has interrupted the completion of consecutive quarters of enrollment. See Readmission: Undergraduate and Graduate Students.

A **second baccalaureate** applicant is a college graduate who because of a change of objective wishes to obtain a second bachelor's degree in a major different from that of the first degree.

An **international** applicant is a student who holds or expects to hold a student, exchange, visitor, or diplomatic visa and who wishes to attend school in the United States.

Admission as a Freshman Applicant

The undergraduate admissions policy of the University of California is guided by the University's commitment to serve the people of California and the needs of the State, within the framework of the California Master Plan for Higher Education.

The University's eligibility requirements follow the guidelines set forth in the Master Plan, which specify that the top one-eighth of the State's high school graduates be eligible for admission to the University of California. These requirements, described in detail in the Minimum Admission Requirements for Freshmen section, are designed to ensure that all eligible students are adequately prepared for University work. Meeting eligibility requirements entitles an applicant to be considered for admission but does not constitute an offer of admission.

In recent years, the number of freshman applicants to UCI has exceeded the number of spaces available. Since the campus cannot admit all eligible applicants, it must use standards that are more demanding than the minimum UC requirements to select students. These standards, which the University calls selection criteria, are used to identify applicants who have demonstrated the highest academic achievement and who have a variety of other qualities that can contribute to the strength and diversity of the campus community.

In the case that UCI is unable to accommodate all qualified applicants in their first-choice major, those students who indicate a valid alternate major may be offered admission in that major. Students who wish to change their major after enrolling at UCI must submit a change of major petition.

ADMISSIONS SELECTION

UCI seeks to select students who have a demonstrated record of academic and personal achievement. The primary criterion for admission to UCI is academic excellence, including the number of college preparatory courses completed; the level of achievement in these courses, including honors, Advanced Placement, International Baccalaureate, and college courses completed; and the quality of the senior-year program as measured by the type and number of academic courses in progress or planned. Also considered are the high school grade point average calculated on UC-specified subjects (UCI uses a maximum of eight honors grade points in determining the UC GPA) and the required standardized national examinations.

The level of performance needed to gain admission varies from year to year depending on the size and the academic quality of the applicant pool and the number of enrollment spaces.

A secondary criterion in UCI's selection process is personal achievement outside the classroom. A range of pursuits is considered, including academic activities, the creative and performing arts, community service and leadership, athletics, participation in pre-collegiate programs that develop academic ability, and other extracurricular activities. Persistence counts more than scattered involvement, while initiative and curiosity are also important.

The admissions process at UCI is also sensitive to individual circumstances and the effect these may have had on the resources available to and the experiences of applicants. While all applications receive careful consideration, reviewers take note of any extenuating circumstances and/or a variety of cultural and economic situations, including students who are the first in their families to attend college, who have a low family income, or who have worked in support of their family during high school. The emphasis, however, is less on the personal circumstances of the applicant and focuses instead on how the applicant has responded to challenges while achieving academic success.

Two or more members of the admissions committee read most applications, and every attempt is made to become familiar with the unique accomplishments of each applicant.

Students interested in the majors below should be aware of the following provisions.

Dance and **Music:** Applicants to either Dance or Music must audition and be selected by faculty.

Engineering: Applicants to any of the Engineering majors must complete four years of high school mathematics, including at least one year beyond intermediate algebra.

Computer Science and Engineering (offered jointly by the Donald Bren School of Information and Computer Sciences and The Henry Samueli School of Engineering): Applicants must complete four years of high school mathematics, including at least one year beyond intermediate algebra. (This requirement does not apply to other majors offered by the Donald Bren School of Information and Computer Sciences.)

MINIMUM ADMISSION REQUIREMENTS FOR FRESHMEN

The University defines a freshman applicant as a student who has graduated from high school or completed a California Certificate of Proficiency, or the General Educational Development (GED) examination, and who has not enrolled in a regular session of any collegiate-level institution. Summer sessions are excluded in the determination.

Freshman applicants who are not residents of California should refer to the Nonresident Admission Requirements section.

Applicants who do not meet the requirements for admission at the time of high school graduation may be considered after they meet the requirements for admission in advanced standing (see Admission as a Transfer Applicant). Transfer credit will be granted for an acceptable course from an accredited college or university taken while still in high school if reported on a valid transcript issued by the college which conducted the course.

The requirements described below represent the minimum academic standards students must attain to be eligible for admission to the University. Meeting minimum eligibility requirements does not guarantee admission. Admission to UC Irvine and the program of choice often requires students to meet more demanding standards.

California Residents

There are three paths to satisfying the University's minimum admission requirements for freshmen students: eligibility in the statewide context, eligibility in the local context, and eligibility by examination alone.

Eligibility in the Statewide Context

Eligibility in the statewide context is the pathway by which most students attain UC eligibility. To be eligible in the statewide context, students must receive a high school diploma or equivalency and satisfy the Subject, Scholarship, and Examination Requirements described below.

UC Subject Requirement

The UC subject requirement consists of several courses from seven core subjects. These required courses are called the "a through g" subjects. Students are required to complete 15 yearlong "a through g" subjects as described below. (A one-year course is equal to one unit; a one-semester course is equal to one-half unit.) Also, at least seven of the 15 units must have been earned in courses taken during the last two years of high school. To meet the subject requirement, these courses must appear on a certified course list which is available in the high schools for California applicants and on the World Wide Web at http://www.universityofcalifornia.edu/admissions/undergrad_adm/paths_to_adm/freshman/subject_reqs.html. The Office of Admissions and Relations with Schools will review and accept courses that meet the requirements for applicants graduating from out-of-State schools.

"a through g" Course Requirements

a. **History/Social Science: 2 years required.** Two years of history/social science, including one year of U.S. history or one-half year of U.S. history and one-half year of civics or American government; and one year of world history, cultures, and geography.

b. **English: 4 years required.** Four years of college-preparatory English composition and literature.

   (All English courses must require frequent and regular writing and reading of classic and modern literature, poetry, and drama. Only two semesters of a certified English-as-a-second-language [ESL] course will be accepted. Also, not more than two semesters of ninth-grade English will be accepted for this requirement.)

c. **Mathematics: 3 years required; 4 recommended.** Three years of mathematics elementary algebra, geometry, and advanced (second-year) algebra. Approved integrated mathematics courses may be used to fulfill part or all of this requirement.

   (Mathematics courses taken in grades 7 and 8 may be used to meet part of this requirement if they are accepted by the high school as equivalent to its own courses.)

d. **Laboratory Science: 2 years required; 3 recommended.** Two one-year courses in laboratory science providing knowledge in at least two of these three disciplines: biology (which includes anatomy, physiology, marine biology, aquatic biology, among others), chemistry, and physics. The final two years of an approved three-year integrated sciences program are acceptable provided the courses cover the basic concepts of two of the three fundamental disciplines. Laboratory courses in earth sciences are acceptable if they have as prerequisites or provide basic knowledge in biology, chemistry, or physics. Not more than one year of ninth-grade laboratory science can be used to meet this requirement.

e. **Language Other Than English: 2 years required; 3 recommended.** Two years of a single language other than English in which there is substantial literature. Courses should emphasize speaking and understanding, and include instruction in grammar, vocabulary, reading, and composition.

   (Language other than English courses taken in grades 7 and 8 may be used to meet this requirement if they are accepted by the high school as equivalent to its own courses. Students are strongly encouraged to complete three or four years of one language in preparation for the UCI Language Other Than English and/or the International/Global Issues breadth requirements.)

f. **Visual and Performing Arts Discipline (VPA): 1 year required.** *For 2006 admission and later,* a single yearlong approved course from a *single* VPA discipline: dance, drama/theatre, music, or visual arts.

g. **College Preparatory Electives: 1 year required.** One year (two semesters), in addition to those required in "a–f" above, chosen from the following areas: visual and performing arts (non-introductory-level courses), history, social science, English, advanced mathematics, laboratory science, and language other than English (a third year in the language used for the "e" requirement or two years of another language).

Courses Satisfying the "g" Requirement:

History: All history courses should require extensive reading and writing. Courses should enable students to establish a breadth of understanding of history (for example, world history, political history, or economic history) and should provide an understanding of the human past, including its relation to the present. Courses should develop a student's critical thinking, ability to evaluate historical data, and ability to analyze and synthesize evidence.

Social Science: Courses should be in one of the social sciences: anthropology, economics, geography, political science, psychology, or sociology, or, alternatively, courses should be interdisciplinary, drawing knowledge from two or more of these fields. Course objectives should include as many of the following as are applicable to the field: (1) to understand the development and basic features of major societies and cultures, (2) to examine the historic and contemporary ideas that have shaped the world, (3) to understand the fundamentals of how differing political and economic systems function, (4) to examine the nature and principles of individual and group behavior, and (5) to study social science methodologies.

In order to develop a student's critical thinking, ability to evaluate ideas and information, and ability to analyze and synthesize qualitative and quantitative evidence in the laboratory and in the field, a social science course must include a body of basic knowledge, extensive reading, and written and oral exposition.

Courses which are designed to meet State-mandated social studies graduation requirements are acceptable provided that they meet the above criteria. Courses of an applied, service, or vocational character are not acceptable social science electives.

English: All English courses should require substantial reading with frequent and extensive practice in writing which is carefully evaluated and criticized. A course in journalism, speech, debate, or drama is acceptable if it meets the rigor in reading and writing stated above. An advanced-level course in English as a second language may be acceptable provided it meets the standards outlined under the "b" requirement.

Advanced Mathematics: Acceptable electives are courses in mathematics with second-year algebra as a prerequisite such as trigonometry, linear algebra, precalculus (analytic geometry and mathematical analysis), calculus, combinatorics, probability, and statistics.

A computer science course is an acceptable mathematics elective if it fulfills the following objectives. The course should enable each student to express algorithms in a standard computer language such as C++, Pascal, Java, BASIC, FORTRAN, or COBOL. By the end of the course each student should complete substantial programming projects in the language used. The course should also involve the study and mastery of various aspects of computer science: how computers deal with data and instructions, the internal components of a computer, and the underlying computer logic.

Laboratory Science: A laboratory science course should be a course in the biological or physical sciences in which students make their own observations and measurements and analyze these data to obtain further information. On average the laboratory activities should involve an amount of time equivalent to at least one full class period per week.

An introductory science course normally offered in the ninth grade is an acceptable science elective provided it is designed to prepare students for laboratory science courses in the tenth grade and beyond. The course must provide an introduction to the fundamental principles of physical and biological science. Laboratory activities as defined above shall be included. (A terminal course designed only to meet graduation requirements is not an acceptable science elective.)

Language Other Than English: It is recommended that elective courses be in the same language used to satisfy the language other than English "e" subject requirement. Elective courses in this language must have at least two years of the language as prerequisite. In order for a second language to qualify as an elective, at least two years of this language must be completed.

Visual and Performing Arts: Courses in this area consist of instruction in dance, drama/theatre, music, and the visual arts. Courses should enable students to understand and appreciate artistic expression and, where appropriate, to talk and write with discrimination about the artistic material studied.

Courses devoted to artistic performance and developing creative artistic ability should have prerequisites (either one year of introductory course work or experience approved by the instructor) and should assume proficiency beyond the introductory level.

Courses must require on average the equivalent of a five-period class per week. Work outside of class must be required; for example, portfolio/performance preparation, reading, writing, or critical listening/viewing.

Dance courses offered for physical education credit or under any other departmental arrangement are acceptable provided they include content satisfying the above criteria.

Courses which are primarily athletic, or body conditioning are not acceptable visual and performing arts electives.

College Preparatory Electives: The general objectives of the "electives" requirement are to improve students' analytical abilities, promote artistic development, and strengthen oral and written skills. The requirement is intended to encourage prospective University students to fill out their high school programs with courses that: (1) strengthen general study skills, particularly analytical skills, expository writing, and oral communication; (2) provide an opportunity to begin work that could lead directly into a major program of study at the University; (3) experience, at some depth, new areas of academic disciplines that might form the basis for future major or minor studies at the University.

Scholarship Requirement

The Scholarship Requirement defines the grade point average (GPA) students must attain in the required "a–g" subjects and the SAT Reasoning Test (or ACT Assessment plus Writing test) and SAT Subject Test scores students must earn to be eligible for admission to the University.

The University uses a combination of GPA and test scores to determine if an applicant meets the Scholarship Requirement. NOTE: Because of the recent changes to the SATs and the ACT, the Eligibility Index is being revised and was unavailable at press time. A new Eligibility Index will be available online at http://www.universityofcalifornia.edu/admissions/.

The University calculates the GPA in the "a–g" subjects by assigning point values to the grades a student earns, totaling the points, and dividing the total by the number of "a–g" course units. Points are assigned as follows: A = 4 points, B = 3 points, C = 2 points, D = 1 point, and F = 0 points.

Only grades the student earns in "a–g" subjects in grades 10–11 are used to calculate the GPA. Courses taken in the ninth grade can be used to meet the Subject Requirement if the student earns a grade of C or better, but they will not be used to calculate the GPA.

Honors-Level Courses. Advanced Placement courses, higher-level courses offered through the International Baccalaureate Program, courses certified by the University as honors courses, and college courses in the "a through g" college preparatory subjects that are transferable are examples of honors-level courses. The University assigns extra grade points for up to four units of honors-level courses taken in the last three years of high school. NOTE: No more than two units of honors-level courses taken in grade 10 may be assigned extra points. Grades in honors courses will be counted as follows: A = 5 points, B = 4 points, and C = 3 points. Grades of D are not assigned extra points. To be counted, these grades must have been earned in University-approved honors-level courses in history, English, advanced mathematics, laboratory science, language other than English, computer science, social science, and the visual and performing arts.

Eligibility in the Local Context

Under the Eligibility in the Local Context (ELC) pathway, the top four percent of students at each participating California high school are designated UC-eligible and guaranteed admission to one of UC's eight general campuses.

To be considered for ELC, students must complete 11 yearlong specific UC-approved courses of the Subject Requirement by the end of the junior year and, with the assistance of each participating high school, the University will identify the top four percent of students on the basis of GPA in the required course work.

The 11 units include: 1 unit of history/social science, 3 units of English, 3 units of mathematics, 1 unit of laboratory science, 1 unit of language other than English, and 2 units chosen from among the other subject requirements.

The University will notify ELC students of their status at the beginning of their senior year. Students designated UC-eligible through ELC must submit the University's undergraduate application during the November filing period and complete remaining eligibility requirements—including the Subject and Examination Requirements—to enroll.

Applicants confirmed as Eligible in the Local Context (ELC) will be considered along with multiple factors for admission selection during comprehensive review.

Comprehensive information about ELC is available on the University's ELC Web site at http://www.ucop.edu/sas/elc/.

Examination Requirements

All freshman applicants must submit examination scores as described below. *Students applying for admission for fall quarter should complete their examination requirements during May or June of their junior year or during their senior year, but no later than the December test date. (Typically, this means that students will take either the SAT Reasoning Test or the ACT Assessment plus Writing test in October or November, and will take the SAT Subject Tests in November or December.)* Scores from earlier dates will be accepted. Applicants must ensure that reports for all scores have been submitted directly to the UCI Office of Admissions and Relations with Schools.

Effective for students entering UC as freshman in fall 2006, each applicant must submit scores on an approved core test of mathematics, language arts, and writing. This requirement can be satisfied by taking *either* of the following:

1. the ACT Assessment plus Writing test*, *or*
2. the SAT Reasoning Test* (critical reading, mathematics, and writing).

*The verbal, mathematics, and writing scores must be from the same sitting. Students who take the ACT must report their composite score.

In addition, all applicants must complete two SAT Subject Tests in two different subject areas: history, literature, mathematics (Level 2 only), science, or language other than English. The SAT Subject Test in literature may not be substituted for the Writing Test. **NOTE: Do not use the score choice option to withhold reporting of SAT Subject Test scores.** UC considers only a student's highest SAT Subject Test scores so there is no advantage to withholding scores. NOTE: The Henry Samueli School of Engineering recommends that freshmen applicants in Engineering majors take the SAT Subject Test in math Level 2.

Eligibility By Examination Alone

A student who does not meet the requirements for Eligibility in the Statewide Context, or ELC, may be able to qualify for admission to the University by examination by achieving high scores on the SAT Reasoning Test (or ACT Assessment) and two SAT Subject Tests. Because of the recent changes to the SATs and ACT, the minimum requirements for eligibility by examination alone are being revised. The revision will be announced in September 2005; the information will be posted at http://www.universityofcalifornia.edu/admissions/ when it becomes available.

Students cannot qualify for eligibility by examination alone if they have taken transferable college courses in any subject covered by the SAT Subject Tests.

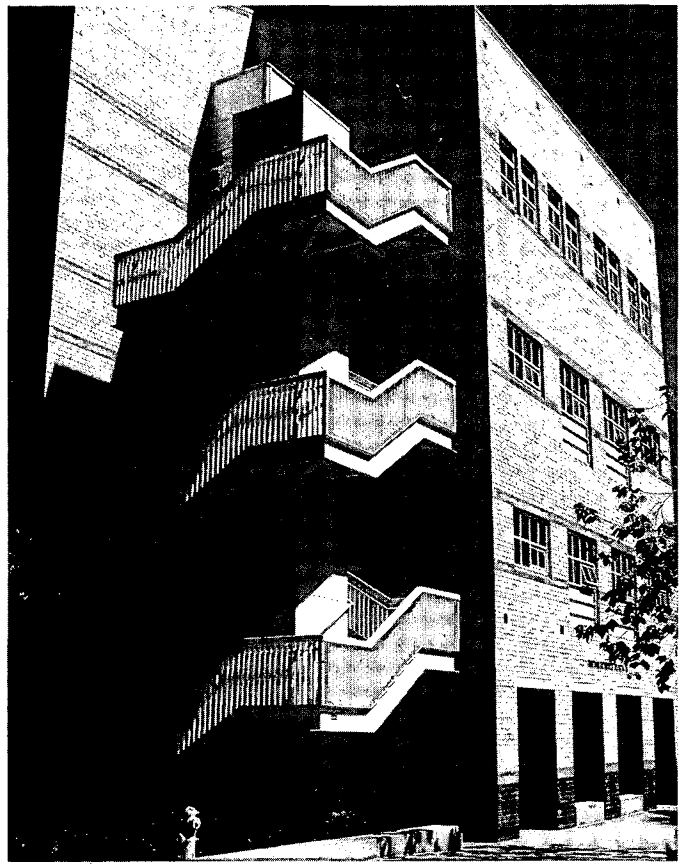
NOTE: UCI typically does not select students for admission by the examination-alone criteria.

Admission as a Transfer Applicant

The University defines a transfer applicant as a student who has completed high school and who has been a registered student in another college or university or in college-level extension classes other than a summer session immediately following high school graduation. UCI considers a California community college transfer applicant as a student who has completed at least 30 semester units/45 quarter units at one or more California community colleges. A transfer applicant may not disregard the college record and apply for admission as a freshman. (Transfer applicants who are not residents of California should also refer to the section on Nonresident Admission Requirements.)

SELECTION CRITERIA

UCI attempts to accommodate as many qualified transfer applicants as possible. Priority consideration for admission of advanced-standing applicants is given to junior-level applicants (with a minimum of 60 semester/90 quarter units of transferable credit) from California community colleges and is based upon: (1) GPA in transferable courses; (2) depth of preparation toward general education and major requirements; and (3) participation in the PAIF (Preliminary Admission-in-the-Field) program, which requires early completion of a transferable English and mathematics course. Applicants with the strongest academic performance will be the most competitive for admission. Junior transfers from four-year colleges, including other UC campuses, and lower-division transfers will be considered as space permits. *Applicants for fall quarter admission must complete required English composition and mathematics courses by the end of the spring term. Applicants for winter or spring*



quarter must complete required English composition and mathematics courses by summer or fall terms, respectively.

In the case that UCI is unable to accommodate all qualified applicants in their first-choice major, those students who indicate a valid alternate major may be offered admission in that major. Students who wish to change their major after enrolling at UCI must submit a change of major petition. This is of particular importance to those who apply in majors which are subject to additional course prerequisites and/or have a limit placed on the number of applicants admitted into the major. (See the following list.)

Some transfer applicants are selected based upon consideration of the academic criteria in conjunction with the following personal achievement criteria: an exceptionally challenging curriculum; outstanding accomplishments relevant to academic aims; hardships or unusual circumstances the applicant has faced, and the ways in which the student has responded to these challenges; a strong, thoughtful match between UCI's programs and the student's academic and career objectives, preparation, talents, and skills; and potential contributions to the campus. The level of performance needed to gain admission varies from year to year depending on the size and the academic quality of the applicant pool and the number of enrollment spaces.

Transfer applicants to the majors listed below must complete prerequisite courses for the major as specified.

Applied Ecology: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Applied Ecology major. All applicants must complete one year of general chemistry with laboratory.

Biological Sciences: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Biological Sciences major. All applicants must complete one year of general chemistry with laboratory.

Chemistry: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Chemistry major. All applicants must complete the following required courses: one-year of general chemistry with laboratory, and one year of approved calculus.

Criminology, Law and Society: Applicants may be subject to additional screening.

Dance: Applicants must audition and be selected by faculty.

Earth and Environmental Sciences: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Earth and Environmental Sciences major. All applicants must complete the following required courses: one year of calculus and one year of *either* general chemistry with laboratory or calculus-based physics with laboratory.

Ecology and Evolutionary Biology: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Ecology and Evolutionary Biology major. All applicants must complete one year of general chemistry with laboratory.

Economics: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Economics major. All applicants must complete the following required courses: one-year of microeconomics and macroeconomics theory, and one semester or two quarter courses of approved calculus.

Engineering: Applicants must select either Aerospace Engineering, Biomedical Engineering, Biomedical Engineering: Premedical, Chemical Engineering, Civil Engineering, Computer Engineering, Electrical Engineering, Engineering (a general program of study which is open to upper-division students only), Environmental Engineering, Materials Science Engineering, or Mechanical Engineering as their major on the application. Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete the following required courses: one year of approved calculus, two courses in calculus-based physics with laboratory for engineering and physics majors, three additional courses as specified by the major, and completion of lower-division writing. See the The Henry Samueli School of Engineering section of this *Catalogue* for information on courses required for each major.

Computer Science and Engineering: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Computer Science and Engineering major. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer, including one year of calculus, one year of engineering physics (with laboratory) including electromagnetism, one year of Java programming, and one additional approved course for the major. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact the Donald Bren School of Information and Computer Sciences at (949) 824-5156 or The Henry Samueli School of Engineering at (949) 824-4334. NOTE: The major in Computer Science and Engineering will be available to transfer students effective fall 2006.

Information and Computer Science, Computer Science, and Informatics: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the majors in Information and Computer Science, Computer Science, and Informatics. All applicants must complete the following required courses: one year of discrete mathematics if available; if not, first-year calculus (a semester of pre-calculus and a semester of calculus may not be used to fulfill this requirement); and one year of transferable computer science courses, including a programming course involving concepts such as are found in C++, Java, Eiffel, or another object-oriented high-level language. Programming-only courses in Basic, Fortran, Cobol, Pascal, and C are not acceptable. Students should select UC-transferable courses that do not focus strictly on learning a programming language but instead focus on topics such as object-oriented design, data structures, algorithms, and computer architecture, if such courses are available. NOTE: The major in Informatics will accept junior-level transfer students beginning fall 2006.

NOTE: It is strongly recommended that transfer students enter the ICS, CS, or Informatics major with knowledge of Java, as it is used in most programming-related courses. The lower-division requirements consist of five courses which must be taken in a certain order and which are prerequisite for upper-division courses. Students who transfer to UCI in need of completing any part of this sequence may find that it will take longer than two years to complete their degree.

Mathematics: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Mathematics major. All applicants must complete one year of approved calculus.

Music: Applicants must audition and be selected by faculty.

Physics: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission to the Physics major. All applicants must complete the following required courses: one year of calculus-based physics with laboratory for engineering and physics majors, and one year of approved calculus.

Psychology and Social Behavior: Applicants may be subject to additional screening.

TRANSFER STUDENT ADMISSION REQUIREMENTS

The University of California requirements for admission as a transfer applicant vary according to the high school record. Transfer applicants who have completed a California Certificate of Proficiency or the equivalent must also meet regular University entrance requirements.

Transfer applicants should also refer to the section on Information for Transfer Students: Fulfilling Requirements for a Bachelor's Degree.

The transcript submitted from the last college attended must show, as a minimum, that the student was in good standing and had earned a grade point average of 2.00 or better in all transferable course work.

A transfer applicant must also meet **one** of the following conditions:

1. Students who were eligible for admission to the University when they graduated from high school—meaning they satisfied the Subject, Scholarship, and Examination Requirements or were identified by the University during their senior year in high school as eligible under the Eligibility in the Local Context (ELC) program—are eligible to transfer if they have a C (2.0) average in their transferable college course work.
2. Students who met the Scholarship Requirement but did not satisfy the Subject Requirement must take transferable college courses in the subjects they are missing, earn a grade of C or better in each of these required courses, and earn an overall C (2.0) average in all transferable college course work to be eligible to transfer.

3. Students who were not eligible for admission to the University when they graduated from high school because they did not meet the Scholarship Requirement must:
   a. Complete 60 semester units or 90 quarter units of transferable college credit with a grade point average of at least 2.4 (no more than 14 semester units or 21 quarter units may be taken Pass/Not Pass), **and**
   b. Complete the following course pattern requirement, earning a grade of C or better in each course:

      i. Two transferable college courses (3 semester or 4–5 quarter units each) in English composition; **and**

      ii. One transferable college course (3 semester or 4–5 quarter units) in mathematical concepts and quantitative reasoning; **and**

      iii. Four transferable college courses (3 semester or 4–5 quarter units each) chosen from at least two of the following subject areas: the arts and humanities, the social and behavioral sciences, the physical and biological sciences.

      NOTE: For UCI, in fulfilling items i and ii, the courses in English and mathematics should be completed no later than the following term:

Applicants for:	Courses must be completed by:
Fall	Spring term
Winter	Summer term
Spring	Fall term

ADMISSION FOR A SECOND BACHELOR'S DEGREE

A student whose educational objective has changed substantially after receiving the bachelor's degree may be considered for admission to a program for a second degree. Admission as a candidate for a second bachelor's degree requires that the applicant be fully eligible for admission to the University and have strong promise of academic success in the new major. All such admissions are subject to the approval of the dean or director of the UCI school or program in which the second degree will be earned.

Students who have *not* attended UCI as undergraduates during a regular academic quarter should complete an *Application for Undergraduate Admission* available from the Office of Admissions and Relations with Schools. Students who have attended UCI as undergraduates during a regular academic quarter should obtain and complete a *Second Baccalaureate Application* form through the Registrar's Office.

Nonresident Admission Requirements

Admission requirements for applicants who are not California residents vary slightly from requirements for California residents. However, all nonresident freshman and transfer applicants are subject to the same selection criteria as California residents, as explained in a previous section. Refer to the Expenses and Fees section for information regarding residence classification for tuition purposes and the Nonresident Tuition Fee.

NONRESIDENT FRESHMAN APPLICANT

A nonresident freshman applicant must (1) graduate from a regionally or state-accredited high school, or complete an appropriate proficiency examination; (2) complete satisfactorily the "a through g" pattern of subject requirements listed under requirements for California residents; (3) earn a grade point average of at least 3.40 or higher in the required high school subjects (3.00 is equal to a B average); (4) meet the examination requirement: either the ACT Assessment plus Writing test *or* the SAT Reasoning Test (critical reading, mathematics, and writing). In addition, all applicants must

complete two SAT Subject Tests in two different subject areas: history/social science, English literature, mathematics, laboratory science, or language other than English. (The SAT Subject Test in literature may not be substituted for the Writing test); and (5) meet the Eligibility Index for nonresidents. (NOTE: Because of the recent changes to the SATs and the ACT, the Eligibility Index is being revised and was unavailable at press time. A new Eligibility Index will be available at http://www.universityofcalifornia.edu/admissions/.)

NONRESIDENT TRANSFER APPLICANT

The minimum admission requirements for nonresident transfer applicants are the same as those for residents, except that nonresidents must have a grade point average of 2.8 or higher in all transferable college course work.

ADMISSION OF INTERNATIONAL STUDENTS

The credentials of an international undergraduate applicant—a student who holds or expects to hold a student, exchange, visitor, or diplomatic visa and who wishes to attend school in the United States—are evaluated in accordance with the general regulations governing admission. The application should be submitted to the University of California Undergraduate Application Processing Service early in the appropriate application filing period. This will allow time for exchange of necessary correspondence and, if the applicant is admitted, will help the student in obtaining the necessary passport visa. Official certificates and detailed transcripts of records should be submitted directly to the UCI Office of Admissions and Relations with Schools only when requested.

International applicants whose native language is not English will be required to demonstrate their English proficiency. This is most often accomplished by achieving a minimum score of 550 (paper-based) or 213 (computer-based) on the Test of English as a Foreign Language (TOEFL), or with a score of 7 (academic module) on the International English Language Testing System (IELTS) examination. Arrangements to take the TOEFL may be made by writing directly to TOEFL/TSE Services Educational Testing Service, P.O. Box 6151, Princeton, NJ 08541-6151, USA; telephone (609) 771-7100; World Wide Web: http://www.toefl.org/. For information about the IELTS test, see http://www.ielts.org/. Students must ask the Educational Testing Service or IELTS to forward results of their tests to the Office of Admissions and Relations with Schools. Completion of an *acceptable* English composition course (as determined by the Office of Admissions and Relations with Schools) with a grade of C or better will also clear the English proficiency requirement for international applicants.

Students who wish to improve their English proficiency to meet the TOEFL or IELTS requirement may enroll in the intensive Program in English as a Second Language sponsored by UC Irvine Extension. Information is available from English and Certificate Programs for Internationals, UC Irvine Extension, P.O. Box 6050, Irvine, CA 92616-6050; telephone (949) 824-5591.

In addition to achieving a minimum TOEFL or IELTS score, all international students whose native language is other than English must take an Academic English/English as a Second Language Placement Test upon arrival and prior to registration. Based upon the results of this test, students may be required to improve certain language skills by enrolling in Academic English/English as a Second Language courses during their first year, with other major course work being adjusted accordingly.

Generally, financial assistance and scholarships from the University are not available to the nonimmigrant-visa student. International students must provide proof that sufficient funds will be available to meet their educational commitments while studying in the United States. International undergraduate students are considered as nonresidents of California and are required to pay nonresident tuition in addition to fees paid by legal residents of California.

Please direct all inquiries regarding the undergraduate admission of international students to the Office of Admissions and Relations with Schools.

ENGLISH LANGUAGE PROFICIENCY OF PERMANENT RESIDENT, REFUGEE, AND INTERNATIONAL (F-1 VISA) STUDENTS: ACADEMIC ENGLISH/ENGLISH AS A SECOND LANGUAGE

Any student (a) whose first or native language is not English, (b) who has not satisfied the UC Entry Level Writing requirement, *and* (c) whose score on the verbal portion of the SAT Reasoning Test is 430 or less (NOTE: at press time this score was subject to change due to the recent changes in the SATs), or any such student without a verbal SAT Reasoning Test score, must, regardless of the student's TOEFL (Test of English as a Foreign Language) score, IELTS (International English Language Testing System) score, or TSWE (Test of Standard Written English) score, take an Academic English/English as a Second Language Placement Test (AE/ESLPT) prior to the first quarter of enrollment. Also, any student who is identified as an ESL student through the UC Analytical Writing Placement Examination must take the AE/ESLPT. The test is given prior to the beginning of each quarter, during Welcome Week prior to the beginning of fall quarter instruction, and on dates to be announced. Information is available from the Testing Office (telephone 949-824-6207) and the Office of Academic English/English as a Second Language (telephone 949-824-6781).

Based upon the results of the test, students may be required to enroll in AE/ESL courses prior to enrolling in any other required writing courses. Students required to enroll in AE/ESL courses must begin satisfying their AE/ESL requirements within their first or second quarter at UCI. They must take these courses in consecutive quarters. The AE/ESL requirements are to be completed within the first six quarters at UCI. Students who have not satisfied the AE/ESL requirements by the end of their sixth quarter will be ineligible to enroll for a seventh quarter at UCI. The UC Entry Level Writing requirement must be satisfied during the quarter following the completion of AE/ESL requirements. If the AE/ESL requirements are completed during the first quarter of enrollment, the UC Entry Level Writing requirement must be satisfied before the beginning of the fourth quarter of enrollment.

AE/ESL courses, offered by the School of Humanities and listed in the School's section of this *Catalogue*, include classes in writing, speaking and listening, and reading and vocabulary development.

CREDIT FOR AE/ESL COURSE WORK

Students whose first language is not English may receive up to 12 baccalaureate credits for AE/ESL course work. Students may receive workload credit for courses taken beyond this 12-unit limit but will not receive additional credits applicable to the bachelor's degree.

CREDIT FOR NATIVE LANGUAGE

Students whose first language is not English may receive credit for course work in their native language and literature, provided such courses were completed on the college level in the country of the vernacular, or on the upper-division or graduate level at UCI or another accredited English-speaking institution. Some restrictions apply; see the School of Humanities section for information.

Advanced Placement Credit

Students who earn scores of 3, 4, or 5 on the College Board Advanced Placement Examinations will receive credit toward graduation at UCI. The unit and subject credit allowed toward degree requirements assigned to each test are shown in the chart on pages 46–47.

Students cannot earn units or grade points at UCI in courses from which they have been exempted on the basis of Advanced Placement credit. Students who elect to enroll in courses for which they have already received Advanced Placement credit will have those courses specially coded on their transcript without unit or grade credit. However, some AP examinations exempt the student from a greater number of UCI units than the number of AP units earned (e.g., 4 units of AP credit for Microeconomics exempts a student from Economics 20A-B, an 8-unit series). In such cases, the student may elect to take the final course in the series for credit (e.g., Economics 20B).

International Baccalaureate

Students completing the International Baccalaureate (IB) diploma with a score of 30 or above will receive 30 quarter units (20 semester units) total toward their UC undergraduate degree.

The University grants 8 quarter units (5 1/3 semester units) credit for certified IB Higher Level examinations on which a student scores 5, 6, or 7. The University does not grant credit for Standard Level examinations.

Some higher-level examinations may be used to fulfill course requirements in lower-division major or general education/breadth requirements. Detailed information is available on the Office of Admissions and Relations with Schools' Web site at http://www.admissions.uci.edu/ib_chart.html.

The units granted for IB examinations are not counted toward the maximum number of credits required for formal declaration of an undergraduate major or the maximum number of units a students may accumulate prior to graduation from the University. Students who enter the University with IB credit do not have to declare a major earlier than other students nor are they required to graduate earlier.

Duplicate Credit. Students should be aware that IB examinations, AP examinations, and college courses taken prior to or after enrolling at the University may be duplicative. In these cases, the University will award credit for only one of these. Students cannot earn units or grade points at UCI in courses from which they have been exempted on the basis of International Baccalaureate credit. Students who elect to enroll in courses for which they have already received IB credit will have those courses specially coded on their transcript without unit or grade credit. However, if a student receives less than full *series* credit the student may elect to take the *remaining* course in the series for credit.

Application Procedures

Application packets for undergraduate admission to the University are available from the counseling office of any California high school or community college, from any University of California Admissions Office, or on the World Wide Web at http://www.universityofcalifornia.edu/apply/.

Students applying for admission to UCI should complete the application and submit it according to the instructions provided in the *Undergraduate Application for Admission and Scholarships.* A nonrefundable application fee of $55 ($65 for international students) must accompany the application. This basic fee entitles the applicant to be considered at one campus; for *each* additional campus selected, an additional $55 fee is required. Applicants concerned with admission or application procedure questions *specific to UCI* should communicate directly with the Office of Admissions and Relations with Schools, University of California, Irvine, CA 92697-1075; telephone (949) 824-6703; World Wide Web: http://www.admissions.uci.edu/. Office hours are 8 a.m. to 5 p.m., Monday through Friday.

WHEN TO APPLY FOR ADMISSION

To ensure that applications will be considered for admission by both UCI (or other University campuses) and the student's choice of major or program of study, the completed application and the application fee should be submitted during the priority filing period. Each campus accepts for consideration all applications it receives during this period. Additionally, students required to fulfill the examination requirements for freshman admission should make arrangements to take the standardized tests early. Completing the examination requirement (SAT Reasoning Test or ACT Assessment plus Writing test and two SAT Subject Tests) no later than the December testing date of the senior year of high school is required for students applying for the fall quarter.

Quarter to be Admitted at UCI	Priority Application Filing Dates
Winter quarter, 2006	File July 1–30, 2005
Spring quarter, 2006	File October 1–30, 2005
Fall quarter, 2006	File November 1–30, 2005
Winter quarter, 2007	File July 1–30, 2006
Spring quarter, 2007	File October 1–30, 2006

After the priority filing period has ended, campuses will accept applications only if they still have openings for new students. Most campuses are unable to accept applications after the formal filing period closes.

Students are advised to check with the Admissions Office to find out if applications are being accepted for winter or spring terms.

TRANSCRIPTS

The Office of Admissions and Relations with Schools requires complete, accurate, and up-to-date information about a student's academic program and work in progress in order to process and respond to the application in a timely manner. The transcript and other documents submitted as part of the application become the property of the University; they cannot be returned or forwarded in any form to another college or university.

Freshman Applicants. *Applicants will be notified if a preliminary high school transcript is required.* Applicants are also responsible for asking testing agencies to report examination scores for either the SAT or ACT tests and two SAT Subject Tests to the UCI Office of Admissions and Relations with Schools. *An official final high school transcript showing an official graduation date also must be forwarded to the campus at which the student has decided to register and enroll.* Official final transcripts should arrive in the UCI Office of Admissions and Relations with Schools by July 15 for those students admitted for fall quarter. Those students entering in the winter or spring quarters must have their transcripts in the Office within one month of the completion of the term of the school from which they entered. A California Certificate of Proficiency, the results from a proficiency test from any state, or a General Education Development (GED) Certificate can be accepted in place of a high school diploma.

Transfer Applicants. *Transfer students should not send transcripts unless requested to do so.* It is essential that applicants accurately complete the self-reported college credit information in the application because it will be used for initial admission screening. *Once students are admitted and decide to enroll at UCI, an official transcript from each college attended and the high school from which they graduated must be sent to the Office of Admissions and Relations with Schools.* Unless a student is attending a summer session, final official transcripts should arrive in the UCI Office of Admissions and Relations with Schools by July 15 for those students admitted for the fall quarter. Summer-session transcripts must be submitted by September 15. Students entering UCI in the winter or spring quarters must have their final official transcripts sent to the Office no later than one month after completion of the term of the school they are currently attending. Delays in receiving official transcripts will disadvantage students in the academic advising process and can affect enrollment in appropriate courses.

EXAMINATION ARRANGEMENTS

Students should make arrangements to take the SAT Reasoning Test and SAT Subject Tests with the Educational Testing Service, College Board/ATP, CN 6200, Princeton, NJ 08541-6200; World Wide Web: http://www.collegeboard.com. For the ACT, students should contact the American College Testing Program Registration Unit, P.O. Box 168, Iowa City, IA 52243; World Wide Web: http://www.act.org. (Test fees should be paid to the testing services, not to the University.) At the same time the test is taken, students should request that their scores be reported to the UCI Office of Admissions and Relations with Schools. To prevent confusion or unnecessary delay, it is important to use precisely the same form of the student's name on both the application for admission and the test materials.

In 2005-06 the SAT Reasoning Test and SAT Subject Tests are offered concurrently on the following Saturday mornings: October 8, 2005; November 5, 2005; December 3, 2005; January 28, 2006; April 1, 2006; (SAT Reasoning Test only); May 6, 2006; and June 3, 2006.

In 2005-06 the ACT Assessment plus Writing test is offered on the following dates: September 24, 2005; October 22, 2005; December 10, 2005; February 11, 2006; April 8, 2006; and June 10, 2006.

Details on testing are available from the College Board, the American College Testing Program, and from most high school counseling offices.

College Board Advanced Placement

Advanced Placement Examination	AP Score	Unit Credit	Credit Allowed Toward Degree
Art			
Art History	3	8	One course toward categories IV and VII-B of the UCI breadth requirement from the Art History 40 series plus 4 units of elective credit; may not replace School of Humanities requirements.
	4 or 5	8	Two courses toward category IV of the UCI breadth requirement from the Art History 40 series and satisfaction of category VII-B; may not replace School of Humanities requirements.
Studio Art[1]			
Drawing	3, 4, or 5	8	Elective credit only.
Two-Dimensional Design Portfolio	3, 4, or 5	8	Elective credit only.
Three-Dimensional Design Portfolio	3, 4, or 5	8	Elective credit only.
Biology	3, 4, or 5 (Non-Biological Sciences Majors)	8	One Biological Sciences course toward category II of the UCI breadth requirement.
	3 (Biological Sciences Majors)	8	Elective credit only.
	4 or 5 (Biological Sciences Majors)	8	Elective credit only.
Chemistry	3	8	Elective credit only.
	4 or 5	8	Chemistry 1A plus 4 units of elective credit. (Chemistry 1A/1LA plus 3 units of elective credit for Chemistry and Engineering majors.)
Computer Science[2]			
A Exam	3	2	Elective credit only.
	4 or 5	2	Engineering E10, CEE10, EECS10, EECS12, MAE10, or ICS 21.
AB Exam	3	4	ICS 21.[3]
	4	4	Engineering E10, CEE10, EECS10, EECS12, MAE10, or ICS 21.[3] Satisfies category V of the UCI breadth requirement.
	5	4	ICS 21 and 22; or Engineering E10, CEE10, EECS10, EECS12, or MAE10. Satisfies category V of the UCI breadth requirement.
Economics			
Macroeconomics	3	4	Elective credit only.
	4 or 5	4	Economics 20C.
Microeconomics	3	4	Elective credit only.
	4 or 5	4	Economics 20A-B.
English[1]	3 (on either or both exams)	8	Elective credit only. Fulfills UC Entry Level Writing requirement.
English Composition and Literature English Language and Composition	4 or 5 (on either exam)	8	One course toward category IV of the UCI breadth requirement from the English 28 series plus 4 units of elective credit; may not replace English major, minor, or School of Humanities requirements.
	4 or 5 (on both exams)	8	Two courses toward category IV of the UCI breadth requirement from the English 28 series; may not replace English major, minor, or School of Humanities requirements.
Environmental Science	3	4	Elective credit only.
	4 or 5	4	Environmental Analysis and Design E8.
French			
French Language	3	8	French 1A-B-C. Satisfies category VI of the UCI breadth requirement.
	4 or 5	8	French 2A-B-C. Satisfies categories VI and VII-B of the UCI breadth requirement.
French Literature	3	8	French 1A-B-C. Satisfies category VI of the UCI breadth requirement.
	4 or 5	8	French 2A-B-C. Satisfies categories VI and VII-B of the UCI breadth requirement.
Geography			
Human Geography	3, 4 or 5	4	Elective credit only.
German Language	3	4	German 1A-B-C. Satisfies category VI of the UCI breadth requirement.
	4 or 5	8	German 2A-B-C. Satisfies categories VI and VII-B of the UCI breadth requirement.
Government and Politics			
American Government	3, 4, or 5	4	Elective credit only.
Comparative Government	3, 4, or 5	4	Elective credit only.
History			
European	3, 4, or 5	8	Elective credit only.
United States	3, 4, or 5	8	Elective credit only.
World	3, 4, or 5	8	Elective credit only
Latin	3 (on one exam)	4	Elective credit only.
Virgil	3 (on both exams)	8	Latin 1A-B-C. Satisfies category VI of the UCI breadth requirement.
Literature	4 or 5 (on one exam)	4	Satisfies categories VI and VII-B of the UCI breadth requirement. Course credit toward the Classics major awarded upon petition.
	4 or 5 (on both exams)	8	Satisfies categories VI and VII-B of the UCI breadth requirement. Course credit toward the Classics major awarded upon petition.

Advanced Placement Examination	AP Score	Unit Credit	Credit Allowed Toward Degree
Mathematics[1]			
AB Exam	3	4	Elective credit only.
	4 or 5	4	Mathematics 2A.
BC Exam[4]	3	8	Mathematics 2A.
	4 or 5	8	Mathematics 2A-B.
Music Theory	3	8	Elective credit only.
	4 or 5	8	Elective credit only and eligibility to take the Placement Exam.
Physics[1]			
Exam B	3, 4, or 5	8	Elective credit only.
Exam C, Part I or II	3	4	Elective credit only.
	4 or 5	4	Physics 7A/7LA
Exam C, Part I (Mechanics)	5	4	Physics 3A.
Exam C, Part II (Electricity and Magnetism)	5	4	Physics 3B.
Psychology	3, 4, or 5	4	Elective credit only.
Spanish			
Spanish Language	3	8	Spanish 1A-B-C. Satisfies category VI of the UCI breadth requirement.
	4 or 5	8	Spanish 2A-B-C. Satisfies categories VI and VII-B of the UCI breadth requirement.
Spanish Literature	3	8	Spanish 1A-B-C. Satisfies category VI of the UCI breadth requirement.
	4 or 5	8	Spanish 2A-B-C. Satisfies categories VI and VII-B of the UCI breadth requirement.
Statistics	3, 4, or 5	4	Statistics7/Mathematics 7 or Social Ecology 13.

[1] Maximum credit 8 units.
[2] Maximum credit 4 units.
[3] Additional placement may be available following individual counseling.
[4] Students who take the Calculus BC examination and earn a subscore of 3 or higher on the Calculus AB portion will receive credit for the Calculus AB examination, even if they do not receive a score of 3 or higher on the BC examination.

NOTIFICATION OF ADMISSION

Most fall quarter freshmen applicants are notified of their status between March 1 and 31. Transfer applicants are usually notified by May 1. In some cases for transfer applicants, complete transcripts of course work and/or a mid-term progress report are required before a final decision can be made; such records will be requested by the Office of Admissions and Relations with Schools. Note that these target dates apply only to those applicants who submitted their applications during the fall priority filing period (November 1–30). Those students who apply after the priority period will be notified as soon as possible after March 31.

Statement of Intent to Register

Students who wish to attend UCI must return a Statement of Intent to Register (SIR). The SIR serves to notify each campus of the student's decision to accept or not accept its offer of admission. Before completing and returning their SIR, students who have applied to more than one campus are advised to take as much time as is appropriate in considering their response to each campus. However, it is essential that students allow enough time to meet the stipulated deadline. Once they have decided which campus to attend, students should submit their positive SIR and nonrefundable $100 deposit (if applicable) either electronically or by mail.

Students must submit their SIR by the following deadline:

Freshmen entering fall 2006: May 1, 2006

Transfers entering fall 2006: June 1, 2006

Freshmen and transfers entering winter 2007: October 15, 2006

Freshmen and transfers entering spring 2007: refer to the specific date on their admit letter. (UCI seldom accepts applicants for a spring term.)

Electronic Filing: Students are encouraged to return their SIR electronically by accessing the Office of Admissions and Relations with Schools (OARS) Web site at http://www.admissions.uci.edu/ and link to "My Admissions Application @ UCI." Students submitting an SIR electronically are required to pay their $100 Acceptance of Admission Fee by credit card.

Filing by Mail: Students who are unable to submit their SIR online may download and print an SIR from the Admissions and Relations with Schools Web site. Students must return the printed SIR along with the $100 Acceptance of Admission Fee (if requested), made payable to UC Regents, to the Office of Admissions and Relations with Schools, 204 Administration Building, University of California, Irvine, CA 92697-1075. Students who are not able to either submit their SIR electronically or download an SIR from the OARS Web site should contact Admissions and Relations with Schools at the address listed above and/or call (949) 824-6703.

Admission to UCI is not an assurance of receiving financial aid nor does it guarantee assignment to University housing. Separate applications are required of applicants desiring financial aid or University housing, and receipt of communications from the Office of Financial Aid and Scholarships, the Housing Office, or any office other than the Office of Admissions and Relations with Schools does not imply that eligibility for admission has been established.

Student Records Access and Disclosure

At UCI, an "applicant" becomes a "student" at the time of submission of the SIR. Information regarding access to student records and disclosure of student record information (both public and confidential) may be found in the Appendix.

INFORMATION FOR ADMITTED STUDENTS

ORIENTATION

Each May information about UCI's orientation programs sponsored by the Office of the Dean of Students is sent to admitted students who plan to enroll in the fall.

Student-Parent Orientation Programs (SPOP) are held at different times during the summer. SPOP is designed to help new students with the registration process and offers informative sessions on academic programs, extracurricular activities, housing choices, and much more. Participants and their parents live in residence halls, and the program fee covers room, board, and program costs. **Mini-SPOPs** (intensive one-day events) are held in July and August for students and parents who are unable to attend the multi-day programs. For more information, visit http://www.dos.uci.edu/orientation/; telephone (949) 824-7759; or send e-mail to orientation@uci.edu.

Transfer Success is a unique one-day program geared to the needs of transfer students. Held in early September, the program provides access to campus resources, a graduate school preparation workshop, and more.

Welcome Week features a variety of academic and social activities for new and returning students and is scheduled the week prior to the beginning of fall quarter classes. For information visit http://www.dos.uci.edu/welcomeweek/.

DIVISION OF UNDERGRADUATE EDUCATION

The core mission of the Division of Undergraduate Education is to provide campus leadership, programs, and services which enhance the quality of undergraduate education at UCI. An advocate and steward for educational excellence, the Division works with all academic units, programs, and members of the UCI community to foster a climate of learning and discovery for every undergraduate student. Through its diverse and innovative programs and services, the Division provides support for student academic achievement, for a rich and coherent curriculum, and for outstanding teaching through the integration of teaching and research activities and the facilitation of effective pedagogy.

The Division of Undergraduate Education is responsible for the following programs and services: the Campuswide Honors Program, which also administers the Scholarship Opportunities Program; the Center for International Education, which includes the Education Abroad Program and the International Opportunities Program; the Peer Academic Advising Program and academic advising for Undecided/Undeclared students; the Undergraduate Research Opportunities Program; the Learning and Academic Resource Center; Student Academic Advancement Services; the Testing Office; the Instructional Resources Center and the Instructional Technology Center; administration of the UCDC Academic Internship Program and the UC Center Sacramento Scholar Intern Program; and the organization of the campus' student orientation programs in cooperation with the Division of Student Affairs. The Division is also responsible for the Freshman Seminar Program where students are introduced to the research university and encouraged to become active participants in intellectual interactions with their peers and professors. The Division's programs and services are described in detail below.

The Division is responsible for the administration of the revised Academic Honesty Policy (adopted by the UCI Academic Senate on December 12, 1996; see the Appendix) as it relates to undergraduates; for maintaining a classroom environment conducive to teaching and learning; and for implementing the Student Recommended Faculty Program, initiated at UCI in 1969. This is the only such program in the U.S. that affords undergraduates the opportunity to identify, select, and propose recruitment of nonrenewable faculty appointments in curricular areas of particular interest not represented at UCI. Call (949) 824-7328 for information.

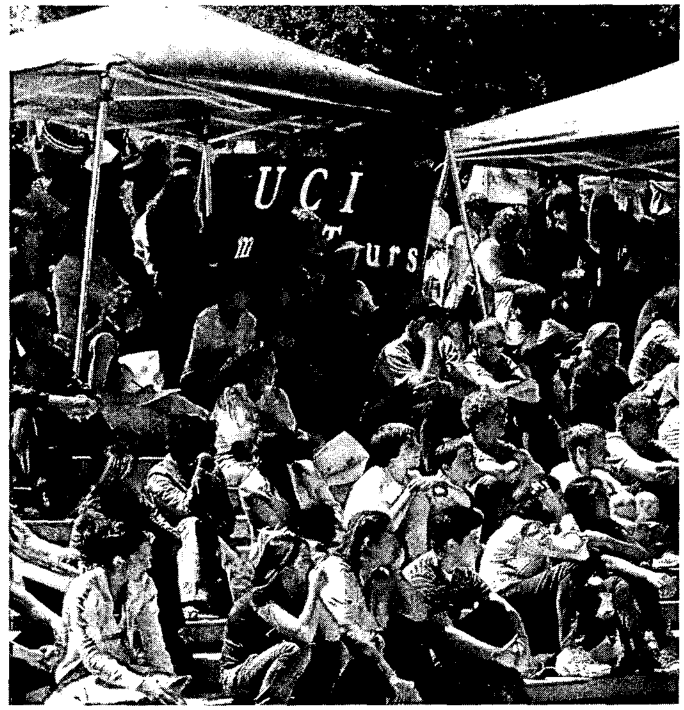
Additionally, the Division's Research, Evaluation, and Grants Office evaluates various programs and conducts research on topics related to undergraduate education such as student retention, academic needs, course grades, enrollment patterns, and curricular issues, and also assists in developing grant proposals related to improvement of undergraduate education.

Placement Testing

UCI's Testing Office administers placement tests to new and continuing students to ensure correct placement in selected introductory courses and to help students assess their readiness for University-level work. These tests are selected or developed by UCI faculty who also determine the grading criteria for each test. Results from placement tests are used by students and their academic counselors to formulate a plan of study which is best suited to the students' learning needs and career goals and to determine enrollment in introductory courses. Additional information, such as entrance examination scores, Advanced Placement (AP) scores, and high school work, also may be used to determine course placement.

Placement tests are given in the areas of chemistry, physics, precalculus, mathematical analysis, Chinese, German, Japanese, Korean, Vietnamese, and Academic English/English as a Second Language:

1. Chemistry Placement Test. Students who plan to enroll in an introductory chemistry course (Chemistry 1A or H2A) are required to take this test unless otherwise exempt.
2. Physics Placement Test. Students who plan to enroll in Physics 7A or 7B are required to take this test unless otherwise exempt. Students with no background in Physics need not take the placement test and should enroll in Physics 7A.
3. Precalculus Placement Test. Students who plan to enroll in Mathematics 2A are required to take this test unless otherwise exempt.
4. Mathematical Analysis Test. Students who plan to enroll in Mathematics 1A or 1B, or who have not had a prior course in precalculus and who plan to enroll in mathematics courses at UCI are strongly encouraged to take this test.
5. Chinese Placement Test. Students who plan to enroll in Chinese 1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B, or 3C are required to take this test. A satisfactory score and successful completion of a faculty oral interview at the 1C level will satisfy breadth category VI; completion at the 2A level will also satisfy one course toward category VII-B; and completion at the 2B level or beyond will satisfy category VII-B in its entirety.
6. German Placement Test. Students who plan to enroll in German 1A, 1B, 1C, 2A, 2B, 2C, or the 100 series are recommended but not required to take this test unless otherwise exempt.
7. Japanese Placement Test. Students who plan to enroll in Japanese 1A, 1B, 1C, 2A, 2B, 2C, or 3A are required to take this test. A satisfactory score and successful completion of a faculty oral interview at the 1C level will satisfy breadth category VI; completion at the 2A level will also satisfy one course toward category VII-B; and completion at the 2B level or beyond will satisfy category VII-B in its entirety.



8. Korean Placement Test. Students who plan to enroll in Korean 1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B, or 3C are required to take this test. A satisfactory score and successful completion of a faculty oral interview at the 1C level will satisfy breadth category VI; completion at the 2A level will also satisfy one course toward category VII-B; and completion at the 2B level or beyond will satisfy category VII-B in its entirety.
9. Vietnamese Placement Test. Students who plan to enroll in Vietnamese 1A, 1B, 1C, 2A, or 2B are required to take this test, unless otherwise exempt, followed by an oral interview.
10. Academic English/English as a Second Language (AE/ESL) Placement Test. This test is required of students (a) whose native language is not English, (b) whose verbal score on the SAT Reasoning Test is 430 or less (NOTE: at press time this score was subject to change due to the recent changes in the SATs); (c) who have not satisfied the UC Entry Level Writing requirement, and (d) who have received a letter from the AE/ESL Program requiring them to take the AE/ESL Placement Test. Scores from the Test of English as a Foreign Language (TOEFL) and the Test of Standard Written English (TSWE) are not considered. The AE/ESL Placement Test also is required of students referred to the AE/ESL Program on the basis of their score on the UC Analytical Writing Placement Examination. See the section on Admission of International Students for additional information.

All newly admitted freshmen will receive a brochure describing the placement tests and the testing schedule for the summer. Students should take required tests before registering for classes and should discuss their results with an academic counselor or faculty advisor. Students enrolling for the first time in fall quarter are strongly advised to take placement tests at the earliest possible date (usually in June) in order to allow time to receive their results and discuss them with an academic counselor during the summer registration period and prior to enrolling in courses. For the convenience of continuing students, placement tests also are administered every quarter during the academic year; consult http://www.testingoffice.uci.edu for dates.

The Testing Office also administers other language tests for exemptions from breadth categories VI and VII-B, and is responsible for the campus-based administration of the UC Analytical Writing Placement Examination.

Further information on placement and language testing may be obtained by calling (949) 824-6207 or by visiting the Office's Web site at http://www.testingoffice.uci.edu/. The Office is a unit of the Division of Undergraduate Education.

UC Analytical Writing Placement Examination

Results from the UC Analytical Writing Placement Examination, formerly known as the Subject A Examination, are used to place students in UCI writing courses. There is a nonrefundable administrative fee associated with the examination. The fee payment process and waiver information are explained in materials students receive in April from the Educational Testing Service. Students who receive admission application fee waivers will automatically have this examination fee waived. Refer to the section on Requirements for a Bachelor's Degree for complete information on the UC Analytical Writing Placement Examination and the UC Entry Level Writing requirement.

Academic Advising

At the time of admission to UCI every undergraduate student is assigned to the school that offers the student's selected major. Students who have indicated "Undecided/Undeclared" as a major on their *UC Application for Admission* receive assistance from the Undecided/Undeclared Advising Program until they select an academic major. This program is located in 256 Administration Building; telephone (949) 824-6987.

Jurisdiction over all questions of academic regulations and academic standing rests with the dean of the school to which a student is assigned or, in the case of undecided/undeclared majors, with the Dean of the Division of Undergraduate Education. Each academic unit provides academic advising for its students and processes requests to add or drop courses, waive or change graduation or other requirements, or change majors. Students are responsible for knowing the governing regulations of the school or program to which they are assigned.

While each academic unit is responsible for maintaining a system which provides academic advising, these systems differ from unit to unit. In some, all of the faculty serve as advisors; in others, only certain members of the faculty are designated as advisors. All advising offices include academic counselors, professionals who assist students in planning their program, selecting a major, and making progress toward a degree. Peer academic advisors (trained upper-division students) assist students in many of the same areas as academic counselors. In addition, they are able to answer questions relating to student life issues, providing a student perspective. Responsibility for informing students of the names of their advisors rests with the dean or chair of the appropriate academic unit. This is done normally by letter; however, students may obtain information by telephone from the office of the appropriate dean or chair. Telephone numbers for academic advising offices are listed in the academic unit sections of the *Catalogue*.

New students are encouraged to plan their academic programs with an academic counselor shortly after being admitted. The optimum time to initiate contact with an academic counselor is before the student enrolls in classes. The academic counselor can help the student determine whether the classes the student wishes to take are appropriate to the student's level of preparation, whether the proposed classes fit within the student's educational goals, and whether the classes will help meet some of the requirements for graduation.

In some schools and programs, consultation between students and their faculty advisors is mandatory. Regardless of whether or not consultation between student and advisor is required, students are responsible for initiating and maintaining periodic contact with their assigned faculty advisor. The actual frequency of these meetings will be determined by the desires of the student, the advisor, and the unit's governing regulations.

Each quarter, new students are required to go to the appropriate academic dean's office prior to registration for advice concerning class enrollment.

Finish in Four Advising

Many UCI entering freshmen graduate in four years, with appropriate planning. Students who wish to be assured of earning their degree in a timely manner should contact the academic counseling office for their major to receive information about Finish-in-Four Advising and assistance in developing a detailed curricular plan.

Undecided/Undeclared Students

Students who enter the University as freshmen or sophomores, who are uncertain about their major, and who wish to explore, experiment, and then decide, participate in the Undecided/Undeclared Advising Program administered by the Division of Undergraduate Education. The Division is devoted to enriching the learning environment for lower-division students, especially those in the freshman year. Further information is available in the Majors and Careers section of this *Catalogue.*

Learning and Academic Resource Center

The Learning and Academic Resource Center (LARC) is a campuswide academic support unit that provides programs designed to help students acquire the skills needed to develop intellectually, become successful learners, and achieve their academic and professional goals.

LARC staff and programs provide students with personal contact and support necessary for academic success on a large and diverse campus where students need to enroll in many large lecture courses. The Center works closely with faculty to develop programs that meet both curricular objectives and the changing needs of students. LARC programs stress the development of academic abilities that all university students need regardless of major: effective study strategies, critical reading, and analytical writing. Other programs focus on specific disciplines and offer students the opportunity to improve their academic skills in such areas as biology, chemistry, mathematics, humanities, social sciences, and computer sciences, among others.

The Center offers adjunct classes, workshops, individual counseling, small peer tutoring groups, and support in all forms of academic writing. Students may enroll in LARC programs by calling (949) 824-6451 to make appointments. Additional information including schedules for adjunct classes, workshops, and tutorials may be obtained online at http://www.larc.uci.edu/.

Student Academic Advancement Services

Student Academic Advancement Services (SAAS) provides individual counseling and academic support for students who are first-generation college students or low-income students, as well as disabled students (those with physical and/or learning disabilities). SAAS sponsors several major projects and a variety of workshops.

A primary responsibility of SAAS is to monitor the academic progress of its students. To best assist students who are having difficulty with their course work, professional counselors maintain a close liaison with academic departments. When needed, referrals to other campus support services are provided. In conjunction with these academic and service units, a variety of workshops are offered throughout the year by SAAS, as well as a graduate school preparatory course for those students whose career interests require graduate study.

SAAS also sponsors and conducts the Summer Bridge at UCI for underprepared students who demonstrate the potential to succeed at the University. Summer Bridge is designed to provide and refine basic academic skills necessary for students to successfully complete their course work during the regular school year.

Students are encouraged to make appointments with Student Academic Advancement Services; telephone (949) 824-6234. Additional information is available online at http://www.saas.uci.edu/.

Honors Opportunities

UCI offers several challenging honors opportunities to its most motivated students. These include a comprehensive Campuswide Honors Program, which enrolls outstanding students from all majors from the freshman through senior years; a variety of major-specific honors programs at the upper-division level; the Humanities Honors Program, also offered at the upper-division level, but open to all majors on campus; and several Excellence in Research programs.

These programs offer some of the advantages usually associated with selective liberal arts colleges: rigorous, small, personalized classes and the intellectual exchange that creates a community of scholars. The difference, however, is that UCI's programs have the support and benefit of the 30.5-million-volume University of California Library system (of which UCI Library collections number some 2.4 million volumes) and of the numerous state-of-the-art laboratories on campus.

Honors students are also encouraged to participate in the Education Abroad Program, the International Opportunities Program, the UCDC Academic Internship Program, or the UC Center Sacramento Scholar Intern Program during their junior or senior year. Qualified students are also encouraged to take advantage of resources available in the Scholarship Opportunities Program (SOP) and the Undergraduate Research Opportunities Program (UROP). These programs are described in a later section.

Campuswide Honors Program

Founded in 1988, the Campuswide Honors Program (CHP) is available to selected high-achieving students in all academic majors from their freshman through senior years. It maintains an active roster of approximately 600 students. The majority of CHP students have continued their studies after graduation from UCI at the most prestigious graduate and professional schools in the country.

CHP provides outstanding UCI students with a special curriculum consisting of small, seminar-style classes, close interaction with peers, mentorship by UCI's top faculty, and the opportunity to participate in undergraduate research. Students also receive assistance in applying for scholarships, internships, education abroad, and relevant work experience. Completion of the Campuswide Honors Program is noted on the student's transcript and baccalaureate diploma.

Admission to the program as an incoming UCI freshman is by invitation only; all eligible candidates are reviewed and selected by faculty representatives from each academic unit. Transfer and other students are eligible to apply for admission to CHP up until the first quarter of their junior year, if they have a minimum grade point average of 3.5. CHP seeks to admit students who have a demonstrated passion for learning, a willingness to explore and take risks, a focus within their primary area of interest, and, at the same time, academic excellence in a range of disciplines outside of their major area.

Students pursue three year-long interdisciplinary Honors core courses (one course per quarter), satisfying categories of the breadth requirement. Many of these courses provide an interdisciplinary approach to major subjects and issues. Faculty from a variety of disciplines are chosen especially for their teaching ability and scholarship. Participants pursue original research under the direct supervision of faculty members, culminating in the production of an honors thesis, creative project, or publication-quality paper. Many CHP students also participate in major-specific honors programs. The senior honors thesis that is developed and produced through these programs satisfies the CHP thesis requirement.

CHP students begin their course of study by taking honors sections of the Humanities Core Course. Team-taught by professors from various disciplines in the School of Humanities, the Humanities Core Course is organized around major themes; currently, the focus is "Associations/Disassociations: The Social Instinct and Its Consequences." Faculty from a wide range of disciplines exemplify the ways in which humanists approach issues from philosophical, historical, and cultural perspectives. In small discussion sections, students put those perspectives into practice in their own writing and in classroom conversations and debates designed to engage each student intellectually in the examination of law and the regulation of society.

The Critical Issues in the Social Sciences sequence is team-taught by professors from the Schools of Social Sciences and Social Ecology. Topics have included human vision; authority (dis)obedience, and human society; decisions and compromises and their rewards and penalties; human language and its disablement; and exotic societies (including our own).

The Idiom and Practice of Science interdisciplinary sequence explores the role science plays in addressing socially significant problems. Students develop the ability to understand scientific models and to judge the content, merit, and limitations of many issues of science in the modern world. The development of analytical and writing skills is emphasized. Topics have included earthquakes, chemistry in the environment, radiation/radioactivity, evolution/aging, the mathematics of power, biodiversity/conservation, genetic plant engineering, the physics of music, and calculus.

CHP students are eligible to participate in other lower-division Honors courses on the campus, along with other qualified students. These include the following courses:

Honors General Chemistry covers the same material as Chemistry 1A-B-C, but in greater depth. Honors General Chemistry Laboratory is also offered.

Honors Organic Chemistry, designed for Chemistry and Biology majors and anyone else interested in a research career, offers a smaller class size and the opportunity for interactions and experiences not possible in the larger Chemistry 51 series. It is usually taken in the sophomore year, after completion of the General Chemistry lecture and laboratory sequence.

Honors Calculus, especially recommended for prospective Mathematics majors and others with a particular interest in mathematics, covers the same material as Mathematics 2D-E, but with greater emphasis on the theoretical structure of the subject matter.

The Honors Introduction to Computer Science sequence is open to CHP students majoring in Information and Computer Science and other students by consent. The first course introduces basic concepts, fundamental laws and principles of software and hardware organization, program construction, applications, and policy and social issues. The second course covers in-depth concepts of programming and mathematical tools for analyzing programs, and the third builds on this background with respect to mathematical tools and analysis.

Extracurricular Activities. CHP students are invited to participate in many social and cultural activities, including weekly coffee hours, beach bonfires, poetry readings, faculty lectures, movie and play nights, trips to museums, and camping retreats. Honors students also produce a quarterly creative writing journal, and continuing Honors students may volunteer for the Peer Mentor Program, providing assistance to incoming Honors students.

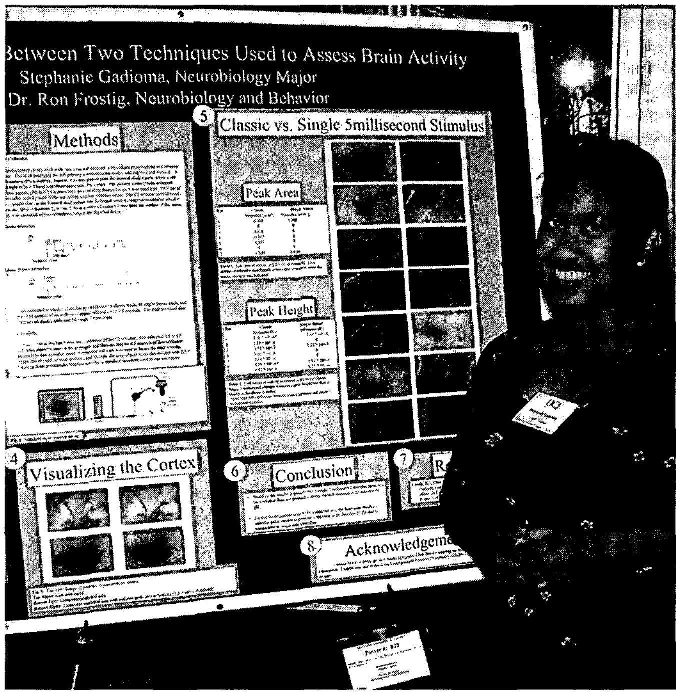
On-Campus Housing. CHP students are guaranteed on-campus housing, as long as they meet the Housing procedures and deadlines. Freshmen may choose to live in Middle Earth in "The Shire," or in Mesa Court in "Loma." Sophomores and upper-division students who wish to live in Honors housing may also select one of the Honors houses in Arroyo Vista. These residences offer a valuable living/learning experience with other Honors students and the community spirit that is a special feature of CHP. Students bring to the living experience their vitality, creativity, and dynamic dedication to learning. Activities have included get-togethers with Honors faculty, staff, and students; international potlucks; off-campus retreats; study breaks; and other events such as workshops and special speakers geared toward the interests of the residents.

Other benefits include extended library borrowing privileges, honors study rooms in the libraries, leadership and service opportunities, honors academic advising services with faculty, honors advisors and peer counselors, and close interaction with faculty and peers.

Additional information is available from the Campuswide Honors Program,1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http//:www.honors.uci.edu/.

Major-Specific and School Honors Programs

Honors programs for qualified junior- and senior-level students also are available to Drama majors in the Claire Trevor School of the Arts; to all majors in the School of Biological Sciences; to students from all schools regardless of their majors, by the School of Humanities; to Asian American Studies majors in the School of Humanities; to Chicano/Latino Studies majors; to Chemistry, Mathematics, and Physics majors in the School of Physical Sciences; to Anthropology, Economics, International Studies, Linguistics, Political Science, Psychology, Social Science, and Sociology majors in the School of Social Sciences; to Information and Computer Science majors; and to all majors in the School of Social Ecology. The focal point of each of these programs is the development of analytical and research skills through the pursuit of research under faculty supervision. An honors-level thesis is required by most of the programs. Students who participate in these programs may also participate in the Campuswide Honors Program. The honors-level thesis that is developed and produced through these programs also satisfies the CHP thesis requirement. Additional information is available in the specific academic unit sections of this *Catalogue.*



Excellence in Research Programs

The School of Biological Sciences and the Departments of Cognitive Sciences and of Psychology and Social Behavior offer students the opportunity to pursue research through their Excellence in Research Programs. Students work on their research projects under faculty supervision and have the opportunity to present their results to peers and faculty and, in certain instances, to have their research papers published. Additional information is available in the specific academic unit sections of this *Catalogue.*

Scholarship Opportunities Program

UCI encourages high-achieving students to learn how they can compete successfully for the most prestigious scholarships, grants, and graduate fellowships available, and to begin learning about the process as early as possible. The Scholarship Opportunities Program (SOP) organizes information about these awards. It also facilitates the campus review process for many of them, provides individual and group counseling, presents workshops, and sponsors the Winners' Circle, a club in which students help each other apply for scholarships, fellowships, and other awards. The names of students who have been awarded the prestigious national and regional scholarships and fellowships are featured on the Distinguished Scholars' Wall in the Student Center lobby. Additional information is available from SOP, 1200 Student Services II; telephone (949) 824-5461; e-mail: ucisop@uci.edu; World Wide Web: http://www.scholars.uci.edu/.

Honors Convocation

The UCI Honors Convocation ceremony is held each June for all students who graduate during that academic year with academic honors, receive special awards, and get inducted into honor societies. Of the graduating seniors, no more than 12 percent will receive academic honors: approximately 1 percent *summa cum laude,* 3 percent *magna cum laude,* and 8 percent *cum laude.* The criteria used in selecting candidates for these honors are available at the counseling office of each school. One general criterion is that students must have completed at least 72 quarter units in residence at a University of California campus by the end of the winter quarter of the academic year in which they graduate. Students who have on file recorded acts of academic dishonesty, as defined in *University of California Policies Applying to Campus Activities, Organizations, and Students,* may be excluded by the Associate Deans from consideration for academic honors at graduation. For further information contact the Campuswide Honors Program at (949) 824-5461.

Phi Beta Kappa

Phi Beta Kappa, founded in 1776, maintains a chapter at UCI. Phi Beta Kappa is the nation's oldest and most prestigious honor society; it recognizes outstanding scholastic achievement in the liberal arts and sciences. Upper-division students whose undergraduate records fulfill certain requirements are eligible for election to membership. Further information can be obtained from the Division of Undergraduate Education, 256 Administration Building; World Wide Web: http://www.due.uci.edu/PhiBetaKappa.html.

Undergraduate Research Opportunities Program

The Undergraduate Research Opportunities Program (UROP), in the Division of Undergraduate Education, encourages and facilitates research and creative activities by undergraduates. Research opportunities are available not only from every discipline, interdisciplinary program, and school, but also from many outside agencies, including national laboratories, industrial partners, and other universities. UROP offers assistance to students and faculty through all phases of the research activity: proposal writing, developing research plans, resource support, conducting the research and analyzing data, and presenting results of the research at the annual spring UCI Undergraduate Research Symposium. Calls for proposals are issued in the fall and spring quarters. Projects supported by UROP may be done at any time during the academic year and/or summer, and the research performed must meet established academic standards and emphasize interaction between the student and the faculty supervisor. In addition, all students participating in faculty-guided research activities are welcome to submit their research papers for faculty review and possible publication in the annual *UCI Undergraduate Research Journal.*

For more information, contact UROP, 2300 Student Services II; telephone (949) 824-4189; fax (949) 824-1607; e-mail: urop@uci.edu; World Wide Web: http://www.urop.uci.edu/.

Summer Undergraduate Research Program

The Summer Undergraduate Research Program (SURP) provides funding for UCI undergraduates from all disciplines who are conducting summer research projects or creative activities under the guidance of UCI faculty members. The program offers students the opportunity to become immersed in a research topic for a full-time 10-week period or the equivalent of 400 hours. SURP is open to all non-graduating UCI undergraduates who are in good academic standing and who have been involved in a faculty-mentored research project or creative activity for at least one quarter. The call for proposals is issued in the spring quarter of each academic year. Proposals should be prepared by the student applicant and jointly submitted by the student and a faculty member. Students who receive the SURP Fellowship can enroll in summer courses, upon receiving approval from their faculty mentor, and as long as they meet the 400-hour minimum requirement of the fellowship. Additional information about SURP is available from UROP, as noted above.

UCDC Academic Internship Program

The UCDC Academic Internship Program supervises and supports students who pursue internships, elective courses, research, and creative activities in the nation's capital. This program, situated in the exciting environment of Washington, D.C., is open to students in all majors. Students may enroll for fall, winter, or spring quarter; earn 12–16 units of course credit; and continue to be registered as full-time students. Financial-aid eligibility is maintained. Students who meet financial need and other eligibility criteria are also considered for a President's Washington Scholarship to help cover costs associated with participation in the program.

Students live in the new Washington D.C. Center building together with students from all of the participating UC campuses. This provides a social and intellectual community throughout the quarter.

The UCDC Academic Internship Program also offers a unique opportunity for UCI faculty members and graduate students to teach and pursue research in the Washington, D.C. area. UCI faculty, along with UC faculty from Berkeley, Davis, Los Angeles, Santa Barbara, and Santa Cruz, offer programs with upper-division courses in diverse academic disciplines. UC students may receive credit for many of these courses.

Interested students with strong academic records are encouraged to apply; visit 1100 Student Services II; telephone (949) 824-5400; e-mail: dccenter@uci.edu; World Wide Web: http://www.dccenter.uci.edu/.

UC Center Sacramento Scholar Intern Program

The UC Center Sacramento (UCCS) Scholar Intern Program supervises and supports students who pursue internships, elective courses, research, and creative activities in the State capitol. This new UC systemwide program is open to students in all majors, and is currently available for the winter, spring, or summer terms. While living in Sacramento, students are enrolled at UCI and earn 12–16 units of credit. Financial aid eligibility is maintained. Internship opportunities are available for students in many different settings including the offices of Assembly Members, Senators, and the Governor, as well as with State agencies, nonprofit organizations, and lobbying organizations.

Interested students with strong academic records are encouraged to apply; visit 1100 Students Services II; telephone (949) 824-5400; e-mail: dccenter@uci.edu; World Wide Web: http://uccs.universityofcalifornia.edu/.

Instructional Resources Center

The Instructional Resources Center (IRC), a unit of the Division of Undergraduate Education, provides instructional support through a variety of services and programs to the UCI teaching community. This support includes teaching development and skills training, as well as provision of classroom equipment, including instructional technology.

Teaching development includes consultation with teaching professionals regarding instructional strategies, methods, and learning theory. Faculty members and Teaching Assistants (TAs) may request consultations, and *all services are free and confidential.* Consultation can be further enhanced by videotaping the teacher in the classroom. Additionally, instructors can access a midterm feedback form through the Electronic Educational Environment's "Instructors' Toolbox" (http://www.eee.uci.edu/) in order to obtain feedback from students before the end of the term. To schedule an appointment for a consultation or other service, visit http://www.irc.uci.edu and click on "Teaching Enhancement Services."

Other programs and services include: a two-day TA Professional Development Program during Welcome Week; a quarterly Teaching Colloquy; workshops specifically for new faculty, experienced faculty, and graduate students; and workshops and individual assistance with the compilation of Teaching Portfolios. IRC also co-hosts the annual "Celebration of Teaching."

IRC also provides services related to computerized presentation technology, video-conferencing, distance learning, audiovisual equipment and rental, film and video research and ordering, equipment repair, lecture hall media support, and video and multimedia production.

IRC's Instructional Technology Center, located on the ground floor of Social Science Tower, includes a 30-seat computer-assisted classroom, a room in which to conduct distance-learning courses, a 20-seat walk-in computer laboratory, and a media center where instructors can produce multimedia resources for their classes. Technicians and instructional specialists are available to advise teachers.

IRC's main office is located in Building 603, next to Humanities Hall. Hours are from 8 a.m. to 12 noon and from 1 to 5 p.m., Monday through Friday. Staff are available after hours and on weekends by special appointment. For general information, call (949) 824-1385; World Wide Web: http://www.irc.uci.edu/.

IRC offers the following courses:

University Studies 390A-B-C Advanced Pedagogy and Academic Job Preparation (2-2-2). Service learning course for graduate students who serve as teaching mentors for other TAs. Satisfactory/Unsatisfactory only. Prerequisite: must have a concurrent appointment as a mentor with the Instructional Resources Center.

390A: Introduction to principles of good course design and instructional development. Students design and implement an integrated curriculum in the context of the fall TA Professional Development Program.

390B: Introduction to the Scholarship of Teaching and Learning literature within the students' respective disciplines. Students select or create several teaching methods stated or implied by the literature and translate these findings into workshops for other TAs.

390C: Prepares students for their future roles as faculty members and the academic job search. Covers job search skills; creation of CV, cover letters, statement of teaching philosophy; job interview and negotiation skills; types of higher educational institutions and professorial responsibilities.

Center for International Education

The Center for International Education (CIE) includes the Education Abroad Program (EAP) and the International Opportunities Program (IOP). CIE is a comprehensive resource and counseling center which helps students take advantage of the many worldwide opportunities that exist for study, work, internship, volunteering, research, and non-credentialed teaching, and prepares students for participation in these programs. Participating in an international educational experience typically introduces students to ways of thinking different from their own, broadens their understanding of the historical and contemporary world, sharpens their interest in particular fields, enhances their overall intellectual development, and prepares them for a career in this globally interconnected society.

Professional staff and international peer advisors, who have returned from an IOP or EAP experience, are available to guide students in making appropriate choices of international programs for their educational goals. All EAP and IOP participants are provided with pre-departure orientations, an EAP or IOP Student Guide handbook, and reentry orientations upon their return to UCI.

Students can keep up-to-date on CIE events, deadlines, and new international opportunities by subscribing to the biweekly electronic newsletter, *CIE-NEWS*. For information on how to subscribe, contact CIE.

EAP Summary of Opportunities

EAP Host Country	PROGRAM DURATION				ELIGIBILITY				Program	Applications Due
	Year	Fall	Spring	Summer	Sophomore	Junior	Senior	Graduate		
Australia	•	•	•			•	•	•	Fall: Year/Spring:	January April/May
Barbados	•	•				•	•	•	All:	January/February
Brazil	•	•	•		•	•	•	•	Fall: Year/Spring:	January April/May
Canada	•	•	•			•	•	•	Fall/Year: Spring:	January/February January to May
Chile	•	•	•		•	•	•	•	Fall: Year/Spring:	January April/May
China	•	•		•	•	•	•	•	All:	January
Costa Rica	•	•	•			•	•	•	Fall/Spring: (Monteverde) Year/Spring: (San José)	 October/November April/May
Czech Republic *Note: See Hungary. Students may participate in the Czech Republic option only after completing the fall semester in Hungary.*			•			•	•	•	All:	January/February *(apply with fall program in Hungary)*
Denmark	•	•	•	•	•	•	•	•	Summer/Fall/Year: Spring:	January April/May
Egypt	•					•	•	•	Year:	January/February
France	•	•	•		•	•	•	•	Fall/Year: Spring:	January April/May
Germany *Note: Third quarter freshman permitted on spring first year German program.*	•	•	•		•	•	•	•	Year/Fall: Spring:	January/February October/November
Ghana	•	•			•	•	•	•	All:	January/February
Hong Kong	•	•	•			•	•	•	Fall/Year: Spring:	December/January April/May
Hungary *Note: Students apply for Budapest fall, spring, or year; or the year option consisting of Budapest fall/Prague spring.*	•	•	•			•	•	•	Fall/Year: Spring:	January/February April/May
India		•				•	•	•	Fall:	January
Ireland (Republic of)	•					•	•	•	Year:	November/December
Israel	•	•	•	•	•	•	•	•	*(programs on hold for 2005–06)*	
Italy	•	•	•	•	•	•	•	•	Summer/Fall/Year: Winter Quarter/ Spring Semester: Siena Spring Quarter	November to January April/May November 2005
Japan	•	•	•		•	•	•	•	Year: Fall: (Meiji Gakuin, Tsuru) (Tsukuba) Spring: (Meiji Gakuin, Tohoku) (ICU, Tsuru)	November January/February November October/November April/May
Korea (Republic of)	•	•		•	•	•	•	•	All:	January
Mexico	•	•	•	•	•	•	•	•	Summer/Fall/Year Spring:	January April/May
Netherlands	•	•	•		•	•	•	•	Fall/Year: Spring:	January/February April/May
New Zealand	•					•	•	•	All:	April/May
Philippines				•	•	•	•	•	Summer:	January/February
Russia		•			•	•	•	•	Fall:	January/February
Singapore	•	•	•		•	•	•	•	Fall/Year: Spring:	January/February April to June
South Africa	•	•	•			•	•	•	Fall: Year/Spring:	January April/May
Spain	•	•	•		•	•	•		Fall/Year Spring:	January March to May
Sweden	•	•		•	•	•	•	•	All:	January
Taiwan	•	•				•	•	•	All:	November
Thailand *Note: Combined winter, spring, and summer program.*	•	•	•	•		•	•	•	Fall/Year: Spring:	January April/May
United Kingdom	•	•		•	•	•	•	•	Year: Summer/Fall:	November/December December to February
Vietnam		•				•	•	•	Fall:	January/February

CIE, EAP, and IOP are located in 1100 Student Services II; telephone (949) 824-6343; e-mail: cie@uci.edu; World Wide Web: http://www.cie.uci.edu/.

EDUCATION ABROAD PROGRAM

The Education Abroad Program (EAP) of the University of California offers students the opportunity to experience a different culture while making progress toward degree objectives. EAP is an overseas study program which operates in cooperation with about 150 host universities and colleges in 35 countries throughout the world. Participation in selected EAP programs may satisfy the Language Other Than English breadth requirement (category VI); see an EAP counselor for a list of approved programs. In addition, one or two courses toward the International/Global Issues breadth requirement (category VII-B) may be satisfied by one or two quarters' participation, respectively, in EAP.

EAP offers four types of programs: (1) Full Immersion Programs. UC students take regular classes at the host university, in the language of the host institution, side-by-side with native students. This option is available in many English-speaking and non-English-speaking countries, and students typically take classes in their major or related fields; (2) Language and Culture Programs. These are designed for students at beginning or intermediate language levels for the purpose of learning or improving language skills. UC students normally take classes side-by-side with other foreign students learning the language of the host country; (3) Programs for lower-division breadth. These programs are designed primarily to allow students to complete lower-division breadth requirements while experiencing another culture. Some other types of courses may also be available. Currently these programs are offered in English; and (4) Special Focus Programs. EAP offers a number of programs with a specific, limited academic focus, for example, Tropical Biology in Costa Rica, and Global Studies in Japan.

The courses and fields of study open to EAP participants vary at each center. Each of the host universities has special areas of excellence and strength, as described in brochures for each country which are available at CIE and online at http://www.eap.ucop.edu/. Interested students can search the EAP program offerings via the EAP Wizard at http://eap.ucop.edu/programwizard/.

Admission of UC students to the Education Abroad programs is subject to several qualifications. All applicants must demonstrate well-defined goals and a clear academic plan for integrating EAP studies into their UC degree program. Other requirements vary by program. Prerequisites generally include a 2.5 to 3.0 GPA, depending on the program. Some programs also require one to two years of university-level training in the host country's language. See the EAP Web site at http://www.eap.ucop.edu/ or individual program brochures for specific details.

University of California faculty who serve as directors and associate directors at most Study Centers provide academic counsel to students while abroad. Full credit is granted for courses satisfactorily completed, and courses are recorded on official UC transcripts. With careful planning, most EAP students make normal progress toward their UC degrees. Application of credits earned abroad toward major or graduation requirements is determined by the academic unit in which the participant's major is offered.

Students interested in the language, literature, art, culture, history, government, or social institutions of the countries where EAP study centers are located have the opportunity to gain substantially from first-hand academic experience. Classes in the natural and physical sciences, engineering, and computer science are available at many prestigious host institutions. In addition, whatever their field of study, EAP participants can broaden their outlook and gain new skills as the result of study in a foreign country, as well as experience vastly different cultures and contrasting patterns of thinking while making progress toward a UC degree.

The cost of studying abroad through EAP is often comparable to the cost of studying at UCI. EAP participants are responsible for the same fees as they pay at UCI, including UC registration and educational fees, campus fees, and room, board, books, and personal expenses. The only additional costs directly related to the program are for their round-trip transportation and orientation and intensive language program (depending on the Study Center). All University of California financial aid (other than work-study), including grants, scholarships, and loans, is available to EAP students who qualify. EAP also offers need-based scholarships to eligible participants. Detailed information is available at http://www.cie.uci.edu/finaid.html.

Applications for EAP are generally due six–nine months prior to the expected time of departure. Students may participate in EAP as sophomores, juniors, or seniors (fourth- or fifth-year), and may apply as early as their freshman year. In addition, students who have completed at least one full year of graduate study and who have support of their academic department and graduate dean may apply. Students interested in EAP should visit the EAP Web site (http://eap.ucop.edu/) to review program options and visit the CIE Web site (http://www.cie.uci.edu) or come to the CIE office for advising and to obtain an application. UCI EAP deadlines are available at http://www.cie.uci.edu/DeadlinesByCountry.html.

INTERNATIONAL OPPORTUNITIES PROGRAM

UCI's International Opportunities Program (IOP) is the link between UCI students and any international educational experience that occurs outside the boundaries of the U.S. and is not a part of the UC Education Abroad Program (EAP). Any UCI student (undergraduate, graduating senior, or graduate) in good academic standing, regardless of major, class level, or foreign language ability, may participate in IOP.

CIE staff provide information and counseling to assist students in finding an appropriate program to meet their needs and interests. Students may choose from academic study (with transferable credit), paid work, paid or unpaid internships, unpaid or compensated volunteer service, field research, and paid teaching opportunities in nearly every country in the world. This includes all academic programs sponsored by U.S. institutions that occur on foreign soil or water (as in the case of the Semester at Sea program), direct enrollment at foreign institutions, summer session abroad programs through UCI and other UC campuses, and UCI Independent Study (199) done in foreign countries under the supervision of a UCI faculty member.

With careful planning IOP students participating in study programs can make progress toward their UCI degree by fulfilling major, minor, or breadth requirements. Students may apply for transfer credit and UCI financial aid by completing the International Study Advance Contract. Many scholarships are also available.

To acquaint students with opportunities abroad, IOP sponsors the annual Go Abroad Fair and periodic presentations, orientations, and workshops. It also maintains a library of international resources and publications listing opportunities abroad. Interested students should visit the CIE Web site at http://www.cie.uci.edu/ or come into the CIE office for assistance.

REQUIREMENTS FOR A BACHELOR'S DEGREE

There are four groups of requirements that must be met to earn a baccalaureate degree from UCI: general UC requirements, UCI requirements, school or program requirements, and degree-specific requirements. UC and UCI requirements are described below. School or program and major-specific requirements are described in full in the academic unit sections.

Students with identified learning and/or physical disabilities, including language-acquisition problems, are eligible to receive support through the Disability Services Center; telephone (949) 824-7494 (voice), 824-6272 (TDD). Staff can assist students from the time they are admitted to UCI until they graduate.

Catalogue Rights

Students enrolled at UCI from their freshman year may elect to meet as graduation requirements (UC, UCI, school, and major): (a) those in effect at the time of entrance; or (b) those subsequently established after entrance.

A readmitted student who has not been enrolled at UCI for three or more consecutive quarters (excluding summer sessions) must adhere to the graduation requirements: (a) in effect for the quarter in which the student is readmitted; or (b) those subsequently established.

Students transferring from other collegiate institutions may elect to meet as graduation requirements either: (a) those in effect at the time of enrollment at UCI; (b) those subsequently established; or (c) those in effect at UCI when the student first entered a previous, accredited collegiate institution, provided that the student has been continuously enrolled in a collegiate institution and that entry was not more than four years prior to the time of enrollment at UCI.

A transfer student who has had a break of enrollment of two consecutive semesters or three consecutive quarters (excluding summer sessions) may follow the requirements in effect at UCI: (a) at the time of enrollment at UCI; (b) those subsequently established; or (c) those in effect at the time of reentry into a previous, accredited collegiate institution, provided that reentry was not more than four years prior to enrollment at UCI.

A transfer student who has been continuously enrolled in college for more than four years prior to transfer may use: (a) the requirements in effect at the time of enrollment at UCI; (b) those subsequently established; or (c) those in effect at UCI four years prior to enrollment at UCI.

Transfer students who complete one of the following options will be considered to have met the total UCI breadth requirement except the upper-division writing requirement: (a) students who transfer from a four-year institution and who have completed the general education requirements of that college, upon approval of petition; (b) students who transfer from another UC campus and provide official documentation that they have met the general education requirements of that campus; (c) students who transfer from another UC campus and are in the process of completing the general education requirements of that campus, upon approval of petition, and who subsequently complete the remaining requirements of that campus at UCI; or (d) California community college transfer students who have completed the Intersegmental General Education Transfer Curriculum prior to transfer.

Transfer students may also elect to complete the UCI breadth requirement.

University Requirements

ENGLISH (UC ENTRY LEVEL WRITING)

Every undergraduate must demonstrate upon entrance to the University an acceptable level of ability in English composition.

The UC Entry Level Writing requirement, formerly known as Subject A, may be met *before* entrance by:

1. Achieving a grade 3, 4, or 5 in either of the two College Board Advanced Placement Examinations in English; *or*
2. Achieving a score of 680 or higher on the SAT II Writing Test (NOTE: for students entering fall 2006, the minimum score required [SAT and ACT] will change; see http://www.universityofcalifornia.edu/admissions/ for information); *or*
3. Achieving a score of 5 or above on the International Baccalaureate's Higher Level English A Examination; *or*
4. Entering the University with credentials from another college which show the completion of a transferable one-quarter (four units) or one-semester (three units) course in English composition with a letter grade of C or better; *or*
5. Achieving a score of 8 or higher on the UC Analytical Writing Placement Examination.

Those students who have not met the requirement before entrance must satisfy the requirement before the beginning of their fourth quarter at UCI. Students who have not satisfied the requirement by that time will be ineligible to enroll for a fourth quarter.

Students enrolled in Humanities 20A-B-C-D (Essentials of Academic Writing) must enroll in an Analytical Writing course (English WR 37, WR 39A, or Humanities 1A S/A) immediately after they are authorized to do so.

The UC Entry Level Writing requirement may be met *after* admission by one of the following three options:

1. Passing the UC Analytical Writing Placement Examination given in mid-May (and on subsequent dates) to all entering freshmen admitted for fall quarter, 2005 (see Placement Testing). Transfer students who have not satisfied the UC Entry Level Writing requirement should contact the UCI Composition Program Office (420 Humanities Instructional Building); telephone (949) 824-6717.
2. Enrolling in sections of the Humanities Core Course designated "S/A." (NOTE: Students held for UC Entry Level Writing and enrolled in the Humanities Core must enroll in a S/A section of the Core Course during their first quarter. Successful completion of the writing component of these sections of this course with a letter grade of C or better will satisfy the requirement. Students who do not receive a letter grade of C or better in Humanities 1A S/A in fall quarter and who continue to be held for UC Entry Level Writing must enroll in Humanities 1B S/A during the winter quarter and satisfy the requirement by earning a letter grade of C or better.)
3. Taking English WR 37 or WR 39A and receiving a letter grade of C or better in that course.

The Pass/Not Pass grade option may not be used to satisfy the UC Entry Level Writing requirement.

Students enrolled at UCI may take only UCI courses in satisfaction of the UC Entry Level Writing requirement. Continuing UCI students may not take summer courses at another institution to satisfy this requirement.

AMERICAN HISTORY AND INSTITUTIONS

This requirement may be met by one of the following options:

1. Completion in high school of one year of United States history with grades of C or better, *or* one semester of United States history and one semester of United States government with grades of C or better; *or*
2. Achieving a score of 3, 4, or 5 on the College Board Advanced Placement Examination in United States History; *or*
3. Achieving a score of 550 or better on the SAT II: American History test (NOTE: for students entering fall 2006, the minimum score required will change; see http://www.universityofcalifornia.edu/admissions/ for information); *or*
4. Presentation of a certificate of completion of the requirement at another California institution; *or*
5. Completion at UCI or another U.S. institution of one year of college-level United States history with grades of C or better, *or* one course in United States history and one in United States government with grades of C or better. Acceptable UCI courses: United States history—History 40A, 40B, 40C; United States government—Political Science 21A.

UCI Requirements

UNIT REQUIREMENT

Credit for a minimum of 180 quarter units, earned by examination, by other evaluation, or course work is required. A course normally offers four quarter units of credit.

GRADE REQUIREMENT

A minimum grade average of at least C (2.0) is required (1) overall, (2) in all of the courses required for the major program, and (3) in the upper-division courses required for the major program. Higher averages than this may be required only in honors programs. Students who fail to attain a C (2.0) average in courses required in the major program may, at the option of the major unit, be denied the privilege of pursuing a major program in that unit. In this context, "the courses required in the major program" are defined as the courses required for the major and offered by the program of the student's major (or programs, in the case of an interdisciplinary or interdepartmental major). A major can include additional courses required for the major in this set, with the approval of the Council on Education Policy. In this case, the list of additional courses is published in the *Catalogue* with the requirements for the major.

RESIDENCE REQUIREMENT

At least 36 of the final 45 units completed by a student for the bachelor's degree must be earned in residence at the UCI campus. Exceptions to this rule may be allowed, with prior departmental approval, to students enrolled in the Education Abroad Program, the UCDC Academic Internship Program, the UC Center Sacramento Scholar Intern Program, or the International Opportunities Program with International Study Advance Contract.

BREADTH REQUIREMENT

Among the many possible purposes for breadth requirements, the one that stands out at UCI is that of introducing students to the basic modes of thought that characterize academic disciplines. In order to know ourselves and the world, we need to know first the ways these can and have been known. Thus the breadth requirement at UCI requires students to devote a substantial amount of their course work, especially in their first years, to connected series of courses which provide a coherent experience within such areas as the natural and social sciences, humanistic inquiry and the arts, and the nature of symbolic systems.

Several other aims that UCI regards as especially desirable are consistent with this chief purpose and are embodied to varying degrees in the UCI breadth requirement: to cultivate a historical consciousness of society and culture; to acquaint students with fundamental ways of thinking different from their own or that of their gender, class, and culture with a view to expanding their sense of human possibilities and awakening an awareness of the conditioned nature of their own assumptions about the world; to equip students with a broad understanding of the contemporary world and its cultural, political, scientific, and technological problems; to equip students with the skills essential to understanding and grappling with these problems; to establish bridges and to understand relationships between academic disciplines; and to provide students with some intellectual experiences which virtually all can be assumed to have had in common and thus to introduce them to what, after all, a university has traditionally been supposed first and foremost to be, an intellectual community.

The breadth requirement is a *graduation* requirement and, with the exception of the lower-division writing requirement, need *not* be satisfied during only the lower-division years. To satisfy the breadth requirement, courses are required in each of the following categories:

I. Writing
II. Natural Sciences
III. Social and Behavioral Sciences
IV. Humanistic Inquiry
V. Mathematics and Symbolic Systems
VI. Language Other Than English
VII. Multicultural Studies and International/Global Issues

The specific course combinations and sequences in each area which may be used by students to satisfy the requirement are listed below. A number of the courses listed are available in more than one academic unit. When a breadth course is cross-listed with another course, that course also is available for fulfillment of the breadth requirement. Students should refer to the actual descriptions of the courses to determine which are cross-listed.

These course combinations were selected to ensure that students, in meeting the requirement, be exposed to subject matter, problems, and techniques which would serve as a first introduction to an academic area, as well as to a connected set of courses which provide a coherent experience in that academic area.

With the exception of categories I and VII, a student may count toward breadth no more than a year of work taken within the discipline of the major. For example, a student majoring in Philosophy may count no more than three quarter courses in philosophy toward breadth categories II, III, IV, V, or VI.

Students fulfill the UCI breadth requirement by completing courses from the list which follows. Students can select from among a variety of courses, depending upon their area of interest. Some of the course combinations available consist of multiple-quarter courses (such as Chemistry 1A-B-C under the Chemistry subsection of "category II. Natural Sciences"). Multiple-quarter courses are referred to as being "sequential," meaning that the course work in the earlier courses is prerequisite to the later course work. Students must take each part of a sequential course in alphabetical order (e.g., students must take Chemistry 1A before either 1B or 1C). Sequential courses are separated by hyphens. Other course combinations consist of single-quarter courses (e.g., Anthropology 2A, 2B, 2C under the Anthropology subsection of "category III. Social and Behavioral Sciences") which are related to one another but for which no course in the combination is preparatory to any other course in the combination. Single-quarter course combinations may be taken in any order. Single-quarter courses are separated by commas. Semicolons separate complete course combinations.

BREADTH CATEGORIES

I. Writing Requirement. Because of the importance of writing in every academic discipline, the University is committed to developing the writing skills of its students at all levels and in all areas. The Writing Requirement expresses this commitment, but the concern for and attention to clear, accurate writing is expected in all courses.

The UCI Writing Requirement consists of three courses beyond the UC Entry Level Writing requirement. Except where otherwise noted below, students must satisfy the UC requirement *prior to* fulfilling the UCI Writing Requirement.

Two of the three courses required must be lower-division courses. Students who have not completed the lower-division writing requirement before the beginning of their seventh quarter at UCI will be subject to probation. Students transferring to UCI normally should have satisfied the lower-division writing requirement before entering UCI; if, however, they have not, they must complete it within their first three quarters of enrollment or they will be subject to probation. Academic English/English as a Second Language students must complete the lower-division writing requirement before the beginning of the seventh quarter following the completion of their AE/ESL courses or they will be subject to probation.

The third course must be an upper-division writing course, and it must be taken only after the successful completion of the lower-division requirement.

Students enrolled at UCI may take only UCI courses in satisfaction of the lower-division and upper-division writing requirements. Continuing UCI students may not take summer courses at another institution to satisfy lower-division or upper-division writing requirements.

Lower-Division Requirement: The two courses taken to fulfill the lower-division requirement must be completed with a minimum grade of C (or a Pass or Credit grade equivalent to C). Students may select from the courses specified below:

1. English WR 39B (Critical Reading and Rhetoric) and WR 39C (Argument and Research).
2. English WR 37 (Intensive Writing) and WR 39C (Argument and Research). Recommended students only.
3. Two quarters of the writing component of the Humanities Core Course (Humanities 1A-B-C) beyond satisfaction of the UC Entry Level Writing requirement. NOTE: Students held for the UC Entry Level Writing requirement and enrolled in the Humanities Core must enroll in a section of the Core Course designated S/A during their first quarter. Successful completion of the writing component of these sections of this course with a letter grade of C or better will satisfy the UC Entry Level Writing requirement. (The Pass/Not Pass grade option may not be used to satisfy it.) For these students, the UCI lower-division writing requirement may be satisfied only in the second and third quarters of the Humanities Core Course. Students who do not receive a C or better in Humanities 1A S/A in fall quarter and continue to be held for the UC Entry Level Writing requirement must enroll in Humanities 1B S/A during the winter quarter and satisfy the requirement by earning a letter grade of C or better. The lower-division writing requirement will be satisfied in the second and third quarters of the Humanities Core Course for these students.
4. Students who complete English WR 37 or WR 39B with a grade of B (3.0) or better may substitute as the second course of the lower-division writing requirement one of the following courses in creative writing or nonfiction and journalism: English WR 30, WR 31, or WR 38.

Upper-Division Requirement: The course taken to fulfill the upper-division requirement must be completed with a minimum grade of C (or a Pass or Credit grade equivalent to C). The requirement may be satisfied by completing any one of the following:

1. An upper-division course designated on a list of approved courses in the quarterly *WebSOC, Searchable Schedule of Classes* (http://www.reg.uci.edu) as approved for satisfaction of the requirement. NOTE: All courses approved to fulfill the upper-division writing requirement should have a "W" suffix. Students are encouraged to consult the *Searchable Schedule of Classes* or their advisor to determine the current upper-division writing requirement course offerings. If a course on the approved list is offered without the "W" suffix, it does not satisfy the upper-division writing requirement.
2. English WR 139W.
3. English WR 109, WR 110, WR 111, or WR 113. Consent of instructor is required. Students may not use such a course to satisfy the requirement unless they have attained a B or better in both courses taken to satisfy the lower-division writing requirement.

Students who fail to attain the required grades in the courses taken in fulfillment of the writing requirement should refer to the Academic Regulations and Procedures section for further information.

II. Natural Sciences. Students must select a three-course combination from one of the following areas:

Biological Sciences: Any three courses from Biological Sciences 1A, 1B, 5, 6, 8A, 9A, 9B, 9C, 9D, 9E, 9F, 9G, 9J, 9K, 9M, 10, 11, 12A, 12B, 12C, 12D, 15, 20, 35, 36, 37, 38, 45, 55, 65, 75, 93, 94 (NOTE: the prerequisite for 1B is 1A.)

Chemistry: Chemistry 1A-B-C and 1LB-LC or 1LA-LB; H2A-B-C and 1LB-LC

Earth System Science: Any three courses from Earth System Science 1, 3, 5, 7, 9, 11, 13, 15, Physics 15, 16, 17, 18, 19, 20A, 20B, 20C, 20D, 21, Engineering 5

Interdisciplinary: Any three courses from Biological Sciences H90, Chemistry H90, Earth System Science H90, Physics H90

Physics: Physics 3A-B-C and 3LB-LC; Physics 7A-B and 7LA-LB plus either Physics 7D and 7LD *or* Physics 7E; any three courses from Physics 14, 15, 16, 17, 18, 19, 20A, 20B, 20C, 20D, 21, Earth System Science 1, 3, 5, 7, 11, 15, Engineering 5

Social Ecology: Environmental Analysis and Design E1, E3, E5

III. Social and Behavioral Sciences. Students must complete three courses from the list below. At least two courses must be in the same area (indicated by italics). At least one course must be an introductory course (indicated by an asterisk).

Anthropology: Anthropology 2A*, 2B*, 2C*, 2D*

Economics: Economics 1*, 20A*-B*-C*

Geography: Social Science 5A*, 5B*, 5C*, 5D*, 18A, 18D

Interdisciplinary:
Asian American Studies 60A*, 60B*, 60C*
Chicano/Latino Studies 61*, 62*, 63*, 64
Social Science 1A*, H1E*-F*-G*, 70A*, 70B*, 70C*
Women's Studies 60A*, 60B*, 60C*

Linguistics: Linguistics 3*, 10, 20, 51, 68, 80 (NOTE: Linguistics 3, 10, 20 may be counted toward either category III or V but not both.)

Logic and Philosophy of Science: Logic and Philosophy of Science 4A*, 4B*

Political Science: Political Science 6A*, 6B*, 6C*, 21A, 31A, 41A, 51A, 61A, 71A

Psychology:
Psychology 7A*, 9A*-B-C, 13T, 21A, 23A, 46A, 56L, 78A
Psychology and Social Behavior P9*

Social Ecology:
Criminology, Law and Society C7*
Environmental Analysis and Design E8*
Psychology and Social Behavior P9*
Social Ecology H20A*-B*-C*

Sociology: Sociology 1*, 2*, 3*, 23, 31, 62

IV. Humanistic Inquiry. Students must select a three-course series from one of the following areas:

Arts:
Arts Interdisciplinary 1A-B, C
Dance 90A-B-C
Drama 40A, 40B, 40C
Music 14A-B-C; 40B-C-D
Studio Art 1A-B-C; 10A, 10B, 10C

Humanities:
Art History 40A, 40B, 40C; 42A, 42B, 42C; 80A, 80B, 80C
Classics 36A, 36B, 36C; 37A, 37B, 37C; 45A-B-C
East Asian Languages and Literatures 55 (three different topics)
Film and Media Studies 85A-B-C
French 50 (three different topics)
German 50 (three different topics)
History 21A, 21B, 21C; 36A, 36B, 36C; 37A, 37B, 37C; 40A, 40B, 40C; any three courses from 70A, 70B, 70C, 70D, 70E
Humanities 1A-B-C; 3A, 3B, 3C; H3A, H3B, H3C; 5A, 5B, 5C
Philosophy 1, 4, and either 5 or 9; 1, 6, 7; 10, 12, and either 11 or 13; any three courses from 20, 21, 22, 23
Russian 50 (three different topics)
Spanish 50 (three different topics)

Interdisciplinary:
African American Studies 40A, 40B, 40C
Women's Studies 50A, 50B, 50C

Literature:
Comparative Literature CL 50A, 50B, 50C
English E 28A or E 28D, E 28B, E 28C or E 28E; three courses from E 6, E 7, E 8, Comparative Literature CL 8

V. Mathematics and Symbolic Systems. Students must select one of the following three-course combinations:

Anthropology 10A-B-C
Computer Science and Engineering 21, 22, 23
Informatics 41, 42, and Information and Computer Science 23
Information and Computer Science 10A-B-C; 10A or 21, plus 22, 23
Linguistics 3, 10, 20 (NOTE: Linguistics 3, 10, 20 may be counted toward either category V or III but not both.)
Logic and Philosophy of Science 29, 30, 31
Mathematics 2A-B plus one course from 2D, H2D, 2J, 4, 6A, 7, or Biological Sciences 7; 2A, 6A, 7; 6A-B plus one course from 2A, 6C, or 7
Philosophy 29, 30, 31
Psychology 10A-B-C
Social Ecology 166A-B-C
Social Science 9A-B-C; 10A-B-C; 100A-B-C
Sociology 10A-B-C
Statistics 100A-B-C

VI. Language Other Than English. Students must demonstrate competency in a language other than English by completing one of the following options:

A. College-level course work equivalent to UCI's third quarter of study in a language other than English. UCI courses approved to satisfy this requirement are:

Arabic 1C; Chinese 1C, S1BC; French 1C, S1BC; German 1C, S1BC; Greek 1C, S1BC; Hebrew 1C; Italian 1C; Japanese 1C, S1BC; Korean 1C, S1BC; Latin 1C, S1BC; Portuguese 1C; Russian 1C; Spanish 1C, S1BC; Tagalog 1C; Vietnamese 1C, S1BC

For information on UCI's prerequisites, course placement policies, and the grade required to advance to the next level of instruction, consult the School of Humanities (Foreign Language Placement and Progression) section in this Catalogue.

B. Credit for three years of high school study or its equivalent in a single language other than English with a C average or better in the third year.

C. A score of 3, 4, or 5 on a College Board Advanced Placement Examination in a language other than English.

D. A score of 570 or better on a College Board SAT Subject Test in a language other than English, with the exception of the test in Modern Hebrew for which a score of 500 or better is required. NOTE: At press time these scores were subject to change due to the recent changes in the SATs.

E. Completion of an approved course of study through the Education Abroad Program (EAP). Careful planning is required to ensure that this requirement is fulfilled. Check with an EAP counselor at the Center for International Education to determine the programs in countries that fulfill this requirement.

F. The equivalent as determined by an appropriate and available means of evaluation. For information on availability of such examinations and testing schedules, consult the Testing Office, Student Services II, (949) 824-6207. If an appropriate means of evaluating competence in a non-English language of instruction does not exist, satisfactory completion, with a C average or better, of one year of formal schooling at the sixth grade level or higher in an institution where the language of instruction is not English will meet the requirement. Appropriate documentation must be presented to substantiate that the course work was completed.

VII. Multicultural Studies and International/Global Issues. Students must complete three courses; one course must be from the Multicultural Studies (VII-A) list, and two courses must be from the International/Global Issues (VII-B) list. In fulfilling category VII, students may use courses which are also being used in fulfillment of other breadth categories. For example, Anthropology 2A simultaneously satisfies category VII-B and a portion of category III. In addition, one course toward Category VII-B may be satisfied by one quarter's participation in the Education Abroad Program (EAP), and two courses toward Category VII-B may be satisfied by two quarters' participation in EAP.

Multicultural Studies (VII-A):
African American Studies 40A, 40B, 40C, 151
Anthropology 85A, 125X, 125Z, 128B, 133A, 136K, 138R, 161T, 162B
Art History 163, 164A, 164B
Asian American Studies 51, 60A, 60B, 60C, 101, 110, 111, 111A, 132, 133, 135, 141, 142, 150, 151, 151A, 151B, 151C, 151D, 151E, 151G, 151H, 151J, 151K, 161, 162, 164, 165, 197
Chicano/Latino Studies 61, 62, 63, 64, 65, 102, 103, 104, 110A, 110B, 111A, 111B, 113, 114, 117, 119, 131, 132A, 132B, 134, 135, 141, 143, 147, 151, 152, 154, 155, 158, 160, 161, 163, 170, 171, 173, 174, 175, 176
Classics 175
Comparative Literature CL 9, CL 105
Criminology, Law and Society C172
Education 104E, 124, 155, 160
English E 105
Environmental Analysis and Design E15, E131U, E190U

Film and Media Studies 130
History 15A, 15B, 15C, 146D, 146E, 146F, 146G, 146H, 148A, 148B, 150, 151A, 151B, 151C, 152, 155
Humanities 1C
Linguistics 2
Music 78A, 78B
Philosophy 131E
Political Science 27A, 61A, 124A, 124B, 124C, 124D, 126A, 126C
Psychology 174A, 174B, 174E, 174F, 174G
Social Science 70A, 70B, 70C, 70T, 78A, 78B, 78C, 167, 170B, 170E, 170F, 171F, 172B, 172C, 172E, 173G, 173H, 173I, 173J, 173K, 173L, 175A, 175B, 177A, 177B, 177C, 177D, 178C, 178D, 178E, 178H, 178J, 178K, 179
Sociology 63, 65, 68A, 161
Spanish 100E, 110C, 140A, 140B, 142
Studio Art 149
Women's Studies 20, 50A, 50B, 50C, 120B, 139, 156A, 156B, 157A, 158A, 158B, 168A, 197

International/Global Issues (VII-B):

Anthropology 2A, 41A, 121A, 121D, 121E, 121H, 121J, 125A, 125B, 125F, 125P-Q, 127A, 134A, 134G, 135A, 135H, 136D, 138O, 138P, 138Q, 162A, 163A, 163I, 163K, 164P, 174A
Art History 40A, 40B, 40C, 42A, 42B, 42C, 80A, 80B, 80C, 162A, 162B, 162C
Asian American Studies 171, 171A, 173
Chicano/Latino Studies 115A, 115C, 133A, 133B, 162, 164, 165
Chinese 2B-C, 3A-B-C, 100A-B-C, 101A-B-C, 115, 180
Classics 176
Comparative Literature CL 40A, CL 40B, CL 40C
Criminology, Law and Society C191
Dance 80, 81, 82, 90A-B-C
Drama 40A, 40B, 40C, 120A, 120B, 120C
East Asian Languages and Literatures 20, 55, 110, 116, 117, 120, 130, 150, 155, 160, 170, 190, 192
Economics 13, 152A, 152P-Q
Environmental Analysis and Design E113, E125, E127, E143U, E190C
Film and Media Studies 160, 161
French 2B-C, S2BC, 50, 101A-B-C, 110, 116, 117, 118, 119, 120, 125, 127, 139, 150, 160
German 2B-C, S2BC, 50, 100A, 100B, 100C, 101, 102A, 102B, 117, 118, 119, 120, 160
Greek 103, 104
History 11, 21A, 21B, 21C, 50, 70A, 70B, 70D, 70E, 100C, 101, 102A, 102B, 103A, 110A, 110B, 110C, 112C, 112D, 114, 115A, 115B, 115C, 116A, 116B, 117A, 117B, 118A, 118B, 118C, 120A, 120B, 120C, 120D, 120E, 122A, 122B, 122C, 123A, 123B, 123C, 123D, 124A, 124B, 126A, 126B, 126C, 127A, 127B, 127C, 128A, 128B, 128C, 130A, 130B, 130C, 131, 132, 133A, 133B, 134A, 134B, 134C, 134D, 158A, 158B, 158C, 161A, 161B, 161C, 163, 168A, 168B, 168C, 169, 170D, 170E, 170F, 170G, 171D, 171E, 171F, 171G, 172D, 172E, 172F, 172G, 173D, 173E, 173F, 173G, 174E, 174G, 175D, 175E, 175F, 175G
Humanities 5A, 5B, 5C, 100, 103A-B, 183B
International Studies 11, 12, 13, 111A, 121, 122, 179, 189
Italian 2B-C, 100A-B, 101A, 101B, 101C
Japanese 2B-C, S2BC, 3A-B-C, 100A-B, 101A-B-C, 115, 180
Korean 2B-C, 3A-B-C, 101A-B-C, 115, 180
Latin 103, 104
Linguistics 1
Music 40B-C-D
Philosophy 117
Political Science 6A, 41A, 42A, 43D, 44A, 141B, 141C, 141D, 141E, 143E, 145B, 146A, 147A, 147B, 148B, 151A, 151B, 151C, 151D, 151F, 152B, 152C, 152D, 152F, 153A, 153B, 153E, 153F, 154C, 154F, 154G, 155F, 155G, 156A, 157A, 172A, 173A
Portuguese 120B, 120C, 121, 122
Russian 2B-C, 50, 140, 150
Social Ecology 183B
Social Science 170C, 170P, 172F, 176A, 183B
Sociology 2, 44, 77, 165A, 175A, 175B
Spanish 2B-C, S2BC, 10A-B, 44, 50, 100A, 100B, 100C, 100D, 110A, 110B, 116, 119, 121, 130A, 130B, 130C, 150, 160, 185
Vietnamese 2B-C, 3A-B-C, 115
Women's Studies 110A, 110C, 120C, 165B, 165D, 166A, 167A, 167B

One of the following fourth-quarter language options:

A. Chinese 2A; French 2A, S2AB; German 2A, S2AB; Greek 100A, 100B; Italian 2A; Japanese 2A, S2AB; Korean 2A; Latin 100A, 100B; Portuguese 2A, 120A; Russian 2A; Spanish 2A, S2AB, 5; Vietnamese 2A

B. Credit for four years of high school study or its equivalent in a single language other than English with a C average or better in the fourth year.

C. A score of 4 or 5 on a College Board Advanced Placement Examination in a language other than English.

D. A score of 620 or better on a College Board SAT Subject Test in a language other than English, with the exception of the test in Modern Hebrew for which a score of 540 or better is required. NOTE: At press time these scores were subject to change due to the recent changes in the SATs.

E. The equivalent as determined by an appropriate and available mean of evaluation. For information on availability of such examinations and testing schedules, consult the Testing Office, Student Services II, (949) 824-6207. If an appropriate means of evaluating competence in a non-English language of instruction does not exist, satisfactory completion, with a C average or better, of two years of formal schooling at the sixth grade level or higher in an institution where the language of instruction is not English will meet the requirement. Appropriate documentation must be presented to substantiate that the course work was completed.

School, Departmental, and Major Requirements

In addition to the University and UCI requirements listed above, each undergraduate student must satisfy the degree requirements for the major and, if applicable, the minor or concentration selected. UCI, school, and departmental or major and minor requirements may overlap; courses taken to fulfill a school or departmental requirement may also help fulfill the UCI breadth requirement. Students are urged to make sure that they understand how many courses are permitted to satisfy more than one requirement. Information on specific degree requirements and courses is available in the academic unit sections of this *Catalogue.*

Students must declare a major by the time they reach junior status (90 units excluding college work completed prior to high school graduation), and should make certain that the background and the preparation prerequisite to junior and senior work in the major have been accomplished. Transfer students should read the section on Information for Transfer Students: Fulfilling Requirements for a Bachelor's Degree.

Students should note that with the exception of courses designated Pass/Not Pass Only, courses taken Pass/Not Pass may *not* be used to satisfy specific course requirements of the student's school and major, unless authorized by the appropriate dean. Additional information on grading is located in the Academic Regulations and Procedures section.

Minor Programs

For certification in a minor, a student must obtain a minimum overall grade point average of at least C (2.0) in all courses required for the minor program. No more than two courses applied to a minor may be taken Pass/Not Pass. Completion of the minor is noted on a student's transcript. (Students are *not* required to minor in a program in order to graduate from UCI.)

Application for Graduation

In order to receive a degree, an undergraduate student must submit an online Application for Graduation via the Student Access link at http://www.reg.uci.edu no later than the published deadline. Specific deadline dates for filing are established quarterly so that candidates' academic records can be reviewed to verify that all graduation requirements have been met. These dates vary among academic units. Students should contact their academic counseling office for deadline and degree audit information.

INFORMATION FOR TRANSFER STUDENTS: FULFILLING REQUIREMENTS FOR A BACHELOR'S DEGREE

This section provides a guide for transfer students in understanding how their course work from another collegiate institution applies to fulfilling UCI degree requirements. Transfer students should use this information in conjunction with the previous section, Requirements for a Bachelor's Degree. Transfer students are required to meet university, breadth, school, department, and major requirements described in the *Catalogue.* The courses and descriptions in this *Catalogue* may be used by prospective transfer students as a guide for selecting courses of similar content and purpose in their own institutions. No student who has taken a course which is accepted for credit by the Office of Admissions and Relations with Schools and which has been mutually determined with a community college as being acceptable toward completion of the UCI breadth requirement shall incur any loss of credit in satisfaction of the requirement.

Transfer students are *strongly* advised to check with the academic counselor in their prospective major or the Office of Admissions and Relations with Schools about courses that may be used to satisfy UCI requirements.

Transfer Students: Completion of the UCI Breadth Requirement

Students transferring to UCI must satisfy the UCI breadth requirement by completing either: (a) the current UCI breadth requirement, (b) one of the options listed in the Catalogue Rights section, or (c) the Intersegmental General Education Transfer Curriculum.

With the exception of students who complete the Intersegmental General Education Transfer Curriculum, transfer students should not feel that the breadth requirement must be completed prior to matriculating to UCI. The breadth requirement, which must be completed prior to graduation, may be satisfied by college-level courses appropriate to UCI offerings and may be met *at any time* during the undergraduate years, *except* in the case of the lower-division writing requirement, which must be completed within the first three quarters of residency at UCI.

BREADTH CATEGORIES

I. Writing. The lower-division writing requirement is met by taking an approved one-year sequence in English composition. Courses used to meet the lower-division writing requirement must be completed with a minimum grade of C (or a Pass or Credit grade equivalent to C). Transfer students may not count any course designed exclusively for satisfaction of the UC Entry Level Writing requirement toward the completion of the UCI lower-division writing requirement. Any student entering UCI with only one semester or one quarter of English composition through which the UC Entry Level Writing requirement is fulfilled will not have satisfied any part of the UCI writing requirement. Students enrolled at UCI may take only UCI courses in satisfaction of the lower-division and upper-division writing requirements. Continuing UCI students may not take summer courses at another institution to satisfy the lower-division or upper-division writing requirements.

II. Natural Sciences. This requirement is met by (a) taking an approved one-year sequence in *one* of the following areas: general chemistry or basic physics; or by (b) taking two semesters or three quarters of approved courses in biological sciences or physical sciences with the exception of mathematics. These courses may or may not include a laboratory.

III. Social and Behavioral Sciences. This requirement is met by taking two semesters or three quarters of approved work in any of the following areas: anthropology, economics, geography, interdisciplinary, linguistics, logic and philosophy of science, political science, psychology, sociology, or social ecology. At least one of the courses must be an introductory course. For students on the quarter system, at least two of the courses must be in the same area. (History, for the purposes of the breadth requirement, is not considered a social or behavioral science but rather an area of humanistic inquiry.)

IV. Humanistic Inquiry. This requirement is met by taking two semesters or three quarters of approved courses in *one* of the following areas: classics, history, philosophy, humanities, English literature, comparative literature, women's studies, dramatic literature, or the history of art, dance, or music. Performance courses may *not* be used in satisfaction of this requirement.

V. Mathematics and Symbolic Systems. This requirement is met by taking two semesters or three quarters of approved courses in mathematics, computer science, linguistics, or logic.

VI. Language Other Than English. This requirement is met by (a) completing the second semester or third quarter of approved college-level study in a language other than English; (b) credit for three years of high school study, or its equivalent, in a single language other than English with a C average or better in the third year; (c) a score of 3, 4, or 5 on a College Board Advanced Placement Examination in a language other than English; (d) a score of 570 or better on a SAT Subject Test in a language other than English, with the exception of the test in Modern Hebrew for which a score of 500 or better is required; NOTE: at press time these scores were subject to change due to the recent changes in the SATs; (e) completion of an approved course of study in an Education Abroad Program; or (f) the equivalent as determined by an appropriate and available means of evaluation. If an appropriate means of evaluating competence in a non-English language of instruction does not exist, satisfactory completion, with a C average or better, of one year of formal schooling at the sixth grade level or higher in an institution where the language of instruction is not English will meet the requirement. Appropriate documentation must be presented to substantiate that the course work was completed.

VII. Multicultural Studies and International/Global Issues. This requirement is met by completing one course in multicultural studies (VII-A) and two courses on international/global issues (VII-B). Courses satisfying VII-A specifically address the history, society, and/or culture of one or more minority groups in California and the United States. Courses satisfying VII-B focus on significant cultural, economic, geographical, historical, political, and/or sociological aspects of one or more foreign countries. See the breadth course list for alternate ways to satisfy VII-B.

INTERSEGMENTAL GENERAL EDUCATION TRANSFER CURRICULUM

California community college transfer students may receive credit for the UCI breadth requirement by completing the Intersegmental General Education Transfer Curriculum (IGETC) prior to transfer. The IGETC consists of a series of subject areas and types of courses which, if completed prior to transfer, will satisfy the breadth and general education requirements at any campus of the University of California. Fulfillment of the IGETC does not satisfy the UCI upper-division writing requirement. Students who do not complete the IGETC prior to transferring to UCI must fulfill the UCI breadth requirement in its entirety. In general, students are encouraged to follow the IGETC pattern to meet general education requirements unless otherwise noted by the academic unit at UCI.

Please note: (1) IGETC must be completed in total prior to enrolling at UCI; (2) students are responsible for requesting IGETC certification from their community college; and (3) the IGETC certification should be submitted to the UCI Office of Admissions and Relations with Schools no later than the end of the first quarter of UCI enrollment.

Courses used to fulfill the IGETC must be completed with a grade of C or better. (Courses may also be taken on a Pass/No Pass basis provided Pass is equal to a letter grade of C or better.)

Lists of specific approved courses which may be taken in fulfillment of the IGETC are available from California community colleges and on the World Wide Web at http://www.assist.org/.

Intersegmental General Education Transfer Curriculum

1. **Language Other Than English:** Proficiency equivalent to two years of high school study in the same language.
2. **English Communication:** One course in English Composition and a second course in Critical Thinking-English Composition.
3. **Mathematical Concepts and Quantitative Reasoning:** One course in mathematics or mathematical statistics which has a prerequisite of intermediate algebra. Courses on the application of statistics to particular disciplines are not acceptable.
4. **Arts and Humanities:** Three courses, at least one in arts and one in humanities.
5. **Social and Behavioral Sciences:** Three courses in at least two different disciplines.
6. **Physical and Biological Sciences:** One physical science and one biological science course; one must include a laboratory.

Transferability of Credit

The University is committed to serve as fully as possible the educational needs of students who transfer from other California collegiate institutions. The principles covering transferability of unit credit and course credit are explained below and, unless otherwise indicated, are much the same whether transfer is from a two-year or a four-year institution.

UNIT CREDIT FOR WORK TAKEN ELSEWHERE

The University of California grants unit credit for courses completed at other accredited colleges and universities when such courses are consistent with the functions of the University as set forth in the Master Plan for Higher Education in California. Equivalent advanced standing credit from institutions on the semester calendar may be determined at a ratio of one semester unit to one and one-half quarter units. (To graduate from UCI a minimum of 180 quarter units, equivalent to 45 UCI quarter courses, are needed.)

Community Colleges

A student may earn a maximum of 105 quarter units (70 semester units) at a community college toward a University degree. No further unit credit may be transferred from a community college, although subject, major, or breadth credit for courses taken will still be granted.

Students anticipating transfer to UCI are urged to consult with their community college counselors. The counselors, with the aid of that college's UC Transfer Course List Agreement (UCTCA), can advise students about California community college courses and units which will transfer to the University. In addition, staff in the UCI Office of Admissions and Relations with Schools can advise students about the transferability of courses. UCTCAs for all California community colleges are available on the World Wide Web at http://www.assist.org/.

Four-Year Institutions

Unit credit is granted for courses consistent with the University of California's functions and which have been completed in colleges or universities accredited by the appropriate agencies. While limitations of credit may be imposed in certain subject areas, these are consonant with the curricula for all students in the University of California. No defined maximum number of units which can be earned toward the degree is set for students transferring from four-year institutions. However, see the Residence Requirement in the UCI Requirements section.

University of California Extension

Extension courses prefixed by XB, XD, XI, XR, XSB, and XSD are granted unit credit on the same basis as courses taken in residence at any accredited collegiate institution.

Students intending to transfer Extension course credit for a degree at another college or university should verify acceptance of the course with that institution. Resident students of the University of California must obtain the consent of the dean of their school or college prior to enrolling for credit in an Extension course. Extension courses are not accepted as part of the residence requirements of the University. Grades earned in University Extension are not used in calculating the University grade point average.

Decisions regarding the acceptability of extension courses taken in institutions other than the University of California rest with the Office of Admissions and Relations with Schools. Decisions regarding the applicability of such courses toward specific degrees and majors rest with the student's academic dean.

COURSE CREDIT FOR WORK TAKEN ELSEWHERE

The policies above refer only to the unit transferability of courses and are uniformly implemented on all UC campuses. Thus, courses which are determined by the University of California to be transferable are assured only of being granted elective course credit. The application of transfer work to specific course and major requirements is determined by the student's academic dean.

The Irvine campus makes every effort to eliminate all barriers to orderly progress from California community colleges into UCI's programs. To this end, courses from many California community colleges have been reviewed by UCI faculty and approved as acceptable toward meeting lower-division major or breadth requirements. Although course equivalencies for the breadth requirement may be liberally interpreted for purposes of transfer, courses to be applied toward school and departmental major requirements must be more precisely equated with UCI courses in unit value and in content.

All California community colleges have entered into articulation agreements with UCI so that the specific application of their courses to UCI's breadth, school, and/or departmental major requirements may be readily communicated to prospective transfer students. By careful selection of courses, it is possible for students to satisfy some or all of the lower-division requirements of their intended program or school prior to transfer. It is recommended that transfer students complete as much of the lower-division breadth, school, and major requirements as possible prior to transferring to UCI. Articulation agreements are available on the World Wide Web at http://www.assist.org/.

Students are urged to consult community college counselors or the Office of Admissions and Relations with Schools for information on planning a program for transfer. Prospective transfer students with specific questions about course work in their major should contact the respective school or department at UCI.

ENROLLMENT AND OTHER PROCEDURES

Except where noted, all information applies to both undergraduate and graduate students. Additional information concerning enrollment and academic policies applying only to graduate students is given in the Research and Graduate Studies section.

Enrollment and Payment of Fees

To receive academic credit for regular courses and other supervised instruction or research, a student must be officially enrolled prior to undertaking such activities. **Registration does not become official until all required fees have been paid, and the student enrolls in classes with the Registrar. Students are responsible for ensuring that their course enrollments are correct.**

A quarterly calendar of dates for enrollment and payment of fees is available at http://www.reg.uci.edu.

The general procedures for enrollment are:

1. Consult the appropriate academic advisor to develop an approved program of study. Secure necessary authorizations for courses that require special approval.

   New undergraduate students entering in the fall should seriously consider attending one of the Student-Parent Orientation Program (SPOP) sessions during the summer for academic advising and enrollment assistance.
2. Pay careful attention to deadlines. Enroll in classes during the published registration period.
3. Pay required fees online or to the Cashier's Office on or before the published deadline. Other outstanding obligations must be satisfied at this time also.

NOTE: Late fee payment and/or late enrollment in classes may require the student to enroll in classes using the Add-Card procedure.

WEB REGISTRATION

WebReg, UCI's Web registration system, allows students to enroll in classes from anywhere in the world. Students may add and drop classes, inquire about open sections, change their grading option or units for a variable-unit class, put themselves on an official waiting list, and list their confirmed class schedule. Immediate feedback on the availability of a class and a student's eligibility to enroll is provided; schedule changes may be made during the registration period or the adjustment period. Complete information about WebReg is available on the Registrar's Web site at http://www.reg.uci.edu.

PAYMENT OF FEES AND ENROLLMENT

Registration fees are assessed quarterly and appear on ZOT Account Online (http://www.fs.uci.edu). Students who do not pay all required fees online or to the Cashier's Office during the published registration period are subject to a late service fee of $50. Students who do not enroll in classes during the published registration period are subject to a late service fee. Students enrolled in zero (0) units at the close of business at the end of the second week of classes are assessed a $50 late enrollment fee. A signature of the student's dean is required for late enrollment after the second week of classes.

The student is subject to *both* late service fees if fees are not paid online or to the Cashier's Office and the student does not enroll in classes by the registration deadlines, published in the Quarterly Calendar on the Registrar's Web site (http://www.reg.uci.edu).

To avoid the expense and inconvenience of late enrollment, students are urged to enroll and pay fees well before the published registration deadlines. Students with financial need should make advance arrangements with the Office of Financial Aid and Scholarships, or another source, to have funds available when fees are due.

Late registration (payment of fees and/or enrollment in classes) is permitted only in exceptional circumstances with the authorization of the student's dean. A student who is allowed to apply late and, as a result, must pay fees and enroll late, is required to pay late service fees. Late services charges may be waived *only* if the University is responsible for the late transaction.

CHANGE OF CLASS ENROLLMENT

After officially enrolling with the Registrar, a student may add or drop classes, change sections of a course, change units in a variable unit course, or change the grading option by obtaining the approval of the instructor and by completing an Add, Drop, or Change Card, available from the student's academic counseling office or the Registrar's Office. In the first two weeks of classes, instructors may authorize the use of WebReg for adding, dropping, and changing the grade option.

An undergraduate student may not enroll in more than 20 units or fewer than 12 units of course work during a given quarter without the permission of the student's academic dean or, for undecided/undeclared students, the Dean of the Division of Undergraduate Education. Changes to Pass/Not Pass grading must not cause the student to exceed the limitations to Pass/Not Pass enrollment.

Graduate students may not enroll in more than 16 or fewer than eight units of graduate or upper-division credit without prior approval of the departmental graduate advisor and the Dean of Graduate Studies.

Students may add classes through the sixth week of classes with the approval of the instructor in charge of the class.

To change the grading option of a class during the first two weeks of instruction, students must obtain the signature of the instructor in charge. The Change Card must then be submitted to the Registrar's Office no later than the end of the second week of instruction. Changes in the grading option from the third through the tenth week require approval of the instructor and the student's academic dean.

Students may drop classes from the first through the sixth week of a quarter, inclusive, with the signature of the instructor in charge.

After the sixth week of instruction, students may add or drop a class only with the permission of the instructor and the student's academic dean. Permission to drop after the sixth week can be granted only if the student is not failing the course and is not subject to disqualification, and only if dropping the course would be to the educational benefit of the student, of the class as a whole, or both.

A W notation will be recorded for each course dropped after the end of the sixth week of instruction. The effective date of a "drop" is the date the approved Drop Card is received in the Registrar's Office.

Students are responsible for their official enrollment and must be officially enrolled in each class they attend. They must officially drop classes they have ceased attending. The student cannot simply discontinue attendance in a class; a Drop Card must be filed before the last day of instruction for the quarter.

The Registrar's Office cannot accept Add, Drop, or Change Cards after the last day of instruction of a particular quarter.

NOTE: Instructors and deans may have earlier deadlines than those mentioned above.

Change of Major

Each school or program has its own standards for change of major, and some majors are impacted, that is, more students apply than can be accommodated. Once a student selects a major, or decides to change majors, the student should visit the academic counseling office for their prospective major to obtain current information about prerequisites, program planning, and policies and procedures. Information also is available on the Registrar's Web site under How to Change Majors. In addition, a form called the Undergraduate Petition for Change of Major must be completed. The form is available from academic counselors and the Registrar's Office.

All schools with exceptional requirements have major-change criteria approved by the Academic Senate and published on the Division of Undergraduate Education Web site at http://www.due.uci.edu/Change_of_Major.html. Students changing majors may meet the approved major-change criteria of the unit they wish to enter that are in place at the time of their change of major or those in effect up to one year before.

Reduced-Fee Part-Time Study Program

Part-time study for credit leading to an undergraduate or graduate degree is available in academic units in which there exists good educational reason, as determined by the academic unit, to allow part-time study. To take advantage of reduced fees for part-time status, quarterly course enrollment is limited to 10 units or less for undergraduate students and to eight units or less for graduate students. Students enrolled in excess units after the Friday of the third week of instruction are liable for full fees.

The same admissions standards that apply to full-time students apply to part-time students. Under University policy, academic deans (the Dean of the Division of Undergraduate Education, for undecided/undeclared students; the Dean of Graduate Studies, for graduate students) may approve Petitions for Part-Time Status *only* for reasons of occupation, family responsibilities, or health.

In addition to all other required fees, students approved for part-time status pay one-half of the Educational Fee and, if applicable, one-half of the Nonresident Tuition Fee or Professional School Student Fee. Undergraduate petitions are available from academic counselors or the Registrar's Office; graduate students may obtain further information and petitions from the Office of Research and Graduate Studies. Since there are certain restrictions on receiving undergraduate credit for part-time course work, undergraduates interested in part-time study should read, in addition to the Undergraduate Admissions section, the sections on Expenses and Fees, and Financial Aid. Graduate students should refer to the Research and Graduate Studies section.

Lapse of Status

A student's status may lapse for the following reasons:

Failure to pay required student fees by the prescribed deadline; failure to respond to official notices; failure to settle financial obligations when due or to make satisfactory arrangements with the Cashier's Office; failure to complete the physical examination; or failure to comply with admission conditions.

Each student who becomes subject to lapse of status is given advance notice and ample time to deal with the situation. However, if the student fails to respond, action will be taken without further notice. A "hold" will be placed on all of the student's records and the student will be entitled to no further services of the University except assistance toward clearing the hold. A student must satisfy the conditions which caused the lapse of status before the hold can be cleared.

Retention of Student Records

The Registrar's Office maintains a permanent record of academic work completed by each student. Support documents for the academic record are kept for one year.

Students are strongly advised to carefully check their academic record quarterly. (Student copies of the academic record are available from the Registrar's Office shortly after the close of each quarter.) Discrepancies in the academic record should be reported to the Registrar immediately. After one year, it is assumed that the student accepts the accuracy of their academic record, and supporting source documents are destroyed.

Transcript of Records

The official transcript of a student's academic record will be released only upon receipt of a signed request from the student authorizing the release. All outstanding debts to the University (with the exception of long-term financial aid loans not yet due and payable) must be paid in full before a transcript will be released.

Requests for transcripts by other than the student whose transcript is being sought can be honored only (1) if the request is accompanied by a written authorization signed by the student whose transcript is sought, and (2) upon approval of the Registrar.

Verification of Student Status

The Registrar's Office provides verifications of student status. Verifications may be needed for reference checks, bank loans, applications for good-student-driver insurance rates, and Social Security payments. There is a $6 fee for each verification, however verifications for the purpose of student loan deferments are free of charge. For verification purposes, enrollment in 12 units or more in regular sessions is considered full-time status; enrollment in 6.0–11.9 units is considered half-time status; enrollment in 5.9 units or less is considered less than half-time status. Enrollment in eight units is considered full-time status for summer session.

Cancellation/Withdrawal

Undergraduate students who pay fees for a regular academic quarter and then decide to withdraw from the University must submit a Cancellation/Withdrawal form to the Registrar's Office after obtaining the signatures of their academic dean (or the Dean of the Division of Undergraduate Education, for undecided/undeclared students). Medical students must submit the form to the Curricular Affairs Office in the School of Medicine. This form serves two purposes: (1) a refund of fees, if applicable (see Fee Refund section); and (2) automatic withdrawal from classes.

The effective date of withdrawal is used in determining the percentage of fees to be refunded. This date is normally the date that the student submits the form to the appropriate Dean for approval and is designated by that Dean.

A W notation will be recorded for each course in which enrollment is withdrawn if the student's effective date of withdrawal is after the end of the sixth week of classes. (See W notation in the Grading System section.)

A graduate student in good academic standing who wishes to withdraw and intends to return within one year should submit both the Cancellation/Withdrawal form and an application for a Leave of Absence. Further information appears in the Research and Graduate Studies section.

New undergraduate students are encouraged to seek advice from their admissions or academic counselor to understand the consequences of withdrawal and their eligibility to return.

If an undergraduate student plans to leave the University after completing all academic work for the latest quarter of enrollment and has not paid fees for the next quarter, a formal notice of withdrawal is not necessary.

Readmission: Undergraduate Students

Students are strongly urged to consider the readmission policy in formulating plans for leaving or returning to UCI. Every effort will be made to readmit UCI students who were in good academic standing at the time they ceased attending and who have filed readmission applications by the deadline. Former UCI students who wish to be readmitted should contact the undergraduate counseling office of the school or program which offers their intended major.

Readmission is subject to dean's approval and campus deadlines (August 1 for fall quarter, November 1 for winter quarter, and February 1 for spring quarter). To apply for readmission, a student must first pay a nonrefundable $55 Application Fee ($65 for international students) at the Cashier's Office, and then file the Application for Readmission with the Registrar's Office. Remittance of this fee may be made by bank draft or money order made payable to Regents-UC.

New undergraduate students who cancel registration prior to the first day of the quarter must reapply to UCI; they are not eligible to file for readmission as described above.

If a student has been academically disqualified from the University or has left the University while on probation or subject to disqualification, the student must apply for readmission. The application, however, is subject to the approval of the dean of the school which the student hopes to enter.

Transcripts for work taken at other institutions must be submitted as part of the application.

Readmission: Graduate Students

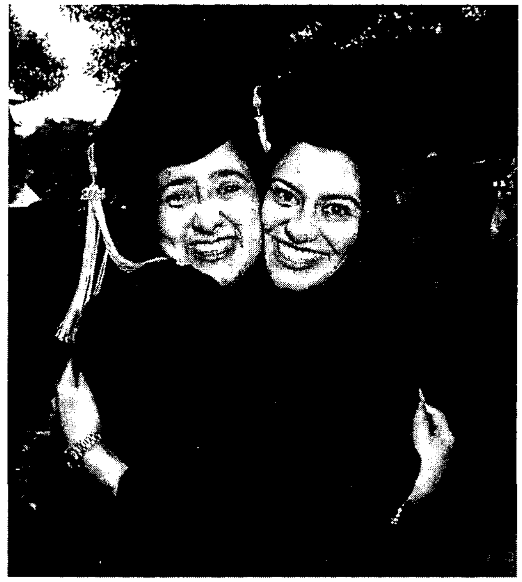
A graduate student who withdraws and has not been granted a leave of absence approved by the Dean of Graduate Studies can resume graduate study only if readmitted. The *Application for Graduate Study* must be submitted by the published deadline for graduate admission applications. Please refer to the statement on readmission which appears in the Research and Graduate Studies section for additional information.

Enrollment at Other Institutions

Various programs exist that enable currently registered UCI students in good standing to take courses at other UC campuses, as well as at California State University and California Community College campuses. More information is available from the Registrar's Office and from the academic counseling offices.

California Residence

Detailed information about California residence is available in the *Catalogue's* Expenses and Fees section. All inquiries with regard to the requirements for the establishment of California residence (including exceptions pertaining to minors, aliens, and dependents of military personnel stationed in California) should be directed to the University of California, Irvine, Residence Deputy, Registrar's Office, 215 Administration Building, Irvine, CA 92697-4975, telephone (949) 824-6129.



Commencement

UCI Commencement ceremonies are held each June for all students who graduate any quarter of that academic year. Commencement protocol information is mailed to all prospective graduates in the spring and also is available from academic counselors. Additional information is available from the Commencement Office; telephone (949) 824-6378; World Wide Web: http://www.commencement.uci.edu/.

Application for Graduation. In order to receive a degree, an undergraduate student must submit an online Application for Graduation via the StudentAccess link at http://www.reg.uci.edu no later than the published deadline. Specific deadline dates for filing the application are established quarterly so that candidates' academic records can be reviewed to verify that all graduation requirements have been met. Students should contact their academic counseling office for deadline and degree audit information.

Diplomas. Students are advised by mail when their diplomas are available, which is three to four months after the quarter in which the student graduated. Please note that summer and fall quarter graduates awarded academic honors (*summa cum laude, magna cum laude,* or *cum laude*) at the end of the academic year are notified by the Registrar's Office to return their previously issued diplomas. New diplomas reflecting the academic honor will be issued and will be available three or four months after the end of spring quarter. Students may then pick up their diplomas at the Registrar's Office or authorize the Registrar to send their diplomas by certified mail, or registered air mail to locations outside the United States. All outstanding debts due to the University, with the exception of long-term financial aid loans, must be paid in full before a student's diploma will be released.

ACADEMIC REGULATIONS AND PROCEDURES

Except where noted, all information applies to both undergraduate and graduate students. Additional information concerning academic regulations applying only to graduate students is given in the Research and Graduate Studies section.

Student Academic Records

The Registrar's Office maintains a permanent record of academic work completed by each student. Support documents for the academic record are kept for one year.

Each student is responsible for carefully examining their enrollment and academic records and may do so throughout the academic year. Students must promptly notify the Registrar's Office if they find a discrepancy in their records.

Student academic records may not be changed after one year or, in some cases, in less than one year if Academic Senate regulations specify a shorter time limit. For example, the notation "NR," which means that no grade has been reported, must be removed within one quarter of subsequent enrollment or it will automatically be converted to the grade "F" or "NP" (under Senate Regulation IR 345).

After a student's degree has been certified by the student's dean, the academic record may not be altered except in those cases where a procedural or clerical error on the part of an instructor has occurred.

GRADING SYSTEM

A — Excellent (4.0 grade points per unit)

B — Good (3.0 grade points per unit)

C — Average (2.0 grade points per unit)

D — Lowest passing grade (1.0 grade point per unit)

F — Not passing (no grade points)

I — Incomplete

P — Pass (equal to grade C or better)

NP— Not Pass (equal to grade C- or below)

S — Satisfactory (equal to grade B or better; graduate students only in courses designated by the Graduate Council)

U — Unsatisfactory (graduate students only in courses so designated by the Graduate Council)

IP — In Progress (restricted to certain sequential courses, so designated by the Subcommittee on Courses or Graduate Council, for which the final quarter grade of a multiquarter course is assigned to the previous quarter(s) of the sequence).

NR— No Report (given when an instructor does not submit final grades for a class or individual grades for students whose names appear on the official class roster; NR becomes an F or NP after one quarter of subsequent enrollment or at the end of the quarter immediately preceding award of the degree, whichever comes first. The instructor may replace an NR with a grade within one quarter of subsequent enrollment or may authorize the student to drop the class, which would result in the NR becoming a W).

UR— Unauthorized Repeat. A UR notation is recorded for the grade when a student already has a passing grade for a nonrepeatable course and has taken it again.

W — Withdrew. A W notation is recorded on a student's permanent record for each course a student drops after the end of the sixth week of instruction in a quarter. Courses in which a W has been entered on a student's record will be disregarded in determining the student's grade point average and will not be considered as courses attempted in assessing the student's satisfaction of the normal progress requirement.

Plus and minus suffixes may be attached to the grades A, B, C, and D.

GRADE POINTS AND GRADE POINT AVERAGE

Grade points are assigned on a four point basis: A, 4 points per unit; B, 3 points per unit; C, 2 points per unit; D, 1 point per unit; F and I, zero points. Plus or minus suffixes modify the above by plus or minus 0.3 grade point per unit, with the exception of the A+ grade which is assigned 4 points per unit.

Requirements for a bachelor's degree include the accumulation of baccalaureate credit for a minimum of 180 quarter units with an average of at least C (grade point average of at least 2.0). A course at UCI normally offers four quarter units of credit, and, in the following text, the term "course" may be understood to carry four units. The grade point average is the sum of all accumulated grade points (grade points earned in a course taken for a letter grade times the unit value of the course) divided by the sum of all units attempted. P, NP, S, U, NR, IP, and I grades, as well as workload credit, are excluded in computing grade point average.

Baccalaureate credit counts toward degree requirements and is used to compute the grade point average. Workload credit is used to determine full-time status for financial aid, housing, student loans, and other purposes. For most courses at UCI, baccalaureate credit and workload credit are identical. Courses differing in this credit or "workload credit only" courses are identified in the course description.

It should be noted that final grades as reported by professors are normally permanent and final. A professor may not change a final grade except to correct a clerical or procedural error. Clerical or procedural errors should be corrected within one regular academic quarter after the grade is assigned. No grade may be revised by reexamination or, with the exception of I and IP grades, by completing additional work. If a student is dissatisfied with a grade, the student should review their work with the instructor and receive an explanation of the grade assigned. A grade may be appealed on any reasonable grounds to the instructor, the chair of the department, and the dean of the school. If the matter is not resolved, the student may go for counsel to the Office of the University Ombudsman. Under circumstances explained in the Academic Grievance Procedures *(Manual of the Irvine Division of the Academic Senate, Appendix II)*, a grade may be changed if the Academic Grievance Panel has determined that the grade was assigned on the basis of discrimination.

INCOMPLETE GRADES

An I or Incomplete grade is assigned to a student by an instructor when the student's work is of passing quality but is incomplete because of circumstances beyond the student's control, and when the student has been temporarily excused by the instructor from completing the quarter's work.

For currently enrolled students, the maximum time limit for making up an I grade is three quarters of enrollment. After this time the I grade can no longer be replaced and will appear permanently on the record. *The instructor is not obligated to allow the maximum three-quarter period.* The student should consult the instructor to determine how the Incomplete may be made up. It is strongly recommended that the student and the instructor prepare a written agreement specifying how the Incomplete can be made up and the deadline for doing so. Once the work is completed within the time agreed upon by the instructor, the student should ask the instructor to submit a change of grade form to the counseling office of the school in which the course was offered. The student should *not* reenroll in the course to make up the Incomplete.

Students not currently enrolled at UCI have a maximum of one calendar year in which to replace an Incomplete grade. However, in exceptional individual cases involving the student's prolonged inability to pursue a course of study, extensions of up to two additional years may be granted by the instructor with the approval of the dean of the unit offering the course; students must petition for such an extension within one calendar year following the assignment of the Incomplete grade.

Courses graded I carry no grade points and are not included in computation of the grade point average which appears on the student's permanent record. Any I grade will remain permanently on the record unless the work is completed and a grade assigned as described above.

University of California regulations require a grade point average of 2.0 for all units *attempted* in order to receive a bachelor's degree. *Only when a check for satisfaction of graduation requirements is made are I's treated as F's.* If the student's overall average is at least a 2.0, including the Incomplete grades computed as F's, then the student may graduate. If the Incomplete grades computed as F's decrease the student's average below a 2.0, the student may not graduate until enough I grades have been made up to bring the average up to a 2.0 and this must be done within the time limits specified above.

PASS/NOT PASS

The Pass/Not Pass option is available to encourage students to enroll in courses outside their major field. Courses graded Pass or Not Pass are not included in computation of the grade point average which appears on a student's permanent record. However, if a student receives a Pass in a class, course and unit credit for the class is received, except as provided below. If a Not Pass is received, the student receives no credit for the class.

Some courses are designated by academic units as Pass/Not Pass Only. Students do not have the option of taking these courses for a letter grade.

The use of Pass/Not Pass is governed by all of the following provisions:

1. A student in good standing may take up to an average of four units per quarter on a Pass/Not Pass basis.
2. In addition, students may count a total of 12 units of courses designated Pass/Not Pass Only toward their graduation requirements.
3. A student who earns a grade of C (2.0) or better will have a Pass/Not Pass grade recorded as Pass. If the student earns a grade of C- or below, the grade will be recorded as a Not Pass, and no unit credit will be received for the course. In both cases, the student's grade will not be computed into the grade point average.
4. Courses taken under the Pass/Not Pass option may count toward the unit requirement for the bachelor's degree and toward the breadth requirement. With the exception of courses designated Pass/Not Pass Only, courses taken Pass/Not Pass may not be used to satisfy specific course requirements of the student's school and major, unless authorized by the appropriate dean. No more than two courses applied to a minor may be taken Pass/Not Pass.

   Graduate students may take one course (up to four units) per quarter on a Pass/Not Pass basis. However, such courses are not considered part of the student's graduate program, may not be applied to the requirements for an advanced degree, and do not count toward the minimum number of units for which a graduate student must enroll.
5. Changes to or from the Pass/Not Pass option can be made during the enrollment period. No changes can be made after the first two weeks of classes without the approval of the dean of the student's school. No changes in the Pass/Not Pass option can be made after the last day of instruction of the quarter.
6. A student on academic probation may not enroll in a course with the Pass/Not Pass option unless the course is offered on that basis only.

SATISFACTORY/UNSATISFACTORY GRADES (GRADUATE STUDENTS ONLY)

Satisfactory/Unsatisfactory grading, unlike Pass/Not Pass, is not a student option. With the consent of the academic units involved, and upon approval of the Graduate Council, individual study and research or other individual graduate work undertaken by a graduate student may be evaluated by means of the grades S or U. Also, with the approval of the Graduate Council, certain graduate courses are graded S/U Only. Additionally, the grade S or U may be assigned provisionally in each but the last quarter of a graduate course extending over more than one quarter. Upon completion of the last quarter, letter grades (A to F) replace such provisional grades. When a grade of S or U has been assigned on a provisional basis and the student does not complete all quarters of the course sequence, the instructor may assign a final letter grade or the grade of I to replace the S or U, or let the grade of S or U stand as a final grade. The grade S is defined as equivalent to a grade of B (3.0) or better. No credit will be allowed for work graded Unsatisfactory.

GRADES IN PROGRESS

IP is a transcript notation, restricted to sequential courses which extend over two or more quarters, indicating that the final grade for the individual quarters will not be assigned until the last quarter of the sequence is completed. The grade for the final quarter is then assigned for all of the previous quarters of the sequence. No credit is given until the student has completed the entire sequence. IP notations may be given only for courses designated by the Academic Senate Subcommittee on Courses or Graduate Council for use of this notation. IP notations are not included in computations of the student's grade point average and do not contribute to the number of quarter units completed.

GRADES NOT REPORTED

A No Report (NR) is assigned when the student's name was on the official class roster but the instructor did not submit a final grade. A student who receives an NR must immediately contact the instructor and arrange for the removal or replacement of the NR. An NR becomes an F or NP after one quarter of subsequent enrollment or at the end of the quarter immediately preceding award of the degree, whichever comes first. NR transcript notations are not included in computations of the grade point average and do not contribute to the number of quarter units completed.

REPETITION OF COURSES

Repetition of courses not authorized by the Subcommittee on Courses to be taken more than once for credit is subject to the following provisions. Undergraduates may repeat courses only when grades of C-, D+, D, D-, F, or NP were received. (A C- earned before fall quarter, 1984, is not repeatable.) Unit credit for courses so repeated will be given only once, but the grade assigned at each enrollment shall be permanently recorded. In computing the grade point average of an undergraduate with repeated courses in which a C-, D+, D, D-, F, or NP (if repeated for a letter grade) was received, only the most recently received grades and grade points shall be used for the first 16 units repeated. In case of further repetitions, the grade point average shall be based on all additional grades assigned. Repetition of a course more than once requires approval

in all instances of the School (or equivalent) in which the student is enrolled.

All courses which were originally taken for a letter grade must be repeated for a letter grade. Courses originally taken on a Pass/Not Pass basis may be repeated for a Pass/Not Pass or for a letter grade if the course is so offered.

A graduate student may repeat only once a course in which a grade below B or a grade of U was received. Only the most recently earned grade shall be used in computing the student's grade point average for the first eight units of repeated work; thereafter both the earlier and the later grades will be used.

If a student repeats a course for which a passing grade has already been received and the course is not approved as repeatable for credit, the student will receive a UR and no credit will be given.

Information regarding the repetition of foreign language courses is available in the School of Humanities section.

SATISFACTION OF THE WRITING REQUIREMENT

Students enrolled at UCI may take only UCI courses in satisfaction of the lower-division and upper-division writing requirements. Continuing UCI students may not take summer courses at another institution to satisfy lower-division or upper-division writing requirements. The two courses taken to fulfill the lower-division writing requirement must be completed with a grade of C or better (or a Pass or Credit grade equivalent to C).

1. Students who fail to attain a letter grade of C or better in English WR 37 must repeat the course or enroll in the equivalent. It is recommended that these students enroll in WR 39A followed by WR 39B-C to assure completion of this requirement. Students who fail to attain a grade of C or better in WR 39C must repeat the course.
2. Students who fail to attain a grade of C or better in one or both courses of the English WR 39B-C sequence must repeat the course or courses in question.
3. Students who fail to attain a grade of C or better in at least two quarters of the writing component of the Humanities Core Course after satisfying the UC Entry Level Writing requirement by attaining a grade of C or better in Humanities 1A S/A, should substitute English WR 39C if they need one quarter of additional work to complete the requirement, or English WR 39B-C if they need two quarters to complete the requirement. Students who fail to attain a grade of C or better in Humanities 1A S/A, enroll in Humanities 1B S/A and attain a grade of C or better, but fail to attain a grade of C or better in the writing component of Humanities 1C, should substitute English WR 39C to complete the requirement.
4. Students who fail to attain a grade of C or better in either Humanities 1A S/A or Humanities 1B S/A, should substitute English WR 39A-B-C to complete the requirement.

The course taken to fulfill the upper-division writing requirement must be completed with a grade of C or better (or a Pass or Credit grade equivalent to C). See the UCI Requirements section for further information.

Students who have not completed the lower-division writing requirement before the beginning of their seventh quarter at UCI will be subject to probation. Students transferring to UCI normally should have satisfied the lower-division writing requirement before entering UCI; if, however, they have not, they must complete it within their first three quarters of enrollment or they will be subject to probation. Academic English/English as a Second Language students must complete the lower-division writing requirement before the beginning of the seventh quarter following the completion of their AE/ESL courses or they will be subject to probation.

Credit by Examination

An enrolled student may obtain credit for course material previously mastered by taking a special examination administered by a faculty member who normally teaches that course. Detailed procedures for obtaining credit by examination may be obtained from the counseling office of the school which offers the course. Approval of any petition for credit by examination must be obtained from the dean or designee of that school *before* the examination can be administered. After the dean has signed the petition, the student must have it validated by paying a $5 Credit by Examination Fee at the Cashier's Office.

The instructor giving the examination retains the prerogative (1) to decide whether the course can be taken by examination, (2) to determine the form such an examination may take, and (3) to stipulate whether the grade will be reported as Pass/Not Pass or as a letter grade (e.g., A, B, C, etc.).

A student may take the examination for a particular course only one time. After receiving the grade, the student may accept it or reject it. If the student is not satisfied with the grade received on the examination, the student may choose not to receive credit or a grade. If the student does choose to accept the results of the examination, grades and grade points (if applicable) will be entered on the record in the same manner as those for regular courses of instruction.

Independent Study: Undergraduates Only

A unique class option is available primarily to upper-division students at UCI. The independent-study option allows the student to plan with the instructor a course having a clear relationship to the student's academic program. The plan for the course will include a reading list, a group of assignments, examinations, papers, or similar evidence of intellectual achievement on which academic credit will be based. A description of the course and of its requirements must be approved by the instructor responsible for it and by the department chair or dean. Independent-study credit for undergraduates is limited to five units per quarter.

Final Examinations

Final examinations, or their equivalent, are obligatory in all undergraduate courses except laboratory and studio courses, as individually determined by the Subcommittee on Courses. Normally each such examination shall be conducted in writing and must be completed by all participants by the time scheduled by the Registrar for the quarter in question. These examinations may not exceed three hours duration. Special arrangements may be made for disabled students.

Examinations normally are not required in laboratory and studio courses. At its option, the department concerned may require a final examination subject to prior announcement in the *WebSOC, Searchable Schedule of Classes* for the term.

Final grades from professors are due in the Registrar's Office within 72 hours after the final examination.

Student Copies of Quarterly Grades

After each quarter, a complimentary copy of the student's permanent record is available from the Registrar's Office. On the copy, the student will find grades for all the quarters taken at UCI, a computation of grade point average at the University of California, and a list of the University requirements completed (UC Entry Level Writing, American History and Institutions).

Declaration of Major

All students are required to declare a major by the time they reach junior status (90 units excluding college work completed prior to high school graduation) or they will become subject to disqualification from further registration in the University.

Undergraduate Scholarship Requirements

Requirements for a bachelor's degree include the accumulation of credit for a minimum of 180 quarter units with an average of at least C (grade point average of at least 2.0).

CLASS LEVEL

Undergraduate students are classified as freshman, sophomore, junior, or senior students, based on the total number of units completed, as follows:

Freshman	0	—	44.9
Sophomore	45.0	—	89.9
Junior	90.0	—	134.9
Senior	135 +		

COURSE LOAD LIMITS

An undergraduate may enroll in as few as 12 units or as many as 20 units. To enroll for more than 20 units or fewer than 12 units, students must obtain the authorization of their dean or, for undecided/undeclared students, the Dean of the Division of Undergraduate Education. Refer to the Reduced-Fee Part-Time Study Program section.

ACADEMIC STANDING

To remain in good academic standing a student must maintain a grade point average of at least 2.0 and make progress toward the degree at a satisfactory rate.

An undergraduate student normally is subject to academic probation if at the end of any quarter the grade point average for that quarter, or the cumulative grade point average, is less than 2.0.

A student whose grade point average falls below a 1.5 for any quarter, or who after two consecutive quarters on probation has not achieved a cumulative grade point average of 2.0 or a satisfactory rate of progress, is subject to disqualification.

NORMAL PROGRESS REQUIREMENT

Regular undergraduate students will become subject to probation or to disqualification from further registration in the University if they fail to make normal progress toward the baccalaureate degree, if they fail to declare a major by the time they reach junior status (90 units excluding college work completed prior to high school graduation), or after declaring a major, if they fail to follow the program of study required by the academic unit of their major. Students who have selected undeclared status within a school may be subject to probation or to disqualification if they fail to follow a program of study leading to completion of lower-division school requirements.

A. Normal progress for all regular undergraduate students is defined in the following table, in terms of quarter units completed at the end of quarters enrolled.

Quarter	Normal Progress	Subject to Probation	Subject to Disqualification
1	12–15	8–11	7
2	26–30	18–25	17
3	41–45	27–40	26
4	56–60	41–55	40
5	71–75	56–70	55
6	86–90	72–85	71
7	101–105	88–100	87
8	116–120	105–115	104
9	132–135	124–131	123
10	148–150	141–147	140
11	164–165	159–163	158
12	180	—	—

NOTE: This table is effective fall 2005. Students who began college prior to fall 2005 should consult their academic counselor.

B. Status Determination:

1. Undeclared students who have completed the number of units specified in the given quarter of their enrollment, as shown in the table above, and are following a course of study prescribed by their school are making "Normal Progress."
2. Students who have declared a major must follow the program of study required for their major, as well as complete the units specified in the given quarter of their enrollment, as shown in the table above, in order to make "Normal Progress." Students must declare a major by the time they reach junior status (90 units excluding college work completed prior to high school graduation).
3. Students who fail to make Normal Progress as defined in (1) or (2) above are subject to being placed on probation by the faculty of their academic unit or its designated agent, or for first-year undecided/undeclared students, by the Faculty Board for Undecided/Undeclared Students or its designated agent.

C. Students who have completed two consecutive quarters on academic probation without having achieved at the end of that period at least the normal rate of progress specified under (A) and (B) above are subject to disqualification.

D. For purposes of calculating "Normal Progress," "Subject to Probation," and "Subject to Disqualification," students admitted to the University with advanced standing will be classified with respect to quarter of enrollment at entrance in accordance with the following table:

Quarter at Entrance	Advanced Standing Quarter Units at Entrance
1	0–14
2	15–29
3	30–44
4	45–59
5	60–74
6	75–89
7	90–104
8	105–119
9	120–134
10	135–149

E. Units earned under the following two circumstances are not to be counted toward determination of the quarter at entrance under (D) above: (1) Advanced Placement Examination; (2) concurrent enrollment in college courses while in high school.

F. The quarter of enrollment at entrance of students (including baccalaureate degree candidates who already hold a baccalaureate degree) seeking admission to the University with 150 or more advanced standing units will be determined by the faculty offering the curriculum in which such students seek to enroll. This determination will be made consistent with the program required for such students to obtain the desired degree and with University residence requirements.

G. For purposes of this regulation students will be understood to have declared a major when they have been formally accepted by the faculty of a degree-granting program or its designated agent to pursue a defined course of study leading to a baccalaureate degree.

H. All undergraduate students are expected to graduate when they have completed the baccalaureate requirements of their declared major or majors.

The Normal Progress requirement described above is not to be confused with the Normal Academic Progress requirement for Financial Aid. The former has to do with academic standing, the latter with receipt of financial aid.

Probation is not a necessary step before disqualification. If a student becomes subject to disqualification, the complete record of grades and other accomplishments will be carefully reviewed by the responsible faculty authorities of the student's school or, for undecided/undeclared students, by a faculty authority designated by the Faculty Board for Undecided/Undeclared Students. If the record indicates little probability that the student will be able to meet the academic standards of the University of California, the student will be disqualified from further enrollment. Faculties of undergraduate-degree-granting units and the Faculty Board for Undecided/Undeclared Students are obliged by Academic Senate regulations to maintain a procedure under which a student may contest disqualification actions.

In order to transfer from one campus to another in the University of California or from one UCI school to another, a student who has been disqualified or who is on academic probation must obtain the approval of the appropriate faculty, or its designated agent, into whose jurisdiction the student seeks to transfer.

HONORS

Information about honors opportunities at UCI is found in the Division of Undergraduate Education section and the academic unit sections.

Quarterly Undergraduate Honors

Quarterly undergraduate honors are awarded in each school to students who achieve a quarterly grade point average of 3.5 or better in a minimum of 12 graded units.

Honors at Graduation

Of the graduating seniors, no more than 12 percent will receive academic honors: approximately 1 percent *summa cum laude,* 3 percent *magna cum laude,* and 8 percent *cum laude.* The criteria used by each school in selecting candidates for these honors are included in each school's section of the *Catalogue.* A general criterion is that students must have completed at least 72 units in residence at a University of California campus by the end of the winter quarter of the academic year in which they graduate. Additional information is available in the Division of Undergraduate Education section of this *Catalogue.*

Graduate Scholarship Requirements

For a graduate student, only the grades A+, A, A-, B+, B, and S represent satisfactory scholarship. Information concerning graduate student course load requirements and satisfactory academic progress is given in the Research and Graduate Studies section.

Enrollment in UC Irvine Extension

If a UCI student wishes to enroll in a UC Irvine Extension course concurrently with enrollment in regular courses, the entire program of study must be approved in advance by the dean of the student's school (the Dean of the Division of Undergraduate Education, for undecided/undeclared students; the Dean of Graduate Studies, for graduate students). Fee information is available from the UC Irvine Extension Registration Office.

Credits From Other Institutions or University Extension: Undergraduate Students

UCI undergraduate students who plan to enroll in courses at another institution or University Extension in either a summer or regular session and to use such courses to satisfy any UCI requirements should first consult with and secure prior approval from the academic dean or chair of their major who will determine if the credits are applicable to major and breadth requirements.

UCI undergraduate students *must* submit an official transcript of all course work earned at another institution or college to the Office of Admissions and Relations with Schools. If such courses are determined by the Office of Admissions and Relations with Schools to be transferable, do not duplicate other credit granted, and do not exceed limitations of credit, then the units earned may be applied toward the total required for graduation.

Credits From Other Institutions or University Extension: Graduate Students

In accordance with UC Academic Senate policy, graduate students may be granted unit credit (not grade credit) toward a master's degree for a limited number of acceptable graduate-level courses completed at another institution or through University Extension before enrollment in graduate study at UCI. To receive such credit, the student must submit a formal petition, including an original transcript, after enrollment in graduate study. Approval of the student's graduate advisor and the Dean of Graduate Studies is required. The petition may be downloaded from http://www.rgs.uci.edu/grad/students/forms.htm.

While enrolled at UCI or on a leave of absence, a graduate student may receive unit credit for graduate-level courses completed at another institution or through UCI Extension only with the prior approval of the student's graduate advisor and the Dean of Graduate Studies.

See the Research and Graduate Studies section for further information about graduate transfer credit and the University's Intercampus Exchange Program.

SUPPLEMENTARY EDUCATIONAL PROGRAMS

Summer Session and UC Irvine Extension

Gary W. Matkin, **Dean of Continuing Education**

SUMMER SESSION

Several summer sessions are held on the Irvine campus. The summer 2006 schedule is: Session I, June 26–August 3; Session II, August 7–September 13; overlapping 10-week session, June 26–September 1. Those who enroll in these sessions and take an academic program equivalent to a regular quarter may accelerate their progress toward a degree.

Courses offered include a wide variety from the regular session, supplemented by experimental offerings available only during the summer, including courses offered online. Admission is open to all university students, high school graduates, community members, and qualified high school students who have completed their junior year. Admission to Summer Session does not constitute admission to a regular session of the University; therefore, official transcripts of educational records are not required.

In addition to the regular curriculum, Summer Session also coordinates summer travel-study programs providing students with a sampling of collegiate life abroad. At Pembroke College in Cambridge, England, a diverse number of course topics reflective of English culture are offered; in Scotland, Scottish history and culture; in Paris and Switzerland, international business; in Chile, biological sciences; and in Spain, arts and humanities.

Information is available from the Summer Session Office in the UC Irvine Extension Building; telephone (949) 824-5493. Application forms and course listings are available in March.

UC IRVINE EXTENSION

UC Irvine Extension serves the continuing education needs of the community by providing more than 2,000 credit and noncredit courses, certificate programs, specialized studies, seminars, workshops, conferences, and lecture programs annually. Call (949) 824-5414 for a free quarterly catalogue.

Individual courses promote career advancement and lifelong learning, while certificate programs offer the opportunity for a distinctive achievement in a wide range of fields. Certificate programs are a sequence of courses designed to develop in-depth expertise to improve career opportunities. Extension offers more than 40 certificate programs in fields as diverse as information technologies, engineering, management and leadership, appraisal studies of fine and decorative arts, education, medical product development, finance and investor relations, and paralegal programs.

To meet the specialized, in-house training needs of business and government, UC Irvine Extension develops custom education and training programs. Free evaluations of training needs are available from the director of corporate contract training and professional development programs at (949) 824-1639.

In addition, Extension offers a wide variety of cultural enrichment programs in such areas as art and cultural appreciation, literature, creative writing, personal wellness, foreign language, film, screenwriting, and photography.

Most courses are held in the evenings and on weekends to accommodate the working professional. They are conducted at UCI, at the UCI Learning Center in Orange, and at other sites throughout Orange County.

The general public also has an opportunity to take regular UCI courses without formal admission to the University, through Extension's ACCESS UCI Program (also know as concurrent enrollment). Courses are available on a space-available basis with the approval of the course instructor or academic department. Call (949) 824-5414 for more information.

Several unique programs complement UC Irvine Extension. The Women's Opportunities Center (WOC) provides resources and support for individuals who are in need of career and life-planning programs and services; telephone (949) 824-7128. The Osher Lifelong Learning Institute offers a wide variety of educational and cultural programs for the retired or semi-retired intellectually active adult, all for one annual membership fee. Institute members are also eligible for a 30 percent discount on most Extension courses on a space-available basis. For more information, call (949) 824-7927.

UC Irvine Extension English and Certificate Programs for Internationals (ECPI)

UC Irvine Extension's program in English as a Second Language (ESL) prepares international students to pursue their educational objectives in U.S. colleges and universities, as well as provides opportunities for professional development through certificate programs. An intensive English program offers core courses in grammar, writing, reading and vocabulary development. Other topics include seminar reporting, discussion strategies, listening, note-taking, debate and public speaking, and writing research papers. Elective courses such as TOEFL test preparation, business English, and conversational English are also available.

Professional certificate programs for international students and professionals are offered in an accelerated full-time format. The fast-paced educational format helps individuals become more fluent and effective in their English communication skills, increasing their career potential in today's competitive global business environment.

Requests for information should be addressed to the English and Certificate Programs for Internationals, UC Irvine Extension, P.O. Box 6050, Irvine, CA 92616-6050; telephone (949) 824-5991.

An Academic English/ESL program is offered by the School of Humanities to students who have been admitted to UCI. Refer to the section on Admission of International Students in this *Catalogue* for information.

ROTC

Although actual ROTC courses are not taught on the UCI campus, a cross-town agreement allows qualified UCI students to participate in the Air Force Reserve Officers Training Corps (AFROTC) or the Army Reserve Officer Training Corps (Army ROTC). Academic units earned in these programs are counted as elective units toward fulfillment of UCI graduation requirements. Additional information is available from the Office of Admissions and Relations with Schools, 204 Administration Building.

AIR FORCE ROTC

Through arrangements with the University of California, Los Angeles, Loyola Marymount University, and the University of Southern California, two- through four-year AFROTC programs are available to all qualified UCI students. Successful completion of as little as four semesters of AFROTC academic courses and leadership laboratories can lead to a commission as a second lieutenant in the Air Force.

AFROTC offers a variety of two-, three-, and four-year scholarships, many of which pay the full cost of educational instruction and fees.

Four-year scholarships for incoming students must be applied for before December 1 in the year prior to entering college. Scholarships provide tuition and fee payments and a tax-free stipend of at least $250 per month. More information is available from the Department of Aerospace Studies, University of California, Los Angeles; telephone (310) 825-1742; e-mail: afrotc@ucla.edu; World Wide Web: http://www.sscnet.ucla.edu/afrotc/. Other detachments are located at Loyola Marymount University; telephone (310) 338-2770; e-mail: det040@LMU.edu; World Wide Web: http://www.lmu.edu/afrotc; and the University of Southern California, telephone (213) 740-1867; e-mail: nancykc@usc.edu; World Wide Web: http://usc.edu/dept/afrotc.

ARMY ROTC

Through arrangements with the Department of Military Science at the University of Southern California's program at California State University, Long Beach, or The Claremont Colleges Extension Office at California State University, Fullerton, two- and four-year Army ROTC programs are available to all qualified UCI students. Successful completion of the program leads to a commission as a Second Lieutenant in the U.S. Army (Active, Reserve, or National Guard). Two-, three-, and four-year competitive scholarships which provide tuition and fee payments at UCI, payment for books, and a stipend of at $300–400 per month are available. Qualified students currently serving in any Reserve or National Guard unit may transfer to the Army ROTC program to complete their commissioning requirements. More information is available from the Department of Military Science, California State University, Long Beach; telephone (562) 985-5766 or 985-8108; e-mail: jbarclay@usc.edu; World Wide Web: http://www.trojanrotc.org.

MAJOR CAMPUS PUBLICATIONS

In addition to the *UCI General Catalogue,* various publications available on campus provide information about academic programs, student activities and services, enrollment in classes, and specifics pertaining to the individual departments and schools. Some of these publications are described here. A variety of information about UCI is also available on the World Wide Web at http://www.uci.edu/.

Schedule of Classes and Registration Information

The *Searchable Schedule of Classes,* also known as the *WebSOC,* contains current class offerings including time, room, instructor, capacity, number enrolled and on the waitlist, Web links, status (open, waitlist, full), and more. Access the *Schedule* on the Registrar's Web site at http://www.reg.uci.edu.

The Registrar's Web site also includes registration and related information such as quarterly calendars, final examination schedules, and the Academic Honesty policy. Because the *Schedule* is published quarterly, it and the Registrar's Web site are timely sources of information on new or changed policies, procedures, and fees that could not be included in the *Catalogue* because of the latter's annual publication schedule. The *WebSOC, Searchable Schedule of Classes* is available just prior to the beginning of each quarter's registration period (four weeks before the end of each quarter).

School and Departmental Announcements

Publications by schools and departments contain a wide assortment of academic information of immediate, timely interest to students. These publications can be obtained from the academic unit offices.

University of California Policies Applying to Campus Activities, Organizations, and Students

This booklet contains policies and procedures which govern aspects of student conduct and discipline; campus organizations; the use of University facilities; and time, place, and manner of public expression for which the University is required to implement campus regulations. The booklet is available in the Office of the Dean of Students and on the World Wide Web at http://www.dos.uci.edu/judicial/uci_policy.html.

UCI Student Handbook

The *UCI Student Handbook* is available on the World Wide Web at http://www.newstudents.uci.edu/. A handy resource guide to UCI, it contains a broad spectrum of information for students, ranging from how to obtain a leave of absence to jobs to suggestions for amusement or involvement.

Student-Produced Media

UCI students publish the weekly campus newspaper entitled the *New University;* operate a radio station, KUCI (88.9 FM); and produce *Anthology,* the UCI yearbook.

Today@UCI

Today@UCI (http://www.today.uci.edu) is UCI's online daily news and information portal featuring the latest campus news; a comprehensive calendar of events; profiles of faculty, staff, students, and alumni; and a variety of resources and links for the campus community.

uci.edu Magazine

Published three times yearly, *uci.edu* features stories, news, and photography representing UCI's teaching, research, and public service activities, along with links to information on the Communications Office Web site (http://www.today.uci.edu).

uci.news

A monthly newspaper, *uci.news* features information on campus research, programs, and people, plus a calendar of upcoming events.

uci.brief

A weekly electronic newsletter for faculty and staff, *uci.brief* features news, announcements, involvement opportunities, work/life and events information, and UCI sports updates.

Chancellor's Web Site

The Chancellor's Web site (http://www.chancellor.uci.edu) features biographical information, downloadable photos, information about current campus initiatives, and other broad items of internal and external interest.

LIFE ON CAMPUS

UCI Bookstore

The **UCI Bookstore**, located in the UCI Student Center, stocks all required and recommended course books for classes taught at UCI. In addition, the Bookstore features an extensive selection of general and technical books, medical books, periodicals, computers, software, school supplies, UCI clothing and insignia items, and gifts and greeting cards. Hours of operation are 8 a.m. to 7 p.m., Monday through Thursday, 8 a.m. to 5 p.m. on Friday, and 10 a.m. to 4 p.m. on Saturday; telephone (949) 824-BOOK; World Wide Web: http://www.book.uci.edu/. Electronic inquiries and orders may be sent to books@uci.edu.

UCI Career Center

The UCI Career Center assists UCI students in career planning and decision making through workshops, individual counseling, employment opportunities, and internships. The Center also assists students and alumni seeking career employment opportunities; teaches job-search skills and interviewing techniques; provides career job listings and a full program of on-campus recruitment; and provides graduate and professional school information. Students may easily access all job listing using their student I.D. number via the Career Center's Web site at http://www.career.uci.edu/. This site may be accessed through terminals located in the Center, from the many other on-campus terminals available to students, or via home Internet access. Vocational interest assessments are available on a fee-for-service basis.

The Center's Student Internship Program provides UCI students with opportunities to obtain career-related work experience in business, industry, and government. The Center also sponsors the UCDC and Sacramento Internship Programs which select UCI undergraduate and graduate students for internships (primarily in summer) in Washington, D.C., and Sacramento, providing a behind-the-scenes look at the activities that shape and implement the nation's future course.

The Center's Educational Career Services assists teaching credential candidates as well as master's and Ph.D. degree candidates who are seeking teaching, research, administrative, and counseling positions in education. The Center offers an online letter of recommendation service that allows for the storage of letters of recommendation for graduate students who are seeking employment in higher education and undergraduates who plan to apply to graduate and professional programs. This service is available for a fee. For more information, call (949) 824-6883.

In addition, the Center offers services and programs to meet specialized needs of specific student populations, including the disabled, women, culturally diverse and disadvantaged students, and returning students. Additional information is available from the Center; telephone (949) 824-6881.

Child Care Services

Child Care Services includes six Centers offering programs for children from three months to 12 years of age. The programs are open to children of UCI students, faculty, and staff, with priority enrollment and tuition subsidy available to students at three of the Centers. Information may be obtained by telephoning (949) 824-2100; World Wide Web: http://www.childcare.uci.edu/.

Counseling Center

The Counseling Center is the primary counseling and mental health service for the University community. The Center offers a variety of programs through which students can learn cognitive, affective, and behavioral skills which will enable them to function more effectively in an educational environment. Individual, group, couple, and family psychotherapy are available to all students, as well as crisis intervention services when needed. Staff also provide students with a wide range of workshops and academic courses related to learning and interpersonal issues including stress reduction, assertiveness, coping with depression, human sexuality, cross-cultural interaction, and intimacy and friendships. Staff psychologists train student group leaders, student interns, resident assistants, peer academic advisors, and administrative personnel on topics including stress management, communication, listening, leadership, group dynamics, and crisis intervention skills. The Center's services are free of charge to currently enrolled students. The Counseling Center is located on the second floor of Student Services I; telephone (949) 824-6457; World Wide Web: http://www.counseling.uci.edu.

Office of the Dean of Students

The Office of the Dean of Students offers a diversity of student services and programs which complement and enrich the educational and out-of-class life of UCI students. This is achieved through the provision of a comprehensive range of cultural, social, and intellectual opportunities which promote student learning and development. Additional information is available from the Office; telephone (949) 824-5181; e-mail: deanstu@uci.edu; World Wide Web: http://www.dos.uci.edu/.

CENTRAL OFFICES

The central office of the Dean of Students houses a number of services. More than 325 **clubs and organizations** with a combined membership exceeding 16,000 students encompass a wide range of interests including academic, environmental, faculty/staff, multicultural, political, recreational, religious, service, social, and sports. World Wide Web: http://www.students.uci.edu/clubs/.

UCI's Greek community includes 40 **sororities and fraternities** with over 1,600 members. Programs include membership recruitment, New Member Education Conference, Greek Songfest, Greek Week, and Order of Omega Greek Awards Night. Many of UCI's fraternities and sororities maintain houses in Arroyo Vista, UCI's theme house community. World Wide Web: http://www.dos.uci.edu/greeklife/.

Veterans Services, located in 100 Gateway Commons, provides support services to veteran students and eligible dependents of veterans. Assistance includes benefit certification, work-study, orientation, and outreach programs. For additional information, visit http://www.dos.uci.edu/veteran or call (949) 824-6477.

Policies Pertaining to Students Receiving Federal Education Benefits from the Department of Veterans Affairs

Veterans Affairs Academic Standing Requirement. All students receiving U.S. Department of Veterans Affairs educational benefits must be in good academic standing. An undergraduate student with a cumulative GPA below 2.0 or a graduate student with a cumulative GPA below 3.0 for two consecutive academic quarters will have their VA benefits terminated. Benefits will be reinstated if and when the undergraduate student's cumulative GPA is 2.0 or above or the graduate student's cumulative GPA is 3.0 or above. (*This policy is separate and distinct from the UCI Normal Progress Requirement and the UCI Academic Standing Requirement. The Veterans Affairs Academic Standing Requirement has to do with the receipt of VA benefits.)*

Readmission for Disqualified Graduate Students. Graduate students who are academically disqualified may be readmitted to the University with a recommendation from their academic unit and the Dean of Graduate Studies. See "Academic Disqualification" in the Research and Graduate Studies section of this *Catalogue* for more information.

The **UCI Volunteer Center** is a resource center for students who are interested in volunteer and community service information. Resources and programs include Volunteer Placements, Volunteer Projects, Alternative Spring Break, Orange County AmeriCorps Alliance, and the Community Service Funding Board. For additional information telephone (949) 824-3500; World Wide Web: http://www.volunteer.uci.edu/.

To assist students in becoming more effective leaders, the Office of the Dean of Students offers a variety of leadership programs and opportunities. The **All-University Leadership Conference** is the cornerstone of UCI's leadership offerings. This annual weekend program occurs off campus and involves more than 225 emerging and established student leaders representing the full diversity of campus interest groups. The **Winter Leadership Symposium** is a mid-year on-campus program that explores leadership issues relevant to club and organizational leaders. Information about leadership development programs is available from the Dean of Students Office and on the World Wide Web at http://www.dos.uci.edu/leadership/.

The **Administrative Intern Program** provides participating students with administrative and leadership experience designed to develop personal and professional skills as well as to increase their knowledge of complex organizational structures. Approximately 20 students annually are assigned to campus administrative departments where they develop programs and projects. Academic credit is earned through participation in a weekly seminar entitled Administrative Internship (Management 198A, B, C; 4 units per quarter for a maximum of 12 units). Information is available from the Office of the Dean of Students; telephone (949) 824-5182.

The **University Affairs for Credit Course** (1A-B-C) offers students an opportunity to work on campus projects with a University department to enrich their academic growth and development as well as the academic growth and development of UCI. Each student spends a minimum of 30 hours per quarter working on a proposed project under the supervision of a designated faculty or staff member. Students are required to write a five-page paper at the end of the course addressing the following: (1) description of the experience or project; (2) the impact of the experience or project upon the campus; and (3) the effectiveness (personally and externally) of the experience or project. Students may enroll in University Affairs for Credit for a maximum of three times (or 3.9 units), and the course is graded Pass/Not Pass only.

New Student Programs provides assistance and information to students who are in the process of transitioning to UCI from high school or transferring from another college and coordinates a variety of orientation programs. New Student Programs is located in the Office of the Dean of Students; telephone (949) 824-5182.

The Office of the Dean of Students also is responsible for the campuswide administration of **student discipline.** Information is provided in the booklet *University of California Policies Applying to Campus Activities, Organizations, and Students,* which is available from the Office of the Dean of Students; telephone (949) 824-5590; World Wide Web: http://www.dos.uci.edu/judicial/uci_policy.html.

A variety of other programs including the Welcome Week Anteater Club Fair & BBQ and the Student Organization Recognition Night are coordinated through the Office. Additional information is available from the Office of the Dean of Students; telephone (949) 824-5181; World Wide Web: http://www.dos.uci.edu/.

RESOURCE CENTERS

The Office of the Dean of Students provides support for a number of campus resource centers.

The **Cross-Cultural Center (CCC),** established at UCI in 1974, was the first multicultural center instituted at any of the UC campuses. CCC offers a friendly atmosphere and supportive environment for UCI's diverse student body. It provides meeting space and serves as "home base" for more than 70 registered multicultural organizations. Center facilities include a conference room for group meetings, a lounge for socializing, a study room, and a computer work station. The annual Martin Luther King Jr. Symposium and the Rainbow Festival and Conference, both three-day programs that recognize and reinforce UCI's commitment to ethnic diversity, are major programs administered by CCC. The Center also supports a variety of annual special events such as African Consciousness Quarter, Asian/Pacific American Heritage Month, Mez de la Raza, American Indian Culture Days, and Pilipino American History Month. In addition, CCC sponsors a Faculty-in-Residence Program and Faculty Colloquium designed to support the educational, cultural, and leadership development of UCI's ethnic and culturally diverse students. Involvement opportunities include the Reaffirming Ethnic Awareness and Community Harmony (R.E.A.C.H.) Program, Intern Program, and Volunteer Program. Additional information is available at the Center; telephone (949) 824-7215; World Wide Web: http://www.ccc.uci.edu/.

The **Disability Services Center** offers students with disabilities opportunities to participate in the academic community at UCI. Students with varying disabilities, including those with mobility, visual, hearing, and learning disabilities, and chronic health problems, may be eligible for reasonable disability accommodations through this program. Staff assist students from the point of their admission to UCI through graduation. Specialized services may include testing accommodations, priority registration, document conversion, adaptive equipment, readers, notetakers, interpreters, captionists, liaisons with faculty and campus departments, disability parking, and information regarding disability legal rights in the university setting. A Center Computing Lab provides adaptive computer technology and training. There is no cost to the student for the support services or accommodations provided by the Disability Services Center. Students are responsible for fully acquainting themselves with the detailed procedures for use of accommodations. These procedures are available on the Center's Web site.

Students with disabilities may qualify for reasonable accommodations based on disability-related needs. Students must provide appropriate documentation about their disabilities to the Center. Documentation provided to the Center is confidential. It is the responsibility of the applicant or student to provide this documentation and, if necessary, to cover the cost for such documentation. This includes the cost for professional assessments for such disabilities as learning disabilities, attention deficit disorder, and psychiatric disabilities. Contact the Center for more information about disability documentation requirements. In some cases there is need for recent or very detailed documentation about the disability. UCI reserves the right to determine the most effective and timely accommodations after consultation with the student about the disability and previous use of accommodations. The provision or use of a disability accommodation does not guarantee or ensure a certain level of achievement for the student. Students with disabilities must meet the same academic standards as all other students. Some academic accommodations may require approval of the chair or dean of the student's academic unit.

Students with disabilities who need accommodations (in particular, reading assistance, textbook conversion including e-text and Braille, American Sign Language interpreting services, real-time captioning services, and adaptive computing technology in campus laboratories) that must be planned or arranged in advance of the start of classes should contact the Disability Services Center as quickly as possible after admission to UCI. Failure to do so may delay or in some cases preclude the Center's ability to provide certain accommodations. This advance notice also allows the Center to document needs, discuss service procedures and student responsibilities, and determine the appropriate accommodations.

The Disability Services Center is located next to the Humanities Trailer Complex; telephone (949) 824-7494 (voice), 824-6272 (TDD); e-mail: dsc@uci.edu; World Wide Web: http://www.disability.uci.edu/.

The **International Center** promotes and facilitates international education and exchange by providing services and information to the UCI international population, affiliated offices, and the general campus community. Services include immigration advising and workshops for international students and scholars; employment processing for all non-immigrant employees; and immigration advising and consulting for campus departments. The International Center offers a variety of programs to provide support and resource information to the campus including orientation, tutoring, and other outreach programs and workshops.

All UCI international students and scholars must be aware of their responsibility of maintaining their non-immigrant visa status. International students and scholars on F-1 and J-1 visas are required to report to the International Center upon arrival on the campus. Additionally, these students and scholars must maintain updated records with the International Center for the entire time of their stay at UCI to be in compliance with immigration regulations. For additional information telephone (949) 824-7249; World Wide Web: http://www.ic.uci.edu/.

The **Lesbian, Gay, Bisexual, Transgender Resource Center's (LGBTRC)** mission is to ensure a safe and hospitable campus for UCI's diverse lesbian, gay, bisexual, transgender, and ally communities. LGBTRC provides programs, support services, and resources intended to raise awareness regarding lesbian, gay, bisexual, and transgender issues, to eliminate heterosexism and gender identity oppression, and to support the academic mission of the university. LGBTRC provides peer counseling, information and referral to campus and community resources, and leadership training and volunteer opportunities. The Center is open Monday through Friday, 9 a.m. to 5 p.m. and is located in Gateway Commons facing Aldrich Park; telephone (949) 824-3277; e-mail: lgbtrc@uci.edu; World Wide Web: http://www.lgbtrc.uci.edu/.

Health Education Center

The Health Education Center promotes healthy lifestyle choices through education, leadership opportunities, and campus programming. Students can consult with experts in sexual health, alcohol and other drugs, stress management, tobacco cessation, and nutrition. The Center offers a wide array of printed resources and videos. It also offers several courses, in partnership with the School of Social Ecology, including a survey course called Health Education for University Life. Students interested in health-related leadership opportunities can serve as Peer Health Educators (a three-quarter academic series). The Health Education Center is located in the UCI Student Center; telephone (949) 824-9355 (UCI-WELL); World Wide Web: http://www.health.uci.edu/; e-mail: healthed@uci.edu. Hours are 9 a.m. to 5 p.m., Monday through Friday.

Housing

ON-CAMPUS HOUSING

Housing Administrative Services coordinates application procedures and contracts for on-campus housing. Approximately 30 percent of UCI's student body is housed on campus. For more information, including housing rates for the 2005–06 academic year, visit http://www.housing.uci.edu/has/rates.asp. Rates are subject to change.

Undergraduate Housing

Residence Halls. Approximately 3,300 undergraduates live in UCI's two residence hall communities—**Mesa Court** and **Middle Earth**—which are within walking distance from the center of campus. Each community houses single undergraduates who are primarily freshmen between 17 and 20 years of age. The communities are composed of clusters of small, mostly coed buildings housing 52–75 residents in suite-style layouts. Student rooms feature cable television connections and Ethernet connections to UCI's campus network, e-mail, and the Internet. Each hall has group study rooms, a living room for meetings or informal gatherings, a small kitchen, and coin-operated laundry facilities. Both communities offer recreation rooms with video games, TV, and game tables; fitness rooms, volleyball, and basketball courts; and staffed computer labs.

Mesa Court and Middle Earth have complete food service and dining commons. Students who live in the residence halls participate in prepaid 10-, 14-, or 19-meal-per-week plans. Meals are served cafeteria-style three times daily on weekdays (brunch and dinner on weekends), and the menu offers a wide selection of food. A registered dietician is available to assist students with dietary needs. The halls close during the winter recess, and although they remain open during the Thanksgiving holiday and the spring recess, no meals are served.

Both Mesa Court and Middle Earth maintain a comprehensive residence life program, designed to help freshmen transition to college. Each hall has a live-in Resident Advisor who provides resources and support to freshmen residents. In each community, special interest halls or hall clusters provide educational programs and informal opportunities to get together with other students who hold similar interests. Community-wide social programs are also offered.

Rates for the 2004–05 academic year (late September through mid-June) were $9,772–$10,021 for a single room, $8,512–$8,764 for a double room, and $7,441–$7,693 for a triple room. (Rates vary by the meal plan selected.) Charges are paid in quarterly payments. Rates for 2005–06 will reflect an increase.

Campus Village, an apartment community for continuing students who are single undergraduates under the age of 25, offers 200 two-bedroom apartments, housing four students each. Most units are furnished; all include a bathroom, carpeting, draperies, a stove, and a refrigerator. All apartments provide cable television connections and Ethernet connections to the campus network, e-mail, and the Internet. The Campus Village Community Center offers a variety of facilities and programs including a fitness center, recreation rooms, study rooms, and a computer lab with Internet access. Rates for the

2004–05 academic year, including utilities, were $3,348 per student for an unfurnished apartment and $3,746 per student for a furnished apartment. Campus Village also offers year-long (12-month) contracts. Rates for this option in 2004–05 were $4,382 per student for an unfurnished apartment and $4,903 per student for a furnished apartment. These rates also include utilities and reservation fees. Rates for 2005–06 will reflect an increase.

Arroyo Vista is a community of 40 academic theme, fraternity, and sorority chapter houses for single undergraduates under the age of 25. Each house accommodates 16, 24, or 32 residents in furnished, double-occupancy rooms (bed, desk, and wardrobe closet for each resident). Residents share bathroom facilities on each floor, a spacious living room with fireplace, a study room, a fully equipped kitchen with dishwasher and microwaves, and laundry facilities. Through UCI's Residential Network Computing access (ResNet), all bedrooms in Arroyo Vista feature cable television connections and Ethernet connections to the campus network, e-mail, and the Internet. Students within each house make their own meal arrangements, choosing to cook for themselves or to purchase meal plans at UCI's residential dining facilities.

More than two-thirds of the houses are designated Academic Theme Houses, which are sponsored by academic programs and offer educational programs that advance both a student's academic interests and overall University experience. The rate for the 2004–05 academic year was $3,863 for a double-occupancy room. Rates for 2005–06 will reflect an increase. A meal plan is not provided in the contract, but may be purchased separately through the Residential Dining Office, http://www.UCIDining.com.

The remaining houses are available to fraternity and sorority chapter organizations; consult individual Greek chapters for information.

Graduate/Family Housing

Two on-campus apartment communities serve full-time, registered graduate students, and students who are married, single parents, or who are single and 25 years of age or older. **Verano Place** offers 862 one-, two-, and three-bedroom apartments. The majority are unfurnished, and all have carpeting, draperies, a stove, and a refrigerator. They are attractive and considerably lower in rent than comparable units in the local communities. Monthly rents for 2004–05 ranged from $378–$438 for single students sharing an apartment and from $700–$875 for families. Rates for 2005–06 will reflect an increase.

Palo Verde apartments are three- and four-story buildings in a setting of landscaped courtyards and pathways. The 652-unit complex is for full-time graduate students (single students and those with families). Monthly rents for 2004–05 ranged from $490–$685 for single students sharing an apartment and from $860–$1,650 for families. Rates for 2005–06 will reflect an increase.

To Apply

Housing information and application instructions are available online at http://www.housing.uci.edu. Undergraduates apply for housing online when they submit their *Statement of Intent to Register* (SIR) to the Office of Admissions and Relations with Schools. Graduate applicants can also find housing information and an application online at http://www.housing.uci.edu/gfh, and they will receive information by mail if they request it on their *Application for Graduate Admission.* A $20 nonrefundable processing fee must accompany the housing application when it is submitted. To request housing application materials, call the Housing Office at (949) 824-7247 or send e-mail to housing@uci.edu.

One year of on-campus housing is guaranteed to all freshmen and transfer undergraduate students who are single, under the age of 25, enrolling for fall quarter, and who meet the housing application and contract deadlines. To qualify for this guarantee, students must apply for housing and submit their *Statement of Intent to Register* (SIR) by the stated deadlines: May 1, 2006 for freshmen, and June 1, 2006 for transfer students. Applications received after these dates will be handled in the order received, as space becomes available.

Alternative Housing on the UCI Campus

Vista del Campo Apartments—a privately owned and managed on-campus community—offers furnished apartments with individual leases for senior, junior, and sophomore students and graduate students. Visit http://www.vistadelcampo.com or call (949) 824-0900 for more information.

HOUSING OPPORTUNITIES IN THE COMMUNITY

Services are available to assist students looking for off-campus housing. The *Living Around UCI* guide contains a wealth of information about housing options in Irvine and other nearby communities, as well as a local directory for shopping, banking, utility companies, and other services. Students are encouraged to visit the Housing Office, located in 209 Administration Building, where off-campus housing listings and roommate listings are available. For more information, contact a Housing Advisor at (949) 824-7247, send e-mail to housing@uci.edu, or visit http://www.housing.uci.edu/och/ochmain.htm.

UCI RESIDENTIAL DINING SERVICES

Meal plans are available to students who commute or who live in any of UCI's on-campus communities. The 19-meal plan provides three meals per day, Monday through Friday, and two meals per day (brunch and dinner) on weekends. The 10- and 14-meal plans can be used as each student chooses throughout the week. In addition to these meal plan options, students who live off campus and wish to have occasional meals in the residential dining facilities may choose to purchase a 5- or 10-meal plan or a punch card (one punch for breakfast, two punches for lunch/brunch, and three punches for dinner). Optional meal plans and punch cards are for use in the Mesa Commons and Pippin dining areas only.

For more information, visit http://www.ucidining.com or call the Residential Dining Services Office at (949) 824-4182.

UCI Student Center

The UCI Student Center entered an exciting and much anticipated expansion period in spring 2005. With a projected completion date of spring 2007, the Phase IV Expansion will increase the size of the Student Center by 75 percent, while the Cross-Cultural Center will nearly double in size. Conference and meeting space will nearly triple, and more study space (individual and small group) and lounge space will be available. There will be a new ballroom seating approximately 1,000 and a new multipurpose room seating approximately 300. In addition, there will be three food courts, including one facing the Ring Mall. Outdoor space will be expanded to include a permanent performance stage on the Terrace and a new garden courtyard on the lower level of the building. When the expansion is complete, the UCI Student Center will have an entirely new look and will be one of the largest student centers in the country. For updates, access the UCI Student Center Web site at http://www.studentcenter.uci.edu.

Student Government

ASSOCIATED STUDENTS

All UCI undergraduate students are members of the Associated Students, better known as **ASUCI**. ASUCI is the student representative body that advocates to and is liaison between the UCI administration, faculty, and staff.

ASUCI is comprised of three branches of government: the Executive Officers (five elected at-large members), Legislative Council (15 elected members), and the Judicial Board (seven appointed members). Guided by their constitution and bylaws, these student representatives manage the $18 per student quarterly fee that supports student life activities, advocacy programs, publications/communication, and professional support staff as well as essential campus services.

The Student Government offices can be contacted by phone at (949) 824-5547; e-mail: ASUCI@uci.edu; World Wide Web: http://www.asuci.uci.edu/.

ASUCI Student Life Activities include the annual Welcome Week Dance, Octoberfest, Homecoming, and Wayzgoose and Reggae festivals. Weekly events include such programs as noon shows, major concerts, comedy nights, and preview movie screenings. In cooperation with ASUCI's award-winning yearbook publication, events such as Senior Information Day, Senior Portraits, and Senior Class Picnic are held annually.

ASUCI Advocacy programs include Elections (campus and local), External Affairs, College Legal Clinic, Student Recommended Faculty Program, Campus Safety, and the Visions leadership and internship seminar course (1.3 units).

ASUCI Publications/Communication includes the Columbia Press Association Award-winning *UCI Yearbook Anthology,* and the ASUCI Web site at http://www.asuci.uci.edu/, which is a great source of information about the organization.

ASUCI Services include:

Club and Organization Accounting: The ASUCI Business Office provides banking and accounting services to registered campus organizations.

Express Shuttle: This full-service bus system, founded in 1987, provides bus transportation throughout the city of Irvine from various apartments with high concentration of students directly to UCI. In addition, on-campus shuttles transport students to various key locations around UCI. Schedules and shuttle passes are available in ASUCI, or call (949) 824-5547 for more information.

UCItems and UCI Photo ID: UCItems is the campus specialty store featuring UCI and Greek apparel, custom silkscreening, banners, awards, and special promotions that include discount tickets to Edwards/Regal cinema, Disneyland, Universal Studios, Magic Mountain, Sea World, Knott's Berry Farm, and more. UCItems is also the place where the official UCI Photo ID cards are issued. The store is located in the Student Center and is open Monday through Friday from 9 a.m. to 5 p.m.; telephone (949) 824-7555.

ASSOCIATED GRADUATE STUDENTS

All graduate and professional school students are members of the Associated Graduate Students (AGS). AGS promotes and provides for the distinct needs and priorities of graduate students, and functions as a liaison between graduate students and the UCI administration, faculty, and staff by addressing concerns and working to resolve grievances. Call AGS at (949) 824-6351 for information.

AGS provides graduate students with numerous student-operated services including social and cultural events of benefit to the graduate community. It sets aside funds each year to be used specifically for graduate student development, academic unit services, and special projects. These funds are allocated on a rolling basis to petitioning clubs and organizations on campus.

In partnership with the UCI Student Center, AGS also operates the Anthill Pub & Grille which offers food, beverages, and live entertainment at student-friendly prices.

The AGS Council nominates graduate students for positions on UCI administrative, Academic Senate, and ad hoc committees, and UC Office of the President committees. AGS representatives work with the UC Student Association and other campus organizations to advocate policies supportive of students and vital to the social needs of the community at large.

ASSOCIATED MEDICAL STUDENTS

The Associated Medical Students (AMS) Council, along with the AGS Council, represents the medical student body in all matters relating to the UCI campus, the UC Office of the President, and the community. Medical students are members of AGS and have access to those services. In addition, AMS utilizes a portion of the quarterly AGS fee to provide funding for medical student activities that benefit the School of Medicine community.

THE PAUL MERAGE SCHOOL OF BUSINESS STUDENT ASSOCIATION

The School's Council, along with the AGS Council, represents the graduate Management student body in all matters relating to the UCI campus, the UC Office of the President, and the community. Graduate Management students are members of AGS and have access to those services. In addition, the School's Council uses a portion of the quarterly AGS fee to provide funding for Management student activities that benefit The Paul Merage School of Business community.

Student Health Center

All fully registered students and students approved for part-time study are eligible to access services at the Student Health Center, located at the corner of East Peltason and Pereira Drive. Facilities and services include outpatient clinics staffed by certified, licensed medical professionals; nurses with expertise in college health; a clinical laboratory; radiology; and a pharmacy. General medical clinics are held from 7:30 a.m. to 5:30 p.m. Monday through Friday during the academic year and are available by appointment or on an urgent-care basis. Specialty clinics are held at variously scheduled times by appointment and include optometry, dental, mental health, dermatology, gynecology, women's health, men's health, orthopaedics/sports medicine, ear/nose/throat, and minor surgery. A nurse clinic is available to provide immunizations, health screening, and basic health education.

Health care services are available beginning on the first day of Welcome Week in the fall and continuing through the last day of finals week in June. Basic services continue in the summer as well. All students are encouraged to submit an updated physical examination record to Student Health (see Physical Examination and Health Clearance, below). *All* students pay affordable fees for their clinic visits, laboratory, medication, x-rays, surgical procedures, and eye, dental, and mental health visits. Students may submit a claim to their insurance plans for reimbursement. Services at Student Health are affordable, and fees are generally lower than those of comparable services in the community. Payment plans may be arranged. Medical history and physical examination packets are mailed to new and readmitted students as their names become available to the Student Health Center. Medical students receive their packets from the School of Medicine Admissions Office. International students' packets are mailed by the Office of International Services with their initial registration forms.

All undergraduate, graduate, and medical students are required to carry adequate health insurance. Those students who have private insurance which is equal or superior to the policy provided through the University may be eligible to have the mandatory fee waived. Additional information is available in the Expenses and Fees section of this *Catalogue* and from the Student Health Insurance Coordinator; telephone (949) 824-7093 for undergraduates, (949) 824-2388 for graduate students.

Physical Examination and Health Clearance. All new students and students returning to UCI after an absence of two or more quarters are required to file a completed medical history, proof of tuberculosis screening, and proof of mandatory immunizations with the Student Health Center. All students are encouraged to have a physical examination to screen for health problems. The examination may be performed by the student's own physician, but should be documented on the form provided by Student Health. The physical examination can also be performed at the Student Health Medical Clinic for a fee. Students transferring from another UC campus where their medical records are on file should have the records transferred to the UCI Student Health Center.

The Medical Clinics at Student Health Center provide as many services as possible at very affordable fees. Laboratory tests, x-rays, prescriptions, medical procedures, and supplies are priced very competitively, usually much lower than the fees charged in the community. Professional counseling, psychological, and psychiatric services are available through the Student Health's Mental Health Division for a fee; the cost varies based on the level of professional services provided. Eye and dental care are available on a fee-for-service basis to students and their spouses. Call (949) 824-5304 for an appointment.

INTERCOLLEGIATE ATHLETICS AND CAMPUS RECREATION

Intercollegiate Athletics

UCI's Intercollegiate Athletic Program features 23 sports, with 11 men's teams, 11 women's teams, and one coed sailing team. Men's sports include baseball, basketball, crew, cross country, golf, soccer, swimming and diving, tennis, track and field, volleyball, and water polo. UCI's men's teams compete in the National Collegiate Athletic Association (NCAA) Division I, and the University is a member of the Big West Conference. UCI also competes in the Mountain Pacific Sports Federation (MPSF) in men's volleyball and water polo. UCI's sailing team competes in the Intercollegiate Yacht Racing Association (ICYRA), and crew competes in the Pacific Coast Championships. The UCI women's teams also are members of NCAA Division I and the Big West Conference, competing in basketball, crew, cross country, golf, soccer, swimming and diving, tennis, outdoor track and field, and volleyball. Women's water polo and women's indoor track and field compete in the MPSF.

UCI has captured 21 national team championships in eight different sports since opening in 1965, with 63 individuals winning national titles and over 400 earning All-American honors. UCI has won 48 Big West Conference championships since 1977. Each spring, the University presents the Big West Scholar-Athlete Award to those student-athletes who maintained a 3.0 GPA over the previous three quarters. In the last 22 years, 2,397 UCI student-athletes have earned the award.

The mission of UCI Intercollegiate Athletics is to facilitate and enrich the education and personal growth of its students through their participation in competitive NCAA Division I athletics. Intercollegiate Athletics is committed to the welfare of student-athletes and staff, and advocates an environment that promotes excellence in athletic and academic performance, sportsmanship, diversity, and gender equity. Intercollegiate Athletics also supports the University of California's mission of public service and serves to generate a unifying spirit among students, faculty, staff, and alumni that transcends communities, cultures, and generations.

The Intercollegiate Athletic offices are located in Crawford Hall; telephone (949) 824-6931.

ATHLETIC FACILITIES

On-campus facilities include the Bren Events Center, which seats 5,000 for intercollegiate basketball. The Crawford Hall complex, in addition to housing the athletic administration offices, also includes sports medicine, strength and conditioning, and student-athlete academic support services. Crawford Court gymnasium has 760 chair-back seats for volleyball. Outdoor facilities include Anteater Stadium, a 2,500-seat facility for soccer and track; the 500-seat Anteater Tennis Stadium; Anteater Ballpark, home to the baseball program; and a five-acre multipurpose field complex.

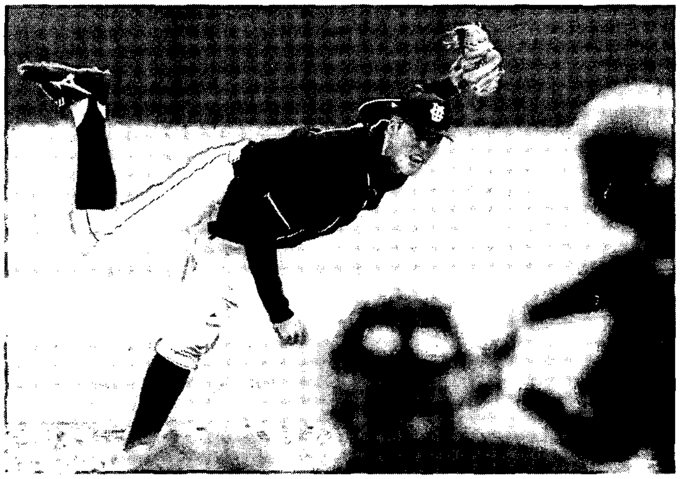
In the spring of 1999, UCI opened the $3-million, 64-meter Anteater Aquatic Complex to house the intercollegiate water polo, swimming, and diving teams. This aquatics facility is designed with a movable bulkhead and is large enough to accommodate multiple activities simultaneously.

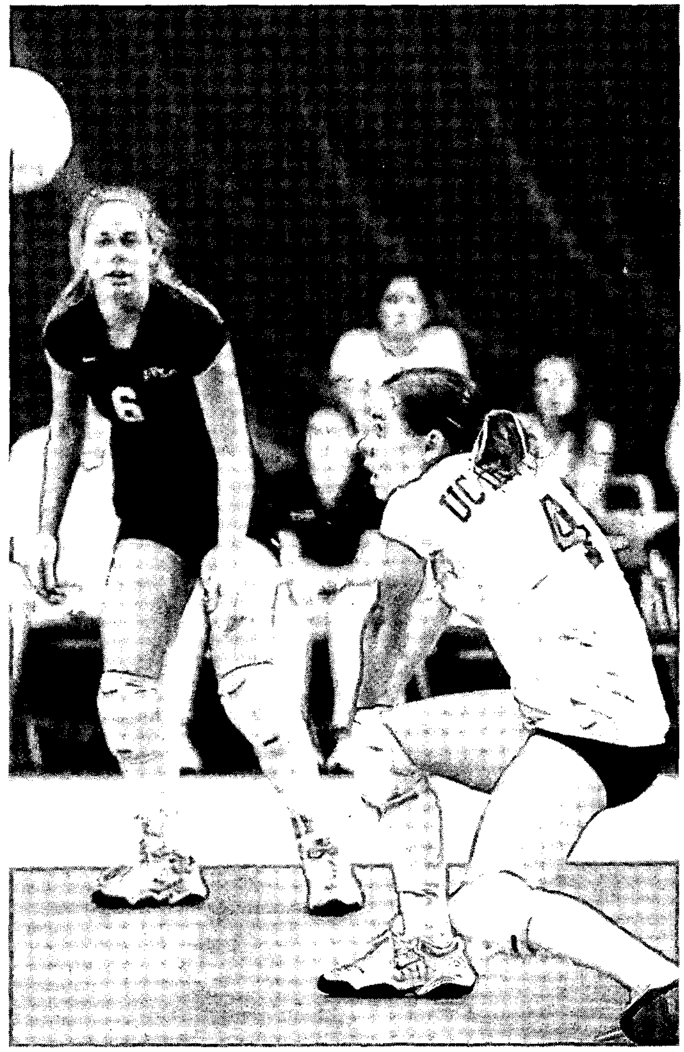
Campus Recreation

Campus Recreation provides UCI students, faculty, and staff with an opportunity to enhance their campus experience by developing and maintaining a physically active lifestyle through classes and clinics, club sports, fitness and wellness, intramural sports, and outdoor adventures. These programs are offered in the Anteater Recreation Center (ARC), ARC fields, and at other off-campus locations.

The Anteater Recreation Center (ARC) is a complete state-of-the-art sports and fitness facility. ARC facilities include: a 10,000-square-foot weight room with 141 cardiovascular and weight machines and more than 15 tons of free weights, a lap and leisure pool, a three-court gym, a rounded-corner one-court gym, an elevated running track, a rock climbing wall, three multipurpose rooms (aerobics, martial arts, dance), and three racquetball courts. Registered students have access to the facilities with current UCI identification and are not required to pay any additional membership fee. Faculty and staff may purchase ARC memberships.

In 2002, the ARC Fields were opened to expand the recreational opportunities for students and the campus community. These facilities include sport fields, tennis courts, a roller hockey rink, and basketball courts. The 20 acres of lighted fields include space for four softball fields, soccer fields, and flag football. There are six lighted tennis courts available for Campus Recreation programs and drop-in use. The roller rink is recreational in size and is also available for program and drop-in use. The two lighted basketball courts add to the basketball opportunities on campus.





Campus Recreation offers a variety of non-credit activity **Classes and Clinics** to students and ARC members. These high-quality classes range from the classic sports of golf, tennis, and swimming to the dynamic style of karate or the peaceful environment of a Tai Chi class. An array of dance classes, such as hip hop, salsa, and belly dance, are offered. For those looking for certifications, scuba diving and CPR and First Aid are available.

Fitness and Wellness provides a wide array of opportunities for participants to begin or improve their fitness program. The ARC fitness center is state-of-the-art with a complete line of free weights, resistance machines, and cardiovascular equipment. The staff is well trained and provides assistance with the proper use of the equipment and with various program goals. Personal training and fitness conditioning classes as well as a variety of fitness and group exercise classes including step, kickboxing, body sculpting, yoga, and pilates are available.

Intramural Sports are structured sport leagues and tournaments, which are designed for the "everyday athlete." All activities feature skill and competitiveness. Sport leagues include basketball, flag football, floor hockey, indoor and outdoor soccer, softball, bowling, and volleyball. Special events and tournaments include badminton, swimming, table tennis, racquetball, tennis, track, wrestling, and more. Registration begins on the first day of each quarter. Participants may sign up as a team or as individuals.

The **Outdoor Adventure** program provides the UCI community with a variety of outdoor recreational opportunities including rock climbing, sailing, a low-ropes challenge course, and seasonal trips for hiking and cross-country skiing. The sailing program includes both sailing classes and a sailing club (UCISA). The classes are offered quarterly and include beginning through advanced sailing opportunities. The club is available for individuals interested in sailing on their own as well as participating in various social activities with other sailors. The Rock Climbing program includes classes, wall membership, and the use of all climbing equipment, as well as supervision. Prior to signing up, interested individuals may try the wall first; all students and ARC members are entitled to a free, first-time climb session.

The UCI **Club Sports** program provides a variety of student-initiated and student-managed club sports. Students are able to learn a new sport or participate in one they have been involved with in the past. Club sports may be competitive, recreational, or instructional in nature. Some current clubs include rugby, lacrosse, soccer, biking, badminton, roller hockey, and volleyball.

All UCI students and ARC members may register and participate in the preceding activities (intramural sports and club sports do have additional eligibility requirements). Up-to-date information, including hours of operation, membership, and class schedules are available in Campus Recreation's quarterly publication and on the Web at http://www.campusrec.uci.edu/. Equipment such as basketballs, volleyballs, racquets, and other items may be checked out on a daily basis from ARC's Gear Up; telephone (949) 824-6401.

Additional information is available from Campus Recreation Services (2nd floor, ARC), 680 California Avenue; telephone (949) 824-5346.

RESEARCH AND GRADUATE STUDIES

William H. Parker, **Vice Chancellor for Research and Dean of Graduate Studies**

Research and graduate education, two major areas of responsibility of the Office of Research and Graduate Studies, are vital and integral parts of academic life at UCI. Programs leading to doctoral or master's degrees are offered in about 50 academic and professional areas, with an extensive array of concentrations and emphases within these areas. Many of UCI's graduate programs and research activities have achieved national reputations for excellence, and several are internationally recognized as leaders in their respective fields. UCI graduate programs continue to grow and to evolve in directions that are consistent with the University's teaching, research, and public service missions. Graduate study at UCI provides the excitement and satisfaction that spring from the discovery and dissemination of new knowledge, as well as from meeting new challenges.

The Vice Chancellor for Research and Dean of Graduate Studies has general administrative responsibility for research and graduate education. In the area of research, the Vice Chancellor has responsibility for the administration of extramurally funded research and training grants, general research administration, and research policy development and implementation. Graduate education responsibilities include admissions, graduate student services, degree awards, fellowship and assistantship administration, and programs that facilitate student and faculty diversity within graduate education at UCI.

The Office of Research and Graduate Studies also is administratively responsible for Organized Research Units, contract and grant administration, University/industry relations, and other campus research activities.

Additional information is available on the World Wide Web at http://www.rgs.uci.edu/.

RESEARCH

A primary mission for UCI is faculty research and scholarship, which plays a valuable role in the education of both graduate and undergraduate students. UCI has established national and worldwide visibility in traditional disciplines such as physics and chemistry, which have earned three Nobel Prizes, along with "new" interdisciplinary pursuits. In the Humanities, UCI has become a center in critical theory. Biological and biomedical investigators conduct both basic science and clinical research in areas such as neuroscience, molecular biology, genetics, and cancer. Engineering specialties include electrical, computer, mechanical, aerospace, civil, and biochemical research.

The Vice Chancellor for Research has responsibility for research policy, research development, animal research administration, UCI-industry relations, and research administration, which includes submission of grant proposals and negotiation and administration of awards. The Vice Chancellor also encourages new research initiatives and administers UCI's organized research programs, interdisciplinary groups of faculty pursuing unique problems that cross departmental and school boundaries.

Office of Technology Alliances

The Office of Technology Alliances (OTA) fosters research partnerships and transfers of technology between UCI and industry that lead to rapid commercialization of research results for the public benefit. OTA makes many of its services available on the World Wide Web at http://www.ota.uci.edu/. Specific services for faculty include assistance with invention disclosures, patentability assessment, technology marketing and licensing, industry-sponsored research collaborations, biological material transfer agreements, and copyrights and trademarks. Specific services for business and industry include access and links to faculty researchers (http://www.faculty.uci.edu/), licensing technology, assistance with research contracts, intellectual property, research materials transfer, and technology information.

California Institute for Telecommunications and Information Technology (Calit2)

The California Institute for Telecommunications and Information Technology (Calit2) was established in December 2000 by the State of California as a partnership between academia and the business community. Calit2—a joint venture between UCI and UCSD, with dedicated research facilities on both campuses—conducts interdisciplinary, collaborative research that generates novel materials, devices, and information systems, with applications in many fields. The Institute's research in networked systems, the environment, transportation, bioinformatics, policy, education, digital arts, security, and other fields will keep California's industry at the cutting edge of technology, accelerating growth in existing companies and spurring high-technology start-ups that will boost the State's economy.

UCI and UCSD faculty from many academic disciplines collaborate with researchers from more than 130 leading California high-technology corporations. A major objective of the Institute is to educate and prepare students—in the classroom and the laboratory—for successful careers in industry, government, and academia.

University of California Humanities Research Institute

The University of California Humanities Research Institute (UCHRI), located at UCI, was founded in 1987 to coordinate the humanities for the 10 campuses of the University of California. UCHRI's distinctive mission is to foster intellectual community, research, and public programs across campus boundaries; to mobilize the strength of the University of California humanities faculty as a whole; and to promote innovative collaborative and interdisciplinary research among humanities scholars and researchers in other disciplines such as the social sciences, sciences, technology, and medicine. An advisory committee represents each campus and advises the UCHRI director on programs.

At the heart of UCHRI's activities are the Residential Research Groups, which bring together both UC and non-UC scholars, postdoctoral fellows, and advanced UC graduate students to work in collaboration on interdisciplinary topics. UCHRI also offers the possibility of multiyear programs of coordinated residential research groups and conferences. Office space is provided for up to 20 resident fellows and modest housing on the UCI campus is made available.

UCHRI sponsors scholarly conferences both at the Institute and on the UC campuses, as well as seminars, workshops, and meetings for a variety of project and planning purposes. In addition, UCHRI works with numerous publishers, including the University of California Press, to publish work from its conferences and residential groups.

Faculty who wish to propose research projects, conferences, workshops, disciplinary forums, or other programs or activities should contact the University of California Humanities Research Institute, 307 Administration Building, Irvine, CA 92697-3350; telephone (949) 824-8179; e-mail: UCHRI@uci.edu.

University of California Institute for Research in the Arts

The University of California Institute for Research in the Arts (UCIRA) supports projects by UC faculty and students working in the visual, performing, and media arts. As a research institute, UCIRA works to develop new approaches to artistic practice and better ways of reaching art audiences. UCIRA seeks projects that are innovative, experimental, and/or multidisciplinary. An endeavor of the UC Office of the President, UCIRA also provides information and advocacy for arts education and research. Applications for support are reviewed by the UCIRA Board. Complete information about UCIRA programs may be found on the World Wide Web at http://ucira.arts.ucla.edu.

Thesaurus Linguae Graecae®

The Thesaurus Linguae Graecae (TLG)® was established in 1972, thanks to a gift by UCI alumna Marianne McDonald. Its goals are to create a comprehensive digital library of Greek literature from antiquity to the present era; to conduct literary research using collected texts; and to apply technological innovation in these endeavors. The TLG® corpus currently contains more than 90 million words of Greek text and essentially all extant texts from Homer to A.D. 600, as well as the majority of texts from the period A.D. 600 to 1453. Work is underway to include later periods of Greek literature.

TLG® research activities combine the traditional concerns and methodologies of philological and literary study with the most advanced features of computer technology. Included among current research foci are the identification of ancient Greek literary and documentary materials from various literary-historical periods; the conversion of these materials into digital form using modern methods of text encoding; the enhancement of automated text-correction routines; and the formulation of criteria for the lexical analysis and categorization of the texts in the corpus. The project also has established procedures to facilitate international access to its textual, bibliographical, and lexical resources either online (http://www.tlg.uci.edu/) or through compact disk.

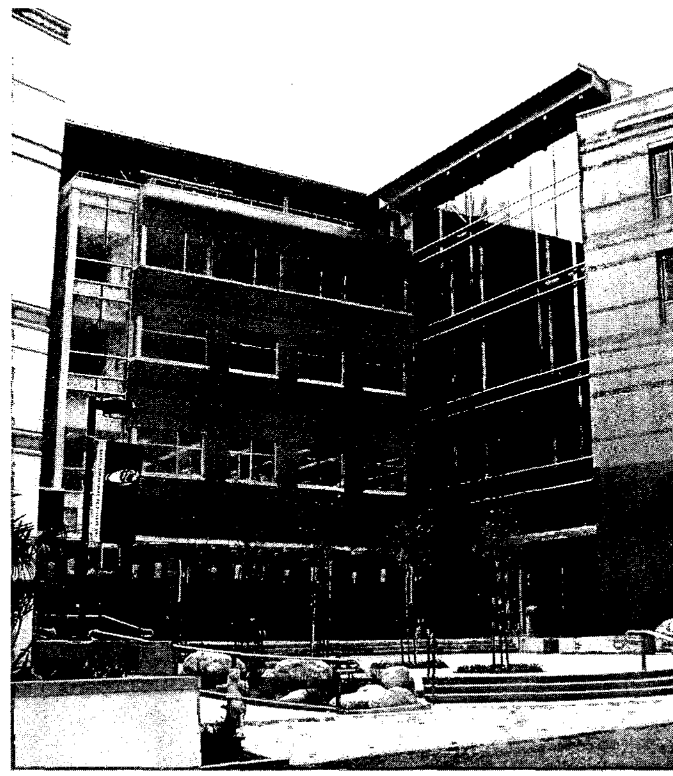
TLG®'s library holdings enhance those of the University Library, and TLG®-related conferences and scholarly visits afford faculty and students contact with eminent classicists. The Thesaurus Linguae Graecae® has made UCI a major source of Classics research activity.

Organized Research Units

Organized Research Units (ORUs) normally consist of an interdepartmental group of faculty, students, and other researchers engaged in a continuing program of multidisciplinary or interdisciplinary research, supported by both University and extramural funding. The work of some ORUs is directed toward the solution of complex contemporary problems, while others conduct basic research essential to the understanding of natural or social phenomena or of humanistic ideas and expressions. The following ORUs have been established on the Irvine campus.

CANCER RESEARCH INSTITUTE

The Cancer Research Institute provides leadership and support for researchers working toward understanding and controlling cancer. The Institute serves as a means of focusing, coordinating, and



directing efforts of scholars in basic and clinical sciences from several departments in the Schools of Biological Sciences and Medicine. It provides a central source of information concerning cancer-related research, as well as a forum in which basic researchers and clinicians can assess advances that may be of immediate value in the diagnosis and treatment of cancer, and in the detection of chemicals or conditions that cause cancer. Ongoing and projected research activities involve the regulation of cell function, viral carcinogenesis, immunology, and basic molecular processes relevant to cancer. The Cancer Research Institute administers Sprague Hall, a research facility in the Biomedical Research Complex dedicated to cancer and genetics. The Cancer Research Institute serves as the basic science arm of UCI's Chao Family Comprehensive Cancer Center, a National Cancer Institute-designated comprehensive cancer center. Other units of the center include the Chao Family Clinical Cancer Research Center and the Cancer Surveillance Program of Orange County.

CENTER FOR EMBEDDED COMPUTER SYSTEMS

The Center for Embedded Computer Systems, established as an informal center in 1998, was recognized as an ORU in 2001. The Center provides the organizational and administrative structure for researchers at UCI, UCR, and UCSD to conduct leading-edge interdisciplinary research in embedded systems, develop innovative design methodologies, and promote technology and knowledge transfer for the benefit of the individual and society. The research program focuses on three application domains: (1) Communications, including infotainment, information appliances, multimedia, personal imaging, and wireless; (2) Automotive, including collision avoidance, control/sensors, entertainment, and emergency services; and (3) Medical, including diagnosis, drug delivery, imaging, implanted devices, and monitoring. Additional information is available online at http://www.cecs.uci.edu/.

CENTER FOR THE NEUROBIOLOGY OF LEARNING AND MEMORY

The Center for the Neurobiology of Learning and Memory (CNLM), founded at UCI in 1983, is a multidisciplinary research institute that fosters and supports collaborative research on the brain processes underlying learning and memory. CNLM's research teams consist of faculty, professional and postgraduate researchers, graduate and undergraduate students, and visiting scholars. They investigate the formation, maintenance, and retrieval of memory at several levels of analysis—from studies of molecular and cellular processes in the brain to studies of memory in animal and human subjects.

Current research projects include investigations of the role of specific genes in memory formation, how neurons organize and communicate to enable learning and memory, the way experience alters the structure and organization of the brain, how we acquire and retrieve short- and long-term memories, and emotional influences on memory formation and retrieval. State-of-the-art techniques, including computer modeling of neural processes and functional neuroimaging, are used. The Center's basic research has important implications for understanding and treating human memory disorders and the diseases that cause them.

CNLM organizes seminars and colloquia throughout the year, as well as periodic workshops and international conferences for the neuroscience community. In addition, the Center organizes and sponsors programs for local schools and the general community, including public lectures focusing on the research of the Center faculty and on health issues related to brain and memory.

CNLM members include faculty from the UCI Departments of Neurobiology and Behavior, Cognitive Sciences, Anatomy and Neurobiology, Pharmacology and Toxicology, and Psychology and Social Behavior, as well as faculty from several other UC campuses, the University of Southern California, the Scripps Research Institute, and the California Institute of Technology. CNLM is located in the Bonney and Qureshey Research Laboratories of the Herklotz Research Facility.

CENTER FOR RESEARCH ON INFORMATION TECHNOLOGY AND ORGANIZATIONS

The Center for Research on Information Technology and Organizations (CRITO) is a multidisciplinary Organized Research Unit that conducts theoretical and empirical research into the social and economic impacts of information technology (IT) in organizations and society. CRITO focuses on the management, use, and impact of IT in the emerging global, competitive marketplace and on the policy issues raised by its use. CRITO researchers focus on the management of IT, the IT-enabled enterprise, technology-intensive user environments, and the increasingly global nature of IT use and production.

The CRITO Consortium, within CRITO, is the only NSF-supported Industry-University Cooperative Research Center (I/UCRC) on the UCI campus. Corporate sponsors of the Consortium have included, among others: the Boeing Company, the Department of Defense, IBM Corporation, Intel Corporation, International Data Corporation, and Microsoft.

CRITO and Consortium research projects include: nationwide study of computers and the Internet in the home; nationwide study of e-government; the payoffs from investments in IT; outsourcing and offshoring of IT and IT-enabled services; the impacts of IT on firm and industry organization; the impacts of computing on work groups and collaborations; IT structuring for e-commerce; the effects of IT on training, employee performance, and quality of work life; the global spread of production and use of computers; and the globalization of the Internet and e-commerce. For more information, see http://www.crito.uci.edu.

Faculty from The Paul Merage School of Business, the Donald Bren School of Information and Computer Sciences, the School of Social Sciences, and the Department of Education conduct research through the unit. There are approximately 15 faculty associates and 20 students involved in CRITO and Consortium research.

CENTER FOR THE STUDY OF DEMOCRACY

The Center for the Study of Democracy (CSD) sponsors research and education to enhance our scientific understanding of both the democratic process in the United States as well as in other established democracies, and expanding democracy around the world. The Center emphasizes five research programs: (1) *Democracy21* focuses on the democratic process in established democracies including the United States as we enter the new century. This program examines ways to increase the citizens' ability to express their preferences and have these preferences represented within the democratic process; (2) *Democratic Transitions/Consolidation* supports research on the development of sustainable democracies in Eastern Europe, East Asia, and other new democracies; (3) *Social Movements and Collective Action* focuses on new forms of citizen participation and the use of collective action to expand the boundaries of democratic action; (4) *Race, Ethnicity, and Democracy* focuses on the representation and participation of minorities, and the institutional structures that may encourage democratic equality; and (5) *Economics of Governance* examines the intersection of economic and political worlds; how economic principles inform or should inform policy making and how economic factors enter into political decision making.

UCI's expertise in this area was recognized by the National Science Foundation, which selected UCI as a national center for the training of graduate students on democracy. The educational activities continue through the CSD's Democracy Fellows program.

CSD hosts an active lecture program, organizes international research conferences, sponsors faculty research, publishes a research paper series, and facilitates research and teaching on democratic themes. The Center has a multidisciplinary faculty from four UC campuses and is one of the leading university-based programs in America devoted explicitly to the study of democracy. Further information is available at the Center's Web site at http://www.democ.uci.edu/.

CENTER FOR VIRUS RESEARCH

The Center for Virus Research (CVR), an interdisciplinary research unit composed of 17 faculty members from 11 departments and five schools at UCI, promotes scholarship, training, and research among faculty. It also seeks the creation of scientific resources which use molecular virology as a foundation. This is accomplished first by stimulating scientific communication among CVR members via seminar series and symposia, as well as among CVR members and non-members from the UCI research community. These interactions can lead to the development of pilot studies and, if successful, into formal grant-supported interdisciplinary research. To further encourage the development of such research, CVR also promotes the creation of common resources to be shared by its membership and the UCI research community. This has led to the development of applied laboratories for BSL3 research, the Viral/Vector laboratory for the construction of recombinant virus, the applied proteome laboratory, an applied immunology laboratory, and most recently, the development of a CVR-sponsored proteomics mass spectrometry facility. The creation of these applied laboratories supports research on molecular virology, viral evolution, viral pathogenesis, viral gene therapy, cancer virology, viral proteomics, and biodefense and emerging disease. These laboratories have also allowed CVR to participate as a subcontractor with industrial researchers, thus enabling University-Industry collaborations.

CRITICAL THEORY INSTITUTE

The Critical Theory Institute (CTI) provides a locus for the conduct and support of collaborative, interdisciplinary research that focuses on the theoretical underpinnings of such fields as history, literature, philosophy, art, anthropology, politics, and cultural studies. CTI's principal function is to create a forum for debate among competing movements in contemporary critical theory. CTI's work encompasses not only the application of theory to data but also a self-reflexive investigation of theoretical presuppositions in order to produce alternative theoretical models, methodologies, and research strategies.

CTI investigates problems according to three- to four-year research projects on announced topics, such as "The Forces of Globalization" (1995–99), "The Futures of Property and Personhood" (1999–2003), and "In Security" (2003–06). Research projects involve collaborations between CTI members and contemporary theorists from around the world. Contributors to each project present lectures in CTI's Irvine Lectures in Critical Theory series. Research programs are concluded with the publication of essay collections in CTI's project series with Columbia University Press. See for example, *"Culture" and the Problem of the Disciplines,* edited by John Rowe.

CTI additionally hosts the annual René Wellek Library Lectures, inaugurated in 1981. Every year, typically in the spring quarter, a distinguished scholar delivers three public lectures on a topic relevant to the field of critical theory. Recent lecturers have included Gayatri Spivak, Judith Butler, Homi Bhabha, Paul Gilroy, Angela Davis, and Achille Mbembe. The Wellek Lectures also are published with Columbia University Press in CTI's ongoing series. Other activities sponsored by CTI include workshops, conferences, reading and discussion groups, one-time lectures by international scholars, and co-sponsorships of a number of other theory-related events.

In recent years, CTI has established broad connections to distinguished institutions and scholars around the world and has been planning collaborative international projects on a regular basis. The inaugural event, a conference entitled "The States of Theory: China and the West," took place in Beijing in the summer of 2000, and was co-organized by CTI and Beijing Language and Culture University. In April of 2002, CTI hosted another major conference, "Derrida/Deleuze: Psychoanalysis, Territoriality, Politics." The two-day event on connections between Derrida and Deleuze featured keynote lectures by Catherine Malabou and Jacques Derrida, and screenings of "D'Ailleurs Derrida" (Fathy, 2001) and "L'Abécédaire de Gilles Deleuze" (Boutang, 1996). In association with the Postcolonial Institute, CTI participated in another international conference in September 2003 in Melbourne, Australia.

Further information on CTI, including a calendar of events, is available at http://www.humanities.uci.edu/critical.

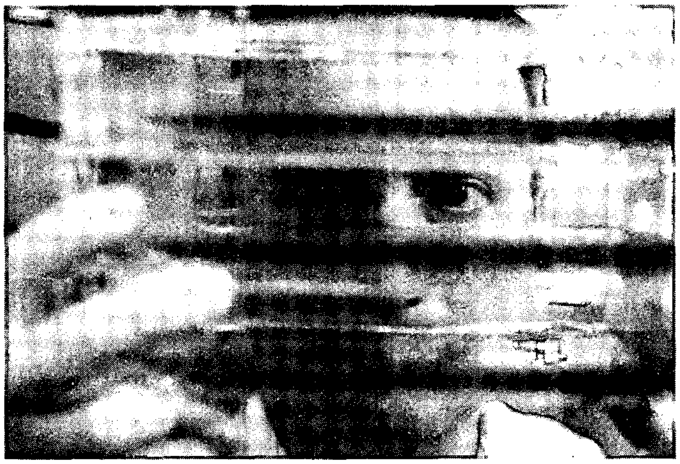
DEVELOPMENTAL BIOLOGY CENTER

The Developmental Biology Center (DBC) is an Organized Research Unit supporting multi-investigator research and training projects in developmental biology. DBC scientists are investigating how cells cooperate during development to control the growth and development of the body. This involves study of the processes of cell division, migration, and differentiation at the molecular, genetic, and cellular levels using a variety of experimental organisms, as well as human material. In support of these research programs, DBC manages shared facilities for confocal microscopy, computer-based image processing and analysis, cell sorting and analysis, and single-cell microinjection. These facilities are part of the Optical Biology Shared Resource of the Chao Family Comprehensive Cancer Center. DBC also administers training grants to support both graduate students and postdoctoral investigators, and Program Project grants supporting research in multiple laboratories.

The unit sponsors seminars; organizes local, national, and international conferences; and hosts visiting scientists for collaborative research. The results of the work will contribute to understanding normal development and growth control as well as abnormalities that lead to birth defects, cancer, and nervous-system malfunction in the human body. New research programs are helping to identify chemicals in the environment that pose hazards for human development, to develop methods to stimulate the regrowth of tissues and organs, and to produce tissues for reconstructive surgery. Additional information is available on the World Wide Web at http://mamba.bio.uci.edu/~pjbryant/ dbc/index.htm.

GENETIC EPIDEMIOLOGY RESEARCH INSTITUTE

The Genetic Epidemiology Research Institute (GERI) was established in 2004 and brings together scientists from epidemiology, developmental and cell biology, molecular biology and biochemistry, evolutionary biology, genetics, immunology, statistics, bioinformatics, and environmental and behavioral sciences to answer complex questions that can best be explored though an interdisciplinary approach. GERI will (1) combine epidemiologic approaches with basic science methods to test hypotheses related to genetic bases of the etiology and progression of disease; (2) facilitate research to apply newly discovered molecular biological processes and genetic characteristics in health and disease in well-characterized human populations; (3) provide epidemiological information that will influence the understanding of the basic processes leading to disease, such as environmental and lifestyle factors, and to test their effect as modifiers of genetic predisposition, thus providing the foundation for disease prevention; and (4) use advances in information sciences and communication technology to allow for efficient data mining and pattern recognition for genetic epidemiological data.



INSTITUTE FOR BRAIN AGING AND DEMENTIA

The goal of the Institute is to mobilize and unify University resources to discover meaningful ways to prevent decline in brain function with aging prior to its inception and to reverse loss of function once it has occurred. The elusive, yet attainable goal of "successful aging," maintaining functionality in one's later years, is one of the great challenges facing the nation. While many individuals continue to maintain and even improve their intellectual and cognitive skills, others suffer a serious and seemingly irreversible loss of cognitive function and develop dementias, most commonly Alzheimer's disease. The Institute is a fully integrated basic science/clinical research program that operates a Dementia Assessment and Treatment Clinic; a Brain Imaging Acquisition/Analysis Unit; a Tissue Repository for cellular and molecular analysis of the aged and Alzheimer's brain; and a comprehensive database of clinical and research data. Research is multidisciplinary, employing the latest techniques in computer science, artificial intelligence, molecular biology, and neuroscience. The Institute also sponsors a specialized educational track in brain aging and dementia for advanced students who wish to develop a career opportunity in an exciting and expanding field. The Institute is the site of a National Institute on Aging Alzheimer's Disease Research Center and a State of California Department of Health Alzheimer's Disease Research Center.

Faculty from the Departments of Neurobiology and Behavior, Neurology, Radiology, Anatomy and Neurobiology, Molecular Biology and Biochemistry, Microbiology and Molecular Genetics, Cognitive Sciences, and Electrical Engineering and Computer Science; the Donald Bren School of Information and Computer Sciences; and the School of Social Ecology comprise the Institute's core group of investigators.

INSTITUTE FOR GENOMICS AND BIOINFORMATICS

The Institute for Genomics and Bioinformatics (IGB) provides an organizational structure for interdisciplinary research and training in genomics, proteomics, bioinformatics, and computational biology—emerging scientific disciplines that are revolutionizing biology, medicine, and society. IGB computational and life scientists are working together to pioneer fundamental processes for reverse engineering gene and protein networks to understand complex biological systems. Through these interdisciplinary collaborations, IGB scientists are creating new theoretical, algorithmic, and software advances in storing, retrieving, networking, processing, modeling, analyzing, navigating, and visualizing biological information. In turn, their computational and computer science accomplishments are providing methods, predictions, and new hypotheses that are driving biological research in previously unanticipated ways. This scientific cross-fertilization is enriching both fields and will continue to do so in the coming decades. More complete descriptions of the Institute's research and training programs are available on the World Wide Web at http://www.igb.uci.edu/.

INSTITUTE OF GEOPHYSICS AND PLANETARY PHYSICS

The Irvine branch of the Institute of Geophysics and Planetary Physics (IGPP) was established in 2001. IGPP is a University of California Multicampus Research Unit (MRU) established in 1946, with existing branches at UCLA, UCSD, UCR, UCSC, and the Los Alamos and Livermore National Laboratories. The Institute's mission is to promote and coordinate basic research on the understanding of the origin, structure, and evolution of the Earth, the Solar System, and the Universe, and on the prediction of future changes, as they affect human life. The UCI branch's research goals complement the MRU in that the understanding of the Earth as a coupled system of atmosphere, land, and ocean is required to plausibly predict future changes in the Earth System. In order to assess the role of human activities on present and future changes in the global environment, as well as the consequent effects on human life, the UCI branch intends to forge links to other UC campuses as well as the national laboratories. The core of the UCI branch is the Center for Global Environmental Change Research (CGECR), which was established in 1999.

IGPP promotes research at UCI by (1) supporting major research initiatives and facilities jointly with the School of Physical Sciences and the Department of Earth System Science; (2) by supporting research by graduate students; and (3) by supporting visiting scientists, seminars, and workshops that promote collaborative research. Facilities that receive IGPP support include: the W. M. Keck Carbon Cycle Accelerator Mass Spectrometry Facility, the Stable Isotope in Atmospheric Trace Gas Facility, the Earth System Modeling Facility, and the Earth System Science (ESS) Analytical Mass Spectronomy Facility.

INSTITUTE FOR MATHEMATICAL BEHAVIORAL SCIENCES

The Institute for Mathematical Behavioral Sciences fosters research in the application of mathematical models and methods to describe and to better understand human behavior, both individual and social. Mimicking the successful interaction between mathematics and the physical sciences, a goal of the Institute is to generate successful interactions between mathematics and the behavioral and social sciences. The Institute sponsors specialized seminars and colloquia, a visiting scholars program, workshops, and focused research groups of faculty, students, and visitors, and it maintains a Technical Report Series. Participants include faculty from the Departments of Anthropology, Cognitive Sciences, Economics, Logic and Philosophy of Science, Political Science, and Sociology in the School of Social Sciences; the Department of Mathematics in the School of Physical Sciences; the Department of Electrical Engineering and Computer Science in The Henry Samueli School of Engineering; the Donald Bren School of Information and Computer Sciences; and The Paul Merage School of Business. Additional information is available at http://www.imbs.uci.edu.

INSTITUTE FOR SOFTWARE RESEARCH

The mission of the Institute for Software Research (ISR) is to advance software and information technology through research partnerships. ISR is dedicated to fostering innovative basic and applied research in software and information technologies. To achieve this goal, ISR works with established companies, start-ups, government agencies, and standards bodies to develop and transition technologies to widespread and practical application. The

Institute also focuses on educating the next generation of software researchers and practitioners in advanced software technologies. It supports the public service mission of the University of California in developing the economic basis of the State of California.

Technical emphases of the Institute include software architecture, decentralized development and applications, event-based systems, requirements engineering, open-source software development, software processes, computer-supported cooperative work, human-computer interaction, user interface software, information visualization, privacy and security, ubiquitous computing, software understanding, analysis and testing, extensible systems, configuration management, configurable distributed systems, Internet protocols and standards, and software engineering education.

Faculty members are drawn from throughout the University of California. Graduate research assistants, professional research staff, and visiting researchers complete the Institute's research body.

ISR supports research projects, sponsors professional meetings, and develops technology. To further its research agenda, the Institute sponsors a distinguished speaker series, technical roundtables, workshops, symposia, and special events. Effective partnerships with industry are essential for ISR to achieve its goals of technology development and transition. Corporate and institutional sponsorships support ISR's research, activities, and professional meetings.

Additional information is available at http://www.isr.uci.edu/.

INSTITUTE FOR SURFACE AND INTERFACE SCIENCE

The Institute of Surface and Interface Science (ISIS) brings together faculty and researchers in chemistry, physics, engineering, and biological sciences by stimulating collaborative projects of an interdisciplinary nature. The common unifying theme is the prominent role played by surfaces and interfaces between media in controlling processes central to many disciplines. The physicists find new and fundamental issues when the outermost atomic layer or two of matter are explored, the chemist encounters the new forms of bonding and energy transfer which make the catalysts central to the chemical and automotive industry possible, and the materials scientist learns to grow unique new artificial materials with properties not found in nature by bonding to surfaces, and exploiting unique properties of atoms which reside in interfaces. The new field of nanoscience is made possible by the experimental and the conceptual advances made by scientists such as those in the ISIS community. Indeed, ISIS is now a major world center of nanoscience and related matters, exploiting and expanding such advances.

INSTITUTE OF TRANSPORTATION STUDIES

The Institute of Transportation Studies (ITS), a University of California multi-campus organized research unit with branches at Irvine, Davis, and Berkeley, was established by act of the State Legislature in 1947 to foster interdisciplinary research on contemporary transportation issues. ITS research at UCI involves faculty and students from The Henry Samueli School of Engineering, the School of Social Sciences, the School of Social Ecology, The Paul Merage School of Business, and the Donald Bren School of Information and Computer Sciences.

ITS has a long and rich history of providing both direct and indirect support to the UCI transportation graduate programs. It provides office and research space to virtually all of the students enrolled in UCI's four graduate transportation programs—the interdisciplinary Program in Transportation Science; the graduate concentration in Transportation Economics; the Transportation Planning option in the Department of Planning, Policy, and Design; and the Transportation Systems Engineering graduate focus in the Department of Civil and Environmental Engineering. ITS provides extensive computing resources to all of these students, together with state-of-the art simulation and laboratory facilities. ITS subscribes to the major transportation research journals and offers a variety of computer-based information retrieval services.

Research at ITS covers a broad spectrum of transportation issues. Much of the research conducted by the Institute is organized around centers. The Institute is part of the **University of California Transportation Center (UCTC)**, a federally designated center for transportation research that focuses on research in transportations systems and policy. The ITS **Center for Activity Systems Analysis (CASA)** supports research directed toward the development of activity-based approaches to travel behavior analysis. For more than 25 years, **CASA** research associates have been on the leading edge of research in travel demand analysis, establishing an international reputation in the study of complex travel behavior, activity-based approaches, agent-based models, microsimulation approaches, data collection technologies, and empirical modeling. The ITS **Center for Advanced Transportation Management Systems Research**, which is part of the Universitywide PATH (Partners for Advanced Transit and Highways) program, supports research directed toward the development of intelligent transportation systems. The ITS Advanced Transportation Management Systems (ATMS) Laboratories provide facilities for the teaching, research, and development of intelligent transportation systems. This major effort is complemented by the ITS **Center for Traffic Simulation Studies (CTSS)**, which features prototype systems for modeling and evaluating intelligent transportation systems and telematics. The **Center for Logistical Innovations in Freight Systems (CLIFS)** focuses on the development of optimization techniques for dynamic and stochastic freight and fleet management and investigation of the impacts of information technology on logistics operations. The **Center for Urban Infrastructure (CUI)** organizes and conducts research into the role of transportation in achieving and promoting sustainable community development. The Institute also plays a major role in the intelligent transportation and telematics research component of the **California Institute for Telecommunications and Information Technology**, one of the Institutes for Science and Innovation created by the Governor of California.

In addition to projects connected to these centers, ITS researchers are involved in many individual projects across several disciplines. ITS also hosts visiting scholars from the U.S. and abroad to facilitate cooperative research and information exchange, and sponsors conferences and colloquia to disseminate research results.

Irvine Research Units

Irvine Research Units (IRU) provide an organizational structure for the conduct of research that is difficult or infeasible to be carried out within the normal school or departmental structure. IRUs normally are established for a period of five years, and may provide the basis for establishment of extramurally supported research centers or Organized Research Units.

HEALTH POLICY AND RESEARCH

The IRU in Health Policy and Research (HPR) is a multidisciplinary unit that provides an environment for collaboration among health policy researchers at UCI. Its shared research space, seminars, and workshops create an atmosphere of synergistic creativity for faculty, staff, and students from diverse academic backgrounds. Interaction among the members results in innovative multidisciplinary research proposals. HPR's staff assists in the development and submission of the proposals and administration of the contracts and grants that result from them.

HPR has 22 members from four units: The Paul Merage School of Business and the Schools of Medicine, Social Ecology, and Social Sciences. Their areas of expertise include anthropology, biostatistics, community health, epidemiology, family medicine, general internal medicine, geriatrics, psychology, marketing, medical economics, medical education, medical ethics, sociology, pediatrics, and public health. HPR also provides an educational environment for undergraduate and graduate students to learn how to conduct health policy research.

The goals of the IRU are: (1) to facilitate collaboration among UCI faculty participating in health policy research; (2) to disseminate research findings; (3) to provide education and training opportunities to undergraduate and graduate students regarding health policy research; and (4) to support the research efforts through extramural support. Research programs emphasize investigations on health disparities, injury prevention, and health care economics. These programs are multidisciplinary, involving faculty associates from more than one department and/or school.

HEARING AND SPEECH SCIENCES

The IRU in Hearing and Speech Sciences was established in 2000 and consists of a multidisciplinary group of scientists interested in processes underlying hearing and speech. The range of expertise represented in the IRU includes the molecular determinants of neuronal function in the auditory system, the processing of acoustic stimuli by the auditory system, the plasticity of the auditory system, the perception of simple and complex acoustic stimuli, the perception of speech and the neural mechanisms that underlie speech perception, and the perception of speech by hearing-impaired listeners. The clinical populations consist of people who either suffer from an auditory neuropathy or are aided by a cochlear prosthesis.

The IRU consists of 10 faculty members, their graduate students, and postdoctoral scholars. The faculty are from the School of Biological Sciences, the Department of Cognitive Sciences in the School of Social Sciences, and basic science and clinical departments of the School of Medicine. The goals of the IRU in Hearing and Speech Sciences are: (1) to foster interdisciplinary research in these areas; (2) to train graduate students and postdoctoral scholars; and (3) to share information in these areas by inviting notable scientists to lecture at UCI and by hosting an annual workshop consisting of IRU members and scientists from other institutions.

The research conducted under the auspices of the IRU is multidisciplinary. It includes examining physiological mechanisms of hearing impairment, assessing manifestations in the human brain of findings obtained in basic science research, relating speech perception to the plasticity of the auditory system, and examining the physiological mechanisms of the perception of simple and complex acoustic signals.

MACROMOLECULAR STRUCTURE

The IRU in Macromolecular Structure ties together UCI investigators who utilize modern methods of macromolecular structure determination as a critical part of their research program. The IRU serves as the focal point for further development of Structural Biology at UCI. An essential function of the IRU is to coordinate multi-investigator research proposals, graduate student recruitment, seminar programs, and course development. Most recently the IRU has helped to establish and support a new Protein Expression Facility for UCI. The purpose of this facility is to aid UCI investigators in the development of recombinant expression systems in order to produce enzymes and proteins for structural work and other applications.

GRADUATE EDUCATION

With the exception of programs conducted by the School of Medicine for the training of physicians, the Dean of Graduate Studies administers graduate education in accordance with academic policies established by the University of California, the Irvine Division of the Academic Senate, and the UCI Graduate Council, a standing committee of the Irvine Division of the Academic Senate. There is no separate graduate faculty at UCI; all graduate work is supervised by academic units and faculties which have concurrent responsibility for undergraduate education.

Information about graduate education at UCI is published here in the *UCI General Catalogue,* on the Office of Graduate Studies Web site, and in individual graduate program publications. The staff of the Office of Graduate Studies and departmental academic advisors are prepared to answer questions about admission, academic policies and procedures, graduate programs and degrees, financial assistance, student services, and other matters of concern to applicants or graduate students. The Office of Graduate Studies is located in 120 Administration Building; telephone (949) 824-4611; World Wide Web: http://www.rgs.uci.edu/grad.

The University of California believes that a diverse student and faculty population is integral to the advancement of academic excellence. It is critical to promoting the lively intellectual exchange and the variety of ideas and perspectives that are essential to advanced scholarly research and debate. The University is committed to expand student outreach, recruitment, and retention efforts. Through the Office of Graduate Studies' diversity programs, steps are taken to increase the participation of diverse groups of Americans who have been educationally or socioeconomically disadvantaged.

It is the goal of UCI's Office of Graduate Studies to award fellowships to many admitted students based upon merit or financial need. In addition, diversity fellowships for new and continuing graduate students are based on demonstrated scholastic achievement, full-time status, U.S. citizenship, and socioeconomic and educational limitations. Each academic department identifies those students whose scholarship, background, and life experiences can best enhance the level of diversity within a department or discipline.

Admission to Graduate Standing

Applicants for admission to graduate study at UCI must apply for acceptance into a specific graduate program to work toward a specific advanced degree. A general requirement for admission is that the applicant hold the degree of Bachelor of Arts, Letters, Philosophy, or Science (or an acceptable equivalent) from an accredited academic institution with degree standards equivalent to those of the University of California. A minimum undergraduate grade point average of at least B (3.0 on a 4.0 scale) is required.

Each applicant's file is comprehensively evaluated by the admissions committee of the applicant's specific graduate program on the basis of such factors as academic subject preparation, scholarship, letters of recommendation, test scores, and examples of previous work. One critical evaluative question is whether the applicant's academic objectives can reasonably be satisfied by a particular graduate program on this campus. Please note that the University of California does not have the capacity to accommodate all applicants who meet the minimum admission requirements.

Application Procedures

HOW TO APPLY

Prospective students should apply online using the *Application for Graduate Study* available at http://www.rgs.uci.edu/grad/. Detailed instructions are included in the electronic application.

For additional information, send e-mail to ogs@uci.edu or call (949) 824-4611.

The mandatory application fee is $60 ($80 for international students) and is not refundable under any circumstances. (Please note, however, that the application fee for The Paul Merage School of Business is $110.) Payment instructions are provided in the electronic application as well as on the Office of Graduate Studies Web site. Financial-need-based application fee waivers may be available for a few domestic (American citizen or permanent resident) applicants.

WHEN TO APPLY

For all graduate programs, applications should be completed and submitted by January 15 to receive full consideration for any financial support. Some academic units may accept applications for winter or spring quarter admission for which deadlines are October 15 and January 15, respectively. In order to process applications in time for the applicant to receive full consideration, letters of recommendation, official transcripts, and official test scores must be received before the published deadlines. Some schools and departments have earlier or later deadlines for filing the application. Applicants should consult their prospective department or school for detailed information. Contact information for the schools and departments may be obtained by visiting the online directory at http://www.rgs.uci.edu/grad/contact/prgm_dir.htm.

Required Supporting Documents

LETTERS OF RECOMMENDATION

Applicants should arrange to have three letters of recommendation forwarded directly to their prospective academic department or program. Recommendation forms are available for downloading at http://www.rgs.uci.edu/grad/. Only one set of three recommendation letters needs to be submitted in support of an application for admission and fellowship or assistantship consideration. It is important that letters of recommendation be completed by professors or instructors in disciplines related to the proposed course of study who are in a position to analyze an applicant's abilities and academic promise.

GRADUATE RECORD EXAMINATION (GRE) SCORES

All applicants are required to take the Graduate Record Examination (GRE) General Test, with the following exceptions: (1) The Paul Merage School of Business requires that M.B.A. applicants take the Graduate Management Admission Test (GMAT), and (2) the only M.F.A. program that requires the GRE General Test for admissions consideration is the M.F.A. program in Arts Computation Engineering. Several programs also require, or strongly recommend, that an applicant report the score of a GRE Subject Test. There is no minimum GRE score. Applicants should register for either the October or December test dates to ensure the timely receipt of their score results for admission consideration. A computerized version of the GRE is now offered year-round. The standard written GRE is administered in 96 countries. In addition, several administrative service tests are given each year in major U.S. cities (dates vary). Applications for the GRE, as well as information about computerized GRE test center locations, is available from the Educational Testing Service, P.O. Box 6000, Princeton, NJ 08541-6000, or online at http://www.gre.org/.

DOMESTIC ACADEMIC RECORDS

Domestic applicants should request that official transcripts be forwarded *directly* to their prospective academic department or program. Two complete sets of official records covering all post-secondary academic work attempted, regardless of length of attendance, are required. Two official sets of transcripts must also be submitted by applicants who attended or graduated from any University of California campus, including UC Irvine. Applicants with academic work in progress must expect to complete their undergraduate degree programs before the intended date of enrollment at UCI and must submit evidence of degree conferral before officially enrolling.

FOREIGN ACADEMIC RECORDS

Official records from overseas institutions should be sent *directly* to the prospective academic department or program at UCI. Records of academic study from foreign institutions must be official, bearing the original signature of the registrar and the seal of the issuing institution. Applicants should not send the original of an academic record which cannot be replaced; they should obtain instead properly certified copies. Unless academic records and diplomas are issued in English by the institution, the official records in their original language must be submitted with an authorized, complete, and exact English translation. Foreign academic records must be in duplicate and include all subjects or courses taken on a yearly basis, together with the units of credit or time allotted to each subject each term or year and the marks or ratings in each subject or examination passed. In all cases the institutional grading scale or other standard of evaluation, including maximal passing and failing marks and definition of grades between them, should appear on official records or as an official attachment. Official evidence of degree conferral must also be supplied, together with evidence of rank in class if available.

TEST OF ENGLISH AS A FOREIGN LANGUAGE (TOEFL)

Applicants whose primary language is not English are required to submit TOEFL scores for admission consideration. However, the TOEFL requirement will be automatically waived for applicants who have received an advanced degree (i.e., higher than a bachelor's degree) from a U.S. college or university.

In addition to the paper-based TOEFL test, a computer-based TOEFL test is now available. Please note that the scales used for scores for the two tests are significantly different. For the paper-based test, a score of 550 or better is required for admission consideration. For the computer-based test, a score of 213 or better is required. (The Paul Merage School of Business requires a minimum paper-based test score of 600, or 250 for the computer-based test.)

The paper-based TOEFL test should be taken at the earliest available date to allow scores to be reported in time to meet application deadlines. Score results from the computer-based test are available much more quickly. Results of institutional administrations of the TOEFL or test results which are more than two years old are not acceptable. Applicants must ask the Educational Testing Service to forward scores directly to the UCI Office of Graduate Studies (Code #4859).

Information about the TOEFL is available from the TOEFL/TSE Services, Educational Testing Service, P.O. Box 6151, Princeton, NJ 08541-6151, USA; World Wide Web: http://www.toefl.org/.

ORAL ENGLISH PROFICIENCY EXAMINATION

All international and permanent resident applicants who are not citizens of countries where English is either the primary or dominant language as approved by the UCI Graduate Council, and who expect to serve as a Teaching Assistant or Teaching Associate, must pass either the Test of Spoken English (TSE), administered by the Educational Testing Service (ETS), or the UCI Campus SPEAK (Speaking Proficiency English Assessment Kit) examination administered by the UCI Humanities Instructional Resources Center (HIRC) as the institutional alternative to the TSE. A minimum score of 50 on either test is required in order to be appointed. Graduate students are responsible for ensuring that the UCI Office of Graduate Studies is notified directly by ETS or HIRC of their passing score prior to beginning their appointment as a Teaching Assistant or Teaching Associate. There is no exception to this requirement. Please note that many UCI degree programs require students to serve as a Teaching Assistant for training purposes as a graduation requirement. UCI encourages prospective students to take the TSE, if possible, prior to application/admission.

The TSE is given 12 times per year at test centers around the world. Information is available from TOEFL/TSE Services, Educational Testing Service, P.O. Box 6151, Princeton, New Jersey 08541-6151, or online at http://www.toefl.org/. Detailed information on all English proficiency tests is available on the Office of Graduate Studies Web site at: http://www.rgs.uci.edu/ grad/students/esl_tests.htm.

SPECIAL NOTE TO FOREIGN APPLICANTS

If admitted, foreign applicants will be required to certify that they possess sufficient funds to cover all fees, transportation, and living expenses for the first year of their studies at UCI. A Confidential International Applicant Questionnaire for the purpose of verifying the amount and source of funds available for graduate study will be forwarded to foreign applicants upon admission to graduate study. The required financial verification must be provided before visa forms can be issued.

Admission and Registration

A formal notice of the admission decision is sent to each applicant as soon as possible after the application and complete records are received, and after the department has made a recommendation. The official notification will be mailed well in advance of the beginning of the quarter for which application has been made.

Admission to graduate standing does not constitute registration for classes. A student is not officially registered for classes until the entire registration procedure is completed each quarter, including payment of registration and other fees and enrollment in courses. Information on registration dates and procedures will be mailed to new applicants prior to the registration cycle. Extensive information for newly admitted students is available online at http://www.rgs.uci.edu/grad/newadmits/index.htm.

If an applicant wishes to defer admission to a later academic quarter (up to a maximum of three quarters after the original quarter of admission), the Office of Graduate Studies must be notified of the request in writing. After formal admission has been offered, the request for deferral must also be approved by the academic program to which the applicant was admitted.

Limited Status

Applicants who wish to undertake graduate study at UCI after the award of the bachelor's degree, but whose proposed study is not within a graduate degree program, are ordinarily admitted under Limited Status. University of California academic regulations provide for the admission of students to Limited Status for two purposes: (1) to pursue a specific academic program which does not lead to an advanced degree; or (2) to prepare for admission to a graduate or professional program by enrolling for a prescribed set of courses (usually undergraduate courses).

The general requirements for admission to Limited Status are the same as those for graduate admission, with the exception that Graduate Record Examination scores are not required.

The Dean of Graduate Studies may offer admission to Limited Status upon the recommendation of an academic unit, which has agreed to oversee the student's program. Limited Status students may enroll in graduate courses, but courses taken while in Limited Status will not satisfy residency or minimum graduate-level course requirements for any UC graduate degree program to which the student may eventually be admitted. Admission to Limited Status is ordinarily for a period of no more than three quarters (one academic year) and does not imply admission to graduate study at some later date.

The Application for Admission to Limited Status includes a nonrefundable Application Fee of $60. The application deadline for Limited Status is the same as the deadline for application to graduate study. Persons who wish to apply directly for Limited Status should first consult the Academic Dean, Director, or Chair of the academic program with which the applicant wishes to affiliate. An academic unit must recommend admission, define the prescribed course of study, and provide academic advising.

Academic Advising

In each academic unit with an advanced degree program, there is at least one formally appointed faculty graduate advisor or director of graduate studies. The graduate advisor is a regular faculty member responsible for supervising graduate study in that unit, for monitoring the academic progress of graduate students, and for seeing that each graduate student is assigned a faculty advisor. The graduate advisor plays a key role in the academic lives of graduate students, advising students and other faculty members about program requirements and the academic policies pertaining to graduate students, approving study lists, and evaluating academic petitions. In many academic units the graduate advisor is instrumental in the nomination of students for fellowship support, the selection of students for assistantship and fellowship appointments, and in the supervision of graduate student teachers. In most schools there also is an associate dean for graduate studies who coordinates many of the functions which affect graduate students within that school. Both graduate advisors and deans are important links between the student and the Dean of Graduate Studies.

Most graduate students also will have an individual faculty advisor or advising committee after the first year of graduate study. When a student is advanced to candidacy for the Ph.D., the doctoral committee becomes the primary source of academic guidance; however, student academic petitions still must be approved by the faculty graduate advisor.

Academic Policies

The academic policies described here apply to students enrolled in study leading to graduate degrees and California education credentials. Other regulations and procedures are covered in the Academic Regulations and Enrollment and Other Procedures sections, and in the description of each graduate program.

SCHOLASTIC REQUIREMENTS

A graduate student is expected to make satisfactory progress toward an approved academic objective, as defined by the faculty of the program in accordance with policies of the Graduate Council, and to maintain a satisfactory grade point average for all work undertaken while enrolled in graduate study. Satisfactory progress is determined on the basis of both the recent academic record and overall performance. A graduate student normally is expected to complete satisfactorily at least eight units of academic credit applicable to the graduate program in each regular academic session (unless on an approved leave of absence), and satisfy all requirements of the academic program according to an approved schedule. For a graduate student, only the grades A+, A, A-, B+, B, and S represent satisfactory scholarship and may be applied toward advanced degree requirements. However, a UCI course in which a grade of B- is earned may be accepted, via a formal petition process, in partial satisfaction of the degree requirements if the student has a grade point average of at least 3.0 in all courses applicable to the degree. Graduate students may not apply courses graded Pass/Not Pass toward any degree or satisfactory progress requirements. A grade point average below the B level (3.0 on a

4.0 scale) is not satisfactory, and a student whose grade point average is below that level is subject to academic disqualification.

A student's academic progress ordinarily is evaluated on the basis of the academic record. A few weeks after the end of a quarter, an updated copy of each enrolled student's permanent academic record is available from the Registrar. This record lists all UCI courses for which a graduate student was enrolled (including courses taken through the Intercampus Exchange Program), the grades assigned, and the cumulative grade point average. This record also includes formal candidacy for an advanced degree, degrees conferred, certain examinations passed, unit credit accepted from other institutions, and other important academic information.

A graduate student who has not demonstrated satisfactory academic progress is not eligible for any academic appointment such as Reader, Tutor, Graduate Student Researcher, Teaching Associate, or Teaching Assistant, and may not hold a fellowship or other award which is based upon academic merit.

SATISFACTION OF DEGREE REQUIREMENTS

To graduate, students must satisfy the degree requirements outlined in the *Catalogue* that is in effect at the time they are admitted to a graduate program. If the degree requirements are subsequently revised, the academic unit may, where appropriate, give students the option to meet the new requirements instead. A student who withdraws from a program, or loses student status for other reasons for one or more quarters, will be bound by the degree requirements in effect at the time of readmission unless otherwise stipulated and agreed to in writing by the academic unit and approved by the Dean of Graduate Studies. A student who defers admission or who changes to another program will be held to the requirements in effect at the time of first registration.

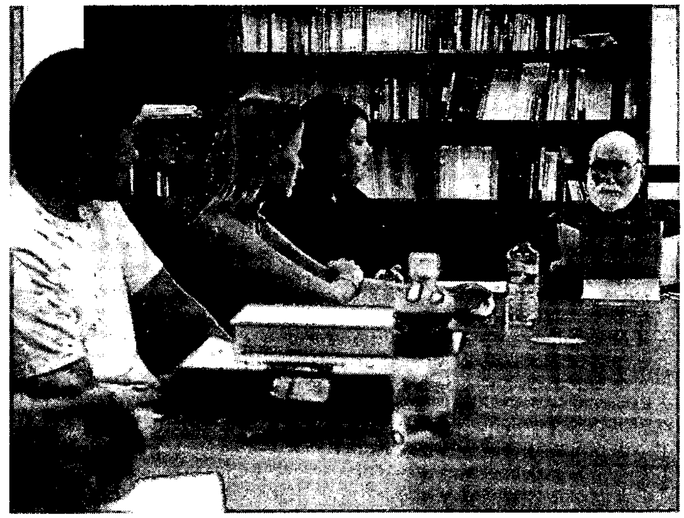
GRADING

With the consent of the academic units involved, and upon approval by the Graduate Council, individual study and research courses at the graduate level may be graded Satisfactory or Unsatisfactory (S/U). Also, with the approval of the Graduate Council certain graduate courses are graded S/U only. A grade of S is assumed equivalent to a grade of B (3.0) or better. No course credit is given to a student for a course in which a grade of U is received.

Graduate students may take one undergraduate course (up to four units) per quarter on a Pass/Not Pass basis. However, such courses are not considered part of the student's graduate program and are not applied toward the requirements for an advanced degree.

The grade of Incomplete (I) may be assigned by an instructor when the student's work is of passing quality but is incomplete because of circumstances beyond the student's control. Although Incomplete grades do not affect a graduate student's grade point average, they are an important factor in evaluating academic progress. The maximum amount of time that an instructor may allow for making up incomplete work is three quarters of enrollment but stricter limits may be applied. When work is completed within the time allowed, the student should ask the instructor to submit a change-of-grade notice to the Registrar, through the dean of the school in which the course was offered. If not made up within the time allowed, an I grade is recorded permanently. (Students who have not been continuously enrolled should contact their graduate advisor for information about completion of incomplete grades.)

IP (In Progress) is a transcript notation restricted to sequential courses extending over two or more quarters for which use of the IP notation has been approved. When the last quarter of the sequence is completed, the grade for the final quarter is assigned for all quarters of the sequence. No credit is given until the student has completed the entire sequence.



A student who received an NR (No Report) transcript notation must immediately contact the instructor and arrange for the removal or replacement of the NR. If no action is taken by the end of the first quarter following the quarter in which the NR was assigned, or by the end of the quarter immediately preceding award of the degree, whichever comes first, the NR becomes an F, U, or NP and will remain permanently on the student's record.

A graduate student may repeat once a course in which a grade below B (3.0) or a grade of U was received. Only the most recently earned grade is used in computing the student's grade point average for the first eight units of repeated work; thereafter both the earlier and the later grades are used.

Additional information about grading may be found in the Academic Regulations section.

LANGUAGE POLICY FOR EXAMINATIONS AND THESES/DISSERTATIONS

English is to be the language of instruction and examination for graduate courses at UCI, unless the subject matter includes foreign language content. Similarly, examinations that satisfy specific degree requirements, such as qualifying/candidacy examinations and thesis/dissertation defenses will be conducted in English, except for the portions of the examination where the subject matter makes a different language specifically appropriate. (Examples include foreign language literature, linguistics, and others.)

Students must seek permission to write their thesis/dissertation in a language other than English. To do so, immediately after advancement to candidacy, the candidate must submit to the Dean of Graduate Studies a letter approved by the thesis/dissertation chair, committee, and department chair. All members of the candidate's thesis/dissertation committee must have a reading knowledge of the language presented in the thesis/dissertation. There must be legitimate reasons for substituting English with a foreign language such as subject matter, special primary audience, publication arrangements, academic position in a foreign country, historical or literary value, or principal language(s) used in the documents to be analyzed and interpreted. **Inability to write in English is not a valid reason.** If the thesis or dissertation is approved to be written in a foreign language, the candidate must submit two abstracts. One must be in English. The other must be written in the language of the thesis or dissertation. Moreover, the thesis/dissertation defense will be conducted in English, except as determined by subject matter. See the *UCI Thesis and Dissertation Manual* for information about the preparation of manuscripts (http://www.lib.uci.edu/libraries/collections/special/thesis/tdmanual.html).

ACADEMIC DISQUALIFICATION

After consultation with the student's academic unit, the Dean of Graduate Studies may disqualify a student who has a grade point average in graduate and upper-division courses below 3.0 for two or more successive quarters; or fails to pass (or does not take) a required examination or course within the time specified for that graduate program; or does not maintain satisfactory academic progress toward completion of an approved program of study.

Unsatisfactory academic progress may be determined on the basis of explicit requirements, but the professional judgment of the faculty upon review of all graduate work undertaken by the student is paramount. Ordinarily, a student whose work does not meet academic standards will be given written notice and a reasonable period of time in which to make up all deficiencies.

Prior to taking final action to disqualify, the Dean of Graduate Studies ordinarily will notify a student who is subject to academic disqualification and will provide reasonable opportunity for the student to correct erroneous or outdated academic records, to submit other information or comments in writing, or to request a second review of his or her academic performance.

Upon written notice of academic disqualification by the Dean of Graduate Studies, disqualification will be noted on the formal academic record of that student. Following the formal notice of disqualification, the student may appeal to the Dean of Graduate Studies only on the basis of procedural error.

ACADEMIC RESIDENCE

A graduate student is considered to be in residence during an academic quarter if at least four units of academic credit are earned in regular upper-division or graduate courses. Credit for one academic quarter of residence may also be earned by completing at least two units of credit in approved courses in each of two six-week summer sessions, or four units of credit in an eight- or ten-week summer session. In the case of Ph.D. students, these must be consecutive sessions.

ENROLLMENT POLICY

Full-time academic enrollment is expected of graduate students at the University of California. Study for the Ph.D. requires a full-time commitment from the doctoral student. Full-time study is defined as enrollment in at least 12 units of upper-division or graduate academic credit per quarter, including credit for supervised research or teaching. Graduate students may enroll in lower-division courses with the approval of their academic advisors, but such courses are not considered to be part of any graduate program.

Graduate students ordinarily may not receive credit for more than 12 units per quarter in graduate courses, or 16 units in upper-division courses, or a proportionate number in combination. Course loads in excess of 16 units must be approved in advance by the student's Graduate Advisor and the Dean of Graduate Studies.

Although in most instances completion of an advanced degree at UCI requires full-time study, the University recognizes the legitimate need for part-time study opportunities and is committed to providing those opportunities wherever possible. Graduate degree programs may be opened to part-time students wherever good educational reasons exist for so doing. In general, part-time status is available in master's and credential programs where part-time study has been judged academically feasible by faculty and approved by the Graduate Council. However, on the recommendation of the academic unit, students admitted to a Ph.D. program *may* be approved by the Dean of Graduate Studies for part-time status on an *ad hoc* basis. Under this policy, part-time enrollment at the graduate level is defined as enrollment for eight units or less. Within the guidelines and limitations noted on the application form available on the Office of Graduate Studies Web site, graduate students may petition for part-time status for a maximum of three consecutive quarters and, if the petition is approved, shall pay the full University Registration Fee and student activities fees, one-half the Educational Fee, and if applicable, one-half the Nonresident Tuition Fee and one-half the Professional School Student Fee.

CONTINUOUS REGISTRATION

A graduate student is expected to register for each regular academic session (fall, winter, and spring quarters) until all requirements for an advanced degree or credential have been completed, including final examinations and the submission of an approved thesis or dissertation. Registration is not official or complete until all required fees have been paid and the student has enrolled in classes. Students are responsible for ensuring that their course enrollment is correct.

A student engaged in study or research outside the State of California for an entire quarter ordinarily will be required to register in absentia. Unless an official leave of absence has been granted, or a petition to pay the Filing Fee in lieu of registration has been approved by the Dean of Graduate Studies, a student who does not register by the final deadline for any regular quarter will lose graduate standing (i.e., the individual's status as a graduate student will lapse), and candidacy for any advanced degree will lapse. Prior to resuming graduate study in the University, a former student must successfully apply for readmission. If readmitted, the student must satisfy the academic requirements in effect at the time of readmission and may be required to satisfy certain requirements a second time, including those for formal advancement to candidacy. A readmitted student must register and then be advanced to candidacy at least one quarter before receiving an advanced degree. A degree cannot be conferred earlier than the second quarter following readmission.

A graduate student who decides to leave the University after enrolling and paying fees for a quarter must file an official Notice of Withdrawal or Cancellation with the Dean of Graduate Studies. A graduate student in good academic standing who withdraws from graduate study and intends to return within one year may submit an application for a leave of absence. If the leave is approved, the student remains in good standing and need not apply for readmission in order to enroll at the expiration of the leave period.

LEAVE OF ABSENCE

A graduate student who withdraws from the University with the intention of returning within one year and wishes to avoid a lapse of student status should request a leave of absence. A leave of absence of up to one year's duration may be granted by the Dean of Graduate Studies upon the recommendation of the student's academic unit, subject to the following guidelines:

1. The student must have completed satisfactorily at least one quarter in residence and be in good academic standing. The leave must be consistent with the student's academic objectives.
2. Leave ordinarily is approved in cases of serious illness or other temporary disability, or temporary interruption of the student's academic program for other appropriate reasons.
3. A student on leave is not eligible for assistance from a University fellowship, research grant, or financial aid program, and may not hold an academic appointment or be employed by the University in any capacity. During a period of leave, a student may not take comprehensive or qualifying examinations or earn academic credit (except by a transfer of credit from another institution approved in advance by the Dean of Graduate Studies). University resources and facilities, including housing, are ordinarily unavailable to students on leave.

4. A student failing to register for the next regular academic session following the expiration of leave will lose graduate standing and will be subject to the following readmission policy.

READMISSION

A student who previously withdrew from the University, or whose student status has lapsed, may request readmission to graduate study by submitting a new *Application for Graduate Study* with the nonrefundable $60 fee ($80 for International students). The Dean of Graduate Studies may grant readmission when recommended by the academic unit. If readmitted, a student's previous academic work will be applied toward the requirements for an advanced degree only with the approval of the graduate advisor and the Dean of Graduate Studies. A readmitted student must satisfy the academic requirements in effect at the time of readmission and may be required to satisfy certain requirements a second time, including those for formal advancement to candidacy. A readmitted student must register and then be advanced or reinstated to candidacy at least one quarter before receiving an advanced degree, which will be conferred no earlier than the second quarter following readmission.

INTERCAMPUS EXCHANGE PROGRAM

A graduate student in good standing who wishes to take advantage of educational opportunities available only at another campus of the University of California may do so through the Intercampus Exchange Program. Ordinarily, an exchange student will have demonstrated a high level of scholarship during at least one quarter of graduate study at the home campus and will have well-defined academic objectives. Approval of the faculty advisor, the host department(s), and the respective Deans of Graduate Studies is required. Direct arrangements between faculty members on the two campuses are encouraged so as to ensure that courses, seminars, or facilities will be available to meet the participating student's needs. Students may take courses on more than one campus of the University in the same academic session.

The exchange student enrolls and pays fees on the home campus and then enrolls at the host campus, following the procedures of that Registrar's Office. A report of academic work completed will be transferred to the student's academic record on the home campus after the term has ended. Although eligible for all normal student services, the exchange student is a visitor and is not formally admitted to graduate study at the host campus. Application forms for the Intercampus Exchange Program may be downloaded from the Office of Graduate Studies Web site at http://www.rgs.uci.edu/grad/students/forms.htm and should be filed with the Office at least four weeks before the beginning of the quarter in order to avoid penalties.

TRANSFERS OF CREDIT

At least one-half of the course requirement for a master's degree must be completed while in residence as a graduate student at UCI. Credit for up to one-fifth of the minimum number of units required for a master's degree may be allowed for graduate-level work completed at another institution or through University Extension prior to first graduate enrollment at UCI. Such courses do not count toward the required number of units in 200-series courses. Up to one-half the units required may be accepted from another graduate division of the University of California. After enrollment, the student must initiate a formal petition for such credit and submit an original transcript. The acceptance of unit credit earned in another program must be recommended by the academic unit to which the student has been admitted and be approved by the Dean of Graduate Studies. No units of transfer credit will be given for any course in which a grade below B (3.0) or equivalent was assigned. Under no circumstances will grade credit be transferred.

A student currently enrolled in a master's degree program or on a leave of absence may receive unit credit (not grade credit) for graduate-level work completed at another institution or through University Extension only with the prior approval of the departmental graduate advisor and the Dean of Graduate Studies. No transfer credit will be given for any course in which a grade below B or equivalent is received.

A student who begins graduate study at UCI in the fall quarter will receive appropriate credit for courses taken in preceding UCI summer sessions, provided that the formal date of admission precedes summer session enrollment. Continuing graduate students will receive credit for courses taken in intervening UCI summer sessions.

Graduate Degrees

MASTER'S DEGREES

The master's degree is conferred at the end of the academic quarter in which all requirements have been satisfied, subject to the final approval of the Graduate Council. The student must be advanced to candidacy for the degree prior to the beginning of the final quarter of enrollment. Therefore, an application for advancement to candidacy, initiated by the student and approved by the academic unit, should be submitted to the Dean of Graduate Studies at least 30 days before the opening of the quarter in which the degree is expected.

The Master of Arts (M.A.) or Master of Science (M.S.) degree normally is attained by one of two routes: Plan I, the thesis option; or Plan II, the comprehensive examination option. Both require a minimum of one year in residence, satisfactory completion of prescribed course work, and an appropriate demonstration of achievement. Plan I includes a minimum of seven courses (28 units), 20 units or more of which must be at the graduate level; a thesis; and a general examination. Plan II requires at least nine courses (36 units), including 24 units or more at the graduate level, and a comprehensive examination covering a broad range of subject matter in the discipline. Only approved 200-series courses completed while in residence at the University satisfy the minimum graduate course requirement. Some programs will have course requirements exceeding the minimums cited above and may have additional or alternative degree requirements. Please refer to the description of the specific program for more information.

Master of Fine Arts (M.F.A.) degrees are awarded by the Claire Trevor School of the Arts (M.F.A. in Dance, Drama, Fine Arts, Music, or Studio Art) and by the Program in Creative Writing (M.F.A. in English) upon successful completion of the equivalent of two years or more of full-time study with an emphasis upon creative expression and professional development. Special thesis or comprehensive examination requirements are established for these programs.

Master of Arts in Teaching (M.A.T.) degrees are awarded upon successful completion of programs designed for the professional development of elementary and secondary school teachers. A minimum of one year in residence is required, usually including summer session course work. A thesis project or other comparable evidence of professional attainment is part of each M.A.T. program.

Master of Business Administration (M.B.A.) degrees are awarded by The Paul Merage School of Business upon successful completion of the equivalent of two years of full-time study in the development of professional managerial skills.

Master of Advanced Study (M.A.S.) degrees are awarded by the School of Social Ecology in Criminology, Law and Society upon successful completion of 52 units of course work in the broad areas of criminal justice, including corrections, probation, criminal prosecution, defense, and civil law. The program is fully online with the exception of a required one-week in-residence course during the first fall quarter.

Master of Urban and Regional Planning (M.U.R.P.) degrees are awarded by the School of Social Ecology upon successful completion of the equivalent of two years of full-time study in contemporary methods of planning and policy analysis.

DOCTOR OF PHILOSOPHY DEGREE

The Doctor of Philosophy (Ph.D.) degree is awarded on the basis of evidence that the recipient possesses knowledge of a broad field of learning and expert mastery of a particular area of concentration within it. The research dissertation is expected to demonstrate critical judgment, intellectual synthesis, creativity, and skill in written communication.

Students are required to advance to candidacy for the doctorate, and to complete all requirements for the doctoral degree, within the normal time specified by the individual graduate program. Students who fail to complete the degree within the normal time limit for their program shall be deemed as not making satisfactory academic progress, and will not be qualified to continue to receive non-instructional University resources (e.g., financial aid, teaching assistantships, student housing). Normal time-to-degree parameters for each doctoral program are indicated in the academic unit sections of this *Catalogue*.

The candidate for the Ph.D. is expected to be in full-time residence for at least six regular academic quarters. Four to six years of full-time academic work beyond the bachelor's degree typically is required to complete the degree. At the end of the first year or so of full-time study, many programs administer a preliminary examination on the student's mastery of fundamental knowledge in the discipline. Upon successfully demonstrating a high level of scholarship on this examination and after further study, the student will continue to a series of qualifying examinations which lead to formal advancement to candidacy for the Ph.D.

Graduate students ordinarily attain candidacy status for the Ph.D. degree when all preparatory work has been completed, when qualifying examinations have been passed, and when they are ready for the dissertation phase. Students are recommended for advancement to candidacy by unanimous vote of the candidacy committee appointed by the academic unit on behalf of the Graduate Council. The Report of the Ph.D. Candidacy Committee (Form I) must be signed by the committee at the time the candidacy examination is concluded and submitted to the Dean of Graduate Studies. Following a unanimous favorable vote of the committee, the student will be advanced to candidacy upon payment of the $65 Candidacy Fee. Candidacy for the Ph.D. will lapse automatically if the student loses graduate standing by academic disqualification or failure to comply with the University policy on continuous registration. A readmitted student who was a candidate for the Ph.D. must again advance to candidacy and thereafter enroll as a candidate for at least one academic quarter before the Ph.D. may be conferred.

Following advancement to candidacy for the Ph.D., a doctoral committee appointed by the academic unit chair (on behalf of the Dean of Graduate Studies and the Graduate Council) supervises the student's program, approves the dissertation, and conducts the final oral examination if required. The chair of the doctoral committee is the member of the faculty responsible for providing primary guidance of the student's dissertation. Ordinarily, the final examination will be given just prior to completion of the dissertation and while the student is in residence during a regular academic session, and will be open to all members of the academic community. All student committees must conform to policy approved by the Graduate Council in effect at the time of examination. Ph.D. degrees are conferred, subject to the final approval of the Graduate Council, as of the last day of the regular academic quarter in which all requirements have been satisfied.

DOCTOR OF EDUCATION DEGREE

The Doctor of Education (Ed.D.) degree is awarded by UCI in conjunction with several California State University campuses. Refer to the Department of Education section of this *Catalogue* for more information, including normal time to advancement and normal time to degree for this program.

THESES AND DISSERTATIONS

Candidates for the Ph.D., Ed.D., and certain master's degrees must conduct an extensive research project and submit a dissertation or thesis in order to fulfill degree requirements. Research expenses are not supported by the University, and the cost of preparing the dissertation or thesis ordinarily ranges from $200 to $1,000, but may be considerably more.

After approval by the doctoral or thesis committee appointed for each candidate by the academic unit, on behalf of the Graduate Council, two copies of the dissertation or thesis must be filed for placement in the UCI Library and automatically become available for public access. The final copy must meet the University's requirements for style, format, and appearance before the degree can be conferred. A thesis and dissertation manuscript preparation manual is available online at http://www.lib.uci.edu/libraries/collections/special/thesis/tdmanual.html. All doctoral students are required to submit an Exit Survey and a Survey of Earned Doctorates prior to the awarding of their degree.

Dissertations and theses must be filed by the deadline published on the Office of Graduate Studies Web site (http://www.rgs.uci.edu/grad/students/forms/filing_deadlines.pdf) in order for them to be reviewed and accepted in time for the degree to be conferred in that quarter.

Those students who complete requirements and submit theses/dissertations after the end of the tenth week of classes and prior to the start of the subsequent quarter will earn a degree for the following quarter, but *will not* be required to pay fees for that quarter. Please note that in order to avoid payment of fees, manuscripts, all forms, and degree paperwork must be submitted prior to the first day of the quarter in which the degree is to be earned.

THE FILING FEE

Under certain circumstances, a student who has advanced to candidacy for a graduate degree may be eligible to pay a Filing Fee equal to half of the Registration Fee in lieu of registration, subject to the approval of the Dean of Graduate Studies. International students who wish to go on Filing Fee status must, in addition, secure approval to do so from UCI's International Center. In general, all requirements for a degree must have been satisfied prior to the start of the quarter, except for the submission of the final version of the dissertation or thesis, or the completion of a final oral or comprehensive examination. A student on Filing Fee status may not make use of any University resource, hold any academic appointment, or receive any student service for which official registration and payment of regular fees is a requirement. A Filing Fee will not be accepted immediately following readmission nor immediately following a leave of absence except under exceptional circumstances. The date for payment of the Filing Fee is the same as that for the payment of other student fees. If all degree requirements are not completed during the quarter in which the Filing Fee is paid, the student must subsequently register and pay all applicable fees.

NONRESIDENT TUITION

Nonresident doctoral students who have advanced to candidacy are eligible for a 75 percent reduction in the annual nonresident tuition fee for a maximum of three consecutive calendar years including time on leave of absence. Reduced nonresident tuition begins with the first academic term following advancement to candidacy, and is based on the prevailing tuition rate for the year it is applied. Any nonresident student who continues to be enrolled, or who re-enrolls following the three-year maximum allowance, will be charged the full nonresident tuition rate that is in effect at that time of enrollment.

CONFERRAL OF GRADUATE DEGREES

Prior to the beginning of the quarter in which an advanced degree is to be conferred, the student must have advanced to candidacy for that degree and should have received formal notice confirming candidacy from the Dean of Graduate Studies. The student should consult the departmental faculty graduate advisor to determine which degree requirements, if any, have not yet been satisfied.

Students are advised by mail when their diplomas are available, which is approximately six months after the quarter in which the degrees are awarded.

Financial Assistance for Graduate Students

Several types of financial assistance are available to graduate students at UCI. These include fellowships, teaching and research assistantships, tuition fellowships for nonresident students, grants-in-aid, and student loans.

All domestic graduate students are encouraged to submit the *Free Application for Federal Student Aid* (FAFSA) each year to access state and federal grants and loans. It is available online at http://www.fafsa.ed.gov or in the Office of Graduate Studies and in the Office of Financial Aid and Scholarships after January 1, with a submission deadline of March 2 each year. The Financial Aid section in this *Catalogue* and the *Financial Aid Handbook* (http://www.ofas.uci.edu/) contain information about assistance based upon financial need that is administered by the Office of Financial Aid and Scholarships.

Applicants interested in assistantships or fellowships should so indicate on their application when applying for admission. Applications for graduate admissions should be completed by January 15 to receive full consideration for fellowship and assistantship awards. Continuing students interested in an assistantship or fellowship should contact the graduate advisor for their academic program. The awarding of fellowships to incoming students for the following academic year begins in the winter quarter.

UCI subscribes to the agreement of the Council of Graduate Schools of the United States, under which successful applicants for awards of financial support are given until April 15 to accept or decline such awards. An award accepted from one of the member universities may be resigned at any time through April 15. However, an acceptance given or left in force after that date commits the student to not accepting another appointment without first obtaining formal release for that purpose from the awarding institution.

Regents', UCI Chancellor's Fellowships, and other merit-based fellowships are awarded by some schools to a number of promising students entering graduate study at UCI leading to the Doctor of Philosophy or Master of Fine Arts degree. Awards may include a stipend, all required student fees, and, if applicable, Nonresident Tuition. Other fellowships are offered, including tuition awards for outstanding applicants who are not residents of California. In many cases, fellowship stipends may be supplemented by partial assistantship appointments. Fellowship awards are typically made by the student's academic unit.

Entering or continuing graduate students may be awarded research or teaching assistantships for all or part of the academic year. The types of assistantships, number available, and required duties vary according to the activities of the academic unit. A graduate assistant who is not a California resident also may receive a tuition fellowship. While enrolled as a graduate student at UCI, students are limited in their employment with the University to no more than 50 percent time.

Through the Office of Graduate Studies' diversity programs, a number of diversity fellowships are awarded to entering and continuing domestic graduate students who may have been disadvantaged in higher education. Departments nominate candidates on the basis of their merit and contribution to the diversity of the department or discipline, as well as demonstrated scholastic achievement, full-time status, and U.S. citizenship. Individuals from diverse cultural, geographic, and socioeconomic backgrounds are especially encouraged to apply to UCI's graduate programs. In conformance with State law, applicants may not be given preferential treatment on the basis of race, ethnicity, gender, religion, or national origin.

CLAIRE TREVOR SCHOOL OF THE ARTS

Nohema Fernández, **Dean**

Arts Student Affairs
101 Mesa Arts Building; (949) 824-6646
World Wide Web: http://www.arts.uci.edu/

The Claire Trevor School of the Arts is dedicated to the study, creation, and performance of the arts within the context of their history and theory. Both undergraduate and graduate degree programs are offered and include extensive studio, workshop, and performing experiences; theoretical and historical studies; and work in arts and technology and criticism. The School consists of the Departments of Dance, Drama, Music, and Studio Art; the undergraduate program in Arts and Humanities; the graduate program in Arts Computation Engineering; and a minor in Digital Arts.

The School's departments are located near each other, facilitating daily interaction among student and faculty in all Arts disciplines. Facilities include studios and classrooms, four theatres, a concert hall, the University Art Gallery, the Donald R. and Joan F. Beall Center for Art and Technology, the Visual Resources Collection, the Gassmann Electronic Studio, the Motion Capture Studio, the Arts Media Center, the Arts Computing Laboratory, the Digital Arts Teaching and Research Laboratories, a television studio, and professionally managed and staffed theatrical production shops and publicity and box offices supporting the School's extensive production and performance schedule.

Arts students regularly participate in choirs, instrumental ensembles, drama and dance productions, and art exhibitions. Qualified students from other academic areas also are eligible to participate in many of these activities and are encouraged to do so. Many of the School's productions take place in the Irvine Barclay Theatre, a fully equipped, 756-seat performing facility.

In addition to the artists, scholars, and performers who are members of the Arts faculty, visits by distinguished guest artists/teachers are a feature of the School's activities.

Students receive assistance with program planning and a variety of other support services from the professional staff in the Office of the Arts Student Affairs. The staff also assists the faculty in providing academic counseling to Arts students.

DEGREES

Arts and Humanities	B.A.
Dance	B.A., B.F.A., M.F.A.
Drama and Theatre	Ph.D.*
Drama	B.A., M.F.A.
Fine Arts	M.F.A.†
Music	B.A., B.Mus., M.F.A.
Studio Art	B.A., M.F.A.

*UCI and UCSD joint program.

†Concentration in Arts Computation Engineering.

Change of Major

Students who wish to change their major to one offered by the School should contact the Arts Student Affairs Office for information about change-of-major requirements, procedures, and policies. Additionally, students should refer to the information available at http://www.due.uci.edu/Change_of_Major.html.

Special Programs of Study

CONCENTRATION IN MEDIEVAL STUDIES

The concentration in Medieval Studies allows undergraduate students in the Schools of the Arts and Humanities to augment their major by completing a coherent program of courses in the area of medieval studies. See the School of Humanities section for additional information.

MINOR IN DIGITAL ARTS

The Minor in Digital Arts is geared toward students with computer skills who want a grounding in the arts. This program allows students to acquire a working knowledge of digital imaging and related technological skills within an arts context. See page 96 for additional information.

MINOR IN RELIGIOUS STUDIES

The interdisciplinary minor in Religious Studies focuses on the comparative study of religions in various cultural settings around the world. The curriculum seeks to provide a wide-ranging academic understanding and knowledge of the religious experience in society through study in the Schools of Humanities, Social Science, Social Ecology, and the Arts. See the Interdisciplinary Studies section for additional information.

CAMPUSWIDE HONORS PROGRAM

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

EDUCATION ABROAD PROGRAM

Upper-division, and in some cases graduate, students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. See the Education Abroad Program section for additional information.

3-2 PROGRAM WITH THE PAUL MERAGE SCHOOL OF BUSINESS

Outstanding Arts majors who are interested in a career in arts management may wish to apply for entry into The Paul Merage School of Business' 3-2 Program. Students normally apply for this program early in their junior year. See The Paul Merage School of Business section for further information.

Honors

Students who have distinguished themselves academically will be considered for honors at graduation. General criteria are that students must have completed at least 72 units in residence at a University of California campus by the end of the winter quarter of the academic year in which they graduate and must have a grade point average of 3.0 or better. More specific criteria include, but are not limited to, cumulative grade point average in the major, curriculum breadth, and extracurricular efforts such as service to the major or the School, and creative/artistic activities; additional information is available from the individual departments. In keeping with the Academic Senate Resolution no more than 12 percent of the graduating seniors may receive honors. Other important factors are considered (see page 52).

ArtsBridge Program

The UCI ArtsBridge program provides scholarships of up to $3,000 per year and hands-on opportunities for talented, energetic UCI students, who bring arts education projects to Orange County schools. ArtsBridge projects are linked to the K-12 curriculum and have included drama workshops, instrumental workshops, musical theatre, photography, painting, dance, and storytelling classes. The program also serves to cultivate an appreciation for the value of arts in society. The ArtsBridge program is open to all majors and minors in the Claire Trevor School of the Arts, by application and/or audition.

Scholarships

The Claire Trevor School of the Arts has some scholarship monies available to incoming and to continuing students on both the undergraduate and graduate levels. For complete information, please contact the Arts Student Affairs Office.

Edna Helen Beach Scholarship: Provides $1,000 per year for two years for an incoming freshman student, and $1,000 for one year for an incoming transfer student. Recipient must be gifted and talented, and will be selected from eligible students with special emphasis on those from underprivileged backgrounds who would not otherwise be able to attend a major research institution.

Carol Stefanik Caniglia Dance Scholarship: For an outstanding Dance major transferring from a community college to UCI.

Kris and Linda Elftmann Scholarship: Up to $1,250 awarded to an outstanding undergraduate student.

Leo Freedman Graduate Fellowship: For outstanding applicants from Orange County, California, preferably from Anaheim; $7,500 covers tuition and fees and includes a small stipend. Two fellowships for two years of graduate study.

William J. Gillespie Foundation Scholarships: Several scholarships in varying amounts, awarded to outstanding Dance majors.

Alice Lowell Memorial Scholarship: Up to $5,000 awarded to a Music major in any instrument or voice.

Steve Lyle Memorial Scholarship: $2,000 awarded to continuing students in Drama; selected by application and recommendation.

Philharmonic Society of Orange County Scholarship Program: All recipients are selected by the UCI Music faculty scholarship committee through an audition process.

> **Ladislaw Reday Memorial Scholarship:** $1,250 awarded to a Music major in any instrument or voice.
>
> **David Lee Shanbrom Memorial Music Scholarship:** $3,000 awarded to an outstanding Music student in any instrument or voice.
>
> **Winifred W. Smith Music Scholarship:** $2,500 awarded to a student with stringed instrument specialization.
>
> **Marcella Louise and Leonard Seiber Jones Music Scholarship:** $1,250 awarded to an incoming Music student in any instrument or voice.

Marjorie and Robert Rawlins Scholarship: Provides several $5,000 scholarships, renewable for four years of undergraduate study, to be awarded to students majoring in piano, violin, viola, or cello. Recipients must be full-time Music majors and must maintain a 3.2 GPA. By audition with the Music faculty scholarship committee.

Harry and Marjorie Ann Slim Memorial Scholarship: Provides up to $2,000 annually to a Music student.

Winifred W. Smith Scholarship: $5,000 awarded to a student studying cello, violin, or piano (preferably cello). Renewable if student meets scholarship criteria.

Elizabeth and Thomas Tierney Scholarship: Up to $1,250 awarded annually to an outstanding undergraduate student.

UCI Town and Gown Music Scholarships: Up to $1,000 annually; awarded to Music students in any instrument or voice.

Phyllis Kovach Vacca Memorial Scholarship: Up to $1,000 awarded to a student studying cello, piano, or violin.

Undergraduate Program

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements: Refer to individual departments.

Graduate Program

The primary endeavor of the Claire Trevor School of the Arts is the creative act. Research activities are pursued both as an end in themselves and as a source that can inform both performance and the studio experience. The intellectual activity of theoretical, literary, and historical courses complements the practical work in studio workshops and performance. The aim of the M.F.A. programs in Dance, Drama, Music, and Studio Art is, thus, to produce artists literate in both traditional and digital media who are responsive to intellectual stimuli, disciplined, and capable of integrating existing knowledge into creative projects. The M.F.A. concentration in Arts Computation Engineering provides broad-based, interdisciplinary training at the intersection of digital technology and cultural and artistic practice. The UCI-UCSD joint doctoral program in Drama and Theatre provides opportunity for significant crossover research and teaching between the two campuses in a wide range of areas in drama and the theatre. It is the strong belief of the UCI Claire Trevor School of the Arts that intellectual integrity and creative excellence cannot exist without each other.

ADMISSION TO THE PROGRAM

Applications are accepted for fall quarter admission only, and ordinarily must be completed by January 15 for the Ph.D. in Drama and Theatre and the M.F.A. in Studio Art and by March 1 for all other M.F.A. programs, as the number of graduate students that can be admitted to the Claire Trevor School of the Arts is limited. Applicants are advised to arrange for auditions, interviews, and the submission of portfolios, compositions, and dossiers, as appropriate, by March 1. Students applying for scholarships and fellowships should do so by January 15, and are also encouraged to apply for financial assistance through the Office of Financial Aid and Scholarships. The Claire Trevor School of the Arts has a modest number of teaching assistantships available in all areas, and all candidates are automatically reviewed for teaching assistantship positions; the School informs successful candidates by June 1 for the following academic year.

Upon admission to the program the student is assigned an advisor. Students should discuss with their advisor the scope of undergraduate preparation to determine any areas which may need strengthening if full benefit from graduate study is to be derived.

Minor in Digital Arts

The minor in Digital Arts is geared toward students with computer skills who want a grounding in the arts. This program allows students to acquire a working knowledge of digital imaging and related technological skills within an arts context. It provides the tools necessary to understand the basic aesthetic components of the new digital media, relating digital arts to traditional art forms. These tools range from a basic understanding of "art" to sophisticated applications of state-of-the-art computer software, in various forms of art production including CD-ROM, digital video and photography, Web site and other network applications, installations, and more.

For entry into the minor, students must show ability to use e-mail, surf the net, and use productivity tools such as word processing or spreadsheets. It is highly recommended that students in the minor have their own computer. Additional information is available on the World Wide Web at http://www.arts.uci.edu.

REQUIREMENTS FOR THE MINOR

The minor in Digital Arts consists of a minimum of eight courses which fall into three categories: I. Required; II. Elective (background); and III. Elective (applied).

I. Required: Arts Interdisciplinary 1A, followed by 1D and 1E (Digital Core).

II. Elective (background). At least two of the following: Dance 21A (Music for Dancers); four units of any of the dance techniques—Dance 30A (Ballet I), 40A (Modern Dance I), 50A (Jazz I), 110 (World Dance); Drama 30A (Acting), 50A (Introduction to Costume Design), 50B (Introduction to Scenic Design), 50C (Introduction to Lighting Design); four units of any of the music performance ensembles (Music 7, 160, 161, 162, 171, 173, 174, 175, 176, 178); Studio Art 20 (Basic Drawing), 30 (Basic Painting), 71 (Basic Photography), 81 (Basic Video).

III. Elective (applied). At least three of the following, one of which must be from the Digital Imaging group (Studio Art 65A or Arts Interdisciplinary 50): Arts Interdisciplinary 50 (Multimedia Arts); Dance 163 (Choreography and Digital Technology), 180A (Laban Studies); Drama 159 (Proseminar in Theatre Design, when topic is Digital Imaging); Music 51 (Music Technology and Computers), 147 (Studies in Music Technology), 151 (Computer Music Composition), 152 (Interactive Arts Programming); Studio Art 65A (Introduction to Digital Imaging), 65B (Introduction to Digital Multimedia), 65C (Introduction to the Internet), 100 (when topic is related to digital arts), 106 (Interactive Digital Media: Sound and Video), 110 (Interdisciplinary Digital Arts), 130 (Projects in New Technologies), 143 (Projects in Computer Painting), 166 (Advanced Collaborative Project), 175 (Digital Arts Aesthetics).

Each of these courses may be taken one time only for credit toward the minor. No course in the Elective (applied) requirements may be taken Pass/Not Pass.

Courses in Arts Interdisciplinary

LOWER-DIVISION

1A-B, C Arts Core (4-4, 4) F, W, S. An introduction to the arts in general, and to the arts at UCI. Concentration on (1) the interdisciplinary nature of the arts, (2) the content of particular arts disciplines, and (3) the departments in the UCI School of the Arts. **1B:** Topics in Dance and Studio Art. **1C:** Topics in Drama and Music. Prerequisite for 1B and 1C: 1A. **(IV)**

1D, E Digital Core. Focus is on (1) issues arising from technological developments; (2) changes in art practice related to integration of art and science; and (3) major areas of digital art inquiry. Prerequisite: Arts 1A.

1D Digital Core: Foundations (4). An introduction to the historical and theoretical foundation of digital art.

1E Digital Core: Developments (4). An overview of recent developments in the digital arts.

40A-B-C Selected Interdisciplinary Topics (4-4-4) F, W, S. Studies in the historic and theoretical interrelationships of artistic disciplines, including such fields as dance, music, art, and/or drama; and investigation of their underlying social and aesthetic bases and the influence of one art upon another. Topics vary.

50 Multimedia Arts: History, Criticism, and Technology (4) F, W, S. Introduction to the history, criticism, and practices of multimedia technology. Students learn through hands-on experience, work in multimedia, in its various forms. Prerequisite: prior computer experience with Macintosh or Windows.

UPPER-DIVISION

100A-B-C The Senior Thesis (4-4-4) F, W, S. Planning, drafting, writing, and presentation of an academic thesis. Open to Arts Interdisciplinary majors, who will interrelate two or more artistic disciplines, and to Campuswide Honors Program students, who will focus their thesis on one or more major areas in the Arts. Prerequisite for 100B: 100A. Prerequisites for 100C: 100B and satisfactory completion of the lower-division writing requirement.

130 Crossing Boundaries: An Introduction to Interdisciplinary Study (4) F, W, S. Investigation of interdisciplinary thought and action beginning with the nature of discipline and extending to the relationship between science and art, politics/society and art, and struggles within the arts between theory and practice and across apparently segregating boundaries. Prerequisite: upper-division standing. May be taken for credit three times as topics vary.

150 Introduction to the Alexander Technique (2) F, W, S. Group lessons. Applying the principles of the Alexander Technique to all movement, including professional activities. Expanding awareness through development of the kinesthetic sense; exploring choices in movement through recognition of habit patterns. Increased ease of movement, enhanced coordination, stress reduction, poise.

199 Independent Study (1 to 4) F, W, S. Individual study or directed projects as arranged with faculty member. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

M.F.A. in Fine Arts with a Concentration in Arts Computation Engineering (ACE)

Arts Computation Engineering (ACE) Building; (949) 824-2109
Simon Penny, **Director**

Faculty

Beatriz da Costa, M.F.A. Diplome Nationale Superieur d'Art Plastiques, Ecole d'Art d'Aix en Provence (France), *Assistant Professor of Studio Art and of Electrical Engineering and Computer Science* (robotic art, tactical gizmology, biotech initiatives, surveillance projects, collaborative practice, social change)

Simon Penny, Graduate Diploma in Sculpture, Sydney College of the Arts, New South Wales (Australia), *Professor of Electrical Engineering and Computer Science, Studio Art, and Informatics* (electronic media art: practice, history and theory; technologies for embodied interaction; cultural applications of emerging technologies; multi-camera machine vision, immersive environments, robotics and motion control)

Bill Tomlinson, Ph.D. Massachusetts Institute of Technology; M.F.A. California Institute of the Arts, *Assistant Professor of Informatics and Drama* (autonomous characters, computational social behavior, interactive media, real-time animation)

Affiliated Faculty

James E. Bobrow, Ph.D. University of California, Los Angeles, *Professor of Mechanical and Aerospace Engineering* (robotics, applied nonlinear control, optimization methods)

John Crawford, Media Artist, Interactive Performance Director and Software Designer; *Coordinator of the Digital Arts Minor and Assistant Professor of Dance* (videodance, documentary, interactive performance, motion capture, digital arts)

Christopher Dobrian, Ph.D. University of California, San Diego, *Associate Professor of Music and Informatics* (electronic music, composition)

J. Paul Dourish, Ph.D. University College, London, *Associate Professor of Informatics* (human-computer interaction, computer-supported cooperative work)

Falko Kuester, Ph.D. University of California, Davis, *Assistant Professor of Electrical Engineering and Computer Science and of Biomedical Engineering* (virtual reality, computer graphics, large-scale data visualization and computer-aided geometric design)

Antoinette LaFarge, M.F.A. School of Visual Arts, *Associate Professor of Studio Art* (digital media)

Cristina Videira Lopes, Ph.D. Northeastern University, *Assistant Professor of Informatics* (programming languages, acoustic communications, operating systems, software engineering)

Gloria Mark, Ph.D. Columbia University, *Associate Professor of Informatics* (computer-supported cooperative work, human-computer interaction)

Gopi Meenakshisundaram, Ph.D. University of North Carolina, *Assistant Professor of Computer Science* (geometry and topology for computer graphics, image-based rendering, object representation, surface reconstruction, collision detection, virtual reality, telepresence)

Joerg Meyer, Ph.D. University of Kaiserslautern, *Assistant Professor of Electrical Engineering and Computer Science and of Biomedical Engineering* (computer graphics, scientific visualization, large-scale rendering, biomedical imaging, virtual reality)

Bonnie Nardi, Ph.D. University of California, Irvine, *Associate Professor of Informatics* (interactive and collaborative technology: human-computer interaction/computer-supported cooperative work, educational technology)

Lisa Marie Naugle, Ph.D. New York University, *Associate Professor of Dance* (modern dance, choreography, dance and digital technology, improvisation, motion capture)

Robert Nideffer, Ph.D. University of California, Santa Barbara, *Associate Professor of Studio Art and Informatics* (electronic intermedia, interface theory and design, technology and culture, contemporary social theory)

Kavita Philip, Ph.D. Cornell University, *Associate Professor of Women's Studies* (science and technology studies, South Asian studies, political ecology, critical studies of race, gender, colonialism, new media, and globalization)

Mark S. Poster, Ph.D. New York University, *Professor of History and of Film and Media Studies* (theory and history of the media, theory of technology and culture, and Internet studies)

As digital technologies infiltrate increasingly diverse aspects of cultural practice, and human culture at large is influenced by the presence of digital technologies, there is a profound need for a new type of professional in the entertainment industry, in education, and in the arts, who can help to construct, manage, and monitor these changes. Such a professional must be technically skilled, artistically skilled, and theoretically skilled, all at an equally high and rigorous level. The goal of the M.F.A. in Fine Arts with a concentration in Arts Computation Engineering is to provide students with a broad-based and interdisciplinary training at the intersection of digital technology and cultural and artistic practices. The ACE program is coordinated across the Donald Bren School of Information and Computer Sciences, The Henry Samueli School of Engineering, and the Claire Trevor School of the Arts, and places equal emphasis on technical, artistic, and critical proficiency. Strongly practical in composition, it provides students with the opportunity to explore in detail topics such as telematic performance, immersive and augmented environments, embodied interaction, and the cultural impact of new technologies.

Graduation is by publicly presented thesis project and written thesis, in addition to completion of course work.

The ACE concentrations in all three fields consist of a two-year curriculum. The following courses are required:

ACE Core: five ACE interdisciplinary theory seminars (Arts 270), four ACE studio/labs (Arts 271–277), two ACE project internships (Arts 279), and one quarter of ACE thesis research (Arts 278).

(NOTE: A total of 48 units of Core courses must be completed. Any of the ACE core category courses may be reduced by one and replaced with a different ACE core course or an elective, in consultation with the student's advisor.)

Electives: four courses in school-based specialization electives chosen by students in consultation with faculty advisors, consistent with the technical, aesthetic, and theoretical themes of their thesis project; and two breadth electives that may be chosen by students in consultation with an advisor, and/or may be assigned by the ACE program committee in consultation with the student. These courses will compensate for lacunae in the student's background and may include upper-division undergraduate courses when appropriate and approved in advance by the candidate's advisor.

COURSES

270 Arts Computation Engineering Interdisciplinary Theory Seminar: Special Topics (4) F, W, S. Counterposes technological discourses with fine arts discourses and practices, with a focus on historical contextualization, utilizing critical theory and science and technology studies perspectives. Topics vary and are not repeated in any three-year period. May be repeated for credit as topics vary. Same as Engineering 270 and Informatics 270.

271 Arts Computation Engineering Studio/Laboratory: Interactive Installation and Performance Design Workshop (4) F, W, S. Designing persuasive spatialized interactive experiences: spatially and temporally distributed narratives. User-system relationships. "Freedom" in interaction: authoriality and control. Audience and the spect-actor. Sensors, behavior logics, and multi-modal output. Machine learning and autopedagogic systems. Training in relevant technologies. May be taken twice for credit. Same as Engineering 271 and Informatics 271.

272 Arts Computation Engineering Studio/Laboratory: Games and Algorithmic Systems in Literature and the Arts (4) F, W, S. Explores the cultural tradition of the game and game play with particular reference to the automation of games in computational systems and the close relation between gaming, improvisation, hypertext, and interactive art. Game programming techniques and projects. May be taken twice for credit. Same as Engineering 272 and Informatics 272.

273 Arts Computation Engineering Studio/Laboratory: Spatial Interaction: Sensors and Input/Output (4) F, W, S. Designing and building sensor and effector systems for cultural applications. Sensors, sensor combinations, sensor data collection and interpretation, input/output techniques and devices. Same as Engineering 273 and Informatics 273.

274 Arts Computation Engineering Studio/Laboratory: Real Space Interaction (4) F, W, S. Designing and building machine artworks, motion control, mechatronic, animatronic, and mobile robotic projects. Mechanics, electromechanics, electronics, microcontrollers, motor control. Aesthetico-critical as well as technical aspects subject to assessment. Same as Engineering 274 and Informatics 274.

275 Arts Computation Engineering Studio/Laboratory: Cultural Practice in Immersive Media (4) F, W, S. Examines and moves beyond existing paradigms of virtuality. Sensor and input devices, their logics and limitations. Embodied and symbolic interaction. Panoramic and stereoscopic image technologies. Stereoscopic graphics and spatialized sound. Technical components and their integration. Collaborative projects. Same as Engineering 275 and Informatics 275.

276 Arts Computation Engineering Studio/Laboratory: Telematic Performance and Teleoperative Art (4) F, W, S. Art and performance projects utilizing real time and quasi-real time distance interaction. Synchronous performance and distributed choreography. Network technologies and protocols. Speed, bandwidth, latency. Web-based technologies. Video and sound. Teleoperation/remote machine control. Same as Dance 276, Engineering 276, and Informatics 276.

277 Arts Computation Engineering Studio/Laboratory: Special Topics (4) F, W, S. Focuses on currently emerging technologies, techniques, and cultural and critical issues. May be repeated for credit as topics vary. Same as Engineering 277 and Informatics 277.

278 Arts Computation Engineering Thesis Research (4 to 12) F, W, S. Independent research for thesis and thesis project. May be taken for credit for a total of 36 units. Same as Engineering 278 and Informatics 278.

279 Special Topics in Arts Computation Engineering (4) F, W, S. Prerequisites vary. May be repeated for credit as topics vary. Same as Engineering 279 and Informatics 279.

399 Arts Computation Engineering: University Teaching (1 to 4) F, W, S. Limited to Teaching Assistants. Prerequisite: consent of instructor.

DEPARTMENT OF DANCE

301 Mesa Arts Building; (949) 824-7283
Alan Terricciano, **Department Chair**

Faculty

David Allan, Choreographer/Former Soloist, National Ballet of Canada; Choreographer, ballet companies, operas, film, and television, *Associate Professor of Dance* (ballet, pas de deux, choreography)
Eloy Barragan, Choreographer, Idaho Dance Theater; Former Dancer, Ballet Idaho; Ballet Master, Eugene Ballet Company, Ballet Idaho, and Western Ballet Theatre, *Assistant Professor of Dance* (ballet choreography)
Bob Boross, M.A. New York University, *Assistant Professor of Dance* (jazz, tap, choreography, musical theatre)
Mary Corey, M.A. University of California, Riverside, Certified Professional Labanotator, *Associate Dean of the Claire Trevor School of the Arts, Co-Director of the Art and Humanities Major, and Professor of Dance* (dance history, modern dance, notation and reconstruction, dance and digital technology)
John Crawford, Media Artist, Interactive Performance Director and Software Designer; *Coordinator of the Digital Arts Minor and Assistant Professor of Dance* (videodance, documentary, interactive performance, motion capture, digital arts)
Diane Diefenderfer, Former Soloist, Los Angeles Ballet, Eglevsky Ballet Company, Frankfurt Ballet Company, Technique, *Lecturer in Dance* (ballet, pointe)
Jennifer Fisher, Ph.D. University of California, Riverside, *Assistant Professor of Dance* (dance history, philosophy, and criticism)
Israel "El" Gabriel, Former Assistant Artistic Director, Bat Dor Dance Company of Israel, *Lecturer with Security of Employment* (ballet, modern, pas de deux, repertory)
Loretta Livingston, B.F.A. California Institute of the Arts; former principal with Bella Lewitzky Dance Company, *Assistant Professor of Dance* (modern dance, choreography, improvisation)
Donald McKayle, Choreographer/Director, concert, theatre, film, television, *Graduate Choreography Advisor, Artistic Director of UCI Dance, and Claire Trevor Professor of Dance* (choreography, modern dance)
Lisa Marie Naugle, Ph.D., New York University, *Associate Professor of Dance* (modern dance, choreography, dance and digital technology, improvisation, motion capture)
Leslie Peck, Former Dancer, New York City Ballet; Principal Dancer, Pacific Northwest Ballet, Houston Ballet, Ballet International, *Assistant Professor of Dance* (ballet, pointe)
James Penrod, M.F.A. University of California, Irvine; C.M.A. Laban Institute of Movement Studies, *Professor Emeritus of Dance* (ballet, modern, dance notation, choreography, movement analysis)
Janice Gudde Plastino, Ph.D. University of Southern California, *Professor of Dance* (kinesiology/anatomy, research methods, choreography, dance science/medicine)
Nancy Lee Ruyter, Ph.D. Claremont Graduate School, *Professor of Dance* (dance history, Spanish dance, choreography, and research methods)
Alan Terricciano, M.A. Eastman School of Music, *Department Chair and Associate Professor of Dance* (musical resources, music for dancers, dance accompaniment, composition, multimedia arts)

The Department of Dance fosters an educational environment in which performance opportunities, creative projects, and theoretical studies complement and reinforce each other, providing a foundation for careers in dance. The program focuses on the dance techniques of ballet, modern, jazz, tap, world dance, and dance and technology. Theoretical studies include history; philosophy, aesthetics, and criticism; Laban studies; dance pedagogy; dance ethnography; dance science; and aesthetics of digital media. Creative opportunities bridge the studio and theoretical work through performance and choreography for multiple contexts; creative applications of animation, motion capture, audio and video technologies; lecture demonstration; and critical, historical, ethnographical, and scientific writing.

The objective of studio work is to develop kinesthetic resources, precision, flexibility, creativity, and freedom in a coordinated and intelligently responsive dancer. The techniques of classical ballet, modern dance, and jazz constitute crafts and styles for the dancer that serve not only as a basis for the training of the body, but also as a basic language of movement for the choreographer.

The theoretical, historical, and scientific courses are designed both to broaden the perspective of those students whose first interest is performance or choreography, and to provide a foundation for those students who plan to pursue careers in the academic, scientific, technological, or administrative fields of dance.

The dance archives in the UCI Library Special Collections offer a rich source of research materials which enhance the Dance program. Among other special holdings, the archives include the extensive Ruth Clark Lert collection of dance books, journals, photographs, original costume sketches, and memorabilia of dance in Europe and the United States from pre-World War I to the present.

CAREERS FOR THE DANCE MAJOR

Careers in dance require excellent training and extraordinary discipline, tenacity, and dedication. Graduates of the Department have an excellent record of placement in the many fields of dance. Some have become professional dancers in ballet companies (including the Metropolitan Opera Ballet, San Francisco Ballet, Nashville Ballet, and Ballet Pacifica); in modern dance companies (including Hubbard Street Dance Company, MOMIX, and Martha Graham Dance Ensemble); in touring companies (including *The Lion King, Fame: The Musical, Carousel,* and *Cirque du Soleil*); and in films, television, and theatre.

In addition to training for professional dance performance and choreography, the major in dance serves as a basis for graduate study or job opportunities in fields such as dance history, dance science, dance pedagogy, dance reconstruction, dance criticism, dance video, and technology. Related fields, such as arts administration, law in relation to the arts, arts therapies, design and production, and music also offer positions for graduates. Students who are interested in a career in physical therapy or dance science will find a major in Dance, with related course work in chemistry, physics, biology, and mathematics, to be excellent preparation for further study.

THE UNDERGRADUATE PROGRAM

The Bachelor of Arts (B.A.) is designed for those who wish to obtain a broad undergraduate background as preparation for careers or graduate work and related fields. It offers students a dance education that stresses performance and choreography, and, at the same time, intellectual depth and scope. In addition to the core, 12 units of elective Dance courses are required. The remaining elective units required for graduation may be chosen from Dance or other disciplines in relation to a student's individual interest. While the program of study in Dance stresses technical proficiency and academic understanding in dance, the B.A. degree program also enables students to pursue elective subjects in their special areas of interest in other academic disciplines.

The Bachelor of Fine Arts (B.F.A.) degree program with specializations in Performance and Choreography, is designed for students who wish to prepare intensively for careers in those areas. The courses required in addition to the core are primarily in Dance. The B.F.A. program allows for a few free electives in other areas. Admission to the B.F.A. program with a specialization in Choreography is by faculty approval only.

The B.F.A. program with a specialization in Performance does not require additional faculty approval beyond the required audition for admission to the Dance major; students should declare their intention to pursue this specialization during spring quarter of their sophomore year.

Proficiency Levels

In addition to meeting the general requirements for admission to UCI, applicants must demonstrate technical/creative promise. The Department holds annual entrance auditions for potential freshmen and transfer students during winter quarter prior to the fall quarter when entrance is anticipated. First-year students wishing to major in Dance must be at technique level II in at least one of the three major genres (ballet, modern, jazz).

Placement auditions for admitted students are held during Welcome Week to determine levels of technical ability for placement in courses. It is suggested that transfer students wishing to pursue a B.A. degree in Dance complete, in addition to their breadth requirements, one course in choreography, two courses in dance technique, and one course in music for dancers prior to transfer to UCI.

Previously admitted majors who wish to obtain a B.F.A. degree should contact the School of the Arts Student Affairs Office to obtain information about change of major requirements, procedures, and policies.

Transfer students wishing to pursue the B.F.A. degree must declare their intention in writing at the time of their entrance audition and demonstrate technique and/or choreography levels appropriate to their year. It is suggested that transfer students complete, in addition to their breadth requirements, one course in choreography, two courses in dance technique, one course in music for dancers, and one course in dance performance prior to transfer to UCI.

Students deficient in level of performance or academic preparation should be prepared to extend their studies beyond the normal four-year program in order to meet the requirements for graduation.

REQUIREMENTS FOR THE B.A. DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements for the Major

Dance 2 (Injury Prevention/Technique Analysis); Dance 21A (Music for Dancers); Dance 60A (Choreography); Dance 90A-B-C (Dance History); Dance 100 (Kinesiology); Dance 180A-B *or* A-C (Laban Studies); Dance 185 (Critical Issues in Dance).

Technique: Students must complete at least one Dance technique course (ballet, modern dance, jazz, Spanish, world dance, pointe, social dance, tap, or repertory) each quarter in residence. At a minimum, students must complete level II in Ballet, Modern, and Jazz (Dance 132A-B-C, Dance 142A-B-C, and Dance 152A-B-C) *and* level III in either Ballet or Modern (Dance 133A-B-C or Dance 143A-B-C). Students who place above level II in any technique must take a year of that technique at the level in which they are placed. All students must also complete one course chosen from Dance 11A, 11B, 11C (Mexican Dance), 12A, 12B, 12C (Spanish Dance), 14 (Social Dance), 52A, 52B, 52C (Tap I), 110 (World Dance), 138 (Character Dance), or 150A, 150B, 150C (Tap II). NOTE: Units earned in ballet, jazz, and modern technique courses beyond the required amount do not count toward departmental elective requirements but may count toward University requirements.

Performance: Two performances from any of the Dance 170 series; four units of Drama 101 (Theater Production), which must be taken during the first year in residence.

Electives: 12 units of electives must be completed within the major.

REQUIREMENTS FOR THE B.F.A. DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements for the Major

Students must complete the departmental requirements as listed for the B.A. degree in Dance. In addition, B.F.A. students must complete the requirements for either the specialization in Choreography or Performance.

Choreography Specialization: Dance 60B-C (Choreography I) or Dance 60B and 62 (Choreography and Music Theatre); Dance 127A (Costume Design for Dance); Drama 30A (Acting); Drama 50C (Lighting Design); any three quarters of courses chosen from Dance 162A-B-C (Choreography II) and Dance 164A (Video Choreography); two courses in Dance 165 (Choreographic Projects—one original choreographic work, approved by the faculty, must be presented in both the junior and senior years); four units (one or two courses) in Art History, Music, Studio Art, or Drama (in addition to Drama 30A, Drama 50C, and Drama 101 requirements).

Performance Specialization: *Technique:* Dance 134A-B-C (Ballet IV) *or* Dance 135A-B-C (Ballet V) *or* Dance 144A-B-C (Modern IV); Dance 153A-B-C (Jazz III); Dance 139 (Partnering).

Performance: Dance 137 (Repertory) or Dance 179 (Etude Ensemble); Dance 170 series: must be in three additional performances beyond the B.A. requirements, one of which must be Dance 170, 171, 172, or 174; Drama 30A (Acting) or a fourth additional performance in the Dance 170 series. Dance 171 and 172 may be repeated for credit. Students must demonstrate proficiency in at least two dance genres in these performances.

Sample Program for Freshmen (B.A. and B.F.A. Programs)

Fall	Winter	Spring
English WR39A	English WR39B	English WR39C
Dance 21A	Breadth	Breadth
Technique	Breadth	Dance 2
Technique	Technique	Technique
	Technique	Technique
	Drama 101 (2 units)	Drama 101 (2 units)

MASTER OF FINE ARTS PROGRAM

Degree Offered

M.F.A. in Dance.

General Information

The M.F.A. program is an intensive program requiring a core of courses in studio and academic areas. The student's individual area of interest is explored through the thesis project in the second year. Projects or written theses may be pursued in choreography, video choreography, dance training, dance history, dance science, dance reconstruction, and dance and digital technology.

Admission

Applicants for admission to the degree program must meet the general requirements for admission to graduate study and hold a B.A. or B.F.A. in Dance or the equivalent. Candidates must meet the minimum requirements for the B.A. degree in Dance at UCI. A paper of 500 words or more on a dance subject and proposals for three choreographic works that could be completed in the graduate program must be submitted. An audition in ballet and modern technique is required for admission and is held in winter quarter. At this audition, applicants must also present a prepared five-minute choreographed piece, which can be a solo performed by the applicant, and/or a videotape of the applicant's choreography. Interviews with faculty are conducted following the audition, and applicants are given a short writing exercise.

Teaching Assistantships

Graduate students are encouraged to apply for teaching assistantships in areas such as notation, dance science, history, music for dancers, choreography, world dance, dance video, philosophy, and all technique classes. Students with expertise in any of these areas are given special consideration.

General Degree Requirements

Normally two years of residence are required. Each candidate must enroll for three courses each quarter for six quarters, exclusive of summer sessions.

In the second year, satisfactory attainment must be demonstrated by a major thesis: in choreography this consists of the composition and production of a choreographic work; in other areas, such as dance history, dance training, or dance science, this consists of a written thesis or a comprehensive project in a chosen area of study. All theses must be defended in a one-hour oral examination which may also test the candidate's general knowledge in the area.

The degree must be completed within three years of entering the program. Students who do not complete the degree within that time will be dropped from the program.

Specific Degree Requirements

Seventy-two quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course. Not more than 20 units in upper-division courses may count toward the degree. Fulfillment of the technique course requirements must be approved by the faculty advisor.

Required Courses

Six courses chosen from any graduate or upper-division dance technique course; Kinesiology for Dance (Dance 201); Musical Resources (Dance 222); Teaching of Dance Techniques (Dance 225); Costume Design (Dance 227); two courses in Graduate Choreography (Dance 261); Movement Analysis (Dance 282); Critical Issues in Dance (Dance 283); Bibliography and Research (Dance 284); Thesis (Dance 286); Proseminar in Dance History (Dance 296) *or* Proseminar in Dance Ethnology (Dance 298).

By the end of their first year, students will choose their area of study for their thesis. Students who wish to produce a choreographic thesis must apply to the graduate choreography advisor during winter of their first year. The faculty will review the applications and will consider the quality of the student's work in Dance 261, as well as the choreographic proposal, in making their selection.

Courses in Dance

LOWER-DIVISION

NOTE: Some courses are not offered every year. Please check with the department advisor.

2 Injury Prevention/Technique Analysis (2). The analysis, management, and prevention of dance injuries. Analysis of body types and technical ability and the means by which to improve dance ability.

11A-B Studio Workshop in Mexican Dance I (2-2) F, W. Principles of Mexican folk dance including basic movement techniques, rhythms, regional dance forms and styles, and cultural context. May be taken for credit three times.

12A-B-C Studio Workshop in Spanish Dance I (2-2-2) F, W, S. Principles of Spanish dance with focus on basic movement techniques, castanet work, and introduction to the genres of flamenco, folk, classical, and neoclassical dance forms. May be taken for credit three times.

14 Social Dance Forms (2). Contemporary and historical forms. Current ballroom, disco, and Western square dance forms; Latin ballroom dances; Dances from the 20s, 30s, and 40s. Pass/Not Pass only.

21A Music for Dancers (4). Emphasis on the development of musical skills most pertinent to the dancer: vocabulary, notational literacy, rhythmic and melodic acuity, score reading, and fundamental analysis; working with live accompaniment.

25 Acting for Dancers (4). Basic acting techniques to aid the dancer in expressivity, dynamics, projection, and creativity. Specific studies based on historical and contemporary acting methods.

30A-B-C Studio Workshop in Ballet I (2-2-2) F, W, S, (30) Summer. Fundamentals of ballet technique: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Pass/Not Pass only. May be taken for credit twice.

34 Men's Studio Workshop in Ballet (2) F, W, S. Emphasis on men's traditional ballet, techniques, and movements. Prerequisites: Dance 30A-B-C. May be repeated for credit.

40A-B-C Studio Workshop in Modern I (2-2-2) F, W, S, (40) Summer. Fundamentals of modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman. Pass/Not Pass only. May be taken for credit twice.

50A-B-C Studio Workshop in Jazz I (2-2-2) F, W, S. (50) Summer. Fundamentals of jazz: principles of jazz dance and contemporary forms incorporating the personal point of view of the instructor. Pass/Not Pass only. May be taken for credit twice.

52A-B-C Workshop in Tap I (2-2-2) F, W, S. Beginning tap: principles of rhythm and basic tap steps. Course sequence may be taken for credit twice.

60A-B-C Choreography I (4-4-4) F, W, S. Beginning-to-intermediate study of principles of dance composition. May include composition assignments for stage and video. By audition, works may be shown quarterly in public studio performances.

62 Choreography and Musical Theatre (4). A theoretical and practical examination of the craft of choreography for musical theatre. Students examine the history of choreographic expression in the musical theatre, and then stage songs and dances from the genre. Prerequisites: Dance 60A-B.

63 Ballet Choreography (4). The practical and historical study of ballet choreography. Includes exploration of traditional ballet forms, styles, and genres, as well as new and experimental approaches to choreography for ballet. Prerequisites: Dance 60A-B.

64 Choreography and Musical Composition (4). Emphasis on musical compositional techniques as they pertain to choreography; music composition for choreography methodologies. Historical survey of compositional practices in western art and popular music of the last 300 years. Prerequisites: Dance 60A-B.

80 Introduction to Dance (4) F, W, S. Survey of nineteenth- and twentieth-century ballet, modern dance, and theatre dance. For non-majors only. Dance 80 and Dance 90A-B-C may not both be taken for credit. **(VII-B)**

81 Dance Cultures of the World (4). A survey of selected world dance forms, focusing on social and cultural context. **(VII-B)**

82 Topics in World Dance (4). Various topics in world dance studies focusing on historical, social, and cultural contexts. May be repeated for credit as topics vary. **(VII-B)**

90A-B-C Dance History A, B, C (4-4-4) F, W, S. 90A: Introduction to non-western dance. Dance in the western tradition from prehistory through the Middle Ages. **90B:** The history of dance in the western tradition from the Renaissance through the nineteenth century. **90C:** The history of dance in the western tradition: the twentieth century. Dance 90A-B-C and Dance 80 may not both be taken for credit. **(IV, VII-B)**

UPPER-DIVISION

100 Kinesiology for Dance (4). The study of the production of dance movement or lack of dance movement by the muscles of the body. Anatomical and dynamic analysis of dance movement.

103 Pilates (2) F, W, S. Basics of technique emphasizing alignment, breath control, correction of muscular imbalances. Use of the Universal Reformer. Prerequisites: Dance 133A-B-C, 143A-B-C.

104 Health and Injury in High-Impact Activity (4). Develops skills in the evaluation and management of dance and athletic injuries. Instruction is provided to prepare the advanced student trainer for certification by the National Athletic Trainers Association. Prerequisite: consent of instructor.

110 World Dance (2). Studio workshop of dances and movement sources of specified countries or areas. May be taken for credit six times as topic varies.

123 Dance Accompaniment (4). Examination of technique and etiquette of instrumental accompaniment for dance in lecture and studio environments. Keyboards, percussion, and other instruments are demonstrated. Prerequisite: Dance 21A.

125A-B Teaching of Dance (4-4) W, S. 125A: Pedagogy. The methods and theory of teaching dance forms. **125B:** Practicum. The application of theory in the studio. Prerequisites: Dance 133A-B-C and 143A-B-C; upper-division standing.

127A Costume Design for Dance (4). Costume design and construction specific to the body in motion. Theoretical study and practical execution.

130A-B-C Pointe Class (2-2-2) F, W, S. Beginning and intermediate pointe work; principles of Classical tradition developed from Noverre, Petipa, and Cecchetti. Emphasis on basic pointe techniques and performance styles. Prerequisites: Dance 132A-B-C. May be taken for credit three times.

132A-B-C Studio Workshop in Ballet II (2-2-2) F, W, S, (132) Summer. Intermediate ballet: principles of Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites for non-Dance majors: Dance 30A-B-C or audition. May be taken for credit twice.

133A-B-C Advanced Studio Workshop in Ballet III (2-2-2) F, W, S, (133) Summer. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites: Dance 132A-B-C or audition. May be taken for credit twice.

134A-B-C Advanced Studio Workshop in Ballet IV (2-2-2) F, W, S, (134) Summer. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites: Dance 133A-B-C with a grade of B^+ or better in 133C, or audition. May be repeated for credit.

135A-B-C Advanced Studio Workshop in Ballet V (2-2-2) F, W, S. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. Prerequisites: Dance 134A-B-C with a grade of B^+ or better in 134C, or audition. May be taken for credit three times.

137 Repertory (2) F, W, S. Rehearsal and performance of repertoire from established ballet, modern, or jazz dance choreographers. Prerequisites: Dance 133A-B-C or 143A-B-C or consent of instructor. May be taken for credit twice.

138 Character Dance (2) F, W, S. A dance style mainly based upon the national traditions of the Polish, Russian, and Hungarian dance techniques as used in classical ballet repertoire. Character or jazz shoes required. Prerequisites: Dance 30A-B-C. May be repeated for credit.

139 Partnering (2). Principles of partnering techniques in various dance performance styles. Prerequisites: Dance 133A-B-C, Dance 143A-B-C, or by audition. May be taken for credit four times.

142A-B-C Studio Workshop in Modern II (2-2-2) F, W, S, (142) Summer. Intermediate modern tradition developed from Graham, Humphrey, and Wigman, incorporating the personal point of view of the instructor. Prerequisites for non-Dance majors: Dance 40A-B-C or audition. May be taken for credit twice.

143A-B-C Advanced Studio Workshop in Modern III (2-2-2) F, W, S, (143) Summer. Advanced modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman, incorporating the personal view of the instructor. Prerequisites: Dance 142A-B-C. May be taken for credit twice.

144A-B-C Advanced Studio Workshop in Modern IV (2-2-2) F, W, S. Advanced modern dance. In-depth study of styles, performance elements and principles of modern dance developed from Graham, Horton, Humphrey, Wigman, and current influences incorporating the personal view of the instructor. Prerequisite: Dance 143A-B-C or consent of instructor. May be taken for credit three times.

150A-B-C Studio Workshop in Tap II (2-2-2). Intermediate tap: principles of beginning tap continued and developed. Prerequisite: Dance 52A-B-C or consent of instructor.

151A-B-C Studio Workshop in Tap III (2-2-2) F, W, S. An overview of tap concentrating on the development of various technique forms using intermediate and advanced principles. Prerequisites: Dance 150A-B-C and consent of instructor. May be taken for credit twice.

152A-B-C Intermediate Studio Workshop in Jazz II (2-2-2) F, W, S. Intermediate jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor. Prerequisites for non-Dance majors: Dance 50A-B-C. May be taken for credit twice.

153A-B-C Advanced Studio Workshop in Jazz III (2-2-2) F, W, S. Advanced jazz: principles of jazz dance and contemporary forms incorporating the personal views of the instructor. Prerequisites: Dance 152A-B-C. May be taken for credit twice.

154A-B-C Advanced Jazz: Performance Techniques IV (2-2-2) F, W, S. Advanced jazz emphasizing performance techniques. Prerequisites: Dance 153A-B-C. May be taken for credit twice.

160 Improvisation (2). Structured and experiential improvisation to heighten the personal intuitive processes, the kinesthetic sense, spatial and temporal awareness, and to encourage insights into the potential movement resources of the individual for performance and choreography. Course encourages freedom of exploration. May be taken for credit two times.

162A-B-C Choreography II (4-4-4) F, W, S. Directed choreographic projects for stage or video integrating the elements of stagecraft. In process or completed works may be shown quarterly in public studio or stage performances. By audition only. Prerequisites: Dance 60A-B-C.

163 Choreography and Digital Technology (4). A process-oriented course exploring the use of digital technology and choreography. Students create performance pieces in the dance studio and in computer-mediated environments such as the motion capture studio, working individually and in collaboration. Prerequisites: Dance 60A-B or consent of instructor.

164A Video Choreography (4) F, W, S. Introduction and overview of video dance, choreography for the camera, and documentation of existing stage choreography. History and aesthetics of dance on video and basics of technical equipment, video techniques, and editing. A major final project is required.

165 Choreographic Projects (1 to 4) F, W, S. Supervised choreographic projects for workshop productions. By audition and approval of faculty. May be taken for credit twice.

170 Dance Performance (1 to 4). Rehearsal and performance in a faculty-choreographed production. By audition only. May be taken for credit twice.

171 Dance Workshop (1 to 4) F, W, S. Rehearsal and performance in a student-choreographed production. By audition only. May be taken for credit three times.

172 Master of Fine Arts Concert (1 to 4). Rehearsal and performance in a graduate student-choreographed production. By audition only. May be taken for credit three times.

174 UCI Dance Ensemble Performance (1 to 4). Performance with the UCI Dance Ensemble. Prerequisite: consent of instructor. May be taken for credit twice.

176 UCI Jazz Dance Ensemble (2 to 4). Rehearsal and performance experience in theatrical jazz dance, designed to provide an experience in assimilating various styles of jazz dance and in refining dance performance techniques. Students also master aspects of dance company promotion. Prerequisites: Dance 152A-B-C or consent of instructor. May be taken for credit six times.

177 UCI Spanish Dance Ensemble (1 to 4) F, W, S. Rehearsal and performance with the UCI Spanish Dance Ensemble. Flamenco, regional, classical, and neoclassical Spanish dances are presented throughout the year for campus and off-campus events. Prerequisite: consent of instructor. May be taken for credit 12 times.

179 UCI Etude Ensemble (4) F, W, S. Repertory and performances by undergraduate Dance majors. Concert presentations on and off campus. Faculty directed, student/faculty choreographed. By audition only. May be taken for credit three times.

180A-B, C Laban Studies (4-4, 4) F, W, S. 180A: Elementary Labanotation and introduction to Laban Writer software. **180B:** Intermediate Labanotation and work with Laban Writer software. **180C:** Laban movement analysis and motif writing. Prerequisites: Dance 21A and 132A-B-C or consent of instructor; Dance 180A is required for 180B.

185 Critical Issues in Dance (4) F, W, S. Introduction to comparative aesthetic and philosophical theories of dance; application of philosophical and critical analysis to dance performances. Prerequisites: satisfaction of the lower-division writing requirement and Dance 90A-B-C.

193 Selected Topics in Dance (1 to 4). Directed group studies of topics in dance. May be repeated for credit when topic changes.

197 Independent Study (1 to 4) F, W, S. Individual independent projects in experimental laboratory, library, field, performance, under instructor's direction. Students can receive conceptual, creative, and theoretical instruction in the successful completion of a written report or performance. Prerequisite: consent of instructor. May be repeated for credit.

199 Senior Thesis (4) F, W, S. Directed research or creative activity for senior Dance majors. Research consists of a substantial essay on dance history, research in dance science, or the creation of original or reconstructed choreography. Pass/Not Pass only. May be repeated for credit.

GRADUATE

NOTE: Some courses are not offered every year. Please check with the department advisor.

201 Seminar in Kinesiology for Dance (4) F. Brief introduction to biomechanics, physiology of exercise and equipment, movement principles, and their application to dance techniques. Prerequisite: Dance 100 or consent of instructor.

210 Graduate Studio: World Dance (2) F, W, S. Principles, techniques, and styles of selected genres of world dance such as those of Mexico, Spain, Japan, or other cultures. Prerequisite: consent of instructor. May be taken for credit six times.

222 Musical Resources (4). Detailed study of music as it relates to dance. Historical overview of musical form, style, and other elements. Analysis of various affinities between music and dance. Practical applications. Prerequisite: Dance 221 or consent of instructor.

225 Seminar in the Teaching of Dance Techniques (4). Principles and theories of teaching dance techniques. Supervised presentation and teaching of technique class.

227A Costume Design for Dance (4) F. Overview of basic design elements, draping and drafting techniques, and costume construction.

231A-B-C Graduate Studio: Ballet (2-2-2) F, W, S. Advanced ballet, pointe work, and performance style: principles of the Classical tradition developed from Noverre, Petipa, and Cecchetti. By audition only. May be repeated for credit.

241A-B-C Graduate Studio: Modern (2-2-2) F, W, S. Advanced modern dance: principles of modern tradition developed from Graham, Humphrey, and Wigman, incorporating the personal view of the instructor. By audition only. May be repeated for credit.

251A-B-C Graduate Studio: Jazz (2-2-2) F, W, S. Principles of jazz dance and contemporary forms, incorporating the personal views of the instructor. By audition only. May be repeated for credit.

252A-B-C Graduate Studio: Tap (2-2-2) F, W, S. An overview of tap concentrating on the development of various technique forms using basic and intermediate principles. May be taken for credit four times.

261A-B Graduate Seminar in Choreography (4-4) F, W. Graduate work in dance composition emphasizing the individual aesthetic. Assignments in movement discovery, solo and group forms, with the main emphasis on independent work. May be repeated for credit.

264 Video Choreography (4). Directed choreographic projects for the video camera. Video techniques which create the hybrid art form called video dance. Production of an individual video choreography project. Prerequisites: Dance 164A-B-C.

265 Motion Capture (4). Projects in motion capture; the animation technique of measuring a dancer's position and orientation in three-dimensional space and recording that data in a computer. Individual and group choreography are developed and recorded with state-of-the-art technology.

276 Arts Computation Engineering Studio/Laboratory: Telematic Performance and Teleoperative Art (4) F, W, S. Art and performance projects utilizing real time and quasi-real time distance interaction. Synchronous performance and distributed choreography. Network technologies and protocols. Speed, bandwidth, latency. Web-based technologies. Video and sound. Teleoperation/remote machine control. Same as Arts 276, Engineering 276, and Informatics 276.

281A-B, C Dance and Digital Technology (4-4, 4) F, W, S. 281A: Interactive multimedia. **281B:** Continuing work and more complex projects in interactive multimedia for dance. **281C:** Sound design for choreography and multimedia productions.

282 Seminar in Movement Analysis (4) W, S. Theories of movement analysis and nonverbal communication applied to dance.

283 Critical Issues in Dance (4) F, W, S. Discussion of aesthetics and philosophy as they specifically apply to dance. Cross-cultural comparisons and advanced critical skills are presented. Written critiques and descriptive analyses are required. Prerequisite: Dance 284.

284 Bibliography and Research (4) F. Survey and practice of primary and secondary research methods in dance including electronic searches. Development of writing for presentation, publication, and thesis essay.

285 Graduate Projects (4). Projects may be educational, choreographic, scientific, historical, or philosophical in scope and must have faculty advisor approval. May be taken for credit six times.

286 Thesis (4). Substantial research in a topic approved by the student's graduate committee. Results of the research must be written in approved thesis style. Prerequisite: consent of department. May be taken for credit six times.

287 Graduate Lectures in Dance (1 to 4). A series of lectures and discussions of announced topics in dance. Content may be from history, ethnology, notation, medicine, music, or other areas in the field. Prerequisite: consent of instructor. May be repeated for credit as topics change.

296 Proseminar in Dance History (4). Discussion seminar with emphasis on reading and thinking about problems in dance history; presentation of oral and written reports. Topics vary. May be taken for credit twice.

297 Directed Reading (1 to 4). Topic to be approved by instructor. Paper required. Prerequisite: consent of instructor. May be repeated for credit.

298 Proseminar in Dance Ethnology (4). Seminar in dance ethnology fieldwork. Readings in ethnographic theory and method complement the design, enactment, and analysis of a field study.

399 University Teaching (1 to 4). Limited to Teaching Assistants. Prerequisite: consent of instructor. May be repeated for credit.

DEPARTMENT OF DRAMA

249 Drama Building; (949) 824-6614
Cameron Harvey, **Department Chair**

Faculty

Lonnie Alcaraz, M.F.A. University of California, Irvine, *Assistant Professor of Drama* (lighting design, digital imaging)
Keith Bangs, M.F.A. Yale University, *Lecturer in Drama* (technical production)
Stephen Barker, Ph.D. University of Arizona, *Professor of Drama* (post-modern theatre, Beckett, critical theory)
Richard Brestoff, M.F.A. New York University, *Assistant Professor of Drama* (film and television acting)
Daniel Gary Busby, D.M.A. University of California, Los Angeles, *Assistant Professor of Drama* (music theatre, singing, conducting)
Dennis Castellano, M.F.A. University of California, Irvine, *Senior Lecturer with Security of Employment and Head of Music Theatre* (music theatre)
Robert Cohen, D.F.A. Yale University, *Claire Trevor Professor of Drama* (acting theory, acting, directing)
Myrona DeLaney, M.F.A. University of California, Irvine, *Lecturer in Drama* (music theatre, singing, acting)
Clifford Faulkner, M.A. California State University, Long Beach, *Lecturer in Drama* (scenery design, history of design, gay theatre)
Keith Fowler, D.F.A. Yale University, *Professor of Drama and Head of Directing* (directing, acting)
Clayton Garrison, Ph.D. Stanford University, *Professor Emeritus of Drama* (opera, musical theatre, movement, dramatic literature)
Douglas-Scott Goheen, Ph.D. University of Denver; M.F.A. Yale University, *Professor of Drama* (scenery design, digital imaging)
Cameron Harvey, M.F.A. University of California, Irvine, *Department Chair and Professor of Drama* (artistic direction, producing, lighting design)
Don Hill, M.F. A. University of Southern California, *Lecturer with Potential Security of Employment and Head of Stage Management* (stage management, directing, acting)
Dudley Knight, M.F.A. Yale University, *Department Vice Chair and Professor of Drama* (voice, speech for actors, acting)

Madeline Ann Kozlowski, M.F.A. Brandeis University, *Professor of Drama and Head of Design* (costume design)
Anthony Kubiak, Ph.D. University of Wisconsin, Milwaukee, *Professor of Drama* (American and modern drama, modern poetry, critical theory, philosophy)
Daphne Pi-Wei Lei, Ph.D. Tufts University, *Assistant Professor of Drama* (Asian theatre, Asian American theatre, intercultural theatre, gender theory, performance theory)
Annie Loui, *Associate Professor of Drama* (movement, directing, acting)
David McDonald, Ph.D. Stanford University, *Professor Emeritus of Drama* (dramatic theory, Irish drama, theatre history, playwriting)
Ian Munro, Ph.D. Harvard University, *Associate Professor of Drama* (European drama and performance, early modern popular culture, theatrical performance of wit)
Janelle Reinelt, Ph.D. Stanford University, *Associate Dean of Graduate Studies and Professor of Drama* (British theatre, political theory, performance)
Bryan Reynolds, Ph.D. Harvard University, *Associate Professor of Drama and Head of Doctoral Studies* (Shakespeare, Renaissance drama, critical theory, feminist theory, performance theory, cultural studies)
Thomas Ruzika, M.F.A. University of California, Irvine, *Lecturer in Drama* (lighting design)
Eli Simon, M.F.A. Brandeis University, *Associate Professor of Drama and Head of Acting* (acting, directing)
Phil Thompson, M.F.A. University of California, Irvine, *Assistant Professor of Drama* (voice, speech for actors, acting)
Bill Tomlinson, Ph.D. Massachusetts Institute of Technology; M.F.A. California Institute of the Arts, *Assistant Professor of Informatics and Drama* (autonomous characters, computational social behavior, interactive media, real-time animation)
Richard Triplett, Otis Art Institute, *Professor Emeritus of Drama* (scenery and costume design, history of design)
Christopher Villa, *Lecturer in Drama* (stage combat)
Robert Weimann, Ph.D. Humbolt University (Germany), *Professor Emeritus of Drama* (theory, criticism, literature)
Shigeru Yaji, M.F.A. California State University, Long Beach, *Lecturer in Drama* (costume design)

The Bachelor of Arts program in Drama combines broad liberal study and comprehensive training in several subdisciplines of drama. Each Drama major studies and practices in each of several mutually related areas of the theatre: performance, literature, history, criticism, design and stage management, and production. The curriculum is structured to relate studio practices, technical resources, and production techniques to the development of dramatic literature and current critical theory.

The program is designed for students who, while not necessarily planning to make the theatre their vocation, have a serious interest in the literature, theory, and practice of drama, as well as for students preparing to work professionally in the theatre, often after more specialized training at the graduate level.

The Department of Drama is a member of the University/Resident Theatre Association (U/RTA).

CAREERS FOR THE DRAMA MAJOR

A degree in Drama may or may not lead to professional employment in theatre or film.

Graduates in Drama at UCI have performed in Broadway plays, regional and summer theatres, and in films and television. They serve as artistic directors, designers, art directors, business managers, and performers at more than 100 theatre companies, and as faculty at more than 75 institutions of higher learning.

Not all Drama students become professional theatre artists. Many embark upon careers in law, business, arts management, advertising, and teaching; others pursue further study at UCI or elsewhere.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements for the Major

An introductory course in production theory (Drama 10); one year in acting (Drama 30A-B-C); one year survey in the development of dramatic literature (Drama 40A, B, C); three courses in design (Drama 50A, B, C); one year in the development of theatre (Drama 120A, B, C); two upper-division courses in dramatic literature; three upper-division courses in addition to the two in dramatic literature mentioned above (these may be in studio work and/or dramatic literature, playwriting, and criticism); four units from one of the following options: movement for actors (Drama 34), speech for the theatre (Drama 35), or two technique courses in the Dance Department (two units each, may be taken Pass/Not Pass); eight units of theatre production (Drama 101) of which four units must be completed during the first year of residence at UCI.

Students are required to take Drama 40A, B, C in their sophomore year, after completion of the lower-division writing requirement.

Students entering the Department as freshmen must complete Drama 50A, B, C by the end of their junior year. All other students must complete these courses within one year of entering the major.

Sample Program for Freshmen

Fall	Winter	Spring
Drama 30A	Drama 30B	Drama 30C
Drama 50	Drama 50 or 10	Drama 50 or 10
Drama 101 (2 units)	Drama 101 (2 units)	English WR39C
English WR39A	English WR39B	Elective

Departmental Requirements for the Minor

Drama 10 (Introduction to Production Theory); Drama 30A-B-C (Acting); Drama 40A, B, C (Development of Drama); seven upper-division courses in Drama, each of which must be taken at UCI, including Drama 120A, B, C (Development of Theatre) and one course in Drama 101 (Theatre Production).

Honors in Acting Program

Admission to the Honors in Acting Program requires both eligibility and a special audition. The eligibility requirements for sophomore-level transfer students and native UCI students are: (1) at least one year in good standing as a UCI Drama major; (2) completion of Drama 130A-B and at least one section of either Drama 135 or Drama 165, all at UCI; (3) honors students must possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all acting courses; (4) performance in at least three official Drama at UCI productions (including mainstage, stage 2, stage 3, workshop, or cabaret); (5) completion of all Drama 101 (Theatre Production) assignments; and (6) completion of the eligibility form.

The eligibility requirements for junior-level transfer students are: (1) one year in good standing as a UCI Drama major; (2) completion of Drama 130A-B at UCI; (3) honors students must possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all acting courses; (4) completed performance in at least one official Drama at UCI production (including mainstage, stage 2, stage 3, workshop, or cabaret); (5) completion of four out of eight units of Drama 101; and (6) completion of eligibility form.

A student's audition will determine final admission to the Honors in Acting program. Only truly exceptional students, no more than 10 to 20 percent of those eligible, will be admitted. The Honors auditions, for eligible candidates only, are held at the end of fall quarter and by special arrangement. Auditions will consist of a standard presentation.

Honors in Acting Program students receive: (1) the "Honors in Acting" notation on their official transcript; (2) nomination and recommendation for national University/Resident Theatre Association (U/RTA) auditions; (3) eligibility, on a space available basis, for South Coast Repertory Theatre internships, currently available only to M.F.A. students; and (4) eligibility to audition at UCI-screened Shakespearean Festivals.

Honors in Design Program

The Honors in Design Program provides the opportunity for Drama majors to concentrate on the study and practice of scenery, costume, or lighting design. Honors in Design students study basic and advanced design techniques, participate in classes with graduate design students, serve as an assistant designer to a graduate student or faculty designer, and possibly design a production at UCI.

Eligibility requirements are: (1) at least one year in good standing at UCI as a Drama major; (2) completion of Drama 50A, B, C or equivalent courses; (3) completion of at least two upper-division studio courses in design, one of which may be in production techniques, selected from Drama 150–162, 167–169; (4) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all design and production technique courses; (5) completion of four out of eight units of Drama 101 (Theatre Production); and (6) completion of the eligibility form.

Admission to the Honors in Design Program is competitive. Students may be admitted as early as the winter quarter of their sophomore year but no later than the spring quarter of their junior year. Upon completion of eligibility requirements, the student will schedule an informal portfolio review with a member of the design faculty appropriate to the student's specialty area(s).

The selected faculty mentor may recommend that: (1) the student is ready to proceed with a formal portfolio review and presentation to the Design faculty via the Head of Design; (2) the student rework the content and/or presentation of the material for reconsideration by the faculty mentor; (3) the student is not ready or able to proceed with Honors in Design. Only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted to Honors in Design as determined by the Design faculty via the Head of Design.

Honors in Design students receive: (1) the "Honors in Design" notation on their official transcript; (2) nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews; (3) an assistant designer assignment with a graduate student or faculty designer; and (4) special consideration to design a budgeted and technically supported production.

Honors candidates meet with their faculty mentor at the beginning of every quarter to evaluate their progress and with the Head of Design to check that all grade and course requirements are being satisfied.

Honors in Directing Program

The Honors in Directing Program provides the opportunity for Drama majors to concentrate on the study and practice of stage direction. Honors in Directing students study basic and advanced directing techniques, participate in the Directing Laboratory with graduate Directing students, take a course in directorial themes and/or the history of directing, and direct two full plays in the Drama Workshop series. Honors students also have the opportunity to receive credit as the assistant director of a Stage 1 or Stage 2 Department show; as a production internship with a professional theatre company; or for production/direction responsibility with the Playwright's Workshop.

Admission to the Honors in Directing Program is competitive. Candidates must first complete Drama 170 (Directing) with a grade of B or higher, which qualifies them to enroll in Drama 185 (Advanced Directing). Candidates must apply, as a director, for Drama 198 (Drama Workshop) by submitting a proposal to direct a play in the Drama Workshop series. If the proposal is accepted, the candidate must declare to the Head of Directing that the production is to be counted as an audition for admission to the Honors in Directing Program. A committee of three Drama faculty members, including the Head of Directing, will then see and evaluate the production for clarity of interpretation, unity of style, strength of acting, and ensemble performance, and will examine the candidate's self-evaluation and the evaluations of the director by members of the cast. The Head of Directing will inform the candidate of the committee's decision as to whether or not the candidate is admitted to the Honors Program.

Undergraduate Drama majors can be admitted into the program as early as the winter quarter of their freshman year but no later than the spring quarter of their junior year. Students may be admitted to the program retroactively if all the requirements for Directing Honors have been met by their final year, but only if a faculty committee of three has seen their workshops and agrees to admit the candidate.

To achieve the Honors in Directing distinction, students must fulfill all the courses required of the regular Drama major, with an overall GPA of 3.2 or higher. In addition, students must complete the following courses with a GPA of 3.4 or higher:

1. Drama 170 (Directing). This course is taught each year in the fall quarter only.
2. Two courses in Drama 185 (Advanced Directing). Drama 185 is offered annually in winter quarter and sometimes in spring quarter. In this course, undergraduate Directing students present work in the Directing Laboratory along with graduate Directing students.
3. Two Drama Workshops, one of which must be taken as Drama 198 (Drama Workshop) with the candidate serving as director. The candidate must stage a second Drama Workshop as Drama 199 (Projects in Theater), for which a letter grade is earned.
4. Four additional units to be satisfied by any of the following: Drama 199 (as a summer internship, approved by the Head of Directing, with the candidate serving a professional theatre company as director, assistant director, or production assistant); Drama 199 (as a production/directing project for Playwright's Workshop); Drama 100 (as assistant director to a faculty director); or Drama 199 (as assistant director to a graduate director's thesis production).

Honors candidates meet with the Head of Directing at the beginning of every quarter to evaluate their progress and to check that all grade and course requirements are being satisfied. Successful graduating seniors will receive the "Honors in Directing" notation on their official transcript and will receive a nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews.

NOTE: All of the above courses are open to all students even though they may not qualify for the Honors Program.

Honors in Dramatic Literature, History, and Theory Program

The Honors in Dramatic Literature, History, and Theory Program is designed to challenge superior students beyond the scholarly requirements of the Drama major. It provides them with the opportunity to advance their knowledge of dramatic literature, history, and theory and to further develop their writing, analytical, and research skills. An additional purpose of the program is to better prepare students for graduate study in not only dramatic literature, history, and theory, but in all fields in the humanities and social sciences, as well as in law.

Eligibility requirements are: (1) completion of Drama 40A, B, C and two courses of Drama 103 (for upper-division writing credit), or equivalents to these courses from other institutions; (2) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all dramatic literature, history, and theory courses; and (3) completion of the eligibility form.

Admission to the Honors in Dramatic Literature, History, and Theory Program is competitive. Students must apply to the program prior to the spring quarter of their junior year. Upon completion of eligibility requirements, applicants must submit at least two critical essays, most likely written previously for courses, totaling no more than 30 pages. These essays will be used by the Honors Committee (comprised of the Head of Dramatic Literature, History, and Theory and two additional members of the Drama faculty) to determine admission. Only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted.

Beyond fulfilling the regular requirements of the Drama major, honors students must take three additional upper-division courses in dramatic literature, history, and/or theory, one of which must be focused on theory. Upper-division courses in other departments may be used to fulfill these requirements, as long as the Honors Committee approves them.

Honors students must also write an honors thesis, a 30–40 page research paper written under the supervision of a faculty member on a topic chosen by the student. In consultation with the student, the adviser for this project is selected before the end of the fall quarter of the student's senior year. Students develop their projects until the spring quarter when they enter the writing phase. It is only during the spring quarter that students achieve full course credit for their work on the thesis, in the form of an independent study course with their advisor. This independent study is the final course of the program.

Successful graduating seniors will receive the "Honors in Dramatic Literature, History, and Theory" notation on their official transcript.

Honors in Music Theatre Program

The Honors in Music Theatre Program provides special recognition to the music theatre student who has not only taken full advantage of all music theatre course offerings, but has done so with superior achievement and professional aptitude. Students are selected for this distinction by the music theatre faculty based on their admission into Drama 174 (Music Theatre Workshop IV), grade point average (see below), and exceptional talent. Drama 174 is offered every fall, winter, and spring quarters by audition.

Students in the Honors in Music Theatre Program must fulfill all the courses required of the regular Drama major with the following qualifications and additions:

1. The two upper-division courses in Dramatic Literature must be satisfied with Drama 148A, B (History of American Musical Theatre).
2. The three upper-division courses in Drama must be satisfied with Drama 166A, B, C (Music Theatre Workshop III).
3. The two Dance classes must be satisfied by taking two quarters of ballet, any level. (May be taken Pass/Not Pass.)
4. Additional required courses: Drama 35 (Speech for the Theatre); Drama 100 (University Theatre; specifically, a fully produced, musical production); Drama 130A (Intermediate Acting); Drama 145 (Music Theatre Singing); Drama 146A-B (New York Satellite Program); Drama 147 (Music Theatre Dance); Drama 149 (Music Proficiency for Actors—this course is waived if the student already possesses basic keyboard reading skills); Drama 174 (Music Theatre Workshop IV); Drama 176 (Script and Score); one quarter of tap and one quarter of jazz (Dance Department).

   (Note: Drama 148A, B and Drama 176 are offered every other year on a rotating basis. Drama 148A, B are prerequisites for 176; junior transfers may enroll in 176 *before* taking 148A, B since they may only be on campus for two years.)
5. Honors candidates must possess and maintain an overall GPA of 3.2 or higher, with an overall GPA of 3.4 or higher in the above courses.

Honors candidates will meet with the head of the Music Theatre Program at the beginning of every quarter to evaluate their progress and to check that all grade and course requirements are being satisfied. Successful graduating seniors will receive the "Honors in Music Theatre" notation on their official transcript.

Honors in Stage Management Program

The Honors in Stage Management Program provides the opportunity for Drama majors to concentrate on the study and practice of stage management. Honors students study basic and advanced stage management techniques, participate in classes with graduate stage management students, work as assistant stage managers with graduate student stage managers on graduate student-directed and faculty-directed productions, and stage manage a graduate student-directed or faculty-directed production at UCI.

Eligibility requirements are: (1) at least one year in good standing at UCI as a Drama major; (2) completion of Drama 50A, B, C, or equivalent courses; (3) completion of Drama 163 and one course in production techniques selected from Drama 150–162; (4) possess and maintain an overall GPA of at least 3.2, with a GPA of 3.4 or higher in all stage management and production technique courses; (5) completion of eight units of Drama 101 (Theatre Production); and (6) completion of the eligibility form.

Admission to the Honors in Stage Management Program is competitive. Students may be admitted as early as the winter quarter of their sophomore year but no later than the spring quarter of their junior year. Upon completion of eligibility requirements, the student will submit to the Honors Committee (comprised of the Head of Stage Management and two additional members of the Drama faculty): (1) two prompt books; (2) a resume including all stage management and production experience; (3) letters of reference from two directors with whom the student has worked; and (4) a written paper on the subject of stage management. Only truly exceptional students (no more than 10 to 20 percent of those eligible) will be admitted as determined by the Honors Committee.

Honors in Stage Management students receive: (1) the "Honors in Stage Management" notation on their official transcript; (2) nomination and recommendation for national University/Resident Theatre Association (U/RTA) interviews; (3) assistant stage manager assignments working with graduate student stage managers on graduate student-directed or faculty-directed productions; and (4) a stage management assignment on a graduate student-directed or faculty-directed production.

Honors candidates meet with the Head of Stage Management at the beginning of every quarter to evaluate their progress and to check that all grade and course requirements are being satisfied.

MASTER OF FINE ARTS PROGRAM

Degree Offered

M.F.A. in Drama, with emphasis in Acting, Directing, or Design and Stage Management.

A graduate emphasis in Feminist Studies also is available. Refer to the Women's Studies section of the *Catalogue* for information.

Admission

Applicants for admission to the degree program must meet the general requirements for admission to graduate study and hold a B.A., B.F.A., or higher degree.

Applicants must submit dossiers of biographical information and theatrical experience, together with photographs, essays, reviews, production books, and portfolios, as appropriate.

Normally an audition is required for all applicants who intend to follow the curriculum in Acting. UCI coordinates its auditions with the University/Resident Theatre Association (U/RTA), and conducts auditions, both for U/RTA finalists and UCI applicants, in New York, Chicago, San Francisco, and Irvine during February. Interviews for applicants in Directing and in Design and Stage Management also are required.

General Degree Requirements

Normally three years of residence is required. Each candidate must enroll for three courses each quarter for nine quarters, exclusive of summer sessions.

During the first year of residence each candidate will prepare, for credit, two graduate projects, in either acting, directing, design, stage management, theatrical research, or a combination of two of these. Satisfactory completion of these projects, as determined by the faculty, is prerequisite to entering the second year of the program.

The required thesis normally consists of directing, designing, stage managing, or playing a principal role in a major production, and collecting in essay form the evidences of research, analysis, and judgments which formed a part of the production experience.

Each graduate student is expected to participate in productions throughout residence at UCI.

A total of 108 quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course. Specific course requirements must be satisfied in one of the following three areas:

Acting

Nine graduate studios in acting (Drama 200), taken in tandem with nine graduate studios in voice (Drama 201), stage speech (Drama 202), stage movement (Drama 203) or dance (Dance 231, 241, 251, 150, or 151), and Voice/Movement Dynamics (Drama 206); three master classes in acting (selected from various topics offered in Drama 219); one seminar in script analysis and research (Drama 235); three courses in development of theatre (Drama 120A, B, C)—faculty program head may approve substitutions depending on student's prior academic experience; two seminars in dramatic literature, performance theory, criticism, history of theatre, or contemporary theatre (Drama 220–225, or 230); six graduate projects, of which two may be professional internships (Drama 240 or 295).

Design and Stage Management

Nine graduate studios in design/stage management, one of which is the thesis (Drama 255); seven courses in graduate projects, two of which may be a professional internship (Drama 240, 295); two elective courses; three courses in development of theatre (Drama 120A, B, C)—faculty program head may approve substitutions depending on student's prior academic experience; two courses in production techniques (Drama 150–162, 167–171, 260–265); one course in conceptualization and collaboration (Drama 245, must be taken the first quarter in residence); one seminar in script analysis and research (Drama 235); two courses in dramatic literature, performance theory, criticism, contemporary theatre, or history of music theatre (Drama 220, 221, 223, 230, or 248).

Directing

Nine graduate studios in directing (Drama 211); three courses in development of theatre (Drama 120A, B, C)—faculty program head may approve substitutions depending on student's prior academic experience; two courses in acting (Drama 200); one seminar in script analysis and research (Drama 235); one course in conceptualization and collaboration (Drama 245); two seminars in dramatic literature, performance theory, criticism, theatre history (Drama 220–223, 248); seven projects, of which one is the thesis, one is a project in theatre production, one may be a professional internship, and three must be directed (non-thesis) productions; two or three electives.

DOCTORAL DEGREE PROGRAM

Degree Offered

Ph.D. in Drama and Theatre.

This is a joint program offered by the UCI Department of Drama and the UCSD Department of Theatre and Dance.

Preparation

Students with a B.A. (minimum GPA of 3.5), M.A., or M.F.A. degree in Drama and Theatre are eligible for admission to the doctoral program. Students with training in literature (or another area in the humanities) will also be considered, provided they can demonstrate a background in drama or theatre. Experience in one of the creative activities of theatre (acting, directing, playwriting, design, dramaturgy) enhances a student's chances of admission.

All applicants are required to take the Graduate Record Examination and to submit samples of their critical writing.

While not required for admission, a working knowledge of a second language is highly desirable (see Language Requirement).

Course of Study

Students are required to take a minimum of 144 units, which is equivalent to four years of full-time study (full-time students must enroll for a minimum of 12 units each quarter). Forty of these units are taken in required seminars; the balance is made up of elective seminars, independent study and research projects (including preparing the three qualifying papers), and dissertation research. Students must take a minimum of one seminar per year in the UCSD Department of Theatre and Dance. The program of study makes it possible for students to take a significant number of elective courses and independent studies both with faculty in Drama and Theatre and in other departments.

Required Courses

Students must take a minimum of 12 units (three seminars) each of Drama 290 (Dramatic Literature and Theatre History Prior to 1900) and 291 (Dramatic Literature and Theatre History, 1900 to Present), and 16 units (four seminars) of 292 (Cultural and Critical Theory).

All graduate courses may be repeated when the topic varies. Descriptions of the topics to be treated in a given academic year are published by the Department in the fall. Enrollment in each course requires the consent of the instructor. The courses are limited to registered doctoral students.

These 10 required seminars must be completed by all students, including those who have an M.A. or an M.F.A. degree, before the end of the third year. In addition, students must pass comprehensive examinations at the end of their first and second years.

Drama 293 (Directed Studies) and 294 (Dissertation Research) are also required.

Comprehensive Examinations

In the first year, students prepare for the Written Comprehensive Examination, which is based on a reading list of approximately 150 titles ranging from the Ancient Greeks to the present. Students take this examination at the beginning of the fall quarter of their second year. (Comprehensive examinations are scheduled at the beginning of fall quarter in order to allow students the summer to prepare.) Students who fail the Written Comprehensive may retake it no later than the first week of winter quarter of their second year. Students who fail the Written Comprehensive for a second time are dismissed from the program.

In their second year, students prepare for the Oral Comprehensive Examination. The reading list for this examination is designed to permit students to acquire a knowledge of their dissertation subject area, broadly conceived. The reading list is compiled by the student and the dissertation advisor, in consultation with other members of the faculty, as appropriate; the reading list must be established by the end of winter quarter of the second year. Students take the Oral Comprehensive at the beginning of the fall quarter of their third year. Students also submit a dissertation prospectus (approximately five pages) when they take this examination. Students who fail the Oral Comprehensive may retake it no later than the first week of winter quarter of their third year. Students who fail the Oral Comprehensive for a second time are dismissed from the program.

Advancement to Candidacy: Three Qualifying Papers

Students normally select a dissertation advisor during their second year and must do so before the end of spring quarter of that year. In consultation with the dissertation advisor and other faculty members, students develop topics for three qualifying papers, which are written during their third year. The three qualifying papers—one long (approximately 50 pages) and two short (approximately 30 pages each)—must be completed by the end of the third year; these completed papers provide the basis for the Oral Qualifying Examination. Students write the long paper under the direction of their dissertation advisor; it is understood that the long paper is preparatory to the dissertation. The short papers deal with other related topics, subject to the approval of the student's advisors; the two short papers are understood as engaging in exploring the larger contexts of the dissertation. Students normally pass the Qualifying Examination and advance to candidacy at the end of their third year; students must advance to candidacy no later than the end of fall quarter of their fourth year. Once advanced to candidacy, students write their dissertation which, upon completion, is defended in a final oral examination.

Students may select a dissertation advisor from either the UCI Department of Drama or the UCSD Department of Theatre and Dance. All UCI doctoral dissertation committees must include at least one faculty member from UCSD.

Language Requirement

Students are required to complete an advanced research project using primary and secondary material in a second language (materials may include live and/or recorded performance; interviews with artists, critics, and scholars; and other non-documentary sources, as well as more conventional textual sources). This requirement may be satisfied by writing a seminar paper or a qualifying paper (see Advancement to Candidacy above) that makes extensive use of materials in a second language. The second-language requirement must be satisfied before the end of the third year. This requirement will not be waived for students who are bi- or multilingual; all students are required to do research-level work in more than one language.

It is assumed that students will have acquired a second language before entering the doctoral program, although second-language proficiency is not a requirement for admission. While students may study one or more second languages while at UCI or UCSD, language courses may not be counted toward doctoral program requirements.

Teaching

Students are required to teach a minimum of four quarters. No more than eight units of apprentice teaching may be counted toward the required 144 units.

Departmental Ph.D. Time-Limit Policies

Students must advance to candidacy by the end of the fall quarter of their fourth year. Departmental normative time for completion of the degree is five years; total registered time in the Ph.D. program at UCI or UCSD cannot exceed seven years.

Financial Support

Ph.D. students entering the program with a B.A. may be supported (either by teaching assignments or fellowships) for five years. Students who have an M.A. and have been given transfer credit may be supported for four years. Such support depends upon the funds available, the number of students eligible, and the student's rate of progress.

Courses in Drama

LOWER-DIVISION

10 Introduction to Production Theory (4) F, W, S. An introduction to modern production techniques as practiced in realizing scenic designs. Equipment, theories, techniques, and history of production practices in the technical theatre; class instruction integrated with practical applications.

20 The Nature of Drama: Structure and Style (4). A general introduction to the dramatic literature of several periods, with an emphasis on dramatic form and meaning.

30A-B-C Acting (4-4-4), (30A) F, Summer, (30B) W, (30C) S. A one-year course in basic acting technique and discipline. (NOTE: All acting classes require strict adherence to stage discipline; unexcused class absences, for example, are not permitted.) **30A:** Stage technique and stage discipline. Freeing vocal and physical movement and liberating emotional power. Elementary stage movement and voice. Elimination of regionalisms in speech. Overcoming stage fright. Readings in acting theory. **30B:** Improvisations and scenes. Rehearsal and presentation of at least two scenes with different partners. Developing stage contact with tactics in a "play" situation. Prerequisite: Drama 30A. **30C:** Characterization, scenes and auditioning. Development of character in at least three rehearsed scenes from different plays. Script analysis and performance technique. Preparation of audition pieces. The profession of acting. Prerequisites: Drama 30A-B.

34 Movement for Actors (4) F, W, S. Introduces the basics of stage movement for actors: the theory and practical application of physical relaxation, centering, focus, and balance. The body is trained to express a wide range of creative impulses for performance. May be taken for credit three times.

35 Speech for the Theatre (4) F, W, S. A course aimed at (1) improving natural, clear, unaffected speech and (2) eliminating negative habits and regional accents: exercises for physical tension, vocal support, tone production, vocal quality, and articulation. Open only to Arts majors. May be repeated for credit.

40A, B, C Development of Drama (4, 4, 4) F, W, S. A one-year lecture-discussion course (each quarter may be taken independently) in the development of Western Drama, concentrating on the drama's intellectual, social, and artistic foundations. About 10 plays and supplementary critical material are read each quarter. **40A:** Greek Drama through Shakespeare. Readings from Aeschylus, Sophocles, Euripides, Aristophanes, Marlowe, Shakespeare, and the anonymous playwrights of the medieval theatre. **40B:** Restoration Drama through Ibsen. Readings from Neoclassic, Romantic, and Naturalistic European playwrights in the eighteenth and nineteenth centuries. Molière, Racine, Congreve, Goethe, Ibsen, and Chekhov are included. **40C:** Contemporary Drama. Post Naturalistic theatre: Expressionism, Epic Theatre, Theatre of the Absurd, and Contemporary American Theatre. Among the playwrights studied are Stein, Shaw, Pirandello, Ionesco, Beckett, Williams, Brecht, Weiss, Albee, Churchill, and Duras. Same as Comparative Literature CL 40A, B, C. **(IV, VII-B)**

50A Introduction to Costume Design (4) F, W, S. An introduction to the process and procedures employed by the costume designer for the theatre. The elements of design are discussed in the context of character development, historical period, and style. Exercises extend to drawing, rendering, and investigation of human proportions.

50B Introduction to Scenic Design (4) F, W, S. Introduction to the principles and practice of scenic design. Weekly problems include research into various periods and styles of production with an emphasis on the conceptual idea. Perspective drawing, rendering, and model building are covered in studio exercises and assignments. Prerequisite: Drama 10.

50C Introduction to Lighting Design (4) F, W, S. Introduction to the principles, theories, and equipment employed by the lighting designer for the stage. Areas of investigation include history, technology, and script analysis. Detailed studio attention is given to the theory and practice of design.

65 Music Theatre Workshop I (2) F, W. For students new to singing or musical theatre. Basic vocal technique, characterization, and physicalization of music and lyrics introduced. May be taken for credit three times.

UPPER-DIVISION

100 University Theatre (4). Rehearsal and performance in a faculty-directed production. By audition only. May be repeated for credit.

101 Theatre Production. The production courses are offered to give students the opportunity to participate in departmental productions. Students engage in the production and construction of designed work as well as its applied execution during performance. Prerequisite: consent of instructor. May be taken for credit for a maximum of 24 units provided productions change.

101A Theatre Production: Costume (1 to 6) F, W, S. Pass/Not Pass only.

101B Theatre Production: Scenic (1 to 6) F, W, S. Pass/Not Pass only.

101C Theatre Production: Lighting (1 to 6) F, W, S. Pass/Not Pass only.

101D Theatre Production: Stage Management (2 to 8) F, W, S

101E Theatre Production: Audio (1 to 6) F, W, S. Pass/Not Pass only.

103 Lectures in Dramatic Literature (4). Courses include Medieval and Tudor Drama, Elizabethan and Jacobean Drama, Shakespeare, Restoration and Eighteenth-Century Drama, Modern British Drama, Modern American Drama, Tragedy, and Comedy. Prerequisite when offered for upper-division writing: satisfactory completion of the lower-division writing requirement. May be repeated, provided topic changes.

104 Greek Drama (4). A concentrated examination of the major works of Aeschylus, Sophocles, Euripides, and Aristophanes, with additional readings in Greek dramatic theory and theatre history.

120A, B, C Development of Theatre (4, 4, 4). A one-year lecture course concentrating on the development of world theatre from a visual point of view, from the earliest storytelling rituals through international stage development to contemporary theatrical forms. Prerequisite or corequisite: Drama 40 A, B, C. **(VII-B)**

130A-B Intermediate Acting (4-4). 130A: Rehearsal and presentation of at least five scenes from contemporary material. Exercises in developing relationship communication and character-to-character contact. May be repeated for credit. **130B:** Rehearsal and performance of four scenes developing characters in depth; examination of the credibility and theatricality of characterization and style. Prerequisite for 130A: Drama 30A-B-C with a grade of B or better; for transfer students: one year of beginning acting with a grade of B or better. Prerequisite for 130B: Drama 30A-B-C (or equivalent transfer courses) with a grade of B or better and Drama 130A. May be repeated for credit.

132 Playwriting (4). Completion of a full-length play or its equivalent; discussion of student writing and of relevant literary texts. Prerequisite: satisfactory completion of the lower-division writing requirement. May be repeated for credit as topics vary.

135 Master Classes in Acting (1 to 4). Advanced acting in specialized areas including acting for the camera: film, situation comedy, commercials; auditioning and industry preparation; Shakespeare; Moliere; Chekov; improvisation; movement for the actor; self-starting; stage combat; repertory acting, singing; comedy; clowning; and masks. Prerequisites: Drama 30A-B-C (or equivalent transfer courses) and Drama 130A with a grade of B or better; Drama 130B. May be repeated for credit.

140 Introduction to Asian Theatre (4) W. An introduction to some of the major traditional theatrical forms and dramatic texts from India, China, and Japan. Other than dramatic texts (in English translation), attention is also paid to theory, history, and performance styles of traditional Asian theatre.

141 Asian American Theatre (4) W. An introduction to the history and development of Asian American theatre and drama. Besides play analysis, special attention is also paid to the history and politics of Asian American identity and experience, as well as to aspects of theatrical performance. Prerequisites: Drama 40A, B, C and 120A, B, C.

145 Music Theatre Singing (1) F, W, S. Private weekly voice lessons for the advanced musical theatre student. Corequisite: Drama 166 or 174. May be taken for credit nine times.

146A-B New York Satellite Program (4-4) W, S. An immersion experience in New York City for the musical theatre performer. **146A:** Class preparation. **146B:** Master class in New York. Prerequisites: Drama 30A and audition. May be taken for credit three times. Formerly Drama 146.

147 Music Theatre Dance (4) F, W. An exploration of various dance styles from different eras of the musical theatre stage. Prerequisite: Drama 65 or 165. May be taken for credit six times.

148A, B History of American Musical Theatre (4, 4) F, W. Discusses the composers, librettists, directors, choreographers, and performers in the American musical theatre. **148A:** 1700s–1940s: ballad opera, minstrels, vaudeville, burlesque, operetta, revues, and musical comedy. **148B:** 1940s–present: book musicals, concept musicals, Broadway opera, and new forms. Concurrent with Drama 248A, B.

149 Music Proficiency for Actors (0) F, W, S. Tutorial in basic keyboard and sight reading skills. Students repeat course until they can teach themselves a vocal line from a piano/vocal score. Pass/Not Pass only. Open only to students in the Honors in Music Theatre Program.

150 Costume Production Techniques (4). Studio instruction in pattern making, draping, millinery, and construction techniques. Prerequisite: Drama 50A. May be repeated for credit.

151 Scenery Production Techniques (4). Theatre architecture, the physical stage and its equipment, the principles of scenery construction, and the nature and sources of scenic materials are among the lecture topics. Theatre engineering is studied as a drawing subject. Particular emphasis is given to the maintenance of design integrity in scenic execution. Prerequisite: Drama 50B.

152 Lighting Production Techniques (4). An exploration of the methods and resources used by the lighting designer in the theatre. Class tours are conducted to leading theatres and commercial suppliers to examine equipment and procedures first hand. Detailed studio attention is given to the development of stage lighting graphics and problems related to road trouping. Prerequisite: Drama 50C.

153 Makeup Production Techniques (4). A studio laboratory course in the techniques of stage makeup including projects in prosthetics and ventilation of hair. Prerequisite: consent of instructor.

155 Lighting Systems (4). A study of basic electrical practice used in theatrical lighting. Areas of investigation include control system design, system wiring, maintenance of equipment, and new developments in the field of lighting and illumination. Prerequisite: Drama 50C.

157 Lighting Composition (4). Provides an opportunity for students to pursue stage lighting composition in a studio atmosphere. Laboratory practice includes weekly exercises in style and genre. Emphasis is placed on the realization of conceptual ideas. Prerequisite: Drama 50C. May be repeated for credit.

158 Studio in Theatre Design (4). Examines the various functions of scenery and costume: locale, historical period, mood, and atmosphere, with special assignments in each area. Discussion of problems in scenic metaphors and visualization, with emphasis on techniques of planning and presentation (e.g., floor plans, models, and rendering). Prerequisite: Drama 50A or 50B, or consent of instructor. May be repeated for credit.

159 Proseminar in Theatre Design (4). Content varies. Prerequisite: consent of instructor. May be repeated for credit.

160 Light Plotting Techniques (4). A study of the development of theatrical lighting plots from initial conceptualization through final documentation. Areas of emphasis include script analysis, visual approaches, equipment selection and compositional qualities of light. Prerequisite: Drama 50C.

161 Stage Lighting Graphics (4) S. A studio course in the various graphic methods employed by lighting designers in the theatre. Investigations will include manual and computer-aided techniques. Prerequisite: Drama 50C.

162 History of Stage Lighting (4) W. A historical study of lighting design methods, techniques, and innovation. Areas of emphasis include the development of light sources, equipment, and design styles.

163 Introduction to Stage Management (4) F. A basic study of theatrical, dance, and opera stage management practices, forms, and methods, from first script reading to closing night. Opportunity to observe professionals at work in regional and touring situations as available.

165 Music Theatre Workshop II (4) F, W, S. A workshop in audition technique and song interpretation. Admission by audition only. May be taken for credit six times.

166A, B, C Music Theatre Workshop III (4, 4, 4) F, W. Scene study and song repertoire examined by era for the advanced music theatre student. **166A:** 1900s–1930s: operetta, revue, and musical comedy. **166B:** 1940s–1960s: book musicals. **166C:** 1970s–present: new forms and Broadway opera. Prerequisites: Drama 165 and audition. May be taken for credit six times.

167 Fabric Modification Techniques (4). Exploration of various dying, printing, painting, and texture modification techniques. Prerequisite: Drama 50A. *Offered every other year.*

168 Theatrical Mask Techniques (4). Design and construction of theatrical masks including paper mache, leather, plastics, and latex. Projects employ traditional and contemporary techniques. Prerequisite: Drama 50A.

169 Costume Rendering Techniques (4). Development of costume rendering skills and techniques. Explores collage, pastel, and ink and emphasizes watercolor. Prerequisite: Drama 50A.

170 Directing (4) F. The principles of stage directing, covering the director's functions in the areas of interpretation, composition, coaching, and styling a theatrical production. Directing exercises and projects; the final project is the preparation of a hypothetical proposal for a play production. May be repeated for credit.

171 Production Management (4) F. An examination of stage and production management. Areas of study include production organization, management practices, production scheduling, rehearsal and performance duties, union regulations, and production touring.

173A Theatre Orchestra (2)

174 Music Theatre Workshop IV (4) F, W, S. A performance class concentrating on role building and how an actor prepares for that role. Work culminates with an in-class performance of two abbreviated musicals from different time periods. Prerequisites: audition, Drama 166A, B, C, Drama 148A, B, or consent of instructor. May be taken for credit six times.

175 Staging Shakespeare (4) W. A seminar in Shakespearean staging practice, both Elizabethan and contemporary. Students prepare a hypothetical production book for an assigned play as it could have been produced at the Globe Theatre in 1610, and a proposal to produce the same play in a contemporary manner today. Prerequisites: Drama 170 and consent of instructor. May be repeated for credit.

176 Scripts and Score (4) W. A form and analysis seminar discussing the libretto and score of landmark musicals. Prerequisites: Drama 148A, B. May be taken twice for credit.

180 Contemporary Dramatic Criticism and Theory (4) F, W, S. Reading and analysis of theories and critical approaches to contemporary theatre: Stanislavski, Brecht, Artaud, and others who have contributed to the form and idea of the modern theatre. Writing of assigned exercises in dramatic criticism. Prerequisite when offered for upper-division writing: satisfactory completion of the lower-division writing requirement. May be repeated for credit as topics vary.

185 Advanced Directing (4). A seminar in directorial organization and research. Student prepares a textual and dramaturgical analysis, a production timetable, and a hypothetical production book of an assigned play. Prerequisites: Drama 170 and consent of instructor. May be repeated for credit.

188 Showcase Performance (4). Rehearsal and public performance in departmentally sponsored acting showcase in New York and Los Angeles. Prerequisites: Drama 130A and 135; senior standing; audition and consent of instructor.

190 Studio in Acting (4). May be repeated for credit.

198 Drama Workshop (4) F, W, S. By audition or accepted proposal only. Consists of directing or acting in a regularly scheduled Drama Workshop production and submitting a final evaluation of all work performed. Workshop productions must be proposed by directors on departmental forms, and each project must be approved by the Workshop Committee. Pass/Not Pass only. May be repeated for credit.

199 Project in Theatre (1 to 4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

GRADUATE

200 Graduate Studio: Acting (2) F, W, S. Work in graduate studio taken in tandem with graduate studios in stage voice (Drama 201), stage speech (Drama 202), and stage movement (Drama 203). May be repeated for credit.

201 Graduate Studio: Voice (1) F, W, S. Graduate studio in vocal production for actors. May be repeated for credit.

202 Graduate Studio: Speech (1). Graduate studio in speech for actors. May be repeated for credit.

203 Graduate Studio: Movement (2). Work in graduate studio: stage movement taken in tandem with nine graduate studios in acting (Drama 200), voice (Drama 201), speech (Drama 202), and voice/movement dynamics (Drama 206). May be repeated for credit.

206 Graduate Studio: Voice/Movement Dynamics (2) F, W, S. Daily conditioning exercises. May be repeated for credit.

211 Graduate Studio: Directing (4) F, W, S. May be repeated for credit.

212 Graduate Studio: Playwriting (4). Completion of a full-length play or its equivalent and production of a staged reading of the play at the end of the spring quarter. Discussion of relevant literary texts and student writings. May be repeated for credit.

219 Graduate Master Class (1 to 4) F, W, S. Various topics such as Shakespeare, comedy, Molière, improvisation, Kabuki, television acting. May be repeated for credit.

220 Seminar in Dramatic Literature (4) F, W, S. May be repeated for credit.

221 Seminar in Criticism (4). May be repeated for credit.

223 Seminar in Performance Theory (4). A study of major performance theories since Diderot's *Paradox of Acting.* May be repeated for credit.

224 Seminar in Acting Theory (4) W. History and analysis of theories of acting from Plato to the present day.

225 Seminar on Theatre Pedagogy (4) F, W, S. A seminar on the major teaching systems in the dramatic arts with particular attention to professional arts training. Graduate students in Drama only; required prior to applying for Teaching Assistantships in studio areas. May be repeated for credit.

230 Seminar in Contemporary Theatre (4)

235 Script Analysis and Research (4) F. Analysis of dramatic scripts. Examination of dramaturgic structure, character intentions and interactions, historical and literary milieu, and potentials for theatrical realization. May be repeated for credit.

240 Graduate Projects (1 to 4) F, W, S, Summer. Various projects depending on student's concentration (acting, design, musical theatre, directing). May be repeated for credit.

245 Conceptualization and Collaboration (4) F. A study of the potential for directorial conceptualization and collaboration with designers in the areas of scenery, costume, lighting, and sound. May be repeated for credit.

248A, B History of American Musical Theatre (4, 4) F, W. Discusses the composers, librettists, directors, choreographers, and performers in the American musical theatre. **248A:** 1700s–1940s: ballad opera, minstrels, vaudeville, burlesque, operetta, revues, and musical comedy. **248B:** 1940s–present: book musicals, concept musicals, Broadway opera, and new forms. Concurrent with Drama 148A, B.

255 Graduate Design and Stage Management (4) F, W, S. Studio exercises and projects in costume, scenery, lighting design, and stage management. Open only to Drama graduate students pursuing the Design and Stage Management emphasis. May be repeated for credit as topic varies.

260 Digital Design: Image Compositing/Rendering (4) F. A studio course in scenic or costume rendering for the theatre using computer image manipulation and compositing techniques. May be taken for credit twice.

261 Digital Design: Drawing/Painting/Rendering (4) W. A studio course in scenic or costume rendering for the theatre using the computer for drawing/painting through the use of the digital pen/tablet. May be taken for credit twice.

262 Digital Design: 2D/3D Modeling (4) W. A studio course in CAD's 2D and 3D modeling capabilities for theatrical design. Instruction in state-of-the-art software for 2D and 3D object creation and theatrical presentation conventions.

263 Digital Design: 3D Rendering (4) S. A studio course in theatrical design through 3D modeling on the computer and use of state-of-the-art rendering software. Instruction emphasizes collaborative design process through the use of scenic designer/lighting designer teams for all projects. Prerequisite: Drama 262.

264 Lighting Graphics (4) S. A studio course in the various graphic methods employed by lighting designers in the theatre. Projects include manual and CAD techniques for Light Plot and Paperwork creation. Prerequisite: Drama 262.

265 Digital Design: 2D CAD (4) S. A studio course in theatrical design and architectural lighting design on the computer. Instruction in state-of-the-art software for 2D object creation. Theatrical and architectural standards implemented in performance design. Prerequisite: Drama 262.

290 Dramatic Literature and Theatre History Prior to 1900 (4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

291 Dramatic Literature and Theatre History, 1900 to Present (4) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

292 Cultural and Critical Theory (4). F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

293 Directed Studies (4 to 12). F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

294 Dissertation Research (4 to 12) F, W, S. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory. May be repeated for credit.

295 Professional Internship (1 to 8) F, W, S, (1 to 12) Summer. An arranged internship at the South Coast Repertory Theatre, or other equity theatre company, for qualifying M.F.A. students in acting and directing. A stipend and equity points are provided by the theatre company. May be repeated for credit.

399 University Teaching (4) F, W, S. Limited to Teaching Assistants.

DEPARTMENT OF MUSIC

303 Music and Media Building; (949) 824-6615
David Brodbeck, **Department Chair**

Faculty

Kei Akagi, B.A. International Christian University, Tokyo, *UCI Chancellor's Professor of Music* (piano, jazz studies)
Haroutune Bedelian, Associate of the Royal Academy of Music, London, *Associate Professor of Music* (violin)
David Brodbeck, Ph.D. University of Pennsylvania, *Department Chair and Professor of Music, and The Robert and Marjorie Rawlins Chair in Music* (history, criticism)
Rae Linda Brown, Ph.D. Yale University, *Associate Professor of Music* (history, American musics)
Robin Buck, M.M. University of Southern California, *Associate Professor of Music* (voice, opera)
Ellie Choate, M.A. California State University, Long Beach, *Lecturer in Music* (harp)
Jonathan Davis, M.M. The Juilliard School of Music, *Lecturer in Music* (oboe)
Russell Dicey, B.F.A. California Institute of the Arts, *Lecturer in Music* (French horn)
Theresa Dimond, D.M.A. University of Southern California, *Lecturer in Music* (percussion)
Christopher Dobrian, Ph.D. University of California, San Diego, *Associate Professor of Music and Informatics* (electronic music, composition)
Sherman Ferguson, *Lecturer in Music* (percussion, jazz studies)
Nohema Fernández, D.M.A. Stanford University, *Dean of the Claire Trevor School of the Arts, Professor of Music, and Claire Trevor Dean's Endowed Chair* (Latin American musics, piano)
Bernard Gilmore, D.M.A. Stanford University, *Professor of Music* (composition, theory)
Frederick Greene, M.Mus. Ed. University of Southern California, *Lecturer in Music* (tuba)
Lorna Griffitt, D.M. Indiana University, *Lecturer in Music* (piano)
Robert Hickok, B.Mus. Yale University, *Professor Emeritus of Music* (choral conducting)
Joseph B. Huszti, M.Mus. Northwestern University, *Professor of Music and Director of Voice and Choral Music* (conducting, choral ensembles, voice)
Patricia Kaufmann, M.M. University of Southern California, *Lecturer in Music* (flute)
Mickael McCool, *Lecturer in Music* (gospel choir)
George McMullen, *Lecturer in Music* (trombone, jazz studies)
Margaret Murata, Ph.D. University of Chicago, *Professor of Music* (history, analysis, criticism)
Peter S. Odegard, Ph.D. University of California, Berkeley, *Professor Emeritus of Music* (theory, composition)
Darek Oles, B.A. California Institute of the Arts, *Lecturer in Music* (bass, jazz studies)
Charles M. Owens, B.M. California State University, Los Angeles, *Lecturer in Music and Director of the Jazz Orchestra* (saxophone and jazz studies)
Margaret Parkins, D.M.A. State University of New York at Stony Brook, *Lecturer in Music* (cello)
Bobby Rodriguez, M.A. California State University, Los Angeles, *Lecturer in Music* (trumpet, jazz studies)
John Scanlon, M.A. University of California, Santa Barbara, *Lecturer in Music* (viola)
John Schneiderman, B.Mus. University of California, Irvine, *Lecturer in Music* (guitar, lute)
Nina Scolnik, B.Mus. Oberlin Conservatory, Performance Diploma, The Juilliard School, *Lecturer in Music* (piano)
H. Colin Slim, Ph.D. Harvard University, *Professor Emeritus of Music* (history)
David Stetson, B.M. University of Southern California, *Lecturer in Music* (trombone)
Darryl Taylor, D.M.A. University of Michigan, *Assistant Professor of Music* (voice, opera)
Fred Tinsley, M.A. University of Redlands, *Lecturer in Music* (bass)
Stephen Tucker, D.M.A. University of California, Los Angeles, *Assistant Professor of Music* (orchestra)
Amanda Walker, M.F.A. University of California, Los Angeles, *Lecturer in Music* (clarinet)
David Washburn, M.M. New England Conservatory of Music, *Lecturer in Music* (trumpet)

Additional professional staff in instrumental music supplement the faculty in accordance with the needs of the program.

PROGRAMS OF STUDY

The Department of Music offers two undergraduate degrees (the Bachelor of Arts in Music and the Bachelor of Music) and the Master of Fine Arts degree in Music.

The **Bachelor of Music (B.Mus.)** degree program is performance-oriented. It offers students the opportunity to specialize in one of the following: bassoon, clarinet, composition, contrabass, flute, French horn, harp, jazz instrumental, lute and guitar, oboe, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, violoncello, or voice. (The specialization appears on the student's UCI transcript.) In addition, B.Mus. students may qualify for the Special String Performance option, an intensified curriculum for professional-level students. All B.Mus. students receive weekly private instruction, for a maximum of 12 quarters for entering freshmen or six quarters for transfers and composition students, and present a solo recital during their senior year. B.Mus. students participate in performance classes each quarter. Normal residency for the Bachelor of Music degree is four years, and two years for transfer students. Vocal performance students focus on diction, movement, stage presentation, repertory, criticism, and style. Guitar and lute students focus on ensemble work, repertory with other instruments and voice, criticism, and pedagogy. Piano students give weekly solo performances before other students, and also focus on criticism, style, and interpretation. String, wind, brass, percussion, and also piano students focus on quartet work, small ensembles, and solo sonatas privately coached and presented in afternoon recitals.

The **Bachelor of Arts (B.A.)** degree program enables students to pursue elective subjects in music (such as analysis, history, or jazz), in the arts, or in other academic disciplines. Students receive two years of instrumental or vocal instruction and participate at the same time in two years of ensemble or repertory classes. Students also complete a senior project in an area of interest: a historical project, a composition, or a lecture/performance.

Music scholarships are offered to promising undergraduate performers. Scholarship awards are generally based on the preadmission auditions held in February.

The University's Education Abroad Program offers students the opportunity to study abroad during their junior year. Music majors may enroll in conservatories and universities in several countries; highly qualified performers may be eligible to attend the Conservatorio G. B. Martini in Bologna, Italy. See the Educational Abroad Program section for additional information.

In each baccalaureate degree program, students receive private lessons on their instruments or in voice, and perform in orchestral or choral concerts, in chamber ensembles, and in solo recitals.

A five-year program coordinated with the UCI Department of Education is available for students interested in obtaining a California Teaching Credential.

The **Master of Fine Arts (M.F.A.)** degree program in Music emphasizes Accompanying, Choral Conducting, Composition and Technology, Guitar/Lute Performance, Instrumental Performance, Jazz Instrumental/Composition, Orchestral Conducting, Piano Performance, and Vocal Performance.

PERFORMANCE OPPORTUNITIES

Choral/Vocal

Choral ensembles at UCI offer all students, regardless of major, the opportunity to sing. Regular ensembles include the California Chamber Singers, Concert Choir, Madrigal Singers, Men's Chorus, Women's Chorus, and Women's Chamber Choir. Performances range from international concert tours, to Southern California concert venues, to campus concerts. The Department produces the annual Madrigal Dinner celebrating the court of Henry VIII. Annual invitational choral festivals are an integral part of the program. Opera and oratorio performances feature student soloists.

Instrumental

The UCI Symphony Orchestra offers participants an opportunity to explore the great masterworks of the standard orchestra repertory. The most proficient students have an opportunity to perform a concerto with the orchestra by winning the annual concerto competition. The symphony performs six times a year including collaborations with the UCI Opera Theatre and the Departments of Dance and Drama. Productions have included Bizet's *Carmen* and Humperdinck's *Hansel and Gretel.*

A cornerstone of instrumental study at UCI is the chamber music program. Small ensembles, coached by the faculty, have frequent opportunities to perform.

Additional student performance opportunities are available in larger ensembles: the Wind Ensemble performs music written for varying combinations of wind and percussion instruments; the Jazz Orchestra performs a variety of jazz big band charts; and the Athletics Bands (Pep Bands, Drumline, Marching Band, and others) play for athletic events and other school, community, and private functions.

Composition

Students have the opportunity to compose works for performances by undergraduates and graduates, chamber groups, and a student modern music chamber ensemble. Selected student works may be read by the large performing ensembles.

CAREERS IN MUSIC

A degree in Music offers many career opportunities. Music is a highly competitive profession and a degree may or may not lead to professional employment with an orchestra or as a concert artist. Many graduates do, however, become successful freelance members of symphony orchestras, composers, and performers. Many others go on to pursue graduate degrees in performance, music history, conducting, arts management, music librarianship, composition, or secondary or postsecondary education. Some graduates have made careers in music publishing and in the recording industry.

RECOMMENDED PROFICIENCY LEVELS

All applicants for admission are required to pass an audition in their principal performing medium and will receive information concerning the mandatory audition approximately 60 days following the close of the application period.

Freshmen students wishing to enter either of the baccalaureate degree programs in Music must demonstrate appropriate performance proficiency and should have had a minimum of three years of private instrumental or vocal instruction. They should know scales, fundamental notation, triads, and have the ability to read music in both treble and bass clefs. Basic keyboard skill is highly desirable, as is experience as a solo performer. Choral, orchestral, band, or stage experience is desirable. In addition, they should have knowledge of scales, chords, and arpeggios; sight-reading ability; and a solo repertory from the sonata or chamber literature or the art song and oratorio literature.

Transfer students pursuing either undergraduate degree should have had college-level private instrumental or vocal instruction; two years of music theory; the history of western music; ear-training; sight-singing; sight-reading; and piano.

For transfer students pursuing the B.Mus. degree, results of placement tests will determine the minimum number of quarters necessary to complete degree requirements. All transfer students must take placement tests in musicianship, theory, and history in order to transfer these courses in fulfillment of the UCI Music degree requirements. These placement tests are given just before the beginning of the student's first quarter of study at UCI.

It is strongly recommended that all entering B.Mus. students have at least the following experience and/or abilities in music:

Composition students—instrumental or vocal performance proficiency as listed below for the appropriate instrument; submission of original instrumental and/or electronic compositions (scores and/or tapes) demonstrating creative talent and writing ability.

Guitar and lute students—knowledge of basic chord shapes, ability to read basic chord progressions and staff notation or tablature. Prior knowledge of the lute is desirable but not required. Guitarists with a nonclassical background (fingerstyle, jazz, rock) will be considered if they have adequate facility on the instrument and the desire to explore the classical guitar and lute repertory.

Jazz instrumental students—ability to produce a focused, clear tone and precise intonation on their instrument. Students must perform from memory at least three blues compositions and three compositions (32 bar or other) chosen from Ellington, Parker, Coltrane, Mingus, Monk, or Wayne Shorter. Students also must perform by memory the major, minor, blues, and altered scales in all keys.

Percussion students—mastery of rudimentary snare drum techniques to include open and closed rolls, flams, ruffs, and drags; familiarity with mallet percussion instruments (including bells, xylophone, and marimba) and ability to play rolls on tympani; knowledge of tuning techniques and basic rhythmic reading, major and minor scales, and basic note-reading skills.

Piano students—ability to perform from memory a prelude and fugue from Bach's *Well-Tempered Clavier,* the first movement of a classical sonata of the difficulty of a Beethoven sonata, excluding op. 49 nos. 1 and 2 and op. 79, and a composition from the romantic period or twentieth century.

Special String Performance students—Violin: major and minor scales and arpeggios through three octaves, one movement from a Bach unaccompanied sonata or partita, one movement from a classical or romantic sonata, two contrasting movements of a classical or romantic concerto from the standard repertory; **Viola:** major and minor scales and arpeggios through three octaves, one movement from a Bach suite, one movement of a sonata or concerto from the standard repertory (e.g., Brahms sonata, or concertos by Handel, Hoffmeister, Bartók, or Telemann); **Violoncello:** major and minor scales and arpeggios through three octaves, one movement from a classical sonata (e.g., Sammartini G major sonata, Beethoven sonata) or two contrasting movements from a Bach suite, one movement from a romantic sonata (e.g., Brahms, Strauss) or one movement from a concerto from the standard repertory (e.g., Lalo, Saint-Saëns, Dvôrák, Haydn, Boccherini); **Double Bass:** major and minor scales and arpeggios, a solo from Saint-Saëns' *Carnival of the Animals* or comparable work, two contrasting movements from any concerto of the standard repertory.

String students—ability to produce a clear tone and precise intonation with and without vibrato; controlled vibrato; slurred, *detaché, louré, staccato,* and simple *spiccato* bow strokes; knowledge of all major and minor scales and arpeggios; ability to play and read repertory of a difficulty comparable to the symphonies of Haydn, Mozart, Beethoven, and Schubert as well as demonstrable knowledge of the sonata and/or chamber music literature for the particular instrument.

Voice students—ability to perform solo literature; at least three years of private study and/or participation in choral or instrumental ensemble; some facility at the keyboard; a background in Italian, French, and German art songs.

Woodwind and brass students—ability to sustain tone production; accurate intonation over a dynamic range (from *pianissimo* to *fortissimo*); control of breath and articulation; all major and minor scales and arpeggios (*legato* and *staccato*) commensurate with the range and technique of the particular instrument; ability to play and read repertory from the seventeenth century to the present.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements—Core

Four quarters of theory/musicianship (Music 16A-B-C-D); two quarters of courses chosen from post-tonal theory (Music 35A-B), jazz theory (Music 36A-B), counterpoint (Music 43) or advanced counterpoint (Music 135), instrumentation (Music 136), composition (Music 150), music technology (Music 51, 151, or 152); one year of music history (Music 40B-C-D); attainment of a passing score on the Piano Sight-Reading Examination, to be taken no later than the first quarter of the junior year.

Bachelor of Arts Degree: Satisfactory completion of the Core requirements; one quarter of analysis (Music 155A); one quarter upper-division topics course chosen from the Music 140–148 series or Music 155B; two years of instrumental or vocal instruction (12 units maximum, selected from Music 165–170); two years of ensemble or repertory classes as assigned by the Department selected from Music 63, 160–164, 171–176, 178, 194, or 197. Lesson must be taken concurrently with ensemble or repertory class. Transfer students must complete at least six units of instrumental or vocal instruction in residence and six units in ensemble or repertory courses in residence.

Students may choose to emphasize Analysis, History, Performance, and Jazz. One of the following senior projects (Music 192P) must be completed: (1) a lecture or lecture/performance of approximately 20 minutes in length on a musical subject presented to students, faculty, and guests, which can be a revision of a paper or project prepared for a course; (2) a composition or group of compositions of appropriate length; or (3) a thesis of at least 15 typed, double-spaced pages on a musical subject, which can be based on material taken from a course other than Music 155B. Proposed projects must be approved by the B.A. advisor by the end of the fall quarter of the year in which graduation is expected. Upon approval of the project proposal and with faculty supervision, a student may take Music 199 to research and write the thesis.

Bachelor of Music Degree: Satisfactory completion of the Core requirements; one quarter of analysis (Music 155A); one quarter upper-division topics course chosen from the Music 140–148 series or Music 155B; instrumental or vocal students receive instruction each quarter of residence (Music 165–170) for a maximum of 12 quarters for entering freshmen and six quarters for transfer students. Composition students receive six quarters of studio instruction (Music 165–169) as assigned by the Department and six quarters of composition lessons (Music 157). Normally Music 157 is taken in their junior and senior years. Instruction beyond the maximum must be approved by the Department; senior recital (Music 192S); completion of the following courses according to the approved Bachelor of Music specialization:

Composition: six quarters of ensemble performance selected from orchestra (Music 160), wind ensemble (Music 161), chorus (Music 162 or 171), chamber ensembles (Music 174 or 176), jazz orchestra (Music 178), or advanced jazz combo (Music 182); one quarter instrumentation (Music 136); two quarters of music technology (Music 51 and 151); three quarters of composition (Music 150). A senior project (Music 192P) may be substituted for the recital (Music 192S).

Guitar and Lute: guitar and lute workshop (Music 174) and chamber ensembles (Music 176) each quarter of residence.

Jazz Instrumental: jazz improvisation (Music 181A-B-C), orchestra, wind ensemble, or jazz orchestra as assigned by the Department (Music 160, 161, or 178) each quarter of residence, and nine quarters of chamber ensembles (Music 176, 182, 184, or 185). Transfer students require six quarters of chamber ensembles.

Orchestral or Band instruments: orchestra, wind ensemble, or jazz orchestra, as assigned by the Department (Music 160, 161, or 178) and chamber ensembles (Music 176) each quarter of residence.

Piano: piano repertory (Music 175 each quarter of residence), one quarter of piano pedagogy (Music 126); six quarters of chamber ensembles (Music 176) and three quarters of accompanying (Music 162P, 164P, 166P, or 197) as assigned by the Department. Transfer students must complete six quarters of chamber ensembles or accompanying in residence. Lower-division students must complete three quarters of keyboard skills (Music 21A-B-C) and upper-division students must complete three quarters of piano literature (Music 122A-B-C).

Voice: chorus (Music 162) each quarter of residence (Music 171 may be substituted by junior- and senior-level students with approval of instructor), and a minimum of six quarters of vocal performance (three quarters of Music 63 and three quarters of Music 163) for entering freshmen and a minimum of three quarters (Music 163) for transfer students. Three quarters of diction (Music 158A-B-C) and two quarters of song literature (Music 156A-B), three quarters of word and music (Music 197), three quarters of opera workshop (Music 164). Vocal coaching (Music 168 Lab) is also required for senior-level students, with approval from the Department.

NOTE: "Each quarter of residence" refers to residence within the major and residence at UCI.

Bachelor of Music Degree (Special String Performance): Satisfactory completion of the Core requirements; four years of instruction in the major instrument (Music 77 and 177); four years of orchestra (Music 160); two years of chamber music (Music 194); any three courses in history or criticism of art, dance history, development of drama, dramatic literature, or film criticism; four to eight units of a music elective selected from Music 135, 140–148, 155A-B; senior recital (Music 192S).

Sample Program – B.Mus. in Composition

FALL	WINTER	SPRING
Freshman		
Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]
Breadth II (4) Nat. Sci.	L-D Writing (4)	L-D Writing (4)
Mus. ensemble (2)[2]	Mus. ensemble (2)[2]	Mus. ensemble (2)[2]
Mus. 16x (2) Lesson[3]	Mus. 16x (2) Lesson[3]	Mus. 16x (2) Lesson[3]
Mus. 16A (4) Theory	Mus. 16B (4) Theory	Mus. 16C (4) Theory
Sophomore		
Mus. ensemble (2)[2]	Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.
Mus. 16x (2) Lesson[3]	Mus. ensemble (2)[2]	Mus. ensemble (2)[2]
Mus. 16D (4) Theory	Mus. 16x (2) Lesson[3]	Mus. 16x (2) Lesson[3]
Mus. 150 (4) Comp.	Mus. elective (4)[4]	Mus. elective (4)[4]
	Mus. 150 (4) Comp.	Mus. 150 (4) Comp.
Junior		
Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.
Mus. 40B (4) History[5]	Mus. 40C (4) History	Mus. 40D (4) History
Mus. 51 (4) Mus. Tech.	Mus. 151 (4) Compu. Comp.	Mus. 136 (4) Instrumentation
Mus. 157 (2) Comp. lessons	Mus. 157 (2) Comp. lessons	Mus. 157 (2) Comp. lessons
Senior		
Breadth III (4) Soc/Beh Sci.	Breadth III (4) Soc/Beh Sci.	Breadth III (4) Soc/Beh Sci.
Breadth VII-A (4) Multicul.	Elective (4)	Elective (4)
Mus. 157 (2) Adv. Comp.	Mus. 157 (2) Adv. Comp.	Mus. 157 (2) Adv. Comp.
Mus. 155A (4) Analysis	Mus. 140–148 or 155B (4)[6]	Mus. 192P/S (0) Proj./Recital
	U-D Writing (4)[6]	Elective (4)

1 Preferably Italian, French, German.
2 Selected from 160, 161, 162, 171, 174, 176, 178, or 182.
3 As assigned by the department selected from 165, 166, 167, 168, or 169.
4 Selected from the following: Music 35A-B, 36A-B, 43, 51, 135, or 152.
5 Music 40B-C-D satisfies Breadth IV Humanistic Inquiry and VII-B International/Global Issues.
6 Any upper-division course with a "W" suffix fulfills UCI's upper-division writing requirement.

NOTE: Piano sight-reading examination should be taken no later than the first quarter of junior year.

Sample Program – B. Mus. in Guitar and Lute

FALL	WINTER	SPRING
Freshman		
Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]
Mus. 16A (4) Theory	L-D Writing (4)	L-D Writing (4)
Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.
Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
	Mus. 16B (4) Theory	Mus. 16C (4) Theory
Sophomore		
Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.
Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.
Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
Mus. 16D (4) Theory	Mus. elective (4)[2]	Mus. elective (4)[2]
Junior		
Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.
Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.
Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
Mus. 40B (4) History[3]	Mus. 40C (4) History	Mus. 40D (4) History
Senior		
Breadth III (4) Soc/Beh Sci.	Breadth III (4) Soc/Beh Sci.	Breadth III (4) Soc/Beh Sci.
Mus. 155A (4) Analysis	U-D Writing (4)[4]	Breadth VII-A (4) Multicul.
Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.	Mus. 174 (2) G & L Wkshp.
Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute	Mus. 170 (2) Adv. Guitar/Lute
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
	Mus. 140-148 or 155B (4)[4]	Mus. 192S (0) Sr. Recital

1 Preferably Italian, French, German.
2 Selected from the following: Music 35A-B, 36A-B, 43, 51, 135, 136, 150, 151, or 152.
3 Music 40B-C-D satisfies Breadth IV Humanistic Inquiry and VII-B International/Global Issues.
4 Any upper-division course with a "W" suffix fulfills UCI's upper-division writing requirement.

NOTE: Piano sight-reading examination should be taken no later than the first quarter of junior year.

Sample Program – B. Mus. in Jazz Instrumental

FALL	WINTER	SPRING
Freshman		
Breadth VI (5) Lang.	Breadth VI (5) Lang.	Breadth VI (5) Lang.
Mus. 16A (4) Theory	Mus. 16B (4) Theory	Mus. 16C (4) Theory
Mus. 178 (1) Jazz Orch.[1]	Mus. 178 (1) Jazz Orch.[1]	Mus. 178 (1) Jazz Orch.[1]
Mus. 181A (2) Improv.	Mus. 181B (2) Improv.	Mus. 181C (2) Improv.
Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson
L-D Writing (4)	L-D Writing (4)	
Sophomore		
Mus. 16D (4) Theory	Mus. 36A (4) Jazz Theory[2]	Mus. 36B (4) Jazz Theory[2]
Mus. 78A (4) Jazz History[3]	Mus. 78B (4) Jazz History[3]	Breadth III (4) Soc./Beh. Sci.
Mus. 178 (1) Jazz Orch.[1]	Mus. 178 (1) Jazz Orch.[1]	Mus. 178 (1) Jazz Orch.[1]
Mus. 176 (2) Chamb. Ens.[4]	Mus. 176 (2) Chamb. Ens.[4]	Mus. 176 Chamb. Ens.[4]
Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson
Junior		
Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.
Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.
Mus. 40B (4) History[5]	Mus. 40C (4) History	Mus. 40D (4) History
Mus. 178 (1) Jazz Orch.[1]	Mus. 178 (1) Jazz Orch.[1]	Mus. 178 (1) Jazz Orch.[1]
Mus. 176 (2) Chamb. Ens.[4]	Mus. 176 (2) Chamb. Ens.[4]	Mus. 176 Chamb Ens.[4]
Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson
Senior		
Breadth III (4) Soc./Beh. Sci.	Mus. 140–148 or 155B (4)[6]	Breadth III (4) Soc./Beh. Sci.
Mus. 178 (1) Jazz Orch.[1]	Music 178 (1) Jazz Orch.[1]	Mus. 178 (1) Jazz Orch.[1]
Mus. 182 (2) Adv. Jazz Combo[4]	Mus. 182 (2) Adv. Jazz Combo[4]	Mus. 182 (2) Adv. Jazz Combo[4]
Mus. 183A (4) Jazz Comp.[7]	Mus. 183B (4) Jazz Comp.[7]	Mus. 183C (4) Jazz Comp.[7]
Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson	Mus. 165/7/9 (2) Lesson
Mus. 155A (4) Analysis		Mus. 192S (0) Sr. Recital

1 Selected from 160, 161, or 178
2 Suggested music elective selected from the following: Music 35A-B, 36A-B, 43, 51, 135, 136, 150, 151, or 152.
3 Music 78A or B satisfies Breath VII-A Multicultural Studies.
4 Selected from Music 176, 182, 184 or 185.
5 Music 40B-C-D satisfies Breadth IV Humanistic Inquiry and VII-B International/Global Issues.
6 Any upper-division course with a "W" suffix fulfills UCI's upper-division writing requirement.
7 Suggested electives.

NOTE: Piano sight-reading examination should be taken no later than the first quarter of junior year.

Sample Program – B. Mus. in Orchestral or Band Instruments

FALL	WINTER	SPRING
Freshman		
Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]
Mus 16A (4) Theory	L-D Writing (4)	L-D Writing (4)
Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.
Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
	Mus. 16B (4) Theory	Mus. 16C (4) Theory
Sophomore		
Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.
Mus. 16D (4) Theory	Mus. elective (4)[2]	Mus. elective (4)[2]
Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.
Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
Junior		
Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.
Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.
Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson
Mus. 176 (2) Chamb Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
Mus. 40B (4) History[3]	Mus. 40C (4) History	Mus. 40D (4) History
Senior		
Breadth III (4) Soc./Beh. Sci.	Breadth III (4) Soc./Beh. Sci.	Breadth III (4) Soc./Beh. Sci.
Breadth VII-A (4) Multicul.	Elective (2)	Elective (2)
Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.	Mus. 160/1/178 (2) Lrg. Ens.
Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson	Mus. 166/7/9 (2) Lesson
Mus. 155A (4) Analysis	Mus. 140-148 or 155B (4)[4]	Mus. 192S (0) Sr Recital
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.

1 Preferably Italian, French, German.
2 Selected from the following: Music 35A-B, 36A-B, 43, 51, 135, 136, 150, 151, or 152.
3 Music 40B-C-D satisfies Breadth IV Humanistic Inquiry and VII-B International/Global Issues.
4 Any upper-division course with a "W" suffix fulfills UCI's upper-division writing requirement.

NOTE: Piano sight-reading examination should be taken no later than the first quarter of junior year.

Sample Program – B. Mus. in Piano

FALL	WINTER	SPRING
Freshman		
Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]
L-D Writing (4)	L-D Writing (4)	Breadth II (4) Nat. Sci.
Mus. 21A (1) Kybrd Skills	Mus. 21B (1) Kybrd Skills	Mus. 21C (1) Kybrd Skills
Mus. 165 (2) Adv. Piano	Mus. 165 (2) Adv. Piano	Mus. 165 (2) Adv. Piano
Mus. 16A (4) Theory	Mus. 16B (4) Theory	Mus. 16C (4) Theory
Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.
Sophomore		
Elective (4)	Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.
Mus. 165 (2) Adv Piano	Mus. 165 (2) Adv. Piano	Mus. 165 (2) Adv. Piano
Mus. 16D (4) Theory	Mus. elective (4)[2]	Mus. elective (4)[2]
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.
Junior		
Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.
Mus. 165 (2) Adv Piano	Mus. 165 (2) Adv Piano	Mus. 165 (2) Adv Piano
Mus. 40B (4) History [3]	Mus. 40C (4) History	Mus. 40D (4) History
Mus. 122A (2) Piano Lit.	Mus. 122B (2) Piano Lit.	Mus. 122C (2) Piano Lit.
Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.
Mus. 197 (2) Word/Music[4]	Mus. 197 (2) Word/Music[4]	Mus. 197 (2) Word/Music[4]
Senior		
Breadth III (4) Soc./Beh. Sci.	Breadth III (4) Soc./Beh. Sci.	Breadth III (4) Soc./Beh. Sci.
Breadth VII-A (4) Multicul.	Mus. 126 (2) Piano Pedagogy	Elective (4)
Mus. 165 (2) Adv. Piano	Mus. 165 (2) Adv. Piano	Mus. 165 (2) Adv. Piano
Mus. 155A (4) Analysis	Mus. 140-148 or 155B (4)[5]	Mus. 192S (0) Sr. Recital
Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.	Mus. 176 (2) Chamb. Ens.
Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.	Mus. 175 (1) Piano Rep.

1 Preferably Italian, French, German.
2 Selected from the following: Music 35A-B, 36A-B, 43, 51, 135, 136, 150, 151, or 152.
3 Music 40B-C-D satisfies Breadth IV Humanistic Inquiry and VII-B International/Global Issues.
4 Music 162/4/6P can be substituted.
5 Any upper-division course with a "W" suffix fulfills UCI's upper-division writing requirement.
NOTE: Piano sight-reading examination should be taken no later than the first quarter of junior year.

Sample Program – B.Mus. in Voice

FALL	WINTER	SPRING
Freshman		
Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]	Breadth VI (5) Lang.[1]
Mus. 16A (4) Theory	L-D Writing (4)	L-D Writing (4)
Mus. 162 (2) Choir	Mus. 162 (2) Choir	Mus. 162 (2) Choir
Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice
	Mus. 16B (4) Theory	Mus. 16C (4) Theory
Sophomore		
Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.	Breadth II (4) Nat. Sci.
Mus. 162 (2) Choir	Mus. 162 (2) Choir	Mus. 162 (2) Choir
Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice
Mus. 16D (4) Theory	Mus. elective (4)[2]	Mus. elective (4)[2]
Mus. 158A (2) Dictn.(IPA/Italian)	Mus. 158B (2) Dictn. (French)	Mus. 158C (2) Dictn. (German)
Mus. 63 (1) Vocal Perf.	Mus. 63 (1) Vocal Perf.	Mus. 63 (1) Vocal Perf.
Junior		
Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.	Breadth V (4) Math/Symb.
Mus. 162/171 (2) Choir	Mus. 162/171 (2) Choir	Mus. 162/171 (2) Choir
Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice
Mus. 40B (4) History[3]	Mus. 40C (4) History	Mus. 40D (4) History
Mus. 156A (2) Song Lit.	Mus. 156B (2) Song Lit.	Mus. 164 (2) Opera Wrkshp
Mus. 197 (2) Word/Music	Mus. 197 (2) Word/Music	Mus. 197 (2) Word/Music
Senior		
Breadth III (4) Soc./Beh. Sci.	Breadth III (4) Soc./Beh. Sci.	Breadth III (4) Soc./Beh. Sci.
Breadth VII-A (4) Multicul.	Mus. 164 (2) Opera Wrkshp	Mus. 164 (2) Opera Wrkshp
Mus. 162/171 (2) Choir	Mus. 162/171 (2) Choir	Mus. 162/171 (2) Choir
Mus. 163 (1) Vocal Perf.	Mus. 163 (1) Vocal Perf.	Mus. 163 (1) Vocal Perf.
Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice	Mus. 168 (2) Adv. Voice
Mus. 155A (4) Analysis	Mus. 140-148 or 155B (4)[4]	Music 192S (0) Sr. Recital
Mus. 168L (0) Sr. Recital Coach	Mus. 168L (0) Sr. Recital Coach	Mus. 168L (0) Sr. Recital Coach
		Mus. 159 (2) Vocal Pedagogy[5]

1 Preferably Italian, French, German.
2 Selected from the following: Music 35A-B, 36A-B, 43, 51, 135, 136, 150, 151, or 152.
3 Music 40B-C-D satisfies Breadth IV Humanistic Inquiry and VII-B International/Global Issues.
4 Any upper-division course with a "W" suffix fulfills UCI's upper-division writing requirement.
5 Suggested elective.
NOTE: Piano sight-reading examination should be taken no later than the first quarter of junior year.
Concert attendance is required as part of Music 168.
A Junior Recital is incorporated into Music 197.

MASTER OF FINE ARTS PROGRAM

Degree Offered

M.F.A. in Music, with emphasis in Accompanying, Choral Conducting, Composition and Technology, Guitar/Lute Performance, Instrumental Performance, Jazz Instrumental/Composition, Orchestral Conducting, Piano Performance, and Vocal Performance.

Admission

Applications for admission to the degree program should be submitted by March 1 for the following fall quarter. Applicants must meet the general requirements for admission to graduate study and hold a B.A. in Music, or B.Mus., or the equivalent. Applicants should have completed the equivalent of two years of study in a foreign language.

Applicants must also submit a substantial sample of their writing, preferably on a musical subject (analytical, theoretical, historical); this requirement may be fulfilled by the submission of an undergraduate term paper.

All applicants for programs in performance must audition for members of the Music faculty by March 1. In special cases, a recently recorded demonstration of performance may be accepted. Applicants for programs in composition must submit scores and tapes of their works.

All applicants for admission must demonstrate competence in basic musical skills: sight-singing, written and keyboard harmony, dictation, and minimal facility at the keyboard (including sight-reading). In some cases, students who do not demonstrate appropriate proficiency in some area may be considered for admission. If admitted, these students will be required to make up any deficiency by the end of the first year of residency. All applicants who are admitted will be given a placement examination prior to the beginning of their studies.

General Degree Requirements

Normally, two years of residence are required. Each candidate must enroll for at least 12 units each quarter (normally consisting of three courses) for six quarters, exclusive of summer sessions. Students in choral conducting, vocal performance, piano performance, guitar/lute performance, and orchestral conducting must demonstrate reading knowledge of French, German, Italian, Spanish, or Latin (limited to vocal or choral conducting students only) by passing a written examination administered through the Department of Music, or by passing the appropriate language course (level 2A) for one quarter. This course must be passed with a grade of B or better to fulfill the foreign language requirement. Students who are required to fulfill this requirement must do so prior to the comprehensive examination.

Comprehensive examinations are taken after the fourth quarter in residence as a prerequisite to candidacy for the M.F.A. degree. A student who fails the comprehensive examination may reschedule it once in the following quarter.

Specific Degree Requirements

Seventy-two quarter units in graduate or approved upper-division undergraduate courses must be completed with a grade of at least B in each course. Total units must include 52 units of graduate-level courses, and not more than 20 units in upper-division courses may count toward the degree. Specific course requirements must be completed in one of the following areas:

Accompanying: Bibliography (Music 200); two courses in analysis (Music 201A-B); six courses in instrumental literature (Music 211); one seminar (Music 220, 230, or 235); two graduate projects (Music 240); Directed Reading (Music 250); three courses of vocal or choral accompanying (Music 197, 162P, or 164P) and two courses of instrumental or chamber accompanying (Music 166P or 176) as assigned by the Department; three courses of diction (Music 158) and two courses of song literature (Music 156A-B). There will be a recital at the end of each of the two years of residence.

Choral Conducting: Bibliography (Music 200); two courses in analysis (Music 201A-B); one seminar (Music 220, 230, or 235); five courses in choral literature (Music 210); eight units of Tutorial in Music (Music 191); Directed Reading (Music 250); two graduate projects (Music 240); 10 units of electives selected in consultation with head of student's program area; participation in performance (Music 162, 164, or 171) as assigned by the Department each quarter of residence of which only six units may be counted toward degree requirements; preparation of choral performance supported by a paper (circa 15-25 pages) in the second year of residence.

Composition and Technology: Bibliography (Music 200); two courses in analysis (Music 201A-B); six courses in composition (Music 212); two courses in music technology (Music 215); two seminars (Music 220 or 230); Critical Studies in Music (Music 235); 10 units of electives selected from Music 136, 145–148, 191, 201A, 215, 220, 240, and 250; participation in a large ensemble or chamber group for three quarters selected from Music 160, 161, 162, 162P, 171, 176, 178, 182, 197; preparation of a project in composition, including score and supporting written essay, in the second year of residence.

Guitar/Lute Performance: Bibliography (Music 200); two courses in analysis (Music 201A-B); two seminars (Music 220, 230, or 235); six courses in instrumental literature (Music 211); two graduate projects (Music 240); three quarters of chamber ensembles (Music 176) and three quarters of guitar accompanying (Music 189); eight units of electives selected in consultation with head of student's program area. There will be a solo recital at the end of the second year of residence supported by a written essay submitted prior to the recital.

Instrumental Performance: Bibliography (Music 200); two courses in analysis (Music 201A-B); one seminar (Music 220, 230, or 235); six courses in instrumental literature (Music 211); six quarters of chamber ensembles (Music 176) as assigned by instructors; two graduate projects (Music 240); six units of electives selected in consultation with head of student's program area; participation in a large ensemble as assigned by the Department (Music 160, 161, or 178) each quarter of residence of which only six units may be counted toward degree requirements. There will be a solo recital at the end of the second year of residence supported by a written essay submitted prior to the recital.

Jazz Instrumental/Composition: Bibliography (Music 200); Analysis (Music 201A-B), qualified students may test out of 201A and substitute a four-unit elective; four courses in instrumental literature (Music 211); two courses in composition (Music 212); two courses in music technology (Music 215); two seminars (Music 220 or 230); critical studies in music (Music 235); three courses selected from chamber ensembles (Music 176, 184, 185) or Jazz Orchestra (Music 178); two additional courses in Music 211 for an instrumental performance emphasis or two courses in Music 212 for a composition emphasis. One elective selected from Music 136, 145–148, 160, 161, 215, 220; participation in Music 182 each quarter of residence. The instrumental performance emphasis requires a recital (Music 211R) with at least 50 percent of the material from original works. The composition emphasis requires a recital (Music 212R) with at least 75 percent of the material from original works. Both emphases require final essays and written analysis of original works used for the recital.

Orchestral Conducting: Bibliography (Music 200); two courses in analysis (Music 201A-B); five courses in orchestral literature (Music 213); one course in choral literature (Music 210); three courses in score reading (Music 222A-B-C); one seminar (Music 220, 230, or 235); four courses in orchestral repertoire (Music 195); two quarters of chamber ensembles (Music 176); participation in a large ensemble (Music 160 or 161) each quarter of residence as assigned by the Department. There will be an orchestral performance at the end of the second year of residence accompanied by a historical paper.

Piano Performance: Bibliography (Music 200); two courses in analysis (Music 201A-B); one seminar (Music 220, 230, or 235); six courses in instrumental literature (Music 211); two graduate projects (Music 240); six quarters of chamber ensembles (Music 176) as assigned by instructors each quarter of residence; 12 units of electives selected in consultation with head of student's program area. There will be a solo recital at the end of each of the two years of residence. Prior to the second-year recital, student must submit a supporting written essay of the performance material.

Vocal Performance: Bibliography (Music 200); two courses in analysis (Music 201A-B); two seminars (Music 220 or 227); Vocal Pedagogy (Music 159); three quarters of opera workshop (Music 164); four quarters of vocal performance (Music 163); one course in conducting (Music 193); six courses in vocal literature (Music 210) with concurrent enrollment in vocal coaching (Music 210 Lab); two graduate projects (Music 240); four units of electives selected from Music 158, 215, 220, or 250; preparation of a performance supported by a written essay submitted prior to the recital in the second year of residence.

Courses in Music

LOWER-DIVISION

3 Music Appreciation (4). Introductory learning-to-listen course. Students develop musical understanding through listening to live and recorded performances: identifying such elements as melody, meter, mode, pitch, rhythm, harmony, and timbre; applying those concepts to music from a wide range of historical and cultural origins.

7 Gospel Choir (2) F, W, S. Learning about and performing American spirituals and gospel songs. Approach is one of cultural scholarship rather than "musically straight." Performances are given throughout the year. May be repeated for credit. Same as African American Studies 10.

9 History of Rock (4) S. Explores the development of rock music—its history and stylistic development from a political, sociological, and musical perspective.

10 Piano for Majors (2) F, W, S. For Music majors with little or no piano experience. Provides the necessary background for realizing keyboard exercises required in the theory and harmony courses, and develops skills to play and sight-read simple music from different periods. Pass/Not Pass only. May be taken for credit three times.

14A-B-C European and American Music: 1700–Twentieth Century (4-4-4) F, W, S. Survey of European and American music from the Baroque period through the twentieth century. **14A:** Baroque and Classical music with adequate attention given to the Medieval and Renaissance periods. **14B:** The nineteenth and twentieth centuries. **14C:** Selected topics in American music. **(IV)**

16A-B-C-D Theory/Musicianship (4-4-4-4) F, W, S. 16A: Basic concepts and materials. Major and minor scales, intervals between pitches, key signatures, elements of rhythm, diatonic chords in root position, and inversion. Simple and compound meters. **16B:** Principles of voice-leading, harmonic progression. Triads in first inversion. Triads in second inversion (6-4 chords). Syncopation in simple and compound meters. **16C:** Phrase structure, non-chord tones, the V7 chord and its resolutions, inversions of the V7 chord, ii7 and vii7, other diatonic seventh chords. Non-symmetrical meters and mixed meters. **16D:** Chromaticism and altered chords, secondary (applied) V and V7 chords, secondary vii7 chords, common—chord and common—tone modulations, other modulations, mode mixture, the Neapolitan chord, augmented-sixth chords, altered dominant chords, extended chords (ninth, eleventh, and thirteenth chords), harmonic practices of the late nineteenth century.

21A-B-C Keyboard Skills (1-1-1) F, W, S. Designed to develop the foundational skills of sight-reading, harmonization, transposition, improvisation, figured bass realization, and score reading.

35A-B Post-Tonal Theory (4-4) W, S. Study of significant harmonic, rhythmic, and structural practices since 1900. Analysis and written work exploring free atonality and serialism; neo-tonal practices such as use of extended tertian harmonies, modalism, pandiatonicism, and non-tertian harmonies; structural principles such as aleatory, metric modulation and minimalism. Prerequisite: Music 16D.

36A-B Jazz Theory (4-4) W, S. 36A: Introduction to the jazz symbols and terminology. Study of the most basic harmonic and melodic devices used by the jazz improviser. Emphasis is placed on understanding harmonization. Prerequisite: Music 16D. **36B:** Continuation of the study of harmonic and melodic devices in jazz with emphasis on role that bi-tonality has in modern idiom. Use of non-chordal notes is examined as well as a look at reharmonization of pre-existing melodies. Prerequisite: Music 36A.

40B-C History of European Music to Wagner (4-4) F, W. A survey of Western music. An introduction to the analysis of musical styles and forms and to the sources for constructing music history and reconstructing historical music. **40B:** to J.S. Bach; **40C:** to Richard Wagner. Prerequisites: Music 16C; Music 35B recommended for 40C. Open to Music majors only. **(IV, VII-B)**

40D Twentieth-Century Music (4) S. Survey of principal composers, movements, and compositional techniques of Western art music of the modern era. Prerequisites: Music 16D and 40B-C. **(IV, VII-B)**

41 Great Composers (4). Study of the works of an important composer with emphasis on their significance in historical and social contexts. Composers selected represent a wide variety of historical periods, nationalities, and stylistic orientations. Primarily for non-music majors; majors may enroll with permission. May be taken for credit two times as topics vary.

43 Counterpoint (4) W. Studies in contrapuntal practices of various style periods such as the sixteenth, eighteenth, and twentieth centuries. Prerequisite: Music 16D.

51 Music Technology and Computers (4) F. A study of the influence of technology on the musical culture and aesthetics of America in the twentieth century, with particular emphasis on the role of the computer. Work includes lectures, readings, listenings, discussions, demonstrations, writing, and experimentation.

63 Vocal Performance (1) F, W, S. Performance class for lower-division students emphasizing the development of style and stage presentation of song literature. Repertoire chosen from material assigned in the voice studio. May be repeated for credit.

78A, B History of Jazz (4, 4) F, W. 78A: Development of jazz from its African and African American folk origins through blues, early jazz and the swing era. **78B:** Continuation of the above survey, concentrating on bebop, "cool" jazz, and fusion. **(VII-A)**

92 Sophomore Recital (0) F, W, S. Solo or joint public recital by audition only and with departmental approval. Prerequisite: Music 16C. Corequisite: Music 174, 175, or 176. Open only to Music majors, except students concentrating in voice. Pass/Not Pass only.

UPPER-DIVISION

122A-B-C Piano Literature (2-2-2) F, W, S. Survey of stringed keyboard literature from the English Virginalists through twentieth-century composers. Historical, formal, and stylistic considerations of music presented. Performances by class participants and occasional outside guests. Prerequisites: Music 16A-B-C.

126 Piano Pedagogy (2). The materials and methods of piano instruction are examined and evaluated.

135 Advanced Counterpoint (4) S. Advanced exercises and composition in two- and three-part tonal writing, canon, and fugue, as well as some contemporary forms. Prerequisite: Music 43.

136 Instrumentation (4) W. Ranges and capabilities of modern orchestral instruments. Exercise in writing for various combinations of wind, string, and percussion instruments and for full orchestra. Prerequisite: Music 16C.

NOTE: Courses in the 140–148 sequence are for Music majors and include such topics as: The Motet in the Thirteenth and Fourteenth Centuries (140), Renaissance Keyboard Music (141), The Cantatas of Bach (142), Mozart's Operas (143), Early Nineteenth-Century Opera (144), Schoenberg, Bartók, and Stravinsky (145), Duke Ellington, Miles Davis, and Billie Holliday (146). Topics vary from quarter to quarter; each course may be repeated for credit. Some topics courses are open to nonmajors.

140 Studies in Medieval Music (4)

141 Studies in Renaissance Music (4)

142 Studies in Baroque Music (4)

143 Studies in Classical Music (4)

144 Studies in Romantic Music (4). Prerequisite when offered for upper-division writing: satisfactory completion of the lower-division writing requirement.

145 Studies in Twentieth-Century Music (4). Prerequisites: satisfactory completion of the lower-division writing requirement and upper-division standing.

146 Studies in Jazz Music (4)

147 Studies in Music Technology (4) F, W, S. Specialized topics in electronic music, computer-aided music, and other aspects of music technology.

148 Studies in Ethnomusicology (4)

150 Composition (4) F, W, S. Exercises and projects for diverse instrumental-vocal combinations; contemporary techniques and problems. Participation in the improvisation ensemble and working with electronic media. Prerequisite: Music 16C or consent of instructor. May be repeated for credit.

151 Computer Music Composition (4) W. Exercises in the composition of music uniquely possible by computer, including digital signal processing, computer control of synthesizers and processors, and algorithmic composition. Demonstrations and musical analyses in class; considerable studio work outside class. Prerequisite: Music 51 or consent of instructor.

152 Interactive Arts Programming (4) S. Study of artistic issues and programming techniques involved in the development of interactive computer art and music. Theoretical background, basic tenets of programming, and practical exercises in programming interactive computer multimedia art. Prerequisite: Music 151 or Studio Art 106 or consent of instructor.

155A-B Analysis (4-4) F, W. Methods of formal analysis applicable to all Western musical styles: additive, continuous, transformational, and hierarchic forms; rhythm, texture, and sonority as form and process. Prerequisites: Music 16D and 40B-C, or equivalent; satisfactory completion of the lower-division writing requirement.

156A-B Song Literature (2-2) F, W. A survey of song literature. Designed as an overview of the song repertoire. **156A:** German Lieder. **156B:** Songs of other European languages. Open only to upper-division Music majors.

157 Advanced Study in Composition (2) F, W, S. Individual weekly lessons in composition. Prerequisite: Music 150. Open only to upper-division Music majors. May be taken for credit six times.

158A-B-C Diction (2-2-2) F, W, S. In-depth study of the International Phonetic Alphabet (IPA), including its transcription and pronunciation, and its application for singers. **158A:** Introduction to IPA and Italian diction. **158B:** French diction. **158C:** German diction.

159 Vocal Pedagogy (2) S. Survey about the physical structure of the singing mechanism, science, and philosophy of studio instruction.

160 University Orchestra (2) F, W, S. Study and performance of standard orchestral repertory and works by contemporary composers. Emphasis on ensemble techniques including articulation, balance, phrasing, expression, accompanying. Two concerts per quarter; musicians required to attend all rehearsals. By audition only. May be repeated for credit.

160L Orchestral Tutorial (1 to 2) F, W, S. Tutorial instruction for individual players in the University Orchestra, combining private instruction with independent practice. Corequisite: Music 160. Open to nonmajors only with consent of Department of Music and instructor. May be repeated for credit.

161 Wind Ensemble (2) F, W, S. Advanced ensemble devoted to the study and performance of music written for varying combinations of wind and percussion instruments. Concerts typically include works for small groups as well as those for full symphonic wind ensemble. Membership open to both Music majors and nonmajors by audition only. May be repeated for credit.

162 University Chorus (2) F, W, S. Included in the University Chorus are Concert Choir, Madrigal Singers, Men's Chorus, Women's Chorus. Each quarter a major concert is prepared, often with orchestral accompaniment. Membership is open by audition. May be repeated for credit.

162L Basic Voice Lab (2) F, W, S. Vocal technique and musicianship for selected singers in UCI's choral organizations. Not open to Music majors. Corequisite: Music 162. Prerequisite: consent of Director of the choral group. May be repeated for credit.

162P University Chorus: Accompanying (2) F, W, S. Keyboard accompanying for one of the UCI choral organizations, with individual coaching in sight reading, score reading, and other accompanying skills. Prerequisite: consent of instructor. May be repeated for credit.

162S Summer Choir (2) Summer. Participants with all levels of experience (or inexperience) are encouraged to join this class. Each meeting is a rehearsal, where students learn basic choral singing techniques and apply those techniques to choral repertoire. Pass/Not Pass only. May be repeated for credit.

163 Vocal Performance (1) F, W, S. Performance class for upper-division students emphasizing the development of style and stage presentation of song literature. Repertoire chosen from material assigned in the voice studio. May be repeated for credit.

164 Opera Workshop (2) F, W, S. Students participate in staged performances of scenes from complete operas. The aim is to broaden the repertoire of singers by offering them opportunities to become acquainted with a wide variety of operatic roles.

164P Opera Workshop: Accompanying (2) F, W, S. Training in techniques and operatic repertory for keyboard players. Prerequisite: consent of instructor. May be repeated for credit.

165 Advanced Study in Piano (2) F, W, S. Designed to give students the technique, musical insight, and performance experience for interpreting works of the piano literature in concert performances. Private weekly lessons. Open to Music majors only. May be repeated for credit.

166 Advanced Study for String Instruments (2) F, W, S. Private weekly lessons. Open to Music majors and minors only. Corequisite: Music 160, 161, 162, or 178. May be repeated for credit.

166P String Accompaniment (2) F, W, S. Chamber ensemble experience with the solo string repertory for keyboard, participation in the weekly string master class, performance in public recitals. Prerequisite: consent of instructor. May be taken for credit three times.

167 Advanced Study for Wind Instruments (2) F, W, S. Private weekly lessons. Open to Music majors and minors only. Corequisite: Music 160, 161, 162, or 178. May be repeated for credit.

168 Advanced Study in Voice (2) F, W, S. Designed for voice majors; students are selected by audition. Private weekly lessons. Corequisite: concurrent enrollment in Music 162 or 171. May be repeated for credit.

169 Advanced Study for Percussion Instruments (2) F, W, S. Private weekly lessons. Corequisite: Music 160, 161, or 178 as assigned by the Department. Open to Music majors only. May be repeated for credit.

170 Advanced Study for Guitar and Lute (2) F, W, S. Private weekly lessons. Corequisite: Music 174. Open to Music majors and minors only. May be repeated for credit.

171 Chamber Singers (2) F, W, S. A select ensemble specializing in vocal chamber music from all periods. Frequent performances on and off campus. Membership is open to all singers by audition. May be repeated for credit.

173 Athletics Bands (1 to 2) F, W, S. Bands support athletic events including Drumline: study and rehearsal of rudiments, cadences, arrangements; Marching Band: exercises and performance of marching fundamentals, formations, precision drills; Pep Bands: rehearsal and performance of variety of music styles for athletic events, school, community, private functions. May be repeated for credit.

174 Guitar and Lute Workshop (2) F, W, S. An informal master class for the discussion of solo repertory and performance practice, this workshop also includes special topics such as historical notational systems, traditional American guitar styles, and demonstrations of period plucked instruments.

175 Piano Repertory (1) F, W, S. Weekly one-hour meetings for piano students to perform before each other, followed by open discussion. The aim is to develop a sense of self-criticism and the ability to listen intelligently. May be repeated for credit.

176 Chamber Ensembles (2) F, W, S. A class for instrumental majors. Instrumental students are assigned to various music ensembles, such as classical, jazz, contemporary, etc. May be repeated for credit.

177 Private Lesson (Special String Performance majors) (4) F, W, S. A one-hour weekly private lesson. Instruction in technique and literature for Special String Performance option at junior and senior levels. Corequisite: Music 196. May be repeated for credit.

178 Jazz Orchestra (1) F, W, S. Rehearsal and performance of literature written for large jazz ensemble with emphasis on methods and materials. Laboratory setting for new arrangers and/or composers of modern jazz pieces. Prerequisite: consent of instructor. May be repeated for credit.

180 Music Criticism (4). Topics vary.

181A Beginning Jazz Improvisation (2) F. Develops the student's basic understanding of the fundamentals of jazz improvisation. Basic harmonic patterns, blues, modality, and simpler song forms are covered. This is a performance workshop requiring a reasonable amount of instrumental facility. Prerequisite: Music 16C or equivalent. Formerly Music 178I.

181B Intermediate Jazz Improvisation (2) W. Continuation of beginning jazz improvisation which covers various 32-bar song forms, modal improvisation and more sophisticated blues forms. Studies the development of improvisation through history of jazz including composers Ellington, Monk, Morton, Mingus, Coltrane, Silver, and others. Prerequisite: Music 181A.

181C Advanced Jazz Improvisation (2) S. Reviews the relationship between long-form composition and improvisation. The historical context of various improvisational styles and linear non-chordal improvisation are introduced. Prerequisite: Music 181B.

182 Advanced Jazz Combo (2) F, W, S. Small-group jazz ensemble and improvisational workshop. Range of music covered encompasses the full traditional jazz from improvised ragtime up through the most current avant-garde musical techniques. Prerequisite: consent of instructor. May be repeated for credit.

183A-B-C Jazz Composition (4-4-4) F, W, S. Performance and lecture course for writing and performing original jazz compositions. Emphasis is placed on composing as a way to create new improvisational frameworks. **183A:** Study of be-bop and hard-bop compositional methods centered on diatonic and dominant-motion harmonic structures. **183B:** Study of post-be-bop non-diatonic and modal structures. **183C:** Study of modern tonal-center compositions, intervallic compositions, and alternate rhythms. Prerequisites: Music 36A-B and Music 78A, 78B.

184 Saxophone Quartet (2). A survey and performance of modern four-part saxophone literature. Prerequisite: consent of instructor. May be repeated for credit.

185 Jazz Rhythm Section (2) F, W, S. Survey and performance of jazz rhythm section techniques and literature. Prerequisite: consent of instructor. May be repeated for credit.

188 Advanced String Quartet (2) F, W, S. May be repeated for credit.

189 Accompanying for Plucked Strings: Continuo and Changes (2) F, W, S. Students apply theory to their instruments as they learn the basics of pre-1800 continuo playing and post-1900 jazz charts. Includes discussions of appropriate repertory, treatment of harmonic progressions, and finer points of style and technique. Prerequisite: Music 16C. May be repeated for credit.

191 Tutorial in Music (1 to 4) F, W, S. Independent supplemental instruction related to student's area of study. May be repeated for credit.

192J Junior Recital (0) F, W, S. Solo or joint public recital by audition only and with departmental approval. Corequisite: Music 163, 174, 175, or 176. Prerequisite: Music 16D. Open to Music majors only. Pass/Not Pass only.

192P Senior Project (0) F, W, S. Senior project for Music majors in the B.A. program. Open to Music majors only. Pass/Not Pass only.

192S Senior Recital (0) F, W, S. Performance of solo public recital with departmental approval. The recital must include at least one work composed since 1945. Corequisites: Music 163, 174, 175, or 176. Prerequisites: Music 16D, 40B-C-D or equivalent; and Music 155A. Pass/Not Pass only.

193A-B Conducting (2-2) W, S. 193A: Introduces students to the basic technique employed in the practice of conducting. **193B:** Application of advanced conducting techniques, score study, and leadership skills. Prerequisites: Music 16D and 40B-C-D or equivalent.

195 Orchestral Repertoire (2) F, W. Extensive study of orchestral repertoire, as represented in the canon. Exploration of new and emerging orchestral works and performance techniques. Prerequisites: Music 40B-C-D. May be taken for credit four times.

197 Word and Music (2) F, W, S. Performance class for advanced singers and pianists with emphasis on collaborative approach to vocal literature. Prerequisite: consent of instructor. May be repeated for credit.

199 Independent Study (2) F, W, S. Research, writing, or composition work, under the guidance of a faculty member, normally undertaken in conjunction with preparation of the B.A. Senior Project. Prerequisite: consent of instructor. May be taken for credit two times.

GRADUATE

200 Bibliography and Research (4) F, W. Required of all entering students. A systematic introduction to the bibliographical tools both in the general field of music and in the students' areas of specialization. May be repeated for credit.

201A-B Analysis (4-4) F, W. Various approaches to analysis through concentrated study of a number of selected works.

210 Vocal or Choral Literature (4) F, W, S. Intensive private instruction and study of the various vocal/choral literatures. May be taken for credit six times.

210R M.F.A. Vocal/Choral Recital (0) F, S. Performance of public recital. The recital must include at least one work composed since 1945. Satisfactory/Unsatisfactory only. May be repeated for credit.

211 Instrumental Literature (4) F, W, S. Contents vary according to the student's major instrument. The core of this course is intensive private instruction and study of the various instrumental literatures. May be taken for credit six times.

211R M.F.A. Instrumental Recital (0) F, S. Performance of public recital. The recital must include at least one work composed since 1945. Satisfactory/Unsatisfactory only. May be taken for credit two times.

212 Composition (4) F, W, S. Intensive work in composition geared to each student's level of competence. May be repeated for credit.

212R M.F.A. Composition Recital (0) F, W, S. Performance of a public recital. The recital consists of original works of student composer. Satisfactory/Unsatisfactory only. May be taken for credit twice.

213 Orchestral Literature (4) F, W, S. Intensive private instruction in orchestral conducting. May be repeated for credit.

213R M.F.A. Orchestral Conducting Final (0) S. Satisfactory/Unsatisfactory only.

215 Music Technology (4) F, W, S. Studies in the history, literature, composition, and performance of electronic and computer music, including instruction in the theory and usage of prevalent music technology. May be repeated for credit.

220 Seminar in Music History (4)

222A-B-C Score Reading (4) F, W, S. The ability to read all clefs and transpositions at the piano is stressed. A reasonable proficiency in condensing a full score at the piano, as well as internally, is expected after completing the final quarter. Prerequisite: Music 136.

227 Oratorio Studies (4). The study of the history, content, and styles of oratorio from its development in the seventeenth century to the present. Includes masses and requiems from the same period.

230 Seminar in Contemporary Music (4) F, W, S. Special seminar projects dealing with music of the twentieth century with emphasis on analytical techniques and style criticism. May be repeated for credit.

235 Critical Studies in Music (4) F, W, S. A critical examination of Western music traditions, institutions, and aesthetics, employing new scholarship in music and new critical studies in other disciplines. May be repeated for credit.

240 Graduate Projects (4) F, W, S. Substantial projects in performance, conducting, or composition (other than those specifically required for the degree), accompanied by a summary paper. May be repeated for credit.

250 Directed Reading (4). Individual research projects, resulting in the writing of a substantial paper pertaining to the principal area of concentration. May be repeated for credit.

399 University Teaching (1 to 4) F, W, S. Limited to Teaching Assistants. May be repeated for credit.

DEPARTMENT OF STUDIO ART

3229 Art, Culture and Technology Building; (949) 824-6648
Yong Soon Min, **Department Chair**

Faculty

Kevin Appel, M.F.A. University of California, Los Angeles, *Associate Professor of Studio Art* (painting)

Ed Bereal, Chouinard Art Institute, *Senior Lecturer with Security of Employment Emeritus, Studio Art*

Andrea Bowers, M.F.A. Bowling Green State University, *Lecturer in Studio Art* (painting, drawing)

Juli Carson, Ph.D. Michigan Institute of Technology, *Assistant Professor of Studio Art and Director of the University Art Gallery* (contemporary art)

Miles Coolidge, M.F.A. California Institute of the Arts, *Assistant Professor of Studio Art* (photography)

Steven Criqui, B.A. University of California, San Diego, *Lecturer in Studio Art* (painting, art history, criticism)

Beatriz da Costa, M.F.A. Diplome Nationale Superieur d'Art Plastiques, Ecole d'Art d'Aix en Provence (France), *Assistant Professor of Studio Art and of Electrical Engineering and Computer Science* (robotic art, tactical gizmology, biotech initiatives, surveillance projects, collaborative practice, social change)

Tony DeLap, Claremont Graduate School, *Professor Emeritus of Studio Art*

Ulysses Jenkins, Jr., M.F.A. Otis Parsons Art Institute, *Associate Professor of Studio Art* (video)

Craig Kauffman, M.F.A. University of California, Los Angeles, *Professor Emeritus of Studio Art*

Antoinette LaFarge, M.F.A. School of Visual Arts, *Associate Professor of Studio Art* (digital media)

Simon Leung, B.A. University of California, Los Angeles, *Assistant Professor of Studio Art* (new genres)

Mara Lonner, M.F.A. California Institute of the Arts, *Lecturer in Studio Art* (drawing, sculpture)

Catherine Lord, M.F.A. State University of New York, Buffalo (Visual Studies Workshop), *Professor of Studio Art* (critical theory, feminism, photography)

Daniel Martinez, B.F.A. California Institute of the Arts, *Professor of Studio Art* (public art, sculpture, installation, performance)

Yong Soon Min, M.F.A. University of California, Berkeley, *Department Chair and Associate Professor of Studio Art* (sculpture, cultural studies)

Gifford C. Myers, M.F.A. University of California, Irvine, *Professor of Studio Art* (ceramic sculpture)
Robert Nideffer, Ph.D. University of California, Santa Barbara, *Associate Professor of Studio Art and Informatics* (electronic intermedia, interface theory and design, technology and culture, contemporary social theory)
Deborah Oliver, M.F.A California Institute of the Arts, *Lecturer in Studio Art* (performance)
Simon Penny, Graduate Diploma in Sculpture, Sydney College of the Arts, New South Wales (Australia), *Professor of Electrical Engineering and Computer Science, Studio Art, and Informatics* (robotic sculpture, interactive environments, electronic media, art practice history, and critical theory)
Shelby Roberts, M.F.A. California Institute of the Arts, *Lecturer in Studio Art* (photography)
Connie Samaras, M.F.A. Eastern Michigan University, *Professor of Studio Art* (photography, media and film criticism, gender studies, culture and technology)
David Trend, Ph.D. School of Education, Miami University, *Professor of Studio Art* (video, photography, visual studies, curriculum)
Bruce Yonemoto, M.F.A. Otis Art Institute, *Professor of Studio Art* (video, multimedia, film theory)

The Department of Studio Art takes a wide-ranging, interdisciplinary view of contemporary art practice. The Department emphasizes a demanding, conceptual approach to work in process in addition to traditional notions of product. Students are encouraged to develop an individual, disciplined direction through an experimental approach to media, materials, and techniques. To further this end, the curriculum provides studio experiences in drawing, painting, sculpture, ceramics, photography, digital imaging, and video, in addition to emphasizing cultural studies in relation to contemporary practice. Visiting artists and theorists who teach on a quarterly basis, or who make shorter guest appearances, are an integral part of the program.

The University's Education Abroad Program offers students the opportunity to study abroad. Graduate-level study also is available.

CAREERS FOR THE STUDIO ART MAJOR

Departmental faculty and the range of artists whose work is represented in the University Art Gallery exhibitions provide diverse career models. Some graduates go on to careers as exhibiting artists or teachers; others work in arts-related activities in museums, galleries, and artists' organizations. A bachelor's degree in Studio Art is usually required as preparation for graduate-level study in studio art.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements for the Major

Studio Art 1A-B-C (taken the first year in residence); Studio Art 10A, B, C; Art History 40A, B, C or 42A, B, C; five lower-division courses selected from Studio Art 20–99; upper-division courses totaling 48 units as follows: three intermediate-level courses with no more than two in one area (Studio Art 102–115); six advanced or project courses (Studio Art 100, 101, 130–195, 199); three issues courses (Studio Art 116–129); Senior Thesis Exhibition (Studio Art 198).

Sample Program for Freshmen

Fall	Winter	Spring
Studio Art 1A	Studio Art 1B	Studio Art 1C
Art History 40A/42A	Art History 40B/42B	Art History 40C/42C
English WR39A	Elective	Elective
	English WR39B	English WR39C

Specialization in Game Culture and Technology

This specialization exposes advanced students in the visual arts to an influential and expanding sector of media culture and contemporary art and technology practice, facilitates students' media literacy in relation to an increasingly prevalent art and entertainment form, and enables students to be more critical consumers and producers of new media art and culture.

Admission Criteria: Satisfactory completion of six prerequisite courses, or their equivalent: Studio Art 1A-B-C and 65A-B-C. Admission will be by review at the end of each spring quarter. Students will be notified of acceptance by the beginning of the following fall quarter at the latest. Acceptance will be based on: (1) a written statement of purpose; (2) portfolio; (3) prior course work; and (4) transcripts. A maximum of 12 students will be admitted per year to ensure access to Game Culture and Technology Laboratory research and development facilities used to support student projects. The earliest students may apply for admission to the specialization is at the end of their freshman year. The latest they may apply is at the end of their junior year.

Requirements: Studio Art 1A-B-C (taken the first year in residence); Studio Art 10A, B, C; Art History 40A, B, C or 42A, B, C; Studio Art 65A-B-C and two additional lower-division courses selected from Studio Art 20–99; Studio Art 106 and 110 plus one additional intermediate-level course (Studio Art 102–115); Studio Art 135, 138, 166, 175; eight units of either Studio Art 197 or Studio Art 199 or a combination of both; three issues courses (Studio Art 116–129); Senior Thesis Exhibition (Studio Art 198).

Departmental Requirements for the Minor

Studio Art 1A-B-C; Studio Art 10A, B, C; three lower-division studio classes in three media (Studio Art 20–99); five upper-division courses divided as follows: one from intermediate-level courses (Studio Art 102–115) with no repetition of any course; one from issues courses (Studio Art 116–129); one from advanced or project courses (Studio Art 100, 101, 130–195, 199); plus two additional upper-division courses selected from any of these groups.

MASTER OF FINE ARTS PROGRAM

Degree Offered

M.F.A. in Studio Art

Graduate emphases in Feminist Studies and in Asian American Studies are also available. (Refer to the Program in Women's Studies section or the Department of Asian American Studies section of the *Catalogue* for information.)

General Information and General Degree Requirements

The program is designed to provide intensive professional training for independently motivated students wishing to pursue careers in the field of contemporary art. Rather than traditional ideas of subject and technique, experimental and interdisciplinary approaches to art making are emphasized. Students undergo a rigorous course of study combining seminar classes, intensive critique courses, and independent study. The seminars cover a range of critical issues dealing with the relationship of culture to contemporary art and are designed for students interested in theoretically positioning their art practices within an interdisciplinary framework. All incoming students must take the First-Year Graduate Seminar in preparation for further course work. As students progress in the program, they are required to take a series of additional seminars aimed at training them to develop research skills and a written component augmenting their culminating thesis exhibitions. Various approaches to developing text and word are considered, and students are encouraged to approach developing the thesis textual component following a path best suited to their postgraduate interests (e.g., critical writing, spoken word/performance, critical memoir, digital narrative structures).

The overall emphasis in the program, however, is on studio production. Throughout their three years, students must take a series of critique seminars. Work-in-progress, produced for the given quarter's critique class, is intensively discussed within a group context. Students must also, throughout their graduate careers, work each quarter on an independent basis with faculty of their choice and are encouraged to work with a range of faculty members. During the second year, students must select a thesis committee with whom they will work closely on the development of both thesis studio production and research interests. However, even after selecting their committee, students are still encouraged to work with a range of faculty on an independent basis in order to continue to respond to and reflect on a diversity of ideas and differing approaches to both studio production and art distribution systems. Throughout the first two years, students must also undergo a series of progress checks including open studio reviews and a second-year exhibition. Students are evaluated by faculty committees during their first and second years. Satisfactory opinion by these committees coupled with both satisfactory independent study evaluations and grades of at least a B or above will allow the student to progress to candidacy for the degree. During the third year, candidates must mount a thesis exhibition. In tandem with the final thesis exhibition, students are required to do a public presentation on their work as part of their final defense before their thesis committee.

During the first two years, students are required to take courses from a structured curriculum totaling 12 units each quarter. Beyond that, students can select additional course work from any sector of the Department or University including approved upper-division undergraduate courses. The third year is structured so that students can individualize their course of study through a wide selection of classes. For example, students wishing to focus primarily on studio production can do so through a combination of independent studies and critique classes, or students could design their third year to focus both on studio production and acquiring additional course work in a given research area or graduate emphasis.

M.F.A. candidates are each provided with an individual studio space. Facilities include photography laboratories (analog and digital), video production studios, data laboratories, and sculpture laboratories for work in wood and metal. There are also facilities to support work in digital media, painting, performance, drawing, and ceramics. Students also have regular opportunities to exhibit in two galleries.

Various programs of visiting artists and lecturers are an integral part of the student experience. There is a public lecture series for which solicited graduate student input is considered an important component. Visiting artists, curators, critics, and gallerists are invited to give lectures and conduct studio visits with graduate students. The Studio Art 220 seminar (required both first and second year) incorporates visiting lecturers into a colloquium setting where students are asked to lead in-depth discussions with a given visitor. In addition to artists and curators, Studio Art 220 visiting lecturers include faculty from the UCI campus as well as other UC campuses whose work and research may be of interest to graduate students. Some Studio Art faculty, in addition to their departmental appointment, are affiliated with other UCI and UC programs, e.g., Asian American Studies, African American Studies, Women's Studies, Engineering, Information and Computer Science, Critical Studies, Art History, the Cal-(IT)^2 Gaming Studies Initiative, and the UC Institute for Research in the Arts (UCIRA).

Admission

Applicants for admission to the M.F.A. program must meet the general requirements for admission to graduate study, hold a B.A. or B.F.A. in Art, have completed one year of twentieth-century art history (students who have not completed this will be required to do so as part of their graduate studies), and submit by January 15 a portfolio of their most recent creative work of a maximum of 20 slides, on a #80 Kodak carousel tray, or video tape (VHS; no more than five minutes, cued up). A short incisive statement about the work is required. Normally, anyone who has earned an M.F.A. degree in Studio Art will not be considered for admission into the program.

Specific Degree Requirements

One hundred and eight units over a three-year course of study are required. Residency is required. Students must take a minimum of 12 units per quarter.

First Year: First-Year Graduate Seminar (Studio Art 210), Methods and Materials Workshop (Studio Art 211), Graduate Seminar: Interdisciplinary Studies in Art and Culture (Studio Art 215), Graduate Seminar: Issues in Contemporary Art (Studio Art 220), Graduate Group Critique (Studio Art 230 all three quarters), and Graduate Independent Study (Studio Art 240 all three quarters).

Second Year: Career Development Workshop (Studio Art 212), Graduate Seminar: Interdisciplinary Studies in Art and Culture (Studio Art 215) or Graduate Topics in Studio Production (Studio Art 236), Graduate Seminar: Issues in Contemporary Art (Studio Art 220); Graduate Group Critique (Studio Art 230 two quarters); Graduate Independent Study (Studio Art 240 two quarters); Graduate Research Seminar (Studio Art 260); Graduate Thesis Writing Seminar (Studio Art 261); Graduate Thesis, Independent Study (Studio Art 262).

Third Year: Graduate Group Critique (Studio Art 230); choice of Graduate Seminar: Interdisciplinary Studies in Art and Culture (Studio Art 215), Graduate Seminar: Issues in Contemporary Art (Studio Art 220), Graduate Topics in Digital Media (Studio Art 234), Graduate Topics in Studio Production (Studio Art 236), Directed Reading and Research (Studio Art 250), Directed Group Study (Studio Art 251), Graduate Interdisciplinary and Collaborative Projects (Studio Art 255), Curatorial Projects (Studio Art 257), Cooperative Program and/or Studies Abroad (Studio Art 269), Arts Computation Engineering (ACE) Seminar (Arts 270–279), University Teaching (Studio Art 399) or outside seminar (over two quarters); choice of Graduate Independent Study (Studio Art 240), University Teaching (Studio Art 399), or outside seminar (over two quarters); Graduate Thesis, Independent Study (Studio Art 262 all three quarters); Graduate Thesis, Exhibition Critique (Studio Art 263).

Courses in Studio Art

LOWER-DIVISION

1A-B-C Topics in Visual Culture: Foundation Projects (4-4-4). Approaches to postwar art and culture. Solving visual problems and developing understanding of how gender, sexuality, race, nationality influence contemporary cultures. Examines individual's relation to being an artist, encouraging experimentation rather than repeating received ideas. **(IV)**

10A, B, C Issues in Contemporary Art and Visual Culture (4, 4, 4). Contemporary art and cultural practice of the past 40 years; slide presentations and film/video screenings. Recent history of visual art. Topics relating to those various critiques of the canon presented by multicultural studies, feminism, and gay and lesbian studies. **(IV)**

20 Basic Drawing (4). Encourages an investigation of the premises and limits of drawing, primarily, but not inevitably, as a two-dimensional medium. Includes slide presentations and discussions of the historical uses of a wide range of drawing.

30 Basic Painting (4). Encourages an experimental use of painting techniques, including issues of color, surface, and space. Slide presentations and critiques of student work.

40 Basic Sculpture (4). The practice of sculpture in the contemporary arts; inclusion of spatial interventions, site-specific and environmental design, appropriation of found materials; techniques in cutting, joining, and assembly of wood, metals, and plastics. May include casting, welding, and ceramics. Materials fee.

51 Basic Ceramic Sculpture (4). Exploration of use of clay as sculptural basis with an emphasis on development of an idea and its relation to contemporary and experimental art practice. Hand-building, glazing, finishing processes, and use of other structural materials. Materials fee.

65A Introduction to Digital Imaging (4). Introduction to basic theories and techniques for producing art using digital media. Provides an overview of the aesthetics of digital art, covering such topics as the nature of the real and the relation between digital and analog media.

65B Introduction to Digital Multimedia (4). Introduction to theories and techniques of creating time-based art using digital technologies. Digital sound- and video-editing programs are emphasized and basic concepts in animation, multimedia, and interactivity are covered. Prerequisite: Studio Art 65A.

65C Introduction to the Internet (4). Introduction to creating art for the Internet, covering history and structure along with key types of Internet activity including e-mail, Telnet, html, virtual worlds, CUSeeMe, VRML. Basics of Internet connectivity and hands-on work in UNIX, html, and scripting for the Web. Prerequisite: Studio Art 65B.

71 Basic Photography (4). Photography as an aspect of contemporary art practice, including its relation to the documentary tradition. Slide lectures and field trips. Basic technical skills of black and white photography, including cameras, film developing, and printing. Students must have a 35 mm. non-automatic camera. Materials fee.

81 Basic Video (4). Introduction to the strategies and range of contemporary video production, including screening/discussions on experimental and independent productions. Focuses on acquisition of basic skills in cameras, lighting, sounds, and editing. Readings and screenings are assigned. Materials fee.

91 Basic Performance Art (4). Exploration of objects, gesture, action, text, image, and media to create narrative or non-narrative works. Elements of theory and history of performance art are discussed to illustrate techniques and styles. The goal is to understand, identify, and articulate your artistic vision and voice. May be taken for credit twice.

UPPER-DIVISION

100 Special Topics in Studio Art (4). Prerequisites: Studio Art 10A, B, C; upper-division standing or consent of instructor. May be taken for credit six times as topics vary.

101 Artists as Writers (4). Contemporary art practice involves text, as final form or an integral element. Many contemporary artists consider writing as essential to their practice. Covers historical and contemporary uses of text and image as well as artists' writings. Prerequisites: Studio Art 10A, B, C or consent of instructor; and, when offered for upper-division writing: satisfactory completion of the lower-division writing requirement.

102 Intermediate Drawing (4). Continuation of the investigation initiated in Studio Art 20, with an emphasis on experimentation, personal investigation, and the development of conceptual working premises, as well as the acquisition of necessary skills. Group discussion and critique are emphasized. Prerequisites: Studio Art 1A-B-C and 20 or consent of instructor. May be taken for credit twice.

103 Intermediate Painting (4). Continuation of the investigation initiated in basic painting, with an emphasis on experimentation, personal investigation, development of conceptual working premises, as well as the acquisition of necessary skills. Group discussion and critique are emphasized. Prerequisites: Studio Art 1A-B-C and 30 or consent of instructor. May be taken for credit twice.

104 Intermediate Sculpture (4). Investigation of three-dimensional space, including the construction of objects and the manipulation of the environment. Students define personal projects and translate personal, social, and political experience into visual meaning. Range of artists' works introduced. Group discussion and critiques. Materials fee. Prerequisites: Studio Art 1A-B-C and 40 or consent of instructor. May be taken for credit twice.

105 Intermediate Ceramic Sculpture (4). Further investigation of the use of clay as a medium, with emphasis on experimental practice and the relationship to contemporary visual art. Emphasizes discussion of ideas, and provides information on clay body, fabrication, glazing, and firing. Materials fee. Prerequisites: Studio Art 1A-B-C and 51 or consent of instructor. May be taken for credit twice.

106 Interactive Digital Media: Sound and Video (4). Students learn how to prepare and present multimedia materials within interactive formats. Programs for digitizing and altering sound and video are introduced. Various strategies for editing and arranging materials within temporal parameters are discussed. Prerequisites: Studio Art 1A-B-C, 65A-B-C, or consent of instructor. May be taken for credit twice.

107 Intermediate Photography (4). An in-depth continuation of the critical and technical skills explored in Studio Art 71. Experimentation, photographic interests and vocabulary, critical abilities and development of independent projects. Slide lectures, readings, technical demonstrations, criticism, and social histories of photography. Prerequisites: Studio Art 1A-B-C and 71 or consent of instructor. May be taken for credit twice.

108 Intermediate Video Production (4). Designed to further enable the producer to conceive, develop, and produce an original videotape (single channel, multiple channel, or installation). Use of TV studio and editing facilities. Issues of film and computer compatibility. Readings, screenings, field trips, group critiques. Materials fee. Prerequisites: Studio Art 1A-B-C and 81 or consent of instructor. May be taken for credit twice.

109 Intermediate Performance Art (4). Continued investigation of the concepts and history of experimental performance art, including its relation to contemporary artistic practice. Continues to refine technical skills, as well as space, audiences, and cultural connections. Prerequisites: Studio Art 1A-B-C; Studio Art 91 or consent of instructor. May be taken for credit twice.

110 Interdisciplinary Digital Arts (4) F, W, S. Covers a range of interdisciplinary approaches for utilizing computer systems. Investigates such topics as World Wide Web design and authoring, digital mail art, computer installations, and performance within video conferencing contexts. Prerequisites: Studio Art 1A-B-C, 65A-B-C, or consent of instructor. May be taken for credit twice.

116 Feminist Issues in Studio Arts (4). Feminist perspectives and topics in relation to cultural production. Feminist debates on sexuality, perspectives on women of color, on race and gender, feminist film criticism, histories of the first and second waves of feminism, histories of feminist art. Prerequisite: Studio Art 10A, B, C or consent of instructor. May be taken for credit twice.

118 Issues in Urban Space, Housing, Community Development, and Architecture (4). Social histories and cultural critiques of urban, suburban, and architectural spaces and the social construction of community and public spaces. Content varies and may deal with a variety of geographic locations, cultures, social perspectives, and artists' strategies of public address. Prerequisites: Studio Art 10A, B, C or consent of instructor. May be taken for credit twice.

119 Issues in Contemporary Painting (4). Investigates the work of modern and contemporary painters and writers, emphasizing the historical survey of Modernist artistic influences in contemporary painting. The relationship between artists and writers/critics is studied. Prerequisites: Studio Art 10A, B, C or consent of instructor.

120 Issues in Narrative (4). Emphasizes the construction of narratives in different media—painting, photography, sculpture, video. Particular attention paid to the development of personal and community histories as a working base. Prerequisites: Studio Art 10A, B, C or consent of instructor. May be taken for credit twice.

121 Issues in Race and Representation (4). Emphasizes the construction of racial difference and stereotyping in the visual and performing arts, and on the histories of cultures and artists who functioned outside the contemporary mainstream. Readings assigned. Prerequisite: Studio Art 10A, B, C or consent of instructor. May be taken for credit twice.

122 Issues in Lesbian and Gay Visual Representation (4). History of lesbian and gay culture in relation to the visual and performing arts; the construction of sexual difference, debates around positive and negative representations, queer activism, and the intersections of sexuality with gender and race. Readings assigned. Prerequisite: Studio Art 10A, B, C or consent of instructor. May be taken for credit twice. Studio Art 122 and Women's Studies 161B/157B may not both be taken for credit.

123 Issues in Cultural Display (4). Lecture/seminar on issues of the production and representation of culture, including patronage, museum history, exhibition design and history, arts funding, cultural identity, and cultural diversity. Field trips, screening and slide lectures are generally assigned. Prerequisites: Studio Art 10A, B, C or consent of instructor. May be taken for credit twice.

124 Issues in the History of Intermedia (4). Examines, in a nonlinear and eclectic fashion of contemporary oppositional art practices, work not considered art-making within conventional definitions, and intermedia approaches from the postwar period. Reading and lectures will be drawn from a wide range of sources. Prerequisite: Studio Art 10A, B, C or consent of instructor. May be taken for credit twice.

130 Projects in New Technologies (4). Working with media such as electronic still cameras, desktop publishing, faxes, satellites, virtual reality, digitized imaging. Cultural issues pertinent to the emergence of new technology (e.g., ethical concerns, social impact, copyright laws, nontraditional approaches to distribution, cyberpunk, global markets). Prerequisites: two intermediate courses and consent of instructor. May be repeated for credit as topics vary.

131 Projects in Installation (4). Investigates interior installation in particular spaces. Working in teams, students install, discuss, and remove projects. Technical information and hands-on experience with various media is provided. Prerequisites: two intermediate courses or consent of instructor. May be repeated for credit as topics vary.

135 Gaming Studies (4). Critical analysis of various genres of computer games and gaming theory and practice through playing, writing, and discussion. The focus is on creating a Design Document for the student's own gaming environment using gaming metaphors, design principles, and technologies. Prerequisites: Studio Art 1A-B-C; 10A, B, C; 65A-B-C.

138 World Building (4). Interdisciplinary approaches to working across the digital/nondigital boundary to create an alternative universe. Emphasis is on critical thinking, comprehensive planning, integration of multiple media, and narrative development. Prerequisites: Studio Art 1A-B-C and 65A.

143 Projects in Computing Painting (4). Study and utilization of the computer as a digital sketchbook and design tool for the creation of paintings. Discussion of the issues related to benefits and limitations of new technology in the art-making process. Prerequisite: Studio Art 30, 103, or consent of instructor.

144 Projects in the Artist's Book (4). Investigation of the relationship of the visual artist and the book. Study of the words, images, marks, silences, and formulation of new perceptual literature whose content alters the concept of authorship. Students create book projects utilizing various techniques. Prerequisites: two intermediate-level Studio Art courses.

149 Multimedia and the Arts in the Multicultural Classroom (4) F, W, S. Multiculturalism and underrepresented U.S. minorities and the visual and performing arts: perspectives in artistic perception, creative expression, historical and cultural context, and aesthetic valuing, and media literacy in the interpretation and production of multimedia arts products and applications for K–12 classrooms. Same as Education 104E. **(VII-A)**

150 Advanced Studio Topics/Painting (4). Provides an intensive and specialized working environment. Thematic issues and material strategies explored. Prerequisites: Studio Art 30 and 103 or consent of instructor. May be repeated for credit as topics vary.

150C Advanced Drawing (4). Advanced studio problems for visual exploration. Students pursue individual solutions to self-defined and presubscribed projects. Techniques/materials are individual choice. Continual analysis of the personal process. Prerequisites: Studio Art 20, 102. May be repeated for credit with consent of instructor.

151 Advanced Studio Topics/Sculpture (4). Provides an intensive and specialized working environment. Thematic issues and material strategies will be explored. Prerequisites: two intermediate courses and consent of instructor. Materials fee. May be repeated for credit as topics vary.

152 Advanced Studio Topics/Photography (4). Focused investigation of a range of issues in photographic practice, with an emphasis on defining individual projects and refining critical and conceptual approaches. Readings, slide lectures, and field trips. Materials fee. Prerequisites: Studio Art 107 or consent of instructor. May be repeated for credit as topics vary.

153 Advanced Studio Topics/Video (4). The class will be directed to the production of individual or collaborative videotapes, using studio, portable camera, and editing facilities and sound and computer elements. Emphasis will be on individually initiated projects. Readings and screenings are assigned. Materials fee. Prerequisites: Studio Art 108 or consent of instructor. May be repeated for credit as topics vary.

154 Advanced Studio Topics/Performance (4). An intensive investigation of the practice of performance art, with an emphasis on th development of individual projects, and the refinement of various technical skills, as well as audiences, spaces, and cultural connections. Prerequisites: Studio Art 10A, B, C, 109, and consent of instructor. May be repeated for credit as topics vary.

156 Advanced Studio Topics/Ceramic Sculpture (4). Discussion of ideas, techniques, and personal control of form. Clay body, fabrication, glazing, and firing. Emphasis on development of personal direction. Prerequisites: Studio Art 105. Materials fee. May be repeated for credit with consent of instructor.

157 Color Photography (4). Introduction to color photographic theory, process, and practice. Also serves as an introduction to critical and historical issues specific to color photography as contemporary art practice. Slide lectures, readings, technical demonstrations, and critiques. Prerequisites: Studio Art 71 and 107 or consent of instructor. May be taken for credit twice.

160 Advanced Color Photography (4). For advanced photography students who wish to perfect their skills in traditional color photography methods. An accelerated course geared toward refining critical abilities and developing individual photographic vision through directed projects. Emphasis on color photography as a contemporary art practice. Prerequisites: Studio Art 1A-B-C and 157, or consent of instructor.

166 Advanced Collaborative Projects (4). Organized around the design and completion of a group project such as authoring a CD-ROM, engineering a complex collaborative performance, or curating a Web-based exhibition site. Prerequisites: Studio Art 1A-B-C, 65A-B-C, or consent of instructor. May be taken for credit twice.

175 Digital Art Aesthetics (4). Focuses on current theoretical and political research related to digital imaging, including ethical implications of artificial life, significance of identity politics, gender/race in cyberspace, access to computing systems, issues of post-structuralist aesthetics. Showing of contemporary artists in this field. Prerequisites: Studio Art 1A-B-C, 65A-B-C, or consent of instructor. May be taken for credit twice.

190 Senior Project (4). Directed-study critique class in preparation for final project and life after graduation; documentation and portfolio preparation for graduate school. Investigation of exhibition spaces and funding opportunities, participation in artists' communities outside the university, artists' rights issues. Prerequisite: senior standing.

191 Studio Problems: Methods and Materials (4). An open media discussion and critique course emphasizing the development of working ideas and the execution of projects in all media. Readings assigned as required; field trips, slide and film/video presentations are integral. Prerequisites: two intermediate courses. May be repeated for credit as topics vary.

197 Studio Art Internship (1 to 4). Under faculty supervision, students participate directly in a variety of art institution settings, including museums, galleries, and nonprofit organizations. Pass/Not Pass only. Prerequisites: junior standing, consent of instructor, and consent of department chair. May be taken for credit twice.

198 Senior Exhibition (0). Preparation, installation, and participation in the annual senior exhibition. Pass/Not Pass only. Four units of workload credit only. Prerequisite: senior standing; Studio Art majors only.

199 Independent Study (1 to 4). Individual study or directed creative projects as arranged with faculty member. Prerequisite: consent of instructor. May be repeated for credit.

GRADUATE

210 First-Year Graduate Seminar (4) F. Introductory theory to contemporary art: intellectual history, theoretical antecedents, and current critical concerns. Prerequisite: graduate standing.

211 Methods and Materials Workshops (2) F, W, S. Comprised of a series of workshops introducing graduates to production and facilities in photography, video, digital media, and sculpture. Prerequisite: graduate standing. *May be offered only once during academic year.*

212 Career Development Workshop (2) F, W, S. Workshop for various aspects of career development including but not limited to grant writing, writing a C.V., applying to teaching jobs, working with museums and galleries, working in/with public, not-for-profit, and community arts. Prerequisite: graduate standing.

215 Graduate Seminar: Interdisciplinary Studies in Art and Culture (4) F, W, S. In-depth discussion of contemporary art production in relation to a variety of theoretical, cultural, and historical topics, Material is determined by the given instructor's current research interests. Prerequisites: graduate standing and Studio Art 210. May be repeated for credit as topics vary.

220 Graduate Seminar: Issues in Contemporary Art (4) F, W, S. Classroom interaction with artists, curators, critics, lecturers from fields outside of the arts or from cross-disciplines. Includes recommended readings, discussions, panel participation, writing assignments. Prerequisites: graduate standing and Studio Art 210. May be taken for credit three times.

230 Graduate Group Critique (4) F, W, S. Focus on studio production. Students are expected to help foster and develop an environment in which serious and sophisticated peer critique can take place. Prerequisite: graduate standing. May be taken for credit nine times.

234 Graduate Topics in Digital Media (4) F, W, S. Introduction to art practices utilizing digital media methods and concepts. Emphasis is on works designed to take advantage of the unique medium properties through which the works are produced and delivered. Prerequisite: graduate standing. May be taken for credit twice.

236 Graduate Topics in Studio Production (4) F, W, S. Graduate group study of a specific medium or art practice (e.g., painting; video, installation, photography, sculpture/3-D, performance, digital media, public art, sound art; film). Includes consideration of technical, theoretical, historical, and/or formal issues. Prerequisite: graduate standing. May be repeated for credit as topics vary.

240 Graduate Independent Study (1 to 4) F, W, S. Tutorials and directed study in studio production with a supervising faculty member. In-depth discussions and assessment of graduate student's in-progress studio work concerns. Prerequisites: graduate standing and consent of instructor. May be repeated for credit.

250 Directed Reading and Research (4) F, W, S. Independent study with a supervising faculty member to direct academic research, develop bibliographies, and discuss assigned readings. Prerequisites: graduate standing and consent of instructor. May be repeated for credit as topics vary.

251 Directed Group Study (4) F, W, S. Directed reading and/or study group on a given research topic. Agreed-upon meeting structure may be flexible in order to accommodate off-campus field trips and travel. Prerequisite: graduate standing. May be repeated for credit as topics vary.

255 Graduate Interdisciplinary and Collaborative Projects (4) F, W, S. For graduate students working collaboratively across the School of the Arts (including the ACE specialization) or cross-university. May be team taught with one of the faculty members based in the Department of Studio Art. Prerequisite: graduate standing. May be repeated for credit as topics vary.

257 Curatorial Projects (2 to 8) F, W, S. Independent or group study for graduates working on or developing curatorial projects. Prerequisite: graduate standing. May be repeated for credit.

260 Graduate Research Seminar (4) F, W, S. Preparatory course for researching written thesis and thesis exhibition defense. Includes library research, developing bibliographies, methodologies. Students are expected to develop an abstract for their thesis topic. Prerequisites: graduate standing and Studio Art 210, 215, and 220.

261 Graduate Thesis Writing Seminar (4) F, W, S. Seminar for writing as a component of the thesis. Different models of writing, text, and spoken word are discussed. Corequisite: Studio Art 262. Prerequisites: graduate standing; Studio Art 210, 215, 220, 260.

262 Graduate Thesis Independent Study (1 to 4) F, W, S. Tutorials and directed study in thesis writing, research, and/or studio production with thesis committee chair and/or thesis committee members to be taken during final quarters of study. Corequisite: one section must be taken with Committee Chair in tandem with Studio Art 261 specifically to develop thesis writing. Prerequisites: graduate standing; consent of instructor; Studio Art 210, 215, 220, 260. May be repeated for credit.

263 Graduate Thesis, Exhibition Critique (4) F, W, S. Group critique required for matriculating M.F.A. students during the quarter in which their thesis exhibitions are scheduled. Public presentation/lecture on student's work required. Prerequisites: graduate standing; Studio Art 210, 215, 220, 230, 240, 260, 261, and 262.

269 Cooperative Program and/or Studies Abroad (12) F, W, S. For students undertaking a quarter of study at another UC campus or equivalent academic institution with which there is a cooperative arrangement with the UCI Department of Studio Art. Prerequisites: graduate standing; consent of instructors, Chair of Studio Art Graduate Studies Committee, and Chair of Department.

399 University Teaching (1 to 4) F, W, S. Limited to Teaching Assistants working under the active guidance and supervision of a regular ranks faculty member responsible for curriculum and instruction at the University. Prerequisites: graduate standing and consent of instructor. May be repeated for credit for a maximum of 18 units.

Arts and Humanities

101 Mesa Arts Building: (949) 824-6646
Mary Corey, **Co-Director (Arts)**
Carrie J. Noland, **Co-Director (Humanities)**

Faculty

Kei Akagi, B.A. International Christian University, Tokyo, *UCI Chancellor's Professor of Music* (history of jazz)

Luis F. Avilés, Ph.D. Brown University, *Department Chair and Associate Professor of Spanish* (Golden Age literature and literary theory)

Stephen Barker, Ph.D. University of Arizona, *Professor of Drama* (post-modern theatre, Beckett, critical theory)

David Brodbeck, Ph.D. University of Pennsylvania, *Department Chair and Professor of Music, and The Robert and Marjorie Rawlins Chair in Music* (history, criticism)

Rae Linda Brown, Ph.D. Yale University, *Associate Professor of Music* (history, American musics)

Juan Bruce-Novoa, Ph.D. University of Colorado, *Professor of Spanish* (Latin American and Chicano literatures)

James Chiampi, Ph.D. Yale University, *Professor of Italian* (Italian Renaissance)

Michael P. Clark, Ph.D. University of California, Irvine, *Associate Executive Vice Chancellor for Academic Programs and Professor of English* (Colonial American literature, critical theory)

Robert Cohen, D.F.A. Yale University, *Claire Trevor Professor of Drama* (acting, directing, dramatic literature)

Mary Corey, M.A. University of California, Riverside, Certified Professional Labanotator, *Associate Dean of the Claire Trevor School of the Arts, Co-Director of the Arts and Humanities Major, and Professor of Dance* (dance history, modern dance, notation and reconstruction, dance and digital technology)

Christopher Dobrian, Ph.D. University of California, San Diego, *Associate Professor of Music and Informatics* (electronic music)

Alice Fahs, Ph.D. New York University, *UCI Chancellor's Fellow and Associate Professor of History* (U.S. intellectual/cultural history)

Nohema Fernández, D.M.A. Stanford University, *Dean of the Claire Trevor School of the Arts, Professor of Music, and Claire Trevor Dean's Endowed Chair* (Latin American musics, piano)
Jennifer Fisher, Ph.D. University of California, Riverside, *Assistant Professor of Dance* (dance history, philosophy, and criticism)
Natalka Freeland, Ph.D. Yale University, *Assistant Professor of English* (Victorian literature, the novel, cultural studies and criticism)
Edward Fowler, Ph.D. University of California, Berkeley, *Department Chair of East Asian Languages and Literatures and Professor of Japanese* (modern Japanese literature, cultural studies, film)
Alexander Gelley, Ph.D. Yale University, *Professor of Comparative Literature* (eighteenth- and nineteenth-century European novel, critical theory, comparative literature)
Bernard Gilmore, D.M.A. Stanford University, *Professor of Music* (composition, theory)
Inderpal Grewal, Ph.D. University of California, Berkeley, *Director of the Program in Women's Studies and Professor of Women's Studies* (feminist theories of internationalism and transnationalism, cultural studies, British nineteenth-century studies, South Asia and its diasporas)
Gail K. Hart, Ph.D. University of Virginia, *Director, Humanities Core Course and Professor of German* (eighteenth- and nineteenth-century German literature, drama, fictional prose)
James D. Herbert, Ph.D. Yale University, *Department Chair and Professor of Art History* (modern European art, critical theory)
Lamar M. Hill, University of London, *Professor of History* (Tudor-Stuart Britain)
Branden W. Joseph, Ph.D. Harvard University, *Assistant Professor of Art History* (modern and contemporary American art and visual studies)
Laura H.-Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies and Comparative Literature* (feminist visual cultures)
Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Asian American Studies and English* (Asian American literature, post-colonial literature)
Susan B. Klein, Ph.D. Cornell University, *Director of Religious Studies and Associate Professor of Japanese* (premodern and modern theatre and dance, Japanese religions, feminist critical theory)
Richard W. F. Kroll, Ph.D. University of California, Los Angeles, *Professor of English* (rhetoric, Restoration and eighteenth-century British literature, literary theory)
Anthony Kubiak, Ph.D University of Wisconsin, Milwaukee, *Professor of Drama* (American and modern drama, modern poetry, critical theory, philosophy)
Meredith Lee, Ph.D. Yale University, *Professor Emerita of German* (lyric poetry, eighteenth-century literature, Goethe, music and literature)
Daphne Lei, Ph.D. Tufts University, *Assistant Professor of Drama* (Asian theatre, Asian American theatre, intercultural theatre, gender theory, performance theory)
Simon Leung, B.A. University of California, Los Angeles, *Assistant Professor of Studio Art* (queer theories, modernism and post-modern theories)
Akira Mizuta Lippit, Ph.D. The Johns Hopkins University, *Department Chair and Professor of Film and Media Studies* (film history and theory, critical theory, experimental film and media, Japanese cinema)
Catherine Lord, M.F.A. State University of New York, Buffalo, *Professor of Studio Art* (critical theory, feminism)
Julia Reinhard Lupton, Ph.D. Yale University, *Professor of English* (Renaissance literature, literature and psychology)
Lynn Mally, Ph.D. University of California, Berkeley, *Professor of History* (modern Russian and Soviet history)
Daniel Martinez, B.F.A. California Institute of the Arts, *Professor of Studio Art* (public art, installation, performance)
David McDonald, Ph.D. Stanford University, *Professor Emeritus of Drama* (dramatic theory, Irish drama, theatre history, and playwriting)
Glen Mimura, Ph.D. University of California, Santa Cruz, *Assistant Professor of Asian American Studies* (independent film and video, theory and methods, and popular culture)
Yong Soon Min, M.F.A. University of California, Berkeley, *Department Chair and Associate Professor of Studio Art* (diaspora and post-colonial theories, race and representation)
Ian Munro, Ph.D. Harvard University, *Associate Professor of Drama* (European drama and performance, early modern popular culture, theatrical performance of wit)
Margaret Murata, Ph.D. University of Chicago, *Professor of Music* (history, analysis, criticism)
Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Professor of Spanish* (eighteenth- through twentieth-century Spanish literature, film and visual arts, aesthetics and contemporary cultures)
Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature* (sixteenth- and seventeenth-century German literature, contemporary theory and criticism, feminism)
Robert Nideffer, Ph.D. University of California, Santa Barbara, *Associate Professor of Studio Art and Informatics* (interface theory and design, technology and culture, contemporary social theory)
Carrie J. Noland, Ph.D. Harvard University, *Co-Director of the Major in Humanities and Arts and Associate Professor of French* (twentieth-century poetry, World War II and literature of the avant-garde)
Margot Norris, Ph.D. State University of New York, Buffalo, *Professor of English and Comparative Literature* (modern British literature)
Simon Penny, Graduate Diploma in Sculpture, Sydney College of the Arts, New South Wales (Australia), *Professor of Electrical Engineering and Computer Science, Studio Art, and Informatics* (robotic sculpture, interactive environments, electronic media, art practice history, and critical theory)
James Penrod, M.F.A. University of California, Irvine; C.M.A. Laban Institute of Movement Studies, *Professor Emeritus of Dance* (ballet, modern, dance notation, choreography, movement analysis)
Janelle Reinelt, Ph.D. Stanford University, *Associate Dean of Graduate Studies and Professor of Drama* (political theory and performance)
Bryan Reynolds, Ph.D. Harvard University, *Associate Professor of Drama and Head of Doctoral Studies in Drama* (Shakespeare, Renaissance drama, critical theory, feminist theory, performance theory, cultural studies)
Jens Rieckmann, Ph.D. Harvard University, *Professor Emeritus of German* (twentieth-century literature, fin-de-siècle Austria, Hofmannsthal, Thomas Mann)
Nancy Lee Ruyter, Ph.D. Claremont Graduate School, *Professor of Dance* (dance history, research methods)
Connie Samaras, M.F.A. Eastern Michigan University, *Professor of Studio Art* (photography, media and film criticism, gender studies, culture and technology)
Martin Schwab, Ph.D. University of Bielefeld, *Professor of Philosophy and Comparative Literature* (philosophy, aesthetics, comparative literature)
Sally A. Stein, Ph.D. Yale University, *Associate Professor of Art History* (American art, history of photography, feminist theory)
James Steintrager, Ph.D. Columbia University, *Associate Professor of English* (eighteenth-century Associate, German, and English literature and aesthetics)
Dana F. Sutton, Ph.D. University of Wisconsin, *Professor of Classics* (Greek and Latin drama, Greek poetry, Anglo-Latin literature)
Alan Terriciano, M.A. Eastman School of Music, *Department Chair and Associate Professor of Dance* (musical resources)
David Trend, Ph.D. School of Education, Miami University, *Professor of Studio Art* (visual studies)
Hu Ying, Ph.D. Princeton University, *Associate Professor of Chinese* (narrative literature, translation theory, feminist theory)
Bruce Yonemoto, M.F.A. Otis Art Institute, *Professor of Studio Art* (video, multimedia, film theory)

The major in Arts and Humanities provides students with a broad exposure to a range of disciplinary and methodological opportunities in the Arts and Humanities. It insists on the productive intersection of these two fields as the focus of each student's program. Students improve their critical and historical sophistication while learning about the process of performance and creative work, a combination that equips them to participate more effectively in a society that increasingly joins critique and creation just as closely as it fuses image and information.

Arts and Humanities students investigate the symbolic dimension of human behavior and identity, an interest shared by many critics and artists alike. Often, this interest is expressed in the context of interdisciplinary programs designed to facilitate contact among faculty and students from a wide range of different academic disciplines. This major's focus on the connection between practice and analysis distinguishes it from the broader and more diverse scope of more general interdisciplinary programs. The scholarly work of many UCI faculty in the Arts and Humanities lies at an intersection between the two academic units, and the major translates this intellectual and creative activity into a coherent curriculum and projects current forms of scholarship and artistic practice into the classroom.

CAREERS FOR THE ARTS AND HUMANITIES MAJOR

Graduates of this program will be very attractive to teacher-training programs. There is also a steadily growing market in private industry for students whose training combines skills sharpened by both the Arts and Humanities. Business demands graduates with strong writing and analytic skills, talents stressed in the Humanities. They also desire people with creativity and visual skills who have experience putting their original ideas into practice, something emphasized in the Arts. Graduates will have special skills that will enable them to work in professional fields directly allied with the Arts, including museum work, art foundations, art criticism, journalism, theatre, and the entertainment industry.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

Application Process for the Arts and Humanities Major

New students are not admitted directly to the Arts and Humanities major. Continuing students apply to change their major to Arts and Humanities no earlier than the fall quarter of their sophomore year. Complete information about changing majors to Arts and Humanities is available at http://www.due.uci.edu/Change_of_Major.html. Students must submit a transcript and meet the change-of-major criteria for each of the two departments they propose to combine. In addition, a program of study, approved by the designated faculty member in the Claire Trevor School of the Arts and in the School of Humanities, is required for admission to the Arts and Humanities major. Students are strongly encouraged to consult with the Arts Student Affairs Office early in their decision to apply to Arts and Humanities.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Requirements for the Major

Humanities 1A-B-C; a language other than English through 2C; one lower-division survey in a specialization in the Arts, chosen from Dance 90A-B-C, Drama 40A,B,C, Music 14A-B-C, Studio Art 10A,B,C; six units of "studio courses" in Dance, Drama, *or* Studio Art or six units of "ensemble courses" in Music; Arts and Humanities 100, 101; 16 additional units of upper-division Arts courses and 16 additional units of upper-division Humanities courses focusing on a specific theme, region, or period, chosen with the approval of an Arts and Humanities faculty advisor. (Students must have their proposed program of study approved by their advisor each year.)

It is expected that students will choose their courses from one major in the Arts and one major in the Humanities. Students with well-developed interests can shape their curriculum more precisely to their needs.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Courses in Arts and Humanities

100 The Arts in Theory and Practice (4). Writing seminar explores writings on art from different times and cultures. How have artists and critics in different cultural contexts tried to explain the principles and theories that guide their work? How can students use their concepts to assess art works? Prerequisite: satisfactory completion of the lower-division writing requirement. Same as Humanities and Arts 100.

101 Topics in Arts and Humanities (4). This interdisciplinary course examines themes relevant to both the Arts and the Humanities. May be repeated for credit as topics vary. Same as Humanities and Arts 101.

SCHOOL OF BIOLOGICAL SCIENCES

Susan V. Bryant, **Dean**

101 Biological Sciences Administration
Undergraduate Counseling: (949) 824-5318
Graduate Programs:
Department of Ecology and Evolutionary Biology: (949) 824-4743
Combined Graduate Program in Molecular Biology, Genetics, and Biochemistry: (949) 824-8145
Department of Neurobiology and Behavior: (949) 824-8519
World Wide Web: http://www.bio.uci.edu/

Faculty

Nancy Allbritton, Ph.D. Massachusetts Institute of Technology, M.D. The Johns Hopkins University School of Medicine, *Professor of Physiology and Biophysics, Biological Sciences, Biomedical Engineering, and Chemistry*

Bogi Andersen, M.D. University of Iceland, *Associate Professor of Medicine (Endocrinology) and Biological Chemistry*

Aileen J. Anderson, Ph.D. University of California, Irvine, *Director of the Christopher Reeve Paralysis Foundation Spinal Cord Injury Core Facility and Assistant Professor of Physical Medicine and Rehabilitation and of Anatomy and Neurobiology*

Hoda Anton-Culver, Ph.D. St. Andrews University (Scotland), *Director of the Center for Cancer Genetics Research and Prevention, Chief of Epidemiology, and Professor of Medicine (Epidemiology and Preventive Medicine) and Social Ecology*

Ruslan D. Aphasizhev, Ph.D. University of California, Berkeley, *Assistant Professor of Microbiology and Molecular Genetics*

Joseph Arditti, Ph.D. University of Southern California, *Professor Emeritus of Developmental and Cell Biology*

Kavita Arora, Ph.D. Bombay University, *Associate Professor of Developmental and Cell Biology*

Dana Aswad, Ph.D. University of California, Berkeley, *Professor of Molecular Biology and Biochemistry*

Peter R. Atsatt, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Francisco J. Ayala, Ph.D. Columbia University, *University Professor and Donald Bren Professor of Biological Sciences*

Pierre Baldi, Ph.D. California Institute of Technology, *Director of the Institute for Genomics and Bioinformatics and Professor of Computer Science, Biomedical Engineering, Developmental and Cell Biology, and Biological Chemistry*

Kenneth M. Baldwin, Ph.D. University of Iowa, *Professor of Physiology and Biophysics and of Biological Sciences*

Tallie Z. Baram, M.D. University of Miami, Ph.D. Weizmann Institute of Science (Israel), *Professor of Pediatrics, Neurology, and Anatomy and Neurobiology, and Danette (Dee Dee) Shepard Chair in Neurological Studies*

Alan G. Barbour, M.D. Tufts University School of Medicine, *Professor of Microbiology and Molecular Genetics and of Medicine (Infectious Diseases)*

Lee Bardwell, Ph.D. Stanford University, *Associate Professor of Developmental and Cell Biology*

Albert F. Bennett, Ph.D. University of Michigan, *Department Chair and Professor of Ecology and Evolutionary Biology*

Rudi C. Berkelhamer, Ph.D. University of California, Berkeley, *Associate Dean, Division of Undergraduate Education, and Senior Lecturer with Security of Employment, Ecology and Evolutionary Biology*

Hans-Ulrich Bernard, Ph.D. University Göttingen (Germany), *Professor of Molecular Biology and Biochemistry in Residence*

Michael W. Berns, Ph.D. Cornell University, *Professor of Surgery, Developmental and Cell Biology, and Biomedical Engineering, and Arnold and Mabel Beckman Chair in Laser Biomedicine*

Bruce Blumberg, Ph.D. University of California, Los Angeles, *Associate Professor of Developmental and Cell Biology and of Biomedical Engineering*

Hans R. Bode, Ph.D. Yale University, *Professor of Developmental and Cell Biology*

Peter A. Bowler, Ph.D. University of California, Irvine, *Director of the UCI Arboretum, UC Natural Reserve System Academic Coordinator, and Lecturer with Security of Employment, Ecology and Evolutionary Biology*

Carrie Brachmann, Ph.D. The John Hopkins University School of Medicine, *Assistant Professor of Developmental and Cell Biology*

Rainer K. Brachmann, M.D. Ludwig-Maximilians University Munich (Germany), *Assistant Professor of Medicine (Hematology-Oncology) and Biological Chemistry*

Timothy J. Bradley, Ph.D. University of British Columbia, *Professor of Ecology and Evolutionary Biology*

Ralph A. Bradshaw, Ph.D. Duke University, *Professor of Physiology and Biophysics and of Anatomy and Neurobiology*

Adriana D. Briscoe, Ph.D. Harvard University, *Assistant Professor of Ecology and Evolutionary Biology*

Peter J. Bryant, Ph.D. University of Sussex, *Director of the Graduate Program in Molecular Biology, Genetics, and Biochemistry and Professor of Developmental and Cell Biology*

Susan V. Bryant, Ph.D. University of London, *Dean of the School of Biological Sciences and Professor of Developmental and Cell Biology*

Nancy Burley, Ph.D. University of Texas, Austin, *Professor of Ecology and Evolutionary Biology*

Jorge Busciglio, Ph.D. National University of Cordoba, *Assistant Professor of Neurobiology and Behavior*

Robin M. Bush, Ph.D. University of Michigan, Ann Arbor, *Assistant Professor of Ecology and Evolutionary Biology*

Michael D. Cahalan, Ph.D. University of Washington, *Professor of Physiology and Biophysics and of Biological Sciences*

Lawrence F. Cahill, Ph.D. University of California, Irvine, *Associate Professor of Neurobiology and Behavior and of Social Ecology*

Vincent J. Caiozzo, Ph.D. University of California, Irvine, *Associate Professor of Orthopaedic Surgery and of Physiology and Biophysics in Residence*

Anne L. Calof, Ph.D. University of California, San Francisco, *Associate Professor of Anatomy and Neurobiology and of Developmental and Cell Biology*

David Camerini, Ph.D. Harvard Medical School, *Assistant Professor of Molecular Biology and Biochemistry*

Victoria Camerini, M.D. Harvard Medical School, *Assistant Professor of Pediatrics (Neonatal/Perinatal Medicine) and of Microbiology and Molecular Genetics*

Diane R. Campbell, Ph.D. Duke University, *Professor of Ecology and Evolutionary Biology*

Richard D. Campbell, Ph.D. The Rockefeller Institute, *Professor Emeritus of Developmental and Cell Biology*

Thomas J. Carew, Ph.D. University of California, Riverside, *Department Chair and Donald Bren Professor of Neurobiology and Behavior*

F. Lynn Carpenter, Ph.D. University of California, Berkeley, *Professor of Ecology and Evolutionary Biology*

Paolo Casali, M.D. University of Milan, *Director of the Center for Immunology and Donald Bren Professor of Molecular Biology and Biochemistry and of Medicine*

Jefferson Y. Chan, M.D., Ph.D. University of California, San Francisco, *Assistant Professor of Pathology and Biological Chemistry*

Frances S. Chance, Ph.D. Brandeis University, *Assistant Professor of Neurobiology and Behavior*

K. George Chandy, Ph.D. University of Birmingham (England), M.B.B.S. Christian Medical College, Vellore (India), *Professor of Physiology and Biophysics, Microbiology and Molecular Genetics, Biological Sciences, and Medicine (General Internal)*

Phang-Lang Chen, Ph.D. University of California, San Diego, *Associate Professor of Biological Chemistry*

Ken W.-Y. Cho, Ph.D. University of Pennsylvania, *Professor of Developmental and Cell Biology*

Olivier Civelli, Ph.D. Swiss Institute of Technology, *Professor of Pharmacology and of Developmental and Cell Biology, and Eric L. and Lila D. Nelson Chair in Neuropharmacology*

Michael T. Clegg, Ph.D. University of California, Davis, *Donald Bren Professor of Biological Sciences and of Ecology and Evolutionary Biology*

Melanie Cocco, Ph.D. Pennsylvania State University, *Assistant Professor of Molecular Biology and Biochemistry*

Susana Cohen-Cory, Ph.D. Rockefeller University, *Associate Professor of Neurobiology and Behavior*

Carl Cotman, Ph.D. Indiana University, *Director of the Institute for Brain Aging and Dementia and Professor of Neurology, Psychiatry and Human Behavior, Neurobiology and Behavior, and Biomedical Engineering*

Karina S. Cramer, Ph.D. California Institute of Technology, *Assistant Professor of Neurobiology and Behavior*

Michael G. Cumsky, Ph.D. University of California, Berkeley, *Senior Lecturer with Security of Employment, Molecular Biology and Biochemistry*

Dennis D. Cunningham, Ph.D. University of Chicago, *Senior Associate Dean for Academic Affairs, School of Medicine, and Professor of Microbiology and Molecular Genetics*

Xing Dai, Ph.D. University of Chicago, *Assistant Professor of Biological Chemistry and Biological Sciences*

Rowland H. Davis, Ph.D. Harvard University, *Professor of Molecular Biology and Biochemistry*

Luis M. de la Maza, M.D. Facultad de Medicina (Spain); Ph.D. University of Minnesota, *Professor of Pathology*

Michael Demetriou, M.D., Ph.D. University of Toronto, *Assistant Professor of Neurology and of Microbiology and Molecular Genetics*

Aimee L. Edinger, V.M.D., Ph.D. University of Pennsylvania, *Assistant Professor of Developmental and Cell Biology*

Robert A. Edwards, M.D., Ph.D. Baylor College of Medicine, *Assistant Professor of Pathology in Residence*

James H. Fallon, Ph.D. University of Illinois, *Professor of Anatomy and Neurobiology and of Biological Sciences*

Hung Fan, Ph.D. Massachusetts Institute of Technology, *Director of the Cancer Research Institute, Associate Director of the Chao Family Comprehensive Cancer Center, and Professor of Molecular Biology and Biochemistry*

Mark Fisher, M.D. University of Cincinnati, *Department Chair and Professor of Neurology and Professor of Anatomy and Neurobiology*

Walter M. Fitch, Ph.D. University of California, Berkeley, *Professor of Ecology and Evolutionary Biology*

Donald E. Fosket, Ph.D. University of Idaho, *Professor Emeritus of Developmental and Cell Biology*

Steven A. Frank, Ph.D. University of Michigan, *Professor of Ecology and Evolutionary Biology*

Ron D. Frostig, Ph.D. University of California, Los Angeles, *Associate Professor of Neurobiology and Behavior and of Biomedical Engineering*

David A. Fruman, Ph.D. Harvard University, *Assistant Professor of Molecular Biology and Biochemistry*

Christine M. Gall, Ph.D. University of California, Irvine, *Professor of Anatomy and Neurobiology and of Neurobiology and Behavior*

J. Jay Gargus, M.D., Ph.D. Yale University, *Professor of Physiology and Biophysics and of Pediatrics*

Brandon S. Gaut, Ph.D. University of California, Riverside, *Associate Professor of Ecology and Evolutionary Biology*

Paul Gershon, Ph.D. Liverpool School of Tropical Medicine, University of Liverpool, *Professor of Molecular Biology and Biochemistry*

Roland A. Giolli, Ph.D. University of California, Berkeley, *Department Vice Chair and Professor of Anatomy and Neurobiology*

Charles Glabe, Ph.D. University of California, Davis, *Professor of Molecular Biology and Biochemistry*

Alan L. Goldin, M.D., Ph.D. University of Michigan, *Professor of Microbiology and Molecular Genetics, Physiology and Biophysics, and Biological Sciences*

Sidney H. Golub, Ph.D. Temple University, *Professor Emeritus of Microbiology and Molecular Genetics*

Michael L. Goulden, Ph.D. Stanford University, *Associate Professor of Earth System Science and of Ecology and Evolutionary Biology*

Gale A. Granger, Ph.D. University of Washington, *Professor Emeritus of Molecular Biology and Biochemistry*

Steven Gross, Ph.D. University of Texas, Austin, *Assistant Professor of Developmental and Cell Biology, Biomedical Engineering, and Physics*

George A. Gutman, Ph.D. Stanford University, *Professor of Microbiology and Molecular Genetics, Physiology and Biophysics, and Biological Sciences*

Harry T. Haigler, Ph.D. Vanderbilt University, *Professor of Physiology and Biophysics and of Biological Sciences*

James E. Hall, Ph.D. University of California, Riverside, *Professor of Physiology and Biophysics and of Biological Sciences*

Barbara A. Hamkalo, Ph.D. University of Massachusetts, *Professor Emerita of Molecular Biology and Biochemistry*

G. Wesley Hatfield, Ph.D. Purdue University, *Professor of Microbiology and Molecular Genetics, Biological Sciences, and Biochemical Engineering*

Bradford A. Hawkins, Ph.D. University of California, Riverside, *Associate Professor of Ecology and Evolutionary Biology*

Patrick L. Healey, Ph.D. University of California, Berkeley, *Professor Emeritus of Developmental and Cell Biology*

Agnes Henschen-Edman, M.D., Ph.D. Karolinska Institute (Stockholm), *Professor of Molecular Biology and Biochemistry and of Pathology*

Klemens J. Hertel, Ph.D. University of Colorado, *Assistant Professor of Microbiology and Molecular Genetics and of Biological Sciences*

James W. Hicks, Ph.D. University of New Mexico, *Professor of Ecology and Evolutionary Biology*

Franz Hoffmann, Ph.D. University of Hohenheim, *Senior Lecturer with Security of Employment, Developmental and Cell Biology*

Lan Huang, Ph.D. University of Florida, *Assistant Professor of Physiology and Biophysics*

Taosheng Huang, M.D. Fujian Medical College (China), Ph.D. Mt. Sinai Medical School, *Assistant Professor of Pediatrics (Human Genetics and Birth Defects) and of Developmental and Cell Biology*

Christopher C. W. Hughes, Ph.D. University of London, *Associate Professor of Molecular Biology and Biochemistry and of Biomedical Engineering*

George L. Hunt, Jr., Ph.D. Harvard University, *Professor of Ecology and Evolutionary Biology*

Anthony A. James, Ph.D. University of California, Irvine, *Department Vice Chair and Professor of Molecular Biology and Biochemistry and Professor of Microbiology and Molecular Genetics*

Chenyang (Sunny) Jiang, Ph.D. University of South Florida, *Associate Professor of Social Ecology and of Community and Environmental Medicine*

Robert K. Josephson, Ph.D. University of California, Los Angeles, *Professor of Neurobiology and Behavior and of Ecology and Evolutionary Biology*

Frances A. Jurnak, Ph.D. University of California, Berkeley, *Professor of Physiology and Biophysics and of Biological Sciences*

Keith Justice, Ph.D. University of Arizona, *Professor Emeritus of Biological Sciences*

Peter Kaiser, Ph.D. University of Innsbruck (Austria), *Assistant Professor of Biological Chemistry*

Claudia H. Kawas, M.D. University of Louisville, *Professor of Neurology and of Neurobiology and Behavior, and Nichols Clinical Neuroscience Chair*

Hans S. Keirstead, Ph.D. University of British Columbia, *Assistant Professor of Anatomy and Neurobiology*

Herbert P. Killackey, Ph.D. Duke University, *Associate Executive Vice Chancellor for Academic Personnel and Professor of Neurobiology and Behavior and of Anatomy and Neurobiology*

Leonard M. Kitzes, Ph.D. University of California, Irvine, *Acting Department Chair and Professor of Anatomy and Neurobiology and Professor of Otolaryngology and Biological Sciences*

Daniel J. Knauer, Ph.D. University of Nebraska, *Professor of Developmental and Cell Biology*

Natalia L. Komarova, Ph.D. University of Arizona, *Assistant Professor of Mathematics and of Ecology and Evolutionary Biology*

Harold Koopowitz, Ph.D. University of California, Los Angeles, *Professor of Ecology and Evolutionary Biology*

Stuart M. Krassner, Sc.D. The Johns Hopkins University, *Professor of Developmental and Cell Biology*

John Krolewski, M.D., Ph.D. New York University, *Associate Professor of Pathology*

Frank LaFerla, Ph.D. University of Minnesota, *Associate Professor of Neurobiology and Behavior*

Arthur D. Lander, M.D., Ph.D. University of California, San Francisco, *Department Chair and Professor of Developmental and Cell Biology and Professor of Pharmacology*

Thomas E. Lane, Ph.D. University of California, Los Angeles, *Associate Professor of Molecular Biology and Biochemistry*

Janos K. Lanyi, Ph.D. Harvard University, *Department Chair and Professor of Physiology and Biophysics and Professor of Biological Sciences*

Eva Y.-H. P. Lee, Ph.D. University of California, Berkeley, *UCI Chancellor's Professor of Developmental and Cell Biology and of Biological Chemistry*

Wen-Hwa Lee, Ph.D. University of California, Berkeley, *Donald Bren Professor of Biomedicine and Biological Chemistry*

Howard M. Lenhoff, Ph.D. The Johns Hopkins University, *Professor Emeritus of Developmental and Cell Biology*

Michael Leon, Ph.D. University of Chicago, *Associate Dean of Undergraduate Affairs of the School of Biological Sciences and Professor of Neurobiology and Behavior*

Frances M. Leslie, Ph.D. Aberdeen University (Scotland), *Professor of Pharmacology and of Anatomy and Neurobiology*

Ellis R. Levin, M.D. Jefferson Medical College, *Chief of Endocrinology and Professor of Medicine (Endocrinology), Pharmacology, and Biological Chemistry in Residence*

Diane C. Lin, Ph.D. University of California, Los Angeles, *Associate Adjunct Professor of Developmental and Cell Biology*

Shin Lin, Ph.D. University of California, Los Angeles, *Professor of Developmental and Cell Biology, Physiology and Biophysics, and Biomedical Engineering*

Steven Lipkin, M.D., Ph.D. University of California, San Diego, *Assistant Professor of Medicine (Hematology/Oncology) and Biological Chemistry*

Haoping Liu, Ph.D. Cornell University, *Associate Professor of Biological Chemistry*

Anthony D. Long, Ph.D. McMaster University, *UCI Chancellor's Fellow and Associate Professor of Ecology and Evolutionary Biology*

John Longhurst, M.D., Ph.D. University of California, Davis, *Professor of Medicine (Cardiology), Physiology and Biophysics, Pharmacology, and Biomedical Engineering, and Lawrence K. Dodge Endowed Chair in Integrative Biology*

Kenneth J. Longmuir, Ph.D. University of Oregon, *Associate Professor of Physiology and Biophysics and of Biological Sciences*

Ulricke Luderer, M.D., Ph.D. Northwestern University; M.P.H. University of Washington, *Assistant Professor of Medicine (Occupational and Environmental), Developmental and Cell Biology, and Community and Environmental Medicine*

Hartmut Luecke, Ph.D. Rice University, *UCI Chancellor's Fellow and Professor of Molecular Biology and Biochemistry and of Physiology and Biophysics*

Rui (Ray) Luo, Ph.D. University of Maryland, College Park, *Assistant Professor of Molecular Biology and Biochemistry and of Biomedical Engineering*

Grant MacGregor, Ph.D. University of Sussex, *Associate Professor of Developmental and Cell Biology*

Richard E. MacMillen, Ph.D. University of California, Los Angeles, *Professor Emeritus of Ecology and Evolutionary Biology*

Jerry E. Manning, Ph.D. University of Utah, *Professor Emeritus of Molecular Biology and Biochemistry*

J. Lawrence Marsh, Ph.D. University of Washington, *Director of the Developmental Biology Center and Professor of Developmental and Cell Biology*

John F. Marshall, Ph.D. University of Pennsylvania, *Professor of Neurobiology and Behavior*

James L. McGaugh, Ph.D. University of California, Berkeley, *Research Professor of Neurobiology and Behavior and of Cognitive Sciences*

Matthew J. McHenry, Ph.D. University of California, Berkeley, *Assistant Professor of Ecology and Evolutionary Biology*

Calvin S. McLaughlin, Ph.D. Massachusetts Institute of Technology, *Professor of Biological Chemistry and of Community and Environmental Medicine*

Alexander McPherson, Ph.D. Purdue University, *Professor of Molecular Biology and Biochemistry and of Physiology and Biophysics*

Raju S. Metherate, Ph.D. McGill University, Montreal, *Associate Professor of Neurobiology and Behavior*

Ronald L. Meyer, Ph.D. California Institute of Technology, *Professor of Developmental and Cell Biology*

Frank L. Meyskens, Jr., M.D. University of California, San Francisco, *Senior Associate Dean for Health Sciences, Director of the Chao Family Clinical Cancer Research Center, and Professor of Medicine (Hematology/Oncology) and Biological Chemistry*

Ricardo Miledi, M.D. Universidad Nacional Autónoma de Mexico, *UCI Distinguished Professor of Neurobiology and Behavior and of Molecular Biology and Biochemistry*

Edwin S. Monuki, M.D., Ph.D. University of California, San Diego, *Assistant Professor of Pathology and of Developmental and Cell Biology*

Naomi Morrissette, Ph.D. University of Pennsylvania, *Assistant Professor of Molecular Biology and Biochemistry*

Robert K. Moyzis, Ph.D. The Johns Hopkins University, *Professor of Biological Chemistry and Pediatrics*

Laurence D. Mueller, Ph.D. University of California, Davis, *Professor of Ecology and Evolutionary Biology*

R. Michael Mulligan, Ph.D. Michigan State University, *Associate Dean of Graduate Studies of the School of Biological Sciences and Professor of Developmental and Cell Biology*

Edward Nelson, M.D. Oregon Health Sciences University, *Assistant Professor of Medicine (Hematology/Oncology) and of Molecular Biology and Biochemistry*

Masayasu Nomura, Ph.D. University of Tokyo, *Professor of Biological Chemistry, Microbiology and Molecular Genetics, and Biological Sciences, and Grace Beekhuis Bell Chair in Biological Chemistry*

Diane K. O'Dowd, Ph.D. University of California, San Diego, *Professor of Developmental and Cell Biology and of Anatomy and Neurobiology*

Timothy F. Osborne, Ph.D. University of California, Los Angeles, *Department Chair and Professor of Molecular Biology and Biochemistry*

Andre Ouellette, Ph.D. Indiana University, *Professor of Pathology and of Microbiology and Molecular Genetics*

Ian Parker, Ph.D. University College, London, *Professor of Neurobiology and Behavior*

Diane E. Pataki, Ph.D. Duke University, *Assistant Professor of Earth System Science and of Ecology and Evolutionary Biology*

Ellena M. Peterson, Ph.D. Georgetown University, *Professor of Pathology*

Thomas L. Poulos, Ph.D. University of California, San Diego, *Director of the Irvine Research Unit in Macromolecular Structure and UCI Chancellor's Professor of Molecular Biology and Biochemistry, Physiology and Biophysics, and Chemistry*

Charles E. Ribak, Ph.D. Boston University, *Professor of Anatomy and Neurobiology and of Biological Sciences*

Markus Ribbe, Ph.D. University of Bayreuth (Germany), *Assistant Professor of Molecular Biology and Biochemistry*

Richard T. Robertson, Ph.D. University of California, Irvine, *Professor of Anatomy and Neurobiology and of Biological Sciences*

W. Edward Robinson, M.D., Ph.D. Vanderbilt University, *Associate Professor of Pathology and of Microbiology and Molecular Genetics in Residence*

Irwin A. Rose, Ph.D. University of Chicago, *Professor of Physiology and Biophysics in Residence*

Michael R. Rose, Ph.D. University of Sussex, *Professor of Ecology and Evolutionary Biology*

Ingrid Ruf, Ph.D. Emory University, *Assistant Professor of Molecular Biology and Biochemistry*

Michael D. Rugg, Ph.D. University of Leicester, *Director of the Center for the Neurobiology of Learning and Memory, and Professor of Neurobiology and Behavior, Cognitive Sciences, and Social Ecology*

Hamid M. Said, Ph.D. University of Aston (England), *Professor of Medicine (Gastroenterology, Nephrology), Physiology and Biophysics, and Pediatrics in Residence*

Ann K. Sakai, Ph.D. University of Michigan, *Professor of Ecology and Evolutionary Biology*

Michael K. Samsoszuk, M.D. Harvard University, *Associate Professor of Pathology and Radiological Sciences*

Maike Sander, M.D. University of Heidelberg, *Assistant Professor of Developmental and Cell Biology*

Suzanne B. Sandmeyer, Ph.D. University of Washington, *Department Chair and Professor of Biological Chemistry and Professor of Microbiology and Molecular Genetics and of Biological Sciences*

Rozanne Sandri-Goldin, Ph.D. The Johns Hopkins University, *Professor of Microbiology and Molecular Genetics and of Biological Sciences*

Thomas F. Schilling, Ph.D. University of Oregon, *Assistant Professor of Developmental and Cell Biology*

Michael E. Selsted, Ph.D. University of California, Los Angeles, *Department Chair and Professor of Pathology, Professor of Microbiology and Molecular Genetics and of Pharmacology, and Warren L. Bostick Chair in Pathology*

Bert L. Semler, Ph.D. University of California, San Diego, *Department Chair and Professor of Microbiology and Molecular Genetics and Professor of Biological Sciences*

Donald Senear, Ph.D. University of Washington, *Professor of Molecular Biology and Biochemistry*

Christopher Sims, M.D. The John Hopkins University, *Assistant Adjunct Professor of Physiology and Biophysics*

Martin A. Smith, Ph.D. University of Newcastle Upon Tyne, *Professor of Anatomy and Neurobiology*

Ivan Soltesz, Ph.D. L. Eötvös University (Hungary), *Professor of Anatomy and Neurobiology, Physiology and Biophysics, and Neurobiology and Behavior*

George Sperling, Ph.D. Harvard University, *UCI Distinguished Professor of Cognitive Sciences and of Neurobiology and Behavior*

Eric J. Stanbridge, Ph.D. Stanford University, *UCI Distinguished Professor of Microbiology and Molecular Genetics and of Biological Sciences*

Wendell M. Stanley, Jr., Ph.D. University of Wisconsin, *Senior Lecturer Emeritus in Biochemistry*

Arnold Starr, M.D. New York University, *Research Professor of Neurology, Psychiatry and Human Behavior, Cognitive Sciences, and Neurobiology and Behavior*

Robert Steele, Ph.D. Yale University, *Associate Professor of Biological Chemistry and Biological Sciences*

Oswald Steward, Ph.D. University of California, Irvine, *Director of the Reeve-Irvine Research Center, Professor of Anatomy and Neurobiology and of Neurobiology and Behavior, and Reeve-Irvine Chair in Spinal Cord Injury Research*

Georg Striedter, Ph.D. University of California, San Diego, *Associate Professor of Neurobiology and Behavior and of Ecology and Evolutionary Biology*

Katherine N. Suding, Ph.D. University of Michigan, Ann Arbor, *Assistant Professor of Ecology and Evolutionary Biology*

Christine Suetterlin, Ph.D. University of Basel (Switzerland), *Assistant Professor of Developmental and Cell Biology*

Katumi Sumikawa, Ph.D. Imperial College, London (England), *Associate Professor of Neurobiology and Behavior*

Adam P. Summers, Ph.D. University of Massachusetts, Amherst, *Assistant Professor of Ecology and Evolutionary Biology*

Richard Symanski, Ph.D. Syracuse University, *Senior Lecturer with Security of Employment, Ecology and Evolutionary Biology*

Ji Sze, Ph.D. Purdue University, *Assistant Professor of Anatomy and Neurobiology*

Ming Tan, M.D. The Johns Hopkins University, *Associate Professor of Microbiology and Molecular Genetics, Medicine, and Biological Sciences*

Shao Jun Tang, Ph.D. University of Toronto, *Assistant Professor of Neurobiology and Behavior*

Andrea J. Tenner, Ph.D. University of California, San Diego, *Professor of Molecular Biology and Biochemistry*

Krishna K. Tewari, Ph.D. Lucknow University, *Professor of Molecular Biology and Biochemistry*

Leslie M. Thompson, Ph.D. University of California, Irvine, *Associate Professor of Psychiatry and Human Behavior and of Biological Chemistry*

Kathleen K. Treseder, Ph.D. Stanford University, *Assistant Professor of Ecology and Evolutionary Biology and of Earth System Science*

Bruce Tromberg, Ph.D. University of Tennessee, *Director of the Beckman Laser Institute and Professor of Surgery, Physiology and Biophysics, and Biomedical Engineering*

Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Assistant Professor of Molecular Biology and Biochemistry and of Chemistry*

Neil D. Tsutsui, Ph.D. University of California, San Diego, *Assistant Professor of Ecology and Evolutionary Biology*

Nosratola D. Vaziri, M.D. Tehran University Medical School (Iran), *Chief of Nephrology and Professor of Medicine (Renal Diseases) and of Physiology and Biophysics*

Marcel Verzeano, M.D. University of Pisa Medical School (Italy), *Professor Emeritus of Neurobiology and Behavior*

Larry E. Vickery, Ph.D. University of California, Santa Barbara, *Professor of Physiology and Biophysics and of Biological Sciences*

Luis P. Villarreal, Ph.D. University of California, San Diego, *Director of the Center for Virus Research and Professor of Molecular Biology and Biochemistry and of Virology*

Paul Vrana, Ph.D. Columbia University, *Assistant Professor of Biological Chemistry*

Edward K. Wagner, Ph.D. Massachusetts Institute of Technology, *Professor of Molecular Biology and Biochemistry and of Virology*

Douglas C. Wallace, Ph.D. Yale University, *Donald Bren Professor of Ecology and Evolutionary Biology and of Biological Chemistry*

Craig M. Walsh, Ph.D. University of California, Los Angeles, *Assistant Professor of Molecular Biology and Biochemistry*

Ping H. Wang, M.D. Kaoshing University, *Associate Professor of Medicine (Endocrinology)*

Robert C. Warner, Ph.D. New York University, *Professor Emeritus of Molecular Biology and Biochemistry*

Rahul Warrior, Ph.D. Yale University, *Assistant Professor of Developmental and Cell Biology*

Marian Waterman, Ph.D. University of California, San Diego, *Associate Professor of Microbiology and Molecular Genetics and of Biological Sciences*

Norman M. Weinberger, Ph.D. Case Western Reserve University, *Professor of Neurobiology and Behavior*

Arthur E. Weis, Ph.D. University of Illinois, *Professor of Ecology and Evolutionary Biology*

Gregory Alan Weiss, Ph.D. Harvard University, *Assistant Professor of Chemistry and of Molecular Biology and Biochemistry*

John H. Weiss, M.D., Ph.D. Stanford University, *Professor of Neurology, Anatomy and Neurobiology, and Neurobiology and Behavior*

Stephen G. Weller, Ph.D. University of California, Berkeley, *Professor of Ecology and Evolutionary Biology*

Stephen H. White, Ph.D. University of Washington, *Professor of Physiology and Biophysics and of Biological Sciences*

Dominik Wodarz, Ph.D. Oxford University, *Associate Professor of Ecology and Evolutionary Biology*

Clifford A. Woolfolk, Ph.D. University of Washington, *Professor Emeritus of Molecular Biology and Biochemistry*

Pauline Yahr, Ph.D. University of Texas, *Professor of Neurobiology and Behavior*

Tau-Mu Yi, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Developmental and Cell Biology*

Kyoko Yokomori, Ph.D. University of Southern California, Ph.D. of Agriculture (Veterinary Medicine) University of Tokyo, *Associate Professor of Biological Chemistry*

Fan-Gang (Frank) Zeng, Ph.D. Syracuse University, *Director of the Hearing and Speech Laboratory and Professor of Otolaryngology, Biomedical Engineering, and Cognitive Sciences*

OVERVIEW

This is the ideal time to be studying biology. We are solving problems today whose solutions were unimaginable even a few years ago, and implications for our society, our health, and our environment are profound. The School of Biological Sciences is dedicated to providing students with a unique course of study that fosters a deep appreciation for the exciting facts and concepts in the field, an education that allows graduates to excel in their chosen careers.

To that end, the School has recently redesigned the curriculum to remain on the cutting edge of biological education. All first-year students are enrolled in a Biology Freshman Seminar of their choice with one of 100 faculty members. Each seminar is different, designed by each member of the faculty to share their excitement about a particular aspect of biology with new students. Students also are introduced to basic concepts in ecology and evolutionary biology, as well as cellular and molecular biology, in that first year. The core set of courses in biology continues into the second year, featuring genetics, biochemistry, and molecular biology, followed in the third and fourth year by a choice of advanced courses in biology. Since biology is a laboratory discipline, students complete a series of laboratory courses in which they learn both the techniques and approaches needed to solve problems in biology.

Finally, the faculty expect that most students will engage in cutting-edge research in one of more than 250 laboratories and medical clinics in the School of Biological Sciences and the UCI School of Medicine. It is in these situations that faculty train students to think in a sophisticated way about real-world problems. There is also no feeling of excitement greater than finding out something about the world that no one has ever known before, a feeling afforded in biology only by participation in research. The Excellence in Research Program allows students to present their work and be recognized for their performance with a series of awards and publication of their reports in the School's *Journal of Undergraduate Research.* The combination of small seminars that transmit the faculty's enthusiasm for biology, the set of core classes that instructs students in the concepts of biology, the advanced classes that allow a deep understanding of specialized aspects of biology, the laboratory courses that convey the practical aspects of problem-solving in biology, and the research experiences that engage students in the real excitement in revealing new information about biology, come together to provide an extraordinary experience for students. The Honors Program in the School of Biological Sciences further enhances the educational experience for the best students.

Biology students have the option of specializing in areas of biology that best fit their interests, completing courses for degree programs in Biochemistry and Molecular Biology, Developmental and Cell Biology, Ecology and Evolutionary Biology, Genetics, Neurobiology, or Plant Biology.

Those students who wish to receive a broader education in the area can opt to complete a major in Biological Sciences. Completion of any of these majors forms an excellent basis for application to either graduate or professional studies such as medical school, and graduates of the School of Biological Sciences are routinely accepted to the most prestigious programs in the country.

Students with an interest in the application of ecology to human needs may choose the Applied Ecology major, which is offered jointly by the School of Biological Sciences and the School of Social Ecology. Information is available in the School of Social Ecology section of this *Catalogue.*

The quality of the faculty in the School of Biological Sciences has remained high while increasing steadily in number over the past few years, giving students a remarkable range of expertise in biology and with it, a large number of different advanced courses and research opportunities. In addition, their efforts have brought several high-impact research units to the campus, such as the Center for the Neurobiology of Learning and Memory, the Center for Virus Research, the Beckman Laser Institute, the Cancer Research Institute, the Developmental Biology Center, the Center for Immunology, the Institute for Brain Aging and Dementia, the Macromolecular Structure Research Unit, the Center for Molecular and Mitochondrial Medicine and Genetics, the Institute for Genomics and Bioinformatics, and the Reeve-Irvine Research Center, all of which are accessible to undergraduates. The School of Biological Sciences also has close research and teaching collaborations with faculty in the Schools of Medicine, Physical Sciences, Social Ecology, and Social Sciences; the Donald Bren School of Information and Computer Sciences; and The Henry Samueli School of Engineering.

In addition to the regular University requirements for admission, students interested in the biological sciences should include in their high school curriculum, in addition to a course in biology, four years of mathematics, as well as courses in chemistry and physics, which are now an integral part of most contemporary biological work.

The School's professional counseling staff is always available for consultation to students regarding the many decisions in their academic program. They also are trained to provide guidance in the application process to both professional and graduate schools, a real advantage to the high proportion of students in the School of Biological Sciences who go on to pursue advanced degrees.

Opportunities are available at the graduate level to specialize in Anatomy and Neurobiology, Biological Chemistry, Developmental and Cell Biology, Ecology and Evolutionary Biology, Experimental Pathology, Microbiology and Molecular Genetics, Molecular Biology and Biochemistry, Neurobiology and Behavior, Physiology and Biophysics, and Protein Engineering Science.

Degrees

Biochemistry and Molecular Biology	B.S.
Biological Sciences	B.S., M.S., Ph.D.
Developmental and Cell Biology	B.S.
Ecology and Evolutionary Biology	B.S.
Genetics	B.S.
Neurobiology	B.S.
Plant Biology	B.S.
Applied Ecology (offered jointly with the School of Social Ecology)	B.S.

HONORS

Honors Program in the School of Biological Sciences

The Honors Program in the School of Biological Sciences provides an opportunity for outstanding majors in the School to pursue advanced work in independent research via participation in the Excellence in Biological Sciences Research Program and earn Honors in Biological Sciences upon graduation. Admission to the program is based on an application to participate in the Excellence in Biological Sciences Research program filed during the middle part of the fall quarter of the year of the student's participation. Additionally, students must have a minimum overall 3.5 grade point average and a minimum 3.5 grade point average in all required Biological Sciences courses. The Program requires a minimum of three quarters enrollment in research (Biological Sciences 199) including successful completion of Biological Sciences H195 and the Excellence in Biological Sciences Research program.

Graduation with Honors

Of the graduating seniors, no more than 12 percent will receive Latin honors: approximately 1 percent *summa cum laude,* 3 percent *magna cum laude,* and 8 percent *cum laude.* The selection for these awards is based on winter quarter rank-ordered grade point averages. To be eligible for honors at graduation, the student must, by the end of winter quarter of the senior year, be officially declared a Biological Sciences major; submit an Application to Graduate by the end of winter quarter of the senior year; have completed at least 72 units in residence at a UC campus by the end of the winter quarter of the academic year in which they graduate; have all corrections to the academic record processed by the Registrar's Office by the end of winter quarter; if completing the Language Other Than English breadth requirement with a language exemption test, pass the test by the end of winter quarter; and be able to verify completion of all course work by the end of the spring quarter of the senior year. Other important factors are considered (see page 52).

Excellence in Research Program

The School of Biological Sciences believes that successful participation in creative research is one of the highest academic goals its undergraduates can attain and accordingly rewards such students with Excellence in Biological Sciences Research certificates. Through undergraduate research and the Excellence in Research Program in Biological Sciences, students have the opportunity of presenting the results of their research endeavors to peers and faculty, and possibly of seeing their research papers published. Selected papers are published in the School's *Journal of Undergraduate Research in the Biological Sciences.*

Students must be enrolled in experimental research under Biological Sciences 199 and meet the eligibility requirements of the program in order to participate. The program begins each fall with a series of instructional workshops. Contact the Biological Sciences Student Affairs Office in 231 Steinhaus Hall for information or visit the Web site at http://www.bio.uci.edu/studentaffairs.

Campuswide Honors Program

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

Dean's Honor List. The quarterly Dean's Honor List is composed of students who have received a 3.5 grade point average while carrying a minimum of 12 graded units.

Biological Sciences Honors, Scholarships, Prizes, and Awards

The following honors, scholarships, prizes, and awards are presented at the annual Biological Sciences Honors Convocation held the first week of June.

Dean's Academic Achievement and Service Awards. Awards are based on academic excellence and exceptional service to the School of Biological Sciences.

Excellence in Biological Sciences Alumni Scholarship. This scholarship was established in 2002 with the generous support of Biological Sciences alumni. The award is for undergraduate Biological Sciences majors in their junior year who have demonstrated academic excellence and outstanding extracurricular activities.

Excellence in Research Award. Undergraduates who have successfully completed the requirements for this program are presented with Excellence in Research certificates.

Robert H. Avnet Memorial Scholarship. The Robert H. Avnet Memorial Scholarship has been established to assist a student interested in becoming a physician. The student must be a Biological Sciences major and demonstrate financial need.

Carol Becker McGaugh Award. This award is given to a junior with outstanding research in the area of neurobiology of learning and memory.

Robert Ernst Prize for Excellence in Research in the Biological Sciences. This prize is awarded to a student for meritorious research conducted in the field of biology.

Robert Ernst Prize for Excellence in Student Research in Plant Biology. This prize is awarded to a student for meritorious research conducted in plant biology.

Dean's Award for Excellence in Research. Three students receiving the highest ratings for their papers and oral presentations at the Excellence in Research Program will receive the Dean's Award for Excellence in Research.

Godoy Family Scholarship. The scholarship is awarded to a sophomore planning a career in health sciences, either in a clinical or academic setting.

Dr. William F. Holcomb Scholarship. The intent of the Dr. William F. Holcomb Scholarship is to support biomedical or marine biological studies. The Scholarship is to be used to support continuing academic work over a specific period.

Laurence J. Mehlman Prize. The Laurence J. Mehlman Prize is awarded to an undergraduate student in the School of Biological Sciences who has demonstrated outstanding achievement in both scholarship and service to the School.

Edward Mittelman Memorial Fund Scholarship. The Edward Mittelman Memorial Fund Scholarship is presented to an outstanding Biological Sciences student who will pursue a career in the medical field.

Edward A. Steinhaus Memorial Award. The Edward A. Steinhaus Memorial Award is given to outstanding Biological Sciences graduate student teaching assistants who demonstrate promise as future educators.

Joseph H. Stephens Award for Outstanding Research in Ecology and Conservation. This award is granted to an undergraduate student who has demonstrated outstanding research in ecology and conservation.

Joseph H. Stephens Award for Outstanding Research in Biochemistry and Molecular Biology. This award is granted to an undergraduate student who has demonstrated outstanding research in biochemistry and molecular biology.

Jayne Unzelman Scholarship. The Jayne Unzelman Scholarship is presented to an undergraduate student who has shown academic excellence and been of service to the School of Biological Sciences and/or the University, and to the community.

Special Service Awards. These awards are given to students who have demonstrated great service to the School, the University, and/or community.

Undergraduate Programs

ADMISSION TO THE MAJOR IN BIOLOGICAL SCIENCES

In the event that the number of students who elect Biological Sciences as a major exceeds the number of positions available, applicants may be subject to screening beyond minimum University of California admissions requirements.

Freshmen: Preference will be given to those who rank the highest using the selection criteria as stated in the Undergraduate Admissions section of this *Catalogue.*

Transfer students: Junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites will be given preference for admission. All applicants must complete one year of general chemistry with laboratory with grades of B or better and have a cumulative GPA of 3.0 or higher.

No student may enter as a double major, but Biological Sciences students interested in other areas may apply to become double majors after the first quarter, if the second school or program approves. A strong academic performance in the second area is requisite for acceptance as a double major.

CHANGE OF MAJOR

Students who wish to declare any major within the School of Biological Sciences should contact the Biological Sciences Student Affairs Office in 231 Steinhaus Hall for information about change-of-major requirements, procedures, and policies. Information can also be found at http://www.due.uci.edu/Change_of_Major.html. Change of Major petitions are accepted and reviewed by the School throughout the year.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

All School of Biological Sciences students must complete the following requirements.

University Requirements: See pages 56–60.

School Requirements

Biological Sciences 2B, 194S; Biological Sciences Core 93, 94, 97, 98, 99, 100L; Chemistry 1A-B-C, 1LB-LC or H2A-B-C, 1LB-1LC; Chemistry 51A-B-C, 51LA-LB or 52A-B-C, 52LA-LB; Mathematics 2A-B and one course selected from Biological Sciences 7 or Mathematics 2D or 2J or 7; Physics 3A-B-C, 3LB-LC or 7A-B, 7LA-LB and 7D, 7LD or 7E.

Prerequisites for all Biological Sciences Core courses are rigorously enforced. Students must have a 2.0 cumulative grade point average in the Biological Sciences Core Curriculum, four upper-division elective courses, and three upper-division laboratories.

School Residence Requirement: After matriculation, all courses required for the major must be successfully completed at UCI. The School of Biological Sciences strictly enforces the UCI residence requirement. At least 36 of the final 45 units completed by a student for the bachelor's degree must be earned in residence at the UCI campus. (The School considers courses taken in the Education Abroad Program to be in-residence courses.)

Undergraduate Major in Biological Sciences

The Biological Sciences major presents a unified, in-depth study of modern biology. The Biological Sciences Core is a five-quarter series of courses ranging from ecology and evolutionary biology, to genetics, biochemistry, and molecular biology. Important laboratory techniques and methodology are presented in upper-division laboratories. Advanced elective courses provide an opportunity to continue to diversify students' exposure to the biological sciences or to gain a much more in-depth study of a particular area of the biological sciences.

NOTE: Biological Sciences majors who successfully complete their second year of study may elect to apply for a change of major to one for the following: Biochemistry and Molecular Biology, Developmental and Cell Biology, Genetics, Neurobiology, or Plant Biology. Students may apply directly to the Ecology and Evolutionary Biology major when they apply for admission to UCI. Contact the Biological Sciences Student Affairs Office for more information.

REQUIREMENTS FOR THE B.S. DEGREE IN BIOLOGICAL SCIENCES

University Requirements: See pages 56–60.

School Requirements: See page 131.

Major Requirements

A. *Required Major Courses:* Three courses selected from Biological Sciences D103, D104, D105, E106, E109, N110.

B. *Upper-Division Laboratories:* Three courses selected from Biological Sciences D111L, E112L, E115L, E166, M114L, M116L, M121L, M122L, M124L, N113L.

C. *Upper-Division Biology Electives:* Four upper-division, four-unit courses selected from Biological Sciences D103–D190, E106–E190, M114–M190, N110–N190. Biological Sciences D103, D104, D105, E106, E109, N110 may not be used to satisfy more than one requirement. Chemistry 130A-B-C or 131A-B-C or Physics 147A-B can be used to partially satisfy the elective requirement. Additionally, Psychology/Biological Sciences double majors may also use Psychology 112A-B-C to partially satisfy the elective requirement.

NOTE: Double majors within the School of Biological Sciences, including the Applied Ecology major, are not permitted.

Requirements for the Minor in Biological Sciences

Nine courses are required, no more than two of which may be taken on a Pass/Not Pass basis:

A. Three courses selected from Biological Sciences 93, 94, 97, 98, and 99. (Prerequisites are strictly enforced. Exceptions may be made for some majors that accept the above courses for degree requirements. Consult with the Biological Sciences Student Affairs Office or the academic counseling office of the major.)

B. Six four-unit courses selected from Biological Sciences 5–H90 (excluding 46), 93–99, and D103–D190, E106–E190, M114–M190, N110–N190. Three courses must be upper-division. Prerequisites are strictly enforced. (Courses used to satisfy group A may not also be used to satisfy group B.)

Residence requirement for the minor: A minimum of six courses required for the minor must be completed at UCI. Approved courses taken in the Education Abroad Program are considered to be in-residence courses.

NOTE: Students in any of the majors within the School of Biological Sciences or in the Applied Ecology major may not minor in Biological Sciences.

PLANNING A PROGRAM OF STUDY

Since biological sciences courses are built upon a base of the physical sciences, it is very important for students to take their required physical sciences early, particularly general and organic chemistry. Students who have not completed high school chemistry are well advised to complete a preparatory chemistry course before entering UCI. The academic program shown is only a suggested program. Students should consult the Biological Sciences Student Affairs Office for individual academic planning.

Freshmen will normally take Humanities 1A or lower-division writing courses, Chemistry 1A, Biological Sciences 93, and a freshman seminar (Biological Sciences 2A) during the fall quarter. Students will then continue with Biological Sciences 94, 2B, complete their general chemistry requirement, and continue with Humanities or lower-division writing during the remaining winter and spring quarters.

Sophomores begin organic chemistry (Chemistry 51A or 52A), continue the Biological Sciences Core with 97, 98, 99, and 100L; students enrolling in 100L must have completed or be concurrently enrolled in Biological Sciences 97 and 194S. Sophomores often begin taking courses in other disciplines to meet the UCI breadth requirement and fulfill their mathematics requirement if they have not done so as freshmen.

During their junior year, most majors continue with the Biological Sciences electives and take physics. Students who intend to double major in Chemistry will be required to take Physics 7A-B and 7D or 7E in place of Physics 3A-B-C. Juniors may complete their breadth requirements and usually start their research and their upper-division biology laboratory courses.

Finally, during their senior year, students continue their research and complete their remaining major requirements.

Students in the Biological Sciences major are required to make progress toward their degree, and their progress will be monitored. If normal academic progress toward the degree in Biological Sciences is not being met, students will be subject to probation.

Sample Program — Biological Sciences		
FALL	**WINTER**	**SPRING**
Freshman		
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. 2B
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Humanities 1A[1]	Humanities 1B	Humanities 1C
Bio. Sci. 2A		Math. 2A
Sophomore		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A, 51LA[2]	Chemistry 51B, 51LB	Chemistry 51C
Math. 2B	Bio. Sci. 7 or	Bio. Sci. 100L[3]
Bio. Sci. 194S	Math. 2D or 2J or 7	
Junior		
Required Major course	Required Major course	Required Major course
Physics	Physics	Physics
Elective/Research[5]	Elective/Research	Bio. Sci. elective[4]
		Elective/Research
Senior		
Bio. Sci. elective	Bio. Sci. elective	Bio. Sci. elective
Bio. Sci. U-D Lab	Bio. Sci. U-D Lab	Bio. Sci. U-D Lab
Elective	Research	Research
	Electives	Electives

1 Students have the option of taking Humanities 1A or lower-division writing courses.

2 Chemistry 52A-B-C, 52LA-LB may be taken instead of 51A-B-C, 51LA-LB.

3 Prerequisites are completion of or concurrent enrollment in Biological Sciences 97 and 194S, and satisfactory completion of the lower-division writing requirement; 100L must be completed prior to taking the three upper-division labs.

4 In addition to the listed Biological Sciences elective courses, Chemistry 130A-B-C or 131A-B-C, Physics 147A-B, and Psychology 112A-B-C (for Biological Sciences/Psychology double majors) are counted as Biological Sciences elective courses.

5 Electives should be chosen with the following purposes in mind: UCI breadth requirements; students' own breadth; preprofessional training.

Undergraduate Major in Biochemistry and Molecular Biology

Few areas of Biological Sciences remain that are not impacted by studies at the chemical and molecular level. The major in Biochemistry and Molecular Biology is designed to provide a comprehensive background in this modern, conceptual understanding of biology. Students who wish to begin in-depth study of the molecular basis in any of a variety of fields, including development, gene expression, immunology, pathogenesis, disease, virology, and evolution, can do so through this major. This program will be especially attractive to those students who intend to pursue an advanced degree in biological or medical sciences.

The Biochemistry and Molecular Biology major is based upon required courses in Advanced Biochemistry and Advanced Molecular Biology (Biological Sciences M114 and M116). These courses, together with a wide variety of elective course offerings, provide majors the choice to either explore the breadth of the field or follow a more in-depth study of any of its subdisciplines. For students interested in the interface between biology and chemistry, this program articulates well with a second major in Chemistry.

The program of study emphasizes laboratory experience and its integration with basic theory. This is accomplished in three ways: first, through coordination between the advanced courses in Biochemistry (M114) and Molecular Biology (M116), and laboratory courses in Biochemistry (M114L) and Molecular Biology (M116L) which provide students with the basic laboratory skills and an appreciation for the experimental foundations of the field; second, through advanced laboratories in Immunology (M121L) and Virology (M124L) which provide students with the opportunity to develop cutting edge research skills; and third, by emphasizing independent research sponsored by a participating faculty member. The program encourages the research interests of students in subdisciplines other than immunology or virology by offering the opportunity to substitute one year of independent research for the advanced laboratory.

The major in Biochemistry and Molecular Biology is designed to provide students with the appropriate tools and training to successfully pursue graduate degrees that emphasize basic scientific research, including Ph.D. and M.S. training as well as combined M.D./Ph.D. programs. In addition, and particularly with the explosive growth in biotechnology and its significant influence in everyday life, graduates could use their backgrounds very effectively to pursue careers in business, education, law, and public affairs.

REQUIREMENTS FOR THE B.S. DEGREE IN BIOCHEMISTRY AND MOLECULAR BIOLOGY

University Requirements: See pages 56–60.

School Requirements: See page 131.

Major Requirements

A. *Required Major Courses:* Biological Sciences M114 and M116.

B. *Upper-Division Laboratories:* Biological Sciences M114L, M116L, and one additional laboratory selected from M121L, M124L, or one year of research (Biological Sciences 199) approved by the Biochemistry and Molecular Biology Faculty Board.

C. *Upper-Division Biology Electives:* Four courses selected from Biological Sciences D137, D146, D147, M120–M189, Chemistry 128, 130A-B-C, or 131A-B-C (two of the four must be from Biological Sciences). Two additional four-unit courses selected from Biological Sciences D103–D190, E106–E190, M120–M190, N110–N190, or Chemistry 128, 130A-B-C, or 131A-B-C. No course may be used to satisfy more than one requirement.

Sample Program — Biochemistry and Molecular Biology		
FALL	**WINTER**	**SPRING**
Freshman		
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. 2B
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Humanities 1A[1]	Humanities 1B	Humanities 1C
Bio. Sci. 2A		Math. 2A
Sophomore		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A, 51LA[2]	Chemistry 51B, 51LB	Chemistry 51C
Math. 2B	Bio. Sci. 7 or	Bio. Sci. 100L[3]
Bio. Sci. 194S	Math. 2D or 2J or 7	Breadth/Elective
Junior		
Bio. Sci. M114L	Bio. Sci. M114	Bio. Sci. M116
Biochem./Mol. elective	Biochem./Mol. elective	Biochem./Mol. elective
Bio. Sci. U-D lab/research	Bio. Sci. U-D lab/research	Physics 3C, 3LC
Physics 3A	Physics 3B, 3LB	
Senior		
Biochem./Mol. elective	Bio. Sci. elective or lab	Bio. Sci. elective
Bio. Sci. M116L	Research/Elective	Bio. Sci. M121L/ M124L or research
Research/Elective	Breadth/Elective	Research/Elective
Breadth/Elective		Breadth/Elective

1 Students have the option of taking Humanities 1A or lower-division writing courses.

2 Chemistry 52A-B-C, 52LA-LB may be taken instead of 51A-B-C, 51LA-LB.

3 Prerequisites are completion of or concurrent enrollment in Biological Sciences 97 and 194S, and satisfactory completion of the lower-division writing requirement; 100L must be completed prior to taking upper-division labs.

Application Process to Declare the Major: The major in Biochemistry and Molecular Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Biochemistry and Molecular Biology Faculty Board is completed during the summer. Information can also be found at http://www.due.uci.edu/Change_of_Major.html. Double majors within the School of Biological Sciences, including the Applied Ecology major, are not permitted.

Undergraduate Major in Developmental and Cell Biology

The Developmental and Cell Biology major is intended to provide students with intensive training in cutting edge approaches to understanding the structure and function of cells and how they interact to produce a complex organism, starting with a fertilized egg. The focus of the B.S. in Developmental and Cell Biology is to provide students with intensive training aimed at preparing them for graduate programs in modern Developmental and Cell Biology or other biomedical sciences. In-depth training in the molecular basis of cell and developmental biology will be coupled with integrating knowledge obtained from the recent explosive advances in genomic technology to provide a strong working understanding of how to approach problems in basic research.

The major has distinctive features. The first is a reduction in the number of required courses, allowing students the opportunity to focus more deeply on training in Developmental and Cell Biology. The second is the implementation of a new course in Genomic and Proteomic analysis that is closely tied to problems in genetics, developmental, and cell biology. Understanding the connections among these disciplines and how to apply the appropriate tools for defining and answering fundamental questions in biomedical research is a critical tool for success in research. Another distinctive feature of the major is the opportunity to replace two upper-division laboratory courses with mentored Biological Sciences 199 individual research in faculty laboratories. This offers students the opportunity to apply the tools they have acquired during formal course work to current problems at the frontiers of research. Lastly, students majoring in Developmental and Cell Biology have faculty advisors with whom they meet at least quarterly. The faculty advisors help students plan their curriculum, select appropriate 199 projects and sponsoring labs, and as a group grant petitions and certify the degree. The combination of new upper-division courses, more flexibility in the curriculum, the option for mentored research, and close interaction with faculty advisors will help the Developmental and Cell Biology majors to develop an appreciation of the nature of research and establish a strong foundation for future success in graduate or professional schools.

REQUIREMENTS FOR THE B.S. DEGREE IN DEVELOPMENTAL AND CELL BIOLOGY

University Requirements: See pages 56–60.

School Requirements: See page 131.

Major Requirements

A. *Required Major Courses:* Biological Sciences D103, D104, and D145.

B. *Upper-Division Laboratories:* Biological Sciences D111L and two selected from E112L, E115L, E166, M114L, M116L, M121L, M122L, M124L, N113L. Students may petition to substitute Excellence in Research (Biological Sciences 199) for two upper-division laboratories (other than D111L); 199 research is strongly encouraged. The 199 laboratory must be approved by the Department, and Excellence in Research must be successfully completed. Final approval is given by the Department.

C. *Upper-Division Biology Electives:* one from Biological Sciences D136, D137, D148; one from Biological Sciences D151, D152, M144; and three from Biological Sciences D105, D129, D130, D134, D136, D137, D143, D146, D148, D149, D151, D152, D157, D187, E109, E141, M114, M116, M125, M137, M144, M151, N110, N153, N154.

Application Process to Declare the Major: The major in Developmental and Cell Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Information can also be found at http://www.due.uci.edu/Change_of_Major.html. Double majors within the School of Biological Sciences, including the Applied Ecology major, are not permitted.

Sample Program — Developmental and Cell Biology

FALL	WINTER	SPRING
Freshman		
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. 2B
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Humanities 1A[1]	Humanities 1B	Humanities 1C
Bio. Sci. 2A		Bio. Sci. 194S
Sophomore		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A, 51LA[2]	Chemistry 51B, 51LB	Chemistry 51C
Math. 2A	Math. 2B	Math. 2D, 2J, 7, or Bio. Sci. 7
Junior		
Bio. Sci. D103	Bio. Sci. D104	Bio. Sci. D111L
Physics 3A	Physics 3B, 3LB	Physics 3C, 3LC
Bio. Sci. 100L[3]	Breadth	Bio. Sci. D145
Breadth		
Senior		
U-D Lab or Bio. Sci. 199	U-D Lab or Bio. Sci. 199	U-D Lab or Bio. Sci. elective
U-D Bio. Sci. elective	U-D Bio. Sci. elective	U-D Bio. Sci. elective
U-D Bio. Sci. elective	Bio. Sci. 199 research or breadth	Bio. Sci. 199 research or breadth

1 Students have the option of taking Humanities 1A or lower-division writing courses.

2 Chemistry 52A-B-C, 52LA-LB may be taken instead of 51A-B-C, 51LA-LB.

3 Prerequisites are completion of or concurrent enrollment in Biological Sciences 97 and 194S, and satisfactory completion of the lower-division writing requirement; 100L must be completed prior to taking upper-division labs.

Undergraduate Major in Ecology and Evolutionary Biology

It has famously been said that nothing in biology makes sense except in the light of evolution. This major is designed to allow students to make sense of biology. It is a broad major, including components of evolutionary biology, ecology, and physiology. Faculty interests are also broad and include the evolution of aging, conservation biology, biogeography, plant and animal population and community ecology, the evolution of infectious disease, evolutionary physiology, behavioral ecology, host-disease interactions, evolutionary genetics, marine ecology, genetics of invasive species, and plant population biology. Following graduation students will be especially well prepared to enter graduate programs in either ecology or evolution for advanced study. The major also provides the foundation to pursue careers in governmental and non-governmental environmental organizations, as well as professional schools. The Department considers undergraduate experience in research an integral component of a scientific education, and majors are encouraged to participate in Biological Sciences 199 in which they will be mentored by an individual faculty member within the Department.

REQUIREMENTS FOR THE B.S. DEGREE IN ECOLOGY AND EVOLUTIONARY BIOLOGY

University Requirements: See pages 56–60.

School Requirements: See page 131.

Major Requirements

A. *Required Major Courses:* Biological Sciences 7, E106, and E107.

B. *Upper-Division Laboratories:* Biological Sciences E115L, E166, and one selected from Biological Sciences D111L, E112L, M114L, M116L, M121L, M122L, M124L, N113L.

C. *Upper-Division Biology Electives:* one from Biological Sciences D103, D104, D105, E109, N110; and three from Biological Sciences E111–E190 and D147. Biological Sciences 199 Research is strongly encouraged.

Double majors within the School of Biological Sciences, including the Applied Ecology major, are not permitted.

Sample Program — Ecology and Evolutionary Biology

FALL	WINTER	SPRING
Freshman		
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. E106
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Humanities 1A[1]	Humanities 1B	Humanities 1C
Bio. Sci. 2A		Bio. Sci. 2B
Sophomore		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A, 51LA[2]	Chemistry 51B, 51LB	Chemistry 51C
Math. 2A	Math. 2B	Bio. Sci. 7
Bio. Sci. 194S		Bio. Sci. 100L[3]
Junior		
Bio. Sci. E166	U-D Bio. Sci. elective	Bio. Sci. E115L
Physics 3A	Physics 3B, 3LB	Physics 3C, 3LC
Bio. Sci. research	Bio. Sci. research	U-D Bio. Sci. elective
Breadth		Bio. Sci. research
Senior		
Bio. Sci. E107	U-D Bio. Sci. elective	U-D Bio. Sci. elective
U-D Lab	Bio. Sci. research	Breadth
Bio. Sci. research	Breadth	Bio. Sci. research
Elective		

[1] Students have the option of taking Humanities 1A or lower-division writing courses.

[2] Chemistry 52A-B-C, 52LA-LB may be taken instead of 51A-B-C, 51LA-LB.

[3] Prerequisites are completion of or concurrent enrollment in Biological Sciences 97 and 194S, and satisfactory completion of the lower-division writing requirement; 100L must be completed prior to taking upper-division labs.

Undergraduate Major in Genetics

Genetics pervades every aspect of modern society, from newspaper articles to talk shows, from discussions on health care to discussions on cloning. With the sequencing of the human genome, it is more important than ever for biology students to have a broad background in the study of heredity and evolution. The Genetics major is designed to benefit motivated undergraduates who have a particular interest in learning about developmental genetics, evolutionary genetics, and molecular genetics and to allow them to explore how our knowledge of genetic mechanisms contributes to our understanding of human development and disease. The Genetics major will accommodate students interested in the study of inheritance either as a basic discipline or in terms of its applied aspects in biotechnology, medicine, and agriculture, but will be especially attractive to those students desiring focused study and preparation for graduate training.

Genetics majors begin their study in the junior year with two Genetics courses (Biological Sciences M137 and D137) and a Genomics and Proteomics course (D145). This series of courses is designed to give students an understanding of genetic mechanisms and teach them how to define and answer fundamental questions in biomedical research. Additionally, students choose at least two electives that deal with topics such as the molecular biology of cancer, human genetic diseases, developmental genetics, and the genetics of aging. Finally, Genetics majors are encouraged to explore laboratory research by enrolling in Biological Sciences 199. Laboratory research not only expands a student's technical skills, but is also designed to allow faculty members to mentor Genetics majors. All students majoring in Genetics have a faculty advisor with whom they meet at least quarterly. The faculty advisor helps students plan their curriculum and select appropriate Biological Sciences 199 research projects. Genetics majors also have an opportunity to meet with other Genetics majors on a regular basis and participate in research talks.

The Genetics major provides graduates with advanced training in the skills necessary to pursue graduate degrees in biomedical research. These include Ph.D. graduate programs, teacher-training programs, medical school, and veterinary school. Genetics graduates may also use their backgrounds effectively in planning careers in law, business, education, and public affairs.

REQUIREMENTS FOR THE B.S. DEGREE IN GENETICS

University Requirements: See pages 56–60.

School Requirements: See page 131.

Major Requirements

A. *Required Major Courses:* Biological Sciences D103, D104, D137, D145, and M137.

B. *Upper-Division Laboratories:* three selected from Biological Sciences D111L, E112L, E115L, E166, M114L, M116L, M121L, M122L, M124L, N113L. Students may petition to substitute Excellence in Research (Biological Sciences 199) for two upper-division laboratories; 199 research is strongly encouraged. The 199 laboratory must be approved by the Department, and Excellence in Research must be successfully completed. Final approval is given by the Department.

C. *Upper-Division Biology Electives:* two selected from Biological Sciences D105, D129, D130, D136, D143, D146, D148, D149, D151, D152, D157, D187, E109, E141, M114, M116, M125, M144, M151, N110, N153, N154.

Application Process to Declare the Major: The major in Genetics is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Information can also be found at http://www.due. uci.edu/Change_of_ Major.html. Double majors within the School of Biological Sciences, including the Applied Ecology major, are not permitted.

Sample Program — Genetics

FALL	WINTER	SPRING
Freshman		
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. 2B
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Humanities 1A[1]	Humanities 1B	Humanities 1C
Bio. Sci. 2A		Bio. Sci. 194S
Sophomore		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A, 51LA[2]	Chemistry 51B, 51LB	Chemistry 51C
Math. 2A	Math. 2B	Math. 2D, 2J, or Bio. Sci. 7
		Bio. Sci. 100L[3]
Junior		
Bio. Sci. D103	Bio. Sci. D104	U-D Lab or Bio. Sci. 199
Physics 3A	Physics 3B, 3LB	Physics 3C, 3LC
Bio. Sci. D137	Bio. Sci. M137	Bio. Sci. D145
Breadth	Breadth	Breadth
Senior		
U-D Lab or Bio. Sci. 199	U-D lab or Bio. Sci. 199	U-D Bio. Sci. elective
U-D Bio. Sci. elective	Breadth	Breadth
Breadth		Breadth

[1] Students have the option of taking Humanities 1A or lower-division writing courses.

[2] Chemistry 52A-B-C, 52LA-LB may be taken instead of 51A-B-C, 51LA-LB.

[3] Prerequisites are completion of or concurrent enrollment in Biological Sciences 97 and 194S, and satisfactory completion of the lower-division writing requirement; 100L must be completed prior to taking upper-division labs.

Undergraduate Major in Neurobiology

The Neurobiology major is designed to teach students how neurobiologists apply cellular, molecular, systems, and behavioral analyses in understanding how the nervous system works. The hallmark of the major is a year-long, in-depth exploration of the intellectual tools used to create, advance, and disseminate knowledge about the nervous system. Through neurobiology satellite courses, students acquire advanced factual knowledge about neurobiology. In addition, Neurobiology majors may choose to participate in research through Biological Sciences 199, where they will learn technical skills and receive mentoring from faculty members.

Students completing the Neurobiology major will be well qualified for admission to graduate or professional schools in preparation for careers in biological research, medicine, dentistry, veterinary medicine, nursing, and other related fields. Even without additional education, they will be competitive for positions in the pharmaceutical industry, the health care delivery industry, or in medically or biologically related technologies. The major also provides valuable preparation for students interested in entering other disciplines that increasingly interface with biology and biotechnology, such as law, business administration, and government policy. Additionally, the major provides excellent preparation for students who wish to become high school science teachers.

REQUIREMENTS FOR THE B.S. DEGREE IN NEUROBIOLOGY

University Requirements: See pages 56–60.

School Requirements: See page 131.

Major Requirements

A. *Upper-Division Core:* Biological Sciences N110 and two selected from D103, D104, E106, E109.

B. *Required Major Courses:* Biological Sciences N112A-B-C.

C. *Upper-Division Laboratories:* Biological Sciences N113L and two selected from D111L, E112L, E115L, E166, M114L, M116L, M122L.

D. *Upper-Division Biology Electives:* two selected from Biological Sciences N117–N190 and D149; one additional four-unit course selected from Biological Sciences D103–D190, E106–E190, M114–M190, N110–N190, or from Chemistry 130A-B-C, Chemistry 131A-B-C, and Physics 147A. No course may be used to satisfy more than one requirement.

Application Process to Declare the Major: The major in Neurobiology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Review of applications submitted at that time and selection to the major by the Neurobiology Faculty Board is completed during the summer. Information can also be found at http://www.due.uci.edu/Change_of_Major.html. Double majors within the School of Biological Sciences, including the Applied Ecology major, are not permitted.

Sample Program — Neurobiology

FALL	WINTER	SPRING
Freshman		
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. 2B
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Humanities 1A[1]	Humanities 1B	Humanities 1C
Bio. Sci. 2A		Math. 2A
Sophomore		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A, 51LA[2]	Chemistry 51B, 51LB	Chemistry 51C
Math. 2B	Bio. Sci. 7 or Math. 2D or 2J or 7	Bio. Sci. 110
Bio. Sci. 194S		Breadth/Elective
Junior		
Bio. Sci. N112A	Bio. Sci. N112B	Bio. Sci. N112C
Required Major Course	Bio. Sci. N113L	Required Major Course
Bio. Sci. 100L[3]	Research/Elective	Physics 3C, 3LC
Physics 3A	Physics 3B, 3LB	
Senior		
Bio. Sci. Elective	Bio. Sci. Lab	Bio. Sci. Lab
Bio. Sci. Elective	Bio. Sci. Elective	Research/Elective
Research/Elective	Breadth/Elective	Breadth/Elective

[1] Students have the option of taking Humanities 1A or lower-division writing courses.

[2] Chemistry 52A-B-C, 52LA-LB may be taken instead of 51A-B-C, 51LA-LB.

[3] Prerequisites are completion of or concurrent enrollment in Biological Sciences 97 and 194S, and satisfactory completion of the lower-division writing requirement; 100L must be completed prior to taking upper-division labs.

Undergraduate Major in Plant Biology

Recent developments in plant biology and biotechnology place plants in the center of biological research. A dramatic increase in the understanding of cellular and developmental processes in plants enables plant biologists to control and manipulate plants developmentally as well as genetically. The availability of unique regeneration and gene delivery systems puts plant genetic engineering to the forefront of biotechnology. Food derived from genetically engineered plants is a daily experience for the American public and a continuous topic of ethical, environmental, sociological, and political discussions.

The Plant Biology program builds on core knowledge in plant structure taught in courses required for all majors offered by the School of Biological Sciences. After completing their second year, students may be admitted to the Plant Biology major and take courses primarily focusing on cellular, developmental, and molecular aspects of plant biology in lecture and laboratory classes. Although not affiliated with agricultural sciences, a limited exposure to applied aspects, such as plant breeding and hands-on horticulture is offered through the program. The Plant Biology major is fully compatible with the major in Biological Sciences and with medical school admission requirements.

The Plant Biology major is intended to provide graduates with the knowledge and skills necessary to pursue graduate degrees in biological research, including Ph.D. and M.S. training. In addition, graduates should be excellent candidates for pharmacy schools. Furthermore, the unit requirement for the major gives enough flexibility for students to tailor the curriculum to effectively support careers in business and education. The impact of biotechnology on society and the resulting need for informed specialists make this area of study effective training for students interested in law, journalism, or public affairs.

REQUIREMENTS FOR THE B.S. DEGREE IN PLANT BIOLOGY

University Requirements: See pages 56–60 .

School Requirements: See page 131.

Major Requirements

A. *Required Major Courses:* Biological Sciences D103, D105, D129, and D134.

B. *Upper-Division Laboratories:* Biological Sciences D111L and two selected from Biological Sciences E112L, E115L, E166, M114L, M116L, M121L, M122L, M124L, N113L. Students may petition to substitute Excellence in Research (Biological Sciences 199) for one upper-division laboratory other than D111L; 199 research is strongly encouraged. The 199 laboratory must be approved by the Department, and Excellence in Research must be successfully completed. Final approval is given by the Department.

C. *Biology Electives:* one from Biological Sciences D104, E106, E109; and two from Biological Sciences 9E, 11B, D137, D146, D147, D151, E118, E137, E167, E172, E175, E185, E189, M116, M122, M128, M137, M144.

Application Process to Declare the Major: The major in Plant Biology is open to junior- and senior-level students only. Applications to declare the major can be made at any time, but typically in the spring of the sophomore year. Information can also be found at http://www.due.uci.edu/Change_of_ Major.html. Double majors within the School of Biological Sciences, including the Applied Ecology major, are not permitted.

Sample Program — Plant Biology

FALL	WINTER	SPRING
Freshman		
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. 2B
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Humanities 1A[1]	Humanities 1B	Humanities 1C
Bio. Sci. 2A		Bio. Sci. 194S
Sophomore		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
Chemistry 51A, 51LA[2]	Chemistry 51B, 51LB	Chemistry 51C
Math. 2A	Math. 2B	Math. 2D, 2J, or Bio. Sci. 7
Bio. Sci. 100L[3]		Bio. Sci. D105
Junior		
Bio. Sci. D103	Bio. Sci. Elective	U-D Lab or or Bio. Sci. 199
Physics 3A	Physics 3B, 3LB	Physics 3C, 3LC
Bio. Sci. D134	Bio. Sci. D111L	Bio. Sci. D129
Breadth	Breadth	Breadth
Senior		
U-D Lab	Bio. Sci. Elective	Bio. Sci. Elective
Breadth	Breadth	Breadth
Research	Research	Research

1 Students have the option of taking Humanities 1A or lower-division writing courses.

2 Chemistry 52A-B-C, 52LA-LB may be taken instead of 51A-B-C, 51LA-LB.

3 Prerequisites are completion of or concurrent enrollment in Biological Sciences 97 and 194S, and satisfactory completion of the lower-division writing requirement; 100L must be completed prior to taking upper-division labs.

Special Programs and Courses

Biological Sciences 199

The Biological Sciences 199 Undergraduate Research Training Program provides students the opportunity to pursue independent research. Students conduct experimental laboratory, field, or clinical research as an apprentice scientist under the supervision of a professor in the School of Biological Sciences or the School of Medicine. Biological Sciences 199 research students experience the challenge and excitement of the world of science. Students develop new scientific skills and knowledge while training with professors who are on the cutting edge of research and discovery in the biological and medical sciences. The research training may commence as early as the sophomore year or, in the case of exceptional students, in the freshman year.

To participate in this unique research training program, students must be in good academic standing, and completion of the Biological Sciences 194S Safety and Ethics course is mandatory prior to enrollment. Students are encouraged to investigate the possibilities for research early to assure that all requirements and deadlines are met. It is recommended that students contact a faculty sponsor at least one quarter in advance for Biological Sciences 199 enrollment. Once a faculty sponsor is acquired, the student must submit a research abstract and the signed Waiver and Release of Liability and Acknowledgment of the Assumption of Risk form to the Biological Sciences Student Affairs Office, 231 Steinhaus Hall. At the end of each quarter a Summary Report is required. The abstract and summary forms are available online only. The Waiver is available online or in hard copy at the Student Affairs Office.

Students cannot participate in research involving human blood, body fluids, or tissue, unless special approval is granted. The faculty sponsor must submit a request for exception to the Biological Sciences Student Affairs Office.

Students conducting research directly with patients or other human subjects must comply with special enrollment procedures and the additional safety training required at the clinical site. Visit the Student Affairs Office or the Web site for complete instructions.

The Biological Sciences 199 Undergraduate Research Training Program standards, faculty abstracts, enrollment policies, and announcements are available on the World Wide Web at: http://www.bio.uci.edu/. (Click on "Student Affairs.") The first week of each quarter the Biological Sciences 199 Research Program Opportunities and Enrollment Procedures Workshop is conducted. Check the Web site for workshop dates or visit the Biological Sciences Student Affairs Office, 231 Steinhaus Hall, for information.

The Biological Sciences 199 Undergraduate Research Training Program can provide experience that is beneficial for the future pursuit of graduate school. Information regarding research careers in the biological sciences is best obtained from a faculty research mentor.

Students should be aware that for any one quarter, a maximum of five units of independent study courses, taken in any school or program, is permitted.

Minority Sciences Programs in Biological Sciences

The Minority Sciences Programs (MSP) in Biological Sciences is a UCI umbrella program that provides infrastructure and orchestration for the operation of minority research training grants supported by the National Institutes of Health (NIH) and other agencies. MSP seeks to increase the number of U.S. underrepresented groups in biomedical research careers. MSP participants benefit from early exposure, continuous research training, and faculty mentoring. Support is also provided through paid summer and year-round research internships, access to the latest computer technology, tutoring, academic advising, scientific writing, and participation at national conferences. Furthermore, MSP has established a campuswide, regional, national, and international network of committed faculty and resource programs to facilitate the transition from high school through community college, baccalaureate, and master's degrees to Ph.D. careers in biomedical research and related fields. Additional information is available from the MSP office, 267 Steinhaus Hall; telephone (949) 824-6463; World Wide Web: http://port.bio.uci.edu.

Biological Sciences Tutoring Program

The Tutoring Program provides free tutoring for most Biological Sciences courses and is available to all students in any major. Weekly small group tutoring sessions, reviews for midterms and finals, and a growing online database of worksheets and review materials are provided. In the Tutoring Program, UCI students tutor other UCI students. For the student tutor, this program provides opportunities to develop their teaching abilities, to meet and interact with faculty, and to perform a worthwhile and necessary service. Tutors also receive academic credit. For more information, contact the Biological Sciences Student Affairs Office in 231 Steinhaus Hall.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. Specifically, Biology majors should consider the EAP programs in the United Kingdom, Canada, Sweden, Australia, Denmark, and Costa Rica. See the Center for International Education section for additional information.

Students may wish to participate in the Education Abroad Program's Tropical Biology Quarter which is for undergraduates with at least one year of introductory biology, one quarter of upper-division biology, and a serious interest in biological studies. The program includes lectures, field laboratories, and independent research, with an emphasis on direct field experience. Students also take a course in Spanish language and Latin American culture.

Master of Science with a Concentration in Biotechnology

The School of Biological Sciences offers a master's program with a concentration in Biotechnology designed to train students to enter the field of biotechnology as skilled laboratory practitioners. The upper-division course requirements for admission into the program are extensive. Students interested in applying for admission to the Biotechnology program should plan to complete the necessary courses during their junior and senior years. See the Graduate Study in Biological Sciences section for more information.

3-2 Program with The Paul Merage School of Business

Outstanding Biological Sciences majors who are interested in a career in management may wish to apply for entry into The Paul Merage School of Business' 3-2 Program. Students normally apply for this program early in their junior year. See The Paul Merage School of Business section for further information.

Special Research Resources

Special research resources include the Beckman Laser Institute and Medical Clinic, a research, training, and service facility in the area of laser microbeam technology; the School of Biological Sciences Biohazard (P-3) Facility, which provides laboratory facilities for working with biological agents or biological molecules such as recombinant DNA which would be hazardous when used in open laboratories; the Developmental Biology Center, devoted to analyzing the cellular and genetic mechanisms underlying growth, development, and regeneration; the Center for the Neurobiology of Learning and Memory, a research center for studies of the brain mechanisms underlying learning and memory; the Institute for Brain Aging and Dementia; the Center for Virus Research, which includes the Viral Vector Design research group; the Conservation Biology Project; the Cancer Research Institute; the Center for Immunology; the Macromolecular Structure Research Unit; the UCI Arboretum, a botanical garden facility; the San Joaquin Marsh Reserve, which supports controlled marsh biota; the Burns Piñon Ridge Reserve, a high-desert habitat in San Bernardino County; and the UCI Ecological Preserve, which includes coastal hills on the campus, once under heavy grazing, but now returning to a more natural state. It is important to note that the School of Biological Sciences collaborates with the School of Medicine, thereby providing an opportunity for the sharing of both teaching and research activities. These collaborative efforts include the Institute for Genomics and Bioinformatics; the Reeve-Irvine Research Center; and the Bio-Imaging Interest Group.

Advising: Academic, Career, Health Sciences

231 Steinhaus Hall
World Wide Web: http://www.bio.uci.edu/students/

Academic Advising

The Biological Sciences Student Affairs Office coordinates the advising program and provides academic counseling as well as special services particularly in the area of preprofessional career counseling. Undergraduate Biological Sciences students should consult the Biological Sciences Student Affairs Office for information on academic requirements for the degree, career opportunities, the Biological Sciences 199 Research Program, available tutoring for Biological Sciences courses, Biological Sciences student organizations, and scholarship information. Students can also come to the Biological Sciences Student Affairs Office to change their major, apply for graduation, or for any other help they might need related to their academic career at UCI.

All freshmen will enroll in small-group freshman seminars (Biological Sciences 2A) and all other new students will enroll in special sections of Biological Sciences 190.

Peer Academic Advisors. The Peer Academic Advisors are upper-division Biological Sciences majors who bring with them valuable academic and social experiences. Their functions include counseling students in matters of major selection, program planning, petitioning, tutoring, learning skills problems, and participation in cocurricular and extracurricular activities.

The Peer Advisors are located in the Biological Sciences Student Affairs Office. Office hours are posted at the beginning of each quarter.

Career Advising

Information on graduate and professional schools in the health sciences can be obtained from the Biological Sciences Student Affairs Office. The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information. The Student Affairs Office has developed a complete career library and a close relationship with the Center in an effort to provide current, relevant career information for students.

Areas of opportunity open to those with a Bachelor of Science degree include laboratory technology, publishing, technical editing, pharmaceutical sales, and training programs in county, state, and federal agencies. The bachelor's degree is necessary to pursue studies leading to the M.S. and Ph.D. degrees.

The B.S. degree, plus short training periods, may prepare students for employment in education, medical technology (usually one year), physical therapy, and various other areas.

Education (community colleges, state colleges, or private schools), medical illustration, and public health (which includes hospital administration, biostatistics, epidemiology, environmental health sciences, social work, public health education, maternal and child health, and infectious and tropical diseases) are fields in which opportunities are available upon completion of a master's program.

The Ph.D. degree may lead to research in many areas, among them biochemistry, biometeorology, botany, cytology, ecology, fishery biology, genetics, home economics, microbiology, molecular biology, pathology, physiology, psychobiology, public health, range management, soil conservation, and zoology.

Other areas where advanced degrees are necessary include medicine, dentistry, law, optometry, podiatry, osteopathy, and veterinary medicine.

Health Sciences Advising

Advising for careers in the health sciences is a specialty of the Biological Sciences Student Affairs Office. Students desiring to enter the health sciences should have their programs checked in the Office and should plan to enroll in Biological Sciences 3A. Admissions tests for medical, dental, pharmacy, and graduate schools should be taken in the spring, a year and one-half before the student plans to enter.

Leaders in nearly all health professional schools recommend that students preparing to seek admission to their schools plan to obtain a bachelor's degree. Students who plan to enter a school of dentistry, medicine, or other areas of the health sciences may receive the required preprofessional training at UCI. This preprofessional training may be accomplished by (1) completing the major in Biological Sciences or (2) majoring in any school or department *and* fulfilling concurrently the specific course requirements of the dental, medical, or other professional school the student expects to attend.

Students interested in the health sciences should choose electives in the social sciences, possibly a foreign language, physical chemistry, or other specific courses required or recommended by graduate schools.

The Biological Sciences Student Affairs Office offers specialized services, for a fee, to all students applying to postgraduate professional schools in the health sciences, including a personal file containing the student's letters of recommendation, and a service of sending all recommendations for a student to professional and graduate schools.

Student Participation

AED. Alpha Epsilon Delta Pre-Medical Honor Society is a national honor society open to all students interested in careers in the health professions. AED's goal is to provide the most accurate and up-to-date information, from the application process to practicing in the health field. Guest speakers include medical school students, doctors, practitioners, and admissions counselors.

AMSA. The American Medical Student Association is the oldest, largest, national organization comprised of premedical, medical students, and physicians committed to improving the quality of health care within the local community. AMSA invites students of all ethnicities and majors who have similar interests in medicine to work together in creating a supportive, non-competitive environment. AMSA provides members with knowledge of the medical field, opportunities in community service, hands-on training, leadership positions, and other valuable resources within the local AMSA group and on a national level.

ASDA. The American Student Dental Association is the nation's largest student-run organization for dental students. It is the only association devoted to the concerns of dental students and the student viewpoint on professional issues. ASDA members are a part of a national organization and receive newsletters, journals, and handbooks. The Irvine chapter is open to all students interested in dental careers.

CCM. Chicanos for Creative Medicine has been established to promote interaction among Biological Sciences and prehealth professional Chicano-Latino students at UCI. The aims of CCM are (1) to help members attain their career goals, (2) to provide resource information pertinent to the success of Chicano-Latino students at UCI, and (3) to create and maintain a sense of awareness and attitude of being a Chicano-Latino student at UCI. Activities include guest lecturers speaking on their careers and quarterly fund-raising activities. The group works closely with the Chicano Medical Student Association of the School of Medicine and with the La Raza Medical Association, a Statewide organization.

Flying Sams. The Flying Sams of UCI is comprised of student volunteers involved in providing dental and medical care at the El Testerazo Clinic in Baja California. One weekend per month, members staff the clinic in Mexico and assist health professionals. Activities include taking vitals, organizing the extensive pharmacy, and translating. At UCI, activities range from fundraising to collecting clothes, food, and toys for the community of El Testerazo. The Flying Sams is dedicated to serving the community of El Testerazo with compassion and a commitment to excellence.

KHA. The Korean Health Association (KHA) was organized for pre-health students to enhance their awareness of the diversity of health education opportunities in the fields of medicine, dentistry, pharmacy, optometry, and more. Although KHA concentrates on participants' academic concerns, it also provides opportunities for them to develop and strengthen friendships. The goals of KHA are (1) to assist students in achieving successful academic endeavors in undergraduate studies, (2) to offer assistance and consultation to students regarding their future health-related career goals, (3) to enable students to meet one another, and (4) to encourage peer counseling and tutoring among students.

Med Times. Through the art of journalism, this medical newspaper is dedicated to educating UCI students interested in entering the health field. Roles of prospective members include editors, layout and designers, writers, researchers, photographers, public relations, and much more. Members have the opportunity to interview UCI Medical School faculty and physicians, optometrists, pharmacists, and other leaders of the health field in order to write and publish articles for this medical newspaper with a distribution of 15,000. *Med Times* strives to help UCI Biological Sciences students become the well-rounded physicians, pharmacists, dentists, researchers, and optometrists of tomorrow. Workshops on entrance examinations, interviewing skills, personal statements, and undergraduate survival skills are given. An annual retreat in Big Bear, California, promotes fun and unity within the *Med Times* family. For more information, send an e-mail message to Medtimes@yahoo.com.

PUSO. The Pilipino Pre-health Undergraduate Student Organization (PUSO) was formed to target Pilipino students in the pre-health majors. With an awareness of the need for Pilipino-American health care professionals, PUSO provides service, guidance, and support to members preparing for graduate work in health-related fields. PUSO also seeks to increase the number of culturally sensitive health care professionals in the Pilipino community as well as the community-at-large and produce role models for Pilipino-American youth.

SPVS. The Society of Pre-Veterinary Students (SPVS) is an organization dedicated to helping pre-veterinary students gather information about undergraduate requirements, applying to veterinary schools, and careers in the veterinary field. SPVS presents students with volunteer and job opportunities and holds workshops for applications and personal statements. Activities include discussion sessions with guest speakers from different veterinary specialties, with veterinary school representatives, and with current students, as well as field trips to local animal parks and veterinary offices for " behind-the-scenes" tours. For more information, send e-mail to SPVS@uci.edu.

Sports Medicine Club. This club provides an introduction into sports medicine and athletic training through opportunities for students to work with intercollegiate athletics and engage in research.

U See Eyes. U See Eyes Pre-Optometry Club strives to provide support services for students who are either interested in optometry or merely curious about the profession. The club organizes events such as application and interview workshops, speakers from various optometry schools, mock interviews, and optometry-related volunteer services.

Undergraduate Courses in Biological Sciences

1A-B Life Sciences (4-4) F, W, S. Lecture, three hours. A two-quarter integrated sequence designed to introduce nonmajors to the basic concepts of modern biology. **1A:** Discussion of evolutionary biology, ecology, molecular biology, and genetics. **1B:** Cell and behavioral biology including plant structure and function, photosynthesis, and animal physiology. Prerequisite for 1B: Biological Sciences 1A. Open to nonmajors only. **(II)**

2A Freshman Seminars (1). Lecture, one hour; seminar, one hour. Weekly meetings consisting of presentations by faculty, professional staff, and New Student Peer Academic Advisors provide information about the School of Biological Sciences, campus resources, and special programs/opportunities. Pass/Not Pass only. Open to freshman Biological Sciences majors only.

2B Freshman Seminar (1). Seminar, one hour. Faculty presentations and readings focused on the structure, function, opportunities, and current issues in the biological sciences. Pass/Not Pass only. Open to freshmen only.

3A Career Decision Making (0). Lecture, one hour. An introductory course designed to facilitate the career decision-making process. Decision-making processes, values, and standardized tests of aptitudes, interests, and values are utilized with non-test data in appraising biological sciences career options. Pass/Not Pass only. One unit of workload credit only.

3B Non-Health Sciences Career Exploration (0). Lecture, one hour. A survey course designed to assist students in exploring non-health science career options. Lectures by professionals in various fields. Students are required to investigate one area of particular interest and do a career observation. Pass/Not Pass only. One unit of workload credit only. Open to sophomore, junior, or senior Biological Sciences majors only.

4 Introduction to Biomedical Research and Careers (0). A seminar series for students interested in careers in the biological sciences and medicine. Presents a broad view of research areas, experimental approaches, clinical and industrial applications, issues of national health policies and economics, career paths in the biomedical sciences. May be repeated for credit as topics vary. One unit of workload credit only.

5 Introduction to Molecular Biology (4). Lecture, three hours. Molecules of life, with emphasis on medical applications. Open to nonmajors only. No credit given for Biological Sciences 5 if taken after Biological Sciences 99. **(II)**

6 Tropical Biology: Race to Save the Tropics (4). Lecture, three hours. Population growth combines with tropical resource consumption by industrialized nations to cause high rates of deforestation, pollution, habitat fragmentation, and extinction of species. Discusses tropical biomes, their population, community, and ecosystem processes, and possible means of conservation of biodiversity. **(II)**

7 Biostatistics (4) S. Lecture, three hours; discussion, one hour. Motivated by specific biological and medical issues, this course teaches introductory statistical techniques to investigate real-world experimental data from the health sciences, molecular, cellular, environmental, and evolutionary biology. Biological Sciences 7 and Mathematics 7/Statistics 7 may not both be taken for credit. No credit for Biological Sciences 7 if taken after Mathematics 67/Statistics 67. **(V)**

8A Human Genetics (4) S. Lecture, three hours; discussion, one hour. This survey course in human genetics includes an introduction to basic genetic concepts including family studies, chromosomes, molecular genetics of human disease, and an analysis of the Human Genome Project. Special emphasis is given to ethical and social issues. **(II)**

9A Nutrition Science (4) F, W, S. Lecture, three hours. An introduction to nutrition science, integrating concepts from biology, biochemistry, microbiology, physiology, and psychology to explain the interaction between nutrients and the human body. Biological basis of nutrient standards is analyzed. Effects of nutrition, behavior, exercises on health/disease. **(II)**

9B Biology and Chemistry of Food and Cooking (4) W. Lecture, three hours. The kitchen is used as a laboratory to introduce fundamental principles of biology, chemistry, and physics. A molecular/cellular analysis of cooking, including concepts such as protein structure, browning reactions, colloids, emulsions, carbohydrate metabolism, and development of flavor/texture through biochemical transformations. **(II)**

9C Biotech Basics (4). Lecture, three hours. An overview of current biotechnology. Discusses the biological/molecular basis of novel therapies for diseases, modification of human genes, human genome project, cloning, DNA fingerprinting, and genetically modified food. Targeted for students interested in modern breakthroughs in biology. **(II)**

9D Diseases of the Twenty-First Century (4) F, S. Why do we get sick? An introduction to the biological basis of human disease, including diseases of the cardiovascular, respiratory, nervous, and reproductive systems. Case studies present diagnosis, treatment, and prevention protocols. Inheritable and infectious diseases also discussed. **(II)**

9E Horticulture Science (4). Lecture, two hours; laboratory two hours; field work, one weekend day per quarter. Scientific principles of horticulture at the UCI Arboretum. Taxonomy, plant life history strategies; experiments with seed dormancy; morphological adaptations for specialized sexual and clonal reproduction; basics of plant propagation and ecological restoration. Laboratory fee. **(II)**

9F Current Issues in Biology: A Problem-Based Learning Approach (4). Students explore in-depth several complex biological and interdisciplinary issues using problem-based learning. The main techniques for learning course material are group discussion, research, projects, and presentations. Attendance and group participation are mandatory. Prerequisites: Biological Sciences 1A-B or Biological Sciences 94 and 96. **(II)**

9G Way Your Body Works (4). An introduction to the basic mechanisms that control the organ systems of the human body, including the nervous, cardiovascular, immune, and reproductive systems. Emphasis is on how the body works normally, but includes how these processes fail in disease. **(II)**

9J Biology of Oriental Medicine (4). With lectures, demonstrations, and hands-on learning, the theory and practice of herbal medicine, acupuncture, qigong, and manipulative therapies are explained in Western biomedical terms. The latest basic and clinical research advances in each area are also described. Biological Sciences 9J and 9H may not both be taken for credit. **(II)**

9K Global-Change Biology (4) W. Lecture, three hours; discussion, one hour. Addresses ways in which humans are altering the global environment, with consequences for the ecology of animals, plants, and microbes. Discussion on how these biologically oriented questions relate to human society, politics, and the economy. Same as Earth System Science 13. **(II)**

9M The Biosphere (4) W. An introduction to the role of biological processes in the Earth system. Topics span the functioning of cells, organisms, ecosystems, and the global biosphere, including an introduction to evolution, terrestrial and marine organismal biology, and principles of ecology and biogeochemistry. Same as Earth System Science 9. **(II)**

10 The Biology of Human Diseases (4). Lecture, three hours. Introduction to concepts of diagnosis, treatment, and prevention of major human infectious diseases. Covers some aspects of epidemiology. Scope and impact of infectious diseases in the present and past experiences in controlling infectious disease. Reviews the biology of human organ systems. Open to nonmajors only. **(II)**

11 Topics in Biological Sciences (4) F, W, S. Studies in selected areas of biological sciences. May be taken for credit three times as topics vary. **(II)**

12A Human Reproduction and Development (4) S. Lecture, three hours. Provides detailed insight into human reproduction and development. Reproductive topics include anatomy/physiology of the adult reproductive systems, infertility, and STDs. Development topics include gamete formation, fertilization, fetal development, and birth. Human genetic diseases and developmental disorders also discussed. **(II)**

12B Disease and Civilization (4) S. Lecture, three hours. To demonstrate the role played by infectious diseases on the development of human civilization. The psychological impact of major epidemic diseases upon society and culture. Starting with early hunting and gathering cultures through the effect of AIDS in the modern world. **(II)**

12C Neurobiology of Behavior (4). Lecture, three hours. Examines how animals ranging from insects to mammals have evolved neural solutions to specific problems posed by their environments. Principles derived from research findings draw on the fields of animal behavior, cellular physiology, anatomy, genetics, and molecular biology. **(II)**

12D Molecular Basis of Human Disease (4). Lecture, three hours; discussion, one hour. Introduction to the concepts of the cellular and molecular basis, treatment, and diagnosis of human disease. Diseases resulting from infectious agents such as virus, bacteria, protozoan and metazoan animals, and diseases resulting from genetic disorders discussed in context of molecular mechanisms. **(II)**

15 Botany (4) F. Lecture, three hours. Structure and function of flowering plants related to their roles in ecology and human needs. **(II)**

20 California Natural History (4) F. Lecture, three hours. Introduction to ecological relationships within a variety of California habitats. Explores aspects of the physical environments and the adaptations of organisms to their physical and biological surroundings in habitats such as the coastal zone, mountains, and deserts. **(II)**

25 Biology of Cancer (4) W. Lecture, four hours. Biological, clinical, and psychosocial nature of cancer through the perspectives of medical researchers, biologists, physicians, and health educators. For students of all majors, designed so that each can increase personal awareness of the biology of cancer.

30 Biomedical Ethics (4) S. Lecture, three hours. Ethical issues inherent in twenty-first-century biological and medical advances. An introduction to the basic biology underlying these issues and an analysis of the ethical implications to society. Topics such as cloning, stem cell research, genetic engineering are discussed by guest speakers.

35 The Brain and Behavior (4). Lecture, three hours. Introduction to how the brain works. Biological processes underlying perception, movement, sleep-wake cycles, motivation, language, learning, and memory. Changes in the brain associated with sex differences, drug use, aging, seasons, and time of day. Fundamental properties of the nervous system. Open to nonmajors only. **(II)**

36 Drugs and the Brain (4). Lecture, three hours. Introduction to the actions of drugs on the brain. How studying drug action helps to reveal normal functions of neurons. How drugs can correct neural disorders or disrupt neural function. Biological issues related to drug abuse, drug addiction, and drug seeking. Open to nonmajors only. **(II)**

37 Brain Dysfunction and Repair (4). Lecture, three hours. Introduction to the disruptions in brain function that underlie disorders such as Alzheimer's disease, Parkinsonism, schizophrenia, and depression, and the basis for drug therapies. The brain's ability to repair itself after damage and the pros and cons of that repair. Open to nonmajors only. **(II)**

38 Mind, Memory, Amnesia, and the Brain (4) S. Lecture, three hours. Introduction to neural mechanisms underlying learning and memory. Emphasis on molecular changes that mediate memory as well as structures involved in different forms of memory. Additionally, the biology of memory phenomena, from extraordinary memory to false memory to amnesia is examined. Open to nonmajors only. **(II)**

45 AIDS Fundamentals (4) F, W. Lecture, three hours. Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond. Same as Environmental Analysis and Design E45U. **(II)**

46 Discussion and Literature Research in AIDS (2 to 4) F, W. Discussion, two hours; research, two hours. Students carry out two activities: (1) leading discussions about HIV/AIDS (predominantly regarding sociological and personal reactions) among students taking the AIDS Fundamentals course and (2) literature research about biomedical aspects of AIDS. Prerequisite: Biological Sciences 45 or Psychology and Social Behavior P45 or Environmental Analysis and Design E45U; consent of instructor.

50 The Biology of Heart Disease (4) S. Lecture, four hours. Guest lecturers from the field of cardiovascular medicine discuss current concepts regarding cause, diagnosis, and treatment of heart disease. Topics include surgery, rehabilitation, and congenital defects, with emphasis on prevention.

55 Introduction to Ecology (4). Lecture, three hours. Principles of ecology; application to populations, communities, ecosystems, and humans. Open to nonmajors only. No credit given for Biological Sciences 55 if taken after Biological Sciences 96 or E106. **(II)**

65 Biodiversity and Conservation (4) W. Lecture, three hours. A biological perspective on the current environmental crisis. The origin, evolution, and value of biological diversity. Extinction and depletion caused by overexploitation, habitat loss, and pollution. Conservation through habitat preservation and restoration, captive breeding, cryopreservation. **(II)**

75 Human Development: Conception to Birth (4) W, S. Lecture, three hours. Processes leading to the birth of a healthy child and the avoidance of birth defects. Male and female reproductive systems, hormonal control of egg-sperm formations, sexual intercourse, contraception, venereal diseases, fertilization, cell division, embryonic development, fetal physiology. Open to nonmajors only. **(II)**

H90 The Idiom and Practice of Science (4). The importance of biological sciences in our world are discussed. Topics may include brain and behavior, health and disease, genetics and society, and conservation biology. A primary goal is to encourage students to understand better the world in which they live. Prerequisite: restricted to members of the Campuswide Honors Program. **(II)**

92 Special Group Activities F, W, S.

Sec. 1A Health Sciences Experience, Medicine, and Allied Health (0). Opportunities to observe or participate in various health fields. Specific number of hours per quarter of volunteer work with approved health professionals. Passing contingent on completion of minimum specified hours with satisfactory evaluation. Fields include veterinary and human medicine, and allied health. Pass/Not Pass only. Prerequisites: consent of instructor and minimum third-quarter freshman standing. May be repeated.

Sec. 1B Health Sciences Experience, Dentistry (0). Description same as Sec. 1A. Pass/Not Pass only. Prerequisites: consent of instructor and minimum third-quarter freshman standing. May be repeated.

Sec. 1C Health Sciences Experience, Optometry (0). Description same as Sec. 1A. Pass/Not Pass only. Prerequisites: consent of instructor and minimum third-quarter freshman standing. May be repeated.

Sec. 3 Reading, Writing, and Reasoning for Health Science (4) F, W, S. Designed to strengthen biology students' reading, writing, and critical thinking skills to ensure their success at the University and to prepare them for graduate study in medicine, dentistry, optometry, or public health. Pass/Not Pass only. Open to Biological Sciences majors only.

Sec. 5 Curriculum (2). Initiation, planning, and coordination of student-run courses. Prerequisite: consent of instructor. May be repeated for a total of eight units. Pass/Not Pass only.

190 Transfer Student Seminars (1). Lecture, one hour; seminar, one hour. Weekly meetings consisting of presentations by faculty, professional staff, and New Student Peer Academic Advisors provide information about the School of Biological Sciences, campus resources, and special programs/opportunities. Pass/Not Pass only. Open to new transfer students only.

CORE CURRICULUM

Prerequisites listed for Core courses are rigorously enforced. (Transfer students who have successfully completed one or more years of college biology should consult with the Biological Sciences Student Affairs Office for possible exemption from portions of the Core.)

93 From DNA to Organisms (4) F. Lecture, three hours; discussion, one hour. Cell biology, biochemistry, genetics, and the biology of organ systems. Covers concepts of building blocks (nucleotides, amino acids, and cells) and of information flow (DNA to proteins, receptors to nuclei, the blood to distant organs, and DNA to offspring). No credit given for Biological Sciences 93 if taken after Biological Sciences 97 and/or 98. **(II)**

94 From Organisms to Ecosystems (4) W. Lecture, three hours; discussion, one hour. Patterns of diversity, ecology, and evolutionary biology. Emphasis is on the Tree of Life and how its members are distributed and interact. Prerequisite: Biological Sciences 93. No credit given for Biological Sciences 1A if taken after Biological Sciences 94. **(II)**

97 Genetics (4) F. Lecture, three hours; discussion, one hour. Introduction to genetics. Basic features of the replication and expression of DNA; cell division; and gene transmission. Recombination and mutation in diploid organisms. Prerequisite: Biological Sciences 94.

98 Biochemistry (4) W. Lecture, three hours. Structure and properties of proteins; major biochemical pathways and mechanisms for their control. Prerequisites: completion of Biological Sciences 97 and completion of or concurrent enrollment in Chemistry 51B or 52B.

99 Molecular Biology (4) S. Lecture, three hours. Biochemistry and replication of nucleic acids; molecular genetics; protein biosynthesis; genetic code; regulation of expression of genetic information; biochemical evolution. Prerequisite: Biological Sciences 98.

100L Experimental Biology Laboratory (4) F, S. Lecture, one hour; laboratory, three hours. Basic experimental design, laboratory techniques, data gathering skills, and analysis and preservation of data for a variety of areas of inquiry in the biological sciences. Prerequisites: current enrollment in or completion of Biological Sciences 97 and 194S; satisfactory completion of the lower-division writing requirement.

D103 Cell Biology (4) F, W. Analysis of the basic structure and function of animal cells, with an emphasis on the regulation of cellular processes. The basic features of membranes, cellular compartmentalization, protein trafficking, vesicular transport, cytoskeleton, adhesion, signal transduction, and cell cycle are covered. Prerequisite: Biological Sciences 99. Biological Sciences D103 and 107 may not both be taken for credit. Formerly Biological Sciences 103.

D104 Developmental Biology (4) F, W. Cellular and molecular analysis of how a fertilized egg develops into an organism consisting of complex structures such as the eye, arms, and brain. Emphasis is on the key concepts of developmental processes underlying pattern formation, growth, and regeneration. Prerequisite: Biological Sciences 99. Biological Sciences D104 and 108 may not both be taken for credit. Formerly Biological Sciences 104.

D105 Cell, Developmental, and Molecular Biology of Plants (4) F. Emphasizes the special features of plant cells and plant development as compared to animals. Plants' ability to fuel our planet through photosynthesis and the interactions of plants with microorganisms in making nitrogen available to other life forms are two central topics. Prerequisite: Biological Sciences 99. Formerly Biological Sciences 105.

E106 Processes in Ecology and Evolution (4) S. An in-depth study of the mechanisms that drive evolution and ecology including: natural selection, mutation, genetic drift, speciation, extinction, life history patterns, population dynamics, ecosystem and community structure, predator-prey and host pathogen interactions, and social behavior. Prerequisite: Biological Sciences 93. May be used as a course repeat of Biological Sciences 96. Biological Sciences E106 and 96 may not both be taken for credit. Formerly Biological Sciences 106.

E109 Human Physiology (4) F, W. Lecture, three hours. Functional features of the major organ systems in the human body. Emphasis on homeostasis and the interactions of organ systems in health and disease. (Discussion of behavior and brain function deferred to Biological Sciences N110.) Prerequisite: Biological Sciences 99. Formerly Biological Sciences 109.

N110 Neurobiology and Behavior (4) S. Lecture, three hours. Consideration of the evolution of behavior, including ethological and psychological aspects and analysis of neuroanatomical, neurochemical, neurophysiological, and neuroendocrine systems underlying basic behavioral processes. Corequisite or prerequisite: Biological Sciences 99. Formerly Biological Sciences 110.

UPPER-DIVISION LABORATORIES

D111L Developmental and Cell Biology Laboratory (3) F, W, S. Laboratory, four hours. Students study the division of cells, isolate cellular organelles (chloroplasts, mitochondria, nuclei), and follow changes in cells undergoing programmed cell death. Development is demonstrated in experiments showing cooperation of individual cells in forming a multicellular organism. Prerequisites: Biological Sciences 100L and 194S; concurrent enrollment in or completion of Biological Sciences D103 or D104 or D105. Formerly Biological Sciences 111L.

E112L Physiology Laboratory (3) F, W, S. Laboratory, four hours. Prerequisites: Biological Sciences 100L, E109, and 194S. Formerly Biological Sciences 112L.

E115L Evolution Laboratory (4) S. Laboratory, seven hours. Students perform experiments which illustrate important concepts in evolutionary biology such as natural selection, random genetic drift, inbreeding, age-specific selection, sexual selection, and phylogenetic reconstruction. Prerequisites: Biological Sciences 100L, E106, and 194S. Formerly Biological Sciences 115L.

E166 Field Methods in Ecology (6) F. Laboratory, eight hours. Field studies of major concepts in plant and animal ecology, with emphasis on experimental design, field sampling methods, statistical analysis, and scientific writing. An independent project and two weekend camping trips are required. Satisfies the upper-division writing requirement with a grade of C or better. Prerequisites: Biological Sciences 100L, E106, and 194S, and satisfactory completion of the lower-division writing requirement. Formerly Biological Sciences 166.

M114L Biochemistry Laboratory (4) F, W, S. Laboratory, four hours. Properties of enzymes and the culture and isolation of mutants of microorganisms. Prerequisites: Biological Sciences 99, 100L, and 194S. Formerly Biological Sciences 114L.

M116L Molecular Biology Laboratory (4) F, W, S, Summer. Laboratory, four hours. Students perform experiments which illustrate the chemical and biological properties of nucleic acids. Emphasis is placed on recent techniques in recombinant DNA technology including gene isolation and characterization. Prerequisites: Biological Sciences 99, 100L, and 194S. Formerly Biological Sciences 116L.

M121L Advanced Immunology Laboratory (4) S. Laboratory, four hours. Emphasis is placed on learning modern techniques in immunology such as ELISAs, western blotting, immunofluorescent staining assays. Prerequisites: Biological Sciences M116L and M121; consent of instructor. Concurrent with Molecular Biology and Biochemistry 221L. Formerly Biological Sciences 121L.

M122L General Microbiology Laboratory (6) F, W, S, Summer. Laboratory, six hours. Selective isolation of wide variety of microbial types. Characterization and identification by morphological and comparative nutritional and biochemical approaches. Industrial, medical, and biological research applications. Prerequisites: Biological Sciences 100L and 194S; concurrent enrollment in or completion of Biological Sciences M122. Formerly Biological Sciences 122L.

M124L Virus Engineering Laboratory (4) S. Laboratory, four hours. Students learn to engineer recombinant eukaryotic viruses and express genes in mouse tissue. Prerequisites: Biological Sciences M116L and M124; consent of instructor. Concurrent with Molecular Biology and Biochemistry 224. Formerly Biological Sciences 124L.

N113L Neurobiology Laboratory (3) W, S. Laboratory, four hours. Prerequisites: Biological Sciences 100L and 194S; concurrent enrollment in or completion of Biological Sciences N110. Formerly Biological Sciences 113L.

UPPER-DIVISION ELECTIVES

DEVELOPMENTAL AND CELL BIOLOGY

D115 Molecular Motors and the Cytoskeleton (4) F, W, S. Lecture, three hours; discussion, one hour. Cells use nano-machines (molecular motors) to organize themselves and transport cargo. This interdisciplinary course studies these motors and the rails they move along. Examines their biological function and how they function at the single-molecule level as machines. Prerequisite: Biological Sciences D103 or consent of instructor. Concurrent with Developmental and Cell Biology 205. Formerly Biological Sciences 115.

D126 Systems Biology of Human Disorders (4) F, W, S. Lecture, three hours; discussion, one hour. Introduces human pathophysiology using a systems biology perspective. Focuses on the proper regulation of human systems, and the dire consequences of loss of regulation. The goal is to impart an "engineering" mind-set to understand human disorders. Prerequisites: Biological Sciences 99 or Engineering BME50A-B and Mathematics 2A-B. Formerly Biological Sciences 126A.

D129 Biotechnology and Plant Breeding (4) F. Lecture, three hours. Synopsis of conventional plant breeding techniques, their limitations, and supplementations through modern biotechnology. These new biotechnological methods include steps such as cloning, cell transformation (genetic engineering), and cell fusion. Focuses on crop improvement, the state of the art in animal and human systems, and the impact of gene technology on society. Prerequisite: Biological Sciences 94 or consent of instructor. Formerly Biological Sciences 129.

D129L Plant Cell Culture Laboratory (4) W of odd years. Laboratory, 60 hours per quarter, run on two, full three-day weekend sessions which normally will not conflict with other classes. Isolation and culture of plant cells and tissues, i.e., protoplasts, pollen, meristem. Genetics and structural manipulation of cultured cells, i.e., fusion, laser microsurgery, mutation. Regeneration of plants from cultured cells and tissues. Greenhouse experience (propagation, fertilization, grafting). Prerequisite: Biological Sciences D129 or consent of instructor. Formerly Biological Sciences 129L.

D130 Photomedicine (4) F, W, S. Lecture, three hours; discussion, one hour. Studies the use of optical and engineering-based systems (laser-based) for diagnosis, treating diseases, manipulation of cells and cell function. Physical, optical, and electro-optical principles are explored regarding molecular, cellular, organ, and organism applications. Prerequisites: Physics 3A-B-C or 7A-B-D, or Engineering EECS10, or consent of instructor. Same as Engineering BME135. Formerly Biological Sciences 130.

D134 Plant Physiology (4) S. Lecture, three hours. Plant hormones, growth and development, metabolism, mineral nutrition, and photosynthesis. Prerequisite: Biological Sciences 15 or consent of instructor. Formerly Biological Sciences 134.

D136 Human Anatomy (4) F, W, S. Presents a systems approach to the analysis of human structure. Molecular, cellular, tissue, organ, and organ system levels of structure and organization are integrated throughout. Prerequisite: Biological Sciences 99. Formerly Biological Sciences 136A.

D137 Eukaryotic and Human Genetics (4) F. Lecture, four hours. Structure and function of genes in eukaryotes with emphasis on special problems of genetic studies in humans. Molecular methods of genetic analysis and gene transfer are discussed. Practical applications and ethical and social issues raised by genetic studies are addressed. Prerequisites: Biological Sciences 97; Biological Sciences 99 recommended. Formerly Biological Sciences 137B.

D143 Human Parasitology (4) S. Lecture, three hours. Introduction to human-animal diseases including protozoan, worm, and insect infections. Focus is on diagnosis, epidemiology, immunology, pathology, and treatment of parasitic infection. Prerequisite: Biological Sciences 98 or consent of instructor. Formerly Biological Sciences 143.

D145 Genomics and Proteomics (4) W. Lecture, three hours. Focuses on the applications of genomics and proteomics to problems in genetics, cell, and developmental biology. Students gain a comprehensive understanding of the techniques currently used for genomics analysis and how best to apply these tools to solve research problems. Prerequisites: Biological Sciences 97, 98, 99. Formerly Biological Sciences 145B.

D146 Eukaryotic Genes (4) W. Lecture, three hours. Molecular organization of eukaryotic genes and the molecular mechanisms which regulate their expression. Topics include developmentally regulated genes, tissue-specific gene expression, multigene families, oncogenes, gene transposition, and recombinant gene cloning. Prerequisite: Biological Sciences 99. Formerly Biological Sciences 145A.

D147 Plant Molecular Biology (4) W. Lecture, three hours. Presents the molecular mechanisms of plant growth and development. Topics considered include: the identification of genes regulating cell division, growth, and morphogenesis; control of gene expression by external and internal factors; plant transformation mechanisms. Prerequisite: Biological Sciences D105. Formerly Biological Sciences 147.

D148 Development and Disease (4) F, W, S. Lecture, three hours. Development of animal embryos from a fertilized egg to a functioning organism. Topics include body-axis formation, growth and differentiation of embryonic cells, and organogenesis, with an emphasis on congenital birth defects and diseases that disrupt these processes. Prerequisite: Biological Sciences D104. Formerly Biological Sciences 148.

D149 Development, Injury, and Repair of the Nervous System (4) F, W. Lecture, three hours. The formation of the nervous system including neurogenesis, trophic factors, cell death, and formation of nerve connections. Damage to the brain and spinal cord from injury and disease and experimental strategies for repair. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 149.

D151 Advanced Cell Biology (4) F. Lecture, four hours. Plasma membrane and cytoskeletal-mediated events. Topics include: endocytosis, receptor-ligand interactions, the biochemical basis of growth control, cell structure and motility, and cell-cell, cell matrix interactions. The biochemistry and molecular aspects of these topics are emphasized. Prerequisite: Biological Sciences D103. Formerly Biological Sciences 144B.

D153 Molecular and Cellular Basics of Disease (4) F, W, S. Lecture, three hours. Provides students with examples of how human disease is usually manifested at the cellular level. The roles of specific molecules and organelles are discussed where their roles in the disease process are understood. Prerequisite: Biological Sciences D103. Formerly Biological Sciences 144D.

D154 Developmental and Cell Biology (4) W. Lecture, three hours. An advanced, integrated view of cell biology. Topics include the cell cycle, the cytoskeleton, the extracellular matrix, signal transduction, the cellular basis of development, and the cell biology of cancer. Prerequisite: Biological Sciences D103 or 107. Concurrent with Developmental and Cell Biology 231B. Formerly Biological Sciences 144E.

D157 Comparative Vertebrate Anatomy (6) W. Lecture, three hours; laboratory, six hours. Structure and evolution of the major organ systems in vertebrates, from fish to mammals. Laboratory work includes detailed dissection of a shark and cat. Prerequisite: Biological Sciences D103. Formerly Biological Sciences 157.

D180 Fractal Geometry in Biology (4) F. Lecture, two hours; discussion, one hour. Fractal geometry explored with tools and interests of the biologist. Provides a general background of fractal geometry and investigates the types of biological processes that generate fractals. Prerequisites: completion of the Biological Sciences Core, Physics 3A, and Mathematics 2B. Formerly Biological Sciences 180.

D187 Developmental Genetics (4) W of odd years. Lecture, three hours. Advanced course on the use of genetic analysis to identify the genes that control cell behavior and development. Instructor-led discussion of genetics and the relationship between genotype and phenotype followed by student-led discussion based on assigned readings. Prerequisite: Biological Sciences D137. Formerly Biological Sciences 187.

D190 Topics in Developmental and Cell Biology (2 to 4) F, W, S. Studies in selected areas of developmental and cell biology. Prerequisites: Biological Sciences D103; limited to School of Biological Sciences majors with upper-division standing. May be taken for credit three times as topics vary. Formerly Biological Sciences 139.

ECOLOGY AND EVOLUTIONARY BIOLOGY

E107 Seminar in Ecology and Evolutionary Biology (2) F, W, S. Seminar, one and one-half hours. Invited speakers, graduate students, and faculty present current research in ecology and evolutionary biology. Pass/Not Pass only. Open only to upper-division Ecology and Evolutionary Biology majors. Concurrent with Ecology and Evolutionary Biology 201. Formerly Biological Sciences 165A.

E118 Terrestrial Ecosystems (4) F, W, S. A mechanistic perspective of the structure and functioning of terrestrial ecosystems. Includes the mechanisms that control plant growth, hydrology and nutrient cycling, and the roles terrestrial ecosystems play in local and global biogeochemistry. Prerequisite: Biological Sciences E106 or consent of instructor. Same as Earth System Science 164 and Environmental Analysis and Design E167. Formerly Biological Sciences 118.

E124 Infectious Disease Dynamics (4) F, W, S. Lecture, three hours. Discusses how the dynamical interactions between pathogens and the immune system can give rise to a variety of outcomes which include clearance of infection, persistent infection, escape from immune responses, and pathology. Prerequisite: Biological Sciences 96 or E106 or 97. Formerly Biological Sciences 124B.

E127 Physiological Plant Ecology (4) F. Lecture, three hours. An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape. Prerequisite: Biological Sciences E106 or consent of instructor. Same as Earth System Science 168. Formerly Biological Sciences 127.

E135 Molecular Evolution (4) W. Lecture, three hours. Introduction to the study of evolutionary change in genes and DNA sequences. Combines study of molecular biology with the study of evolution. Molecular evolution has application to many disciplines, including molecular biology, virology, systematics, and the origin of life. Prerequisite: Biological Sciences E106. Formerly Biological Sciences 135.

E136 The Physiology of Human Nutrition (4) F, W, S. Lecture, three hours. Examines the biochemical basis of energy metabolism, physiological processes in digestion and uptake, and the biochemical transformation of carbohydrates, fats, and proteins in the human body. The emphasis is on expanding the students' understanding of physiology. Prerequisites: Biological Sciences 98 and E109. Formerly Biological Sciences 136B

E137 Genetics of Complex Traits (4) F, W, S. Lecture, three hours; discussion, one hour. Many ecologically important traits (e.g., size, age at sexual maturity) and clinical conditions are rooted in the interaction of multiple genetic loci with the environment. Theoretical and practical approaches to dissecting the genetic architecture of complex traits are explored. Prerequisites: Biological Sciences 96 or E106, and 97; Biological Sciences 7 or Mathematics 7 recommended. Formerly Biological Sciences 137C.

E138 Comparative Animal Physiology (4) S of odd years. Lecture, three hours. Maintenance aspects of physiology: water balance; feeding and digestion; metabolism; respiration and circulation. Prerequisite: Biological Sciences E109. Formerly Biological Sciences 138.

E141 Cell Signaling in Development (4) S. Introduction to the general principles of cell signaling, with emphasis on its role in animal development. Topics include: hormone receptor interactions, G-protein linked signaling, enzyme linked cell surface receptors, growth factor signaling in invertebrate and vertebrate systems. Prerequisite: Biological Sciences D104. Formerly Biological Sciences 141.

E142 Writing/Philosophy of Biology (4) F, W, S. Lecture, three hours. Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers. Prerequisite: satisfactory completion of the lower-division writing requirement; Philosophy 40 recommended as background. Same as Philosophy 142 and Logic and Philosophy of Science 142. Formerly Biological Sciences 142.

E150 Conservation Biology (3) W. Lecture, three hours. Considers conservation of animal and plant endangered species. Examines current trends in deforestation, environmental degradation, natural and induced extinctions, principles of preserve design and management, legislation, conservation genetics and ex situ methods of conservation. Prerequisite: Biological Sciences 97. Formerly Biological Sciences 150.

E155 Physiology in Extreme Environments (4) F, W, S. Lecture, three hours. An in-depth look at the physiological mechanisms that allow animals to live and survive in extreme environments. Physiological responses to high altitude, diving, microgravity, deserts, and extreme cold are examined. Prerequisites: Biological Sciences E109 and Physics 3A. Formerly Biological Sciences 155A.

E167 Plant Population Biology (4) F of odd years. Lecture, three hours. Current topics in plant population biology are reviewed in an ecological and evolutionary context. Topics include aspects of population genetics, population ecology, evolutionary ecology, and applications to conservation biology. Discussions of current literature. Prerequisites: Biological Sciences 97, 100L, and E106. Formerly Biological Sciences 167.

E168 Advanced Evolutionary Biology (4) S. Lecture, three hours. An examination of the major mechanisms of evolution. Topics include population and quantitative genetics theory, genetic basis of adaptation, the neutral theory of evolution, the evolution of sex, life-history evolution, coevolution, speciation, and mass extinctions. Prerequisite: Biological Sciences E106. Formerly Biological Sciences 168.

E170 Comparative Biomechanics (4) F, W, S. Explores the comparative biomechanics of plants and animals, with an emphasis on modeling biomechanical systems. Prerequisite: Biological Sciences E109. Formerly Biological Sciences 170A.

E171 Quantitative Methods in Biology (4) W. Lecture, three hours. Introduces students to some cutting-edge research in biology where mathematical methods play an important role. For each mathematical topic, a *Nature* or *Science* research paper is selected. The underlying mathematics and its application to the biological system is discussed. Prerequisites: Mathematics 2B and Biological Sciences 94.

E172 Systematics and Evolution of Flowering Plants (5) S of even years. Lecture, four hours; laboratory, three hours; two required weekend field trips. Basic systematic concepts including computer analysis of phylogenies, introduction to major groups of flowering plants, analysis of evolutionary significance of characters used in systematic studies. Prerequisites: Biological Sciences 94, 97, and E106. Formerly Biological Sciences 172.

E173 Comparative Biochemistry (4) W of even years. Lecture, three hours. Subcellular mechanisms of adaptation to extreme environments: temperature, pressure, osmotic stress, hypoxia. Protein structure and function differences, membrane properties, cellular homeostasis. Evolution of metabolic responses to environmental stress. Prerequisite: Biological Sciences E109. Formerly Biological Sciences 173.

E174 Behavioral Ecology (4) F, W, S. Lecture, three hours; discussion, two hours. Animal behavior as an evolutionary solution to problems encountered during an animal's life cycle. Includes a broad comparative approach to communication, social behavior, habitat selection, and food finding. Prerequisite: Biological Sciences E106 or consent of instructor. Formerly Biological Sciences 174.

E175 Restoration Ecology (4) F, W, S. Lecture, two hours; field work, two hours. Theoretical and practical aspects of habitat restoration and mitigation. Design, implementation, and monitoring of restoration projects in local habitats. Collection of seed and cuttings, planting and maintenance presented. Control of exotics in natural areas discussed. Environmental ethics of restoration emphasized. Prerequisite: Biological Sciences E106. Formerly Biological Sciences 175.

E176 Coevolution of Hosts and Parasites (4) F. Lecture, three hours; discussion, one hour. Ecology and evolution of host-parasite relationships. Ecological factors that influence the spread of disease, genetics of resistance and virulence, and significance of cellular parasites in genomic evolution. Emphasis on conceptual issues with examples from many different organisms. Prerequisite: Biological Sciences 97. Formerly Biological Sciences 176.

E178 Ocean Ecology (4) W of even years. Lecture, three hours; discussion, one hour. Examines the relationships between physical processes in the ocean, biological productivity, and the exploitation of ocean resources by high-trophic-level predators, including humans. Discusses open ocean ecosystems, intertidal and benthic regions of the world ocean. Prerequisite: Biological Sciences 94. Formerly Biological Sciences 178.

E179 Limnology and Freshwater Biology (4) F, W, S. Lecture, three hours; discussion, one hour. Biology of freshwater environments: lakes, ponds, rivers, their biota, and the factors which influence distribution of organisms. Prerequisite: Biological Sciences 94. Formerly Biological Sciences 179.

E179L Limnology and Freshwater Biology Laboratory (4) F, W, S. Laboratory, four hours. Analytical techniques for common water-quality variables of lakes, streams, rivers. Benthic fauna, vertebrates and invertebrates, algae, and aquatic plants. Emphasis on field methods with an experimental approach; laboratory exercises. Requires four days of weekend field trips to estuaries, marshes, lakes, and streams. Prerequisite: concurrent enrollment in or completion of Biological Sciences E179. Formerly Biological Sciences 179L.

E181 Conservation in the American West (4) W of odd years. Lecture, three hours. Critical examination of contemporary conservation issues in the American west, with particular attention to water in California, grazing on public lands, and species decline and extinctions. Prerequisite: Biological Sciences E106. Formerly Biological Sciences 181.

E183 The Comparative Physiology of Exercise (4) F of even years. Lecture, three hours. Focus upon critical topics in the area of exercise biology using the comparative physiological approach. Specifically examine the physiological factors that limit the capacity of an organism to sustain high levels of aerobic metabolism. Prerequisites: Biological Sciences 98, D104, and E109. Formerly Biological Sciences 183.

E184 Entomology (4) F of even years. Lecture, two hours; laboratory, four hours. Central features of the Insecta are reviewed in an evolutionary and ecological context. Topics include external and internal morphology, systematic relationships among the insect orders, insects in ecological communities, and the impact of agricultural and medical pests. Field trips. Prerequisite: Biological Sciences E106. Formerly Biological Sciences 184.

E185 Plant-Animal Interactions (4) W of even years. Lecture, two hours; laboratory, four hours. Ecology and evolution of mutualistic and antagonistic interactions between plants and animals. Topics include pollinator behavior, plant reproductive systems, plant defense mechanisms, and herbivore diet choice. Field-oriented laboratory. Prerequisites: Biological Sciences 97 and E106. Formerly Biological Sciences 185.

E186 Population and Community Ecology (4) W. Lecture, three hours. Population structure, function, development, and evolution. Topics include population structure, population growth and regulation, population dispersion patterns, life history strategies, predation, competition, mutualism, species diversity, succession, island biogeography, and co-evolution. Prerequisite: Biological Sciences E106. Formerly Biological Sciences 186.

E188 Introduction to Insect Physiology (4) W of even years. Lecture, three hours. Physiology of insects. Insect respiration, digestion, excretion, and neurobiology, including sensory systems and effectors. Prerequisites: Biological Sciences D104 and E109. Formerly Biological Sciences 188.

E189 Environmental Ethics (4) W. Lecture, three hours. History of evolution of environmental ethics in America. Management problems in national parks, wilderness areas, wild and scenic rivers, national forests. Contemporary and historical aspects/contributors to the field. Mitigation, endangered species, habitat restoration, biodiversity, and environmental activism. Field trips required. Prerequisite: upper-division standing. Formerly Biological Sciences 189.

E190 Topics in Ecology and Evolutionary Biology (2 to 4) F, W, S. Studies in selected areas of ecology and evolutionary biology. Prerequisite: Biological Sciences E106. May be taken for credit three times as topics vary. Formerly Biological Sciences 169.

MOLECULAR BIOLOGY AND BIOCHEMISTRY

M114 Advanced Biochemistry (4) F, W, S. Lecture, three hours; discussion, one hour. Physical-chemical properties of macromolecules. Structure-function relationships in nucleic acids, protein, carbohydrates, and lipids. Integration and regulation of metabolism. Biochemistry of organs and biochemistry of diseases. Prerequisite: Biological Sciences 99. Formerly Biological Sciences 114.

M116 Advanced Molecular Biology (4) F, W, S. Lecture, three hours; discussion, one hour. Mechanisms of gene expression; special emphasis on regulatory events that occur in Eukaryotic organisms other than initiation of transcription. Chromatin structure and rearrangement, RNA polymerases, cis- and trans-acting elements, RNA processing, transport and stability, protein synthesis, trafficking, and turnover. Prerequisites: Biological Sciences 99, and M114L or M116L. Formerly Biological Sciences 116.

M120 Signal Transduction in Mammalian Cells (4) F. Lecture, three hours; discussion, one hour. Introduction to major biochemical pathways that transmit information from extracellular cues into changes in cell behavior. Focuses on kinases, phosphateses, G proteins, second messengers, and protein-protein interactions. Includes discussion of primary research articles. Emphasis on scientific reading and writing. Prerequisites: Biological Sciences 99; when offered for upper-division writing, satisfaction of the lower-division writing requirement. Formerly Biological Sciences 120A.

M121 Immunology with Hematology (4) W. Lecture, three hours; discussion, one hour. Antibodies, antigens, antigen-antibody reactions, cells and tissues of lymphoreticular and hematopoietic systems, and individual and collective components of cell-mediated and humoral immune response. Prerequisite: Biological Sciences 98 or consent of instructor. Formerly Biological Sciences 121.

M122 General Microbiology (4) F, Summer. Lecture, three hours; discussion, one hour. Comparative metabolism of small molecules and cell structure and relationship to microbial classification. Macromolecule synthesis and regulation, sporulation, cell division, growth, and effect of antibiotics. Prerequisite: Biological Sciences 98. Formerly Biological Sciences 122.

M123 Introduction to Computational Biology (4) S. Lecture, three hours; laboratory, two hours. The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions. Prerequisites: Mathematics 2D or 2J or 7 or Biological Sciences 7. Concurrent with Molecular Biology and Biochemistry 223. Formerly Biological Sciences 123A.

M124 Virology (4) F. Lecture, three hours; discussion, one hour. Replication of viruses in populations, animals, and the host cell. The effects of viral infection on populations, individuals, and specific molecular effects on the target cell. Role of viral infections in cancer and degenerative diseases. Prerequisite: Biological Sciences 99. Formerly Biological Sciences 124.

M125 Molecular Biology of Cancer (4) S. Lecture, three hours. Molecular mechanisms of carcinogenesis. Consideration of transformation by DNA tumor viruses, RNA tumor viruses, and chemical carcinogens. Prerequisite: concurrent enrollment in Biological Sciences 99 or consent of instructor. Formerly Biological Sciences 125.

M128 Genetic Engineering (4) W. Lecture, three hours. Basic biochemical and molecular biology of restriction endonucleases. Vectors for recombinant DNA. Cloning of genes. Sequence analysis of genes. Prerequisite: Biological Sciences 98; Biological Sciences 99 recommended. Formerly Biological Sciences 128.

M132 Microbial Physiology and Pathology (4) F, W, S. Lecture, three hours. Introduction to microbial physiology and the molecular mechanisms of microbial disease pathogenesis. Survey of pathogenic microbes and their medical implications. Prerequisites: Biological Sciences 99; Biological Sciences M122 recommended. Formerly Biological Sciences 123B.

M133 Magnetic Resonance in Biology (4). Lecture, three hours. Basic principles of magnetic resonance. Survey of applications in biology including: protein and nucleic acid structure determination and dynamics, electron paramagnetic resonance and magnetic resonance imaging. Prerequisites: Biological Sciences 98, Mathematics 2B, and upper-division standing. Concurrent with Molecular Biology and Biochemistry 211. Formerly Biological Sciences 133A.

M137 Microbial Genetics (4) W. Lecture, three hours; discussion, one hour. Prerequisites: Biological Sciences 97 and 98. Recommended: concurrent enrollment in Biological Sciences 99. Formerly Biological Sciences 137A.

M140 Macromolecular Structure, Function, and Interaction (4) F. Lecture, three hours; discussion, one hour. Chemistry of macromolecules; emphasis on proteins. Physical and chemical properties of proteins, forces that maintain protein structure, relationship between structure and function, interactions of proteins with ligands and other macromolecules, and experimental methods to study structure, function, and interactions. Corequisite: Chemistry 130A or 131A. Prerequisites: Biological Sciences 98 and 99. Concurrent with Molecular Biology 240. Formerly Biological Sciences 140.

M144 Cell Organelles and Membranes (4) F. Lecture, three hours. Structure, function, and biogenesis of biological membranes and membrane-bound organelles; protein trafficking and transmembrane signaling. Prerequisite: Biological Sciences D103. Formerly Biological Sciences 144A.

M160 Structure-Function Relationships of Integral Membrane Proteins (4) W. Lecture, three hours. Integral membrane proteins such as voltage and ligand-gated ion channels, water channels, pumps, cotransporters, and receptors (e.g., GPCRs). The emphasis is on the relationship between atomic structure and the functional properties of these proteins. Prerequisites: a grade of B or better in Biological Sciences 98 and 99; Biological Sciences M120. Concurrent with Molecular Biology and Biochemistry 255.

M162 Viral Pathogenesis and Immunity (4) F, W, S. Lecture, three hours. The mechanisms of viral pathogenesis and of host resistance to viruses are explored in detail. HIV-1 and Influenza-A are used as examples. In each case, viral replication, cytopathic effects, immune response, and viral evasion are discussed. Prerequisites: Biological Sciences M121 or M124, or consent of instructor; Biological Sciences M122 recommended. Formerly Biological Sciences 162A.

M170A Molecular Pharmacology (4) F. Molecular basis of drug-receptor action at the molecular and cellular levels. Structure-function of drug targets emphasizing enzymes, ion channels, and membrane transport proteins. Understanding how the drugs' mechanisms of action contribute to the development of more efficacious and safer drugs. Prerequisites: Chemistry 51B; Biological Sciences 98 or Chemistry 128.

M190 Topics in Molecular Biology and Biochemistry (2 to 4) F, W, S. Studies in selected areas of Molecular Biology and Biochemistry. Prerequisite: Biological Sciences 98 or consent of instructor. May be taken for credit three times as topics vary. Formerly Biological Sciences 131.

NEUROBIOLOGY AND BEHAVIOR

N112A-B-C Neuroscience: Fundamental Concepts and Current Applications (2-2-2) F, W, S. Lecture, two hours. In-depth exploration of the intellectual tools used to create, advance, and disseminate knowledge about the nervous system. Develops analytical, reasoning, and communication skills by exploring fundamental issues of data interpretation in cellular, molecular, systems, and behavioral analyses of brain function. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 156A-B-C.

N117 Principles of Brain Evolution (4) F, W, S. Lecture, two hours; seminar, one hour. Brains obviously differ between different species, yet many commonalities exist. Surveys species similarities and differences in brain organization, then extracts some general principles of how brains evolve. Emphasis placed on vertebrate brains and on the functional implications of neuroanatomical change. Concurrent with Neurobiology and Behavior 243. Formerly Biological Sciences 117A.

N119 History of Neuroscience (4) F, W, S. Lecture, three hours. An overview of the conceptual and technical foundations of contemporary neuroscience from ancient times to the present. The subjects include synapses, neurons, brain organization, sensory, motor and regulatory systems, learning and memory, human brain function and dysfunction. Prerequisites: Biological Sciences 35 or N110, or Psychology and Social Behavior P115D, or Psychology 9A-B-C, or consent of instructor. Concurrent with Neurobiology and Behavior 255. Formerly Biological Sciences 119.

N146 Neurobiology of Sensation and Attention (4) F, W, S. Lecture, three hours. Focuses on neural mechanisms in sensory cortex at the cellular, synaptic, and systems levels that contribute to sensory processing and attention to sensory stimuli. Covers four topics: neurophysiology of sensory cortex and thalamus; diffuse modulatory systems and neuromodulation; arousal: integration of channels, neurons, systems; sensory processing during attention. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 146.

N153 Neuropharmacology (4) S. Lecture, three hours. Survey of neurotransmitter systems, focusing on how transmitters are made, how they interact with their receptors, and how drugs can influence these processes to alter neural function and behavior. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 153.

N154 Molecular Neurobiology (4) F, W, S. Lecture, three hours. Nature and actions of genes and gene products that regulate the functioning of the nervous system and its interaction with muscles. Topics include: neural control of gene expression; genetics and molecular biology of neural and neuromuscular diseases; gene therapies for neural disorders. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 154.

N158 Neurobiology of Learning and Memory (4). Lecture, three hours. How the brain and behavior change as a result of experience, with an emphasis on identifying the neurochemical processes through which memory is stored and the parts of the brain that are involved. Prerequisite: Biological Sciences 35 or N110. Same as Psychology 162A. Formerly Biological Sciences 158.

N159 Animal Behavior (4) S. Lecture, three hours. Explores why animals behave the way they do from both evolutionary and mechanistic perspectives. Considers selective pressures and evolutionary constraints that shape animal behavior and the underlying neural and hormonal mechanisms by using examples such as why dogs bark, why some birds migrate. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 159.

N160 Language and the Brain (4) W. Lecture, three hours. Analysis of current research on the biological bases of human linguistic capacity. Development, focusing on hemispheric specialization and plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation. Prerequisite: Biological Sciences 35 or N110, or consent of instructor. Same as Psychology 161 and Linguistics 158. Formerly Biological Sciences 160.

N161 Cellular Neurophysiology (4) F, W, S. Lecture, three hours. Introduction to the biophysical mechanisms underlying the generation and propagation of signals within and between nerve cells. Emphasizes the roles of ion channels in generating resting and action potentials, the mechanisms of quantal neurotransmitter release, and the ionic conductances involved in synaptic transmission. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 161.

N163 Endocrinology, Neuroendocrinology, and Behavior (4) F, W, S. Lecture, three hours. Survey of the hormones secreted by the endocrine system, their physiological effects, and their mechanisms of action, followed by consideration of how the endocrine and nervous systems interact to regulate each other and behavior. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 163.

N164 Functional Neuroanatomy (4) F, W, S. Lecture, three hours. How neuroscience uses tools of many disciplines, from imaging to behavior, to develop and test hypotheses about functions of specific parts of the brain. Basic organization of nerve cells and vertebrate nervous system; methods of visualizing nerve cells; neural connections, neural activity patterns. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 164.

N171 Neurobiology of Transmitter Receptors (4) W. Lecture, three hours. Introduction to the use of frog oocytes as a model system for studies in neurobiology. Transplantation of neurotransmitter receptors and voltage-operated ion channels from the brain into oocytes. Prerequisites: Biological Sciences 99 or N110 and consent of instructor. Formerly Biological Sciences 171.

N177 Topics in Cortical Plasticity (4) F, W, S. Focuses on neural mechanisms that underlie cortical plasticity. These include neurophysiological, pharmacological, anatomical, and developmental mechanisms that act at the synaptic, cellular, and system (population of neurons) levels. Prerequisite: Biological Sciences N110. Formerly Biological Sciences 177.

N182 Vision (4). Visual perception and the anatomy and physiology of the visual system. Topics include: the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system. Same as Psychology 131A. Psychology 130A may not be taken for credit after Biological Sciences N182. Formerly Biological Sciences 182.

N190 Topics in Neurobiology and Behavior (2 to 4) F, W, S. Lecture, three hours. Studies in selected areas of neurobiology and behavior. Prerequisite: Biological Sciences 98 or consent of instructor. May be taken for credit three times as topics vary. Formerly Biological Sciences 152.

Seminars and Special Courses

191A-B Senior Seminar on Global Sustainability I, II (2-2) F, W. Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. **A:** Prepare bibliography. **B:** Prepare research proposal. In-progress grading for 191A-B, grade for sequence given upon completion of 191C. Prerequisites: senior standing, Biological Sciences 65, Environmental Analysis and Design E20, and Earth System Science 10. Same as Earth System Science 190A-B and Social Ecology 186A-B.

191C Writing/Senior Seminar on Global Sustainability III (4) S. Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations and to prepare senior research paper. Prepare/write research paper under the direction of a faculty member. Prerequisites: Biological Sciences 191A-B and satisfaction of the lower-division writing requirement. Same as Earth System Science 190C and Social Ecology 186C.

192 Tutoring in Biology (2). Enrollment limited to participants in the Biological Sciences Peer Tutoring Program. Prerequisite: consent of instructor. May be repeated. No more than eight units earned in this course may be counted toward the 180 units required for graduation. Satisfies no degree requirement other than contribution to the 180-unit total.

193 Research Writing for Biological Science Majors (4). Under the guidance of selected faculty in the School of Biological Sciences and a writing professional, students learn to conduct library research in the field of biology and to write scientific review papers. Prerequisite: upper-division Biological Sciences major.

194 Current Topics in Biology (1) F, W, S. A seminar designed to discuss recent research findings and experimental issues in biology. Meets once each week for one hour. Corequisite: Biological Sciences 199.

194S Safety and Ethics for Research (1) F, W, S. Introduces students to the concepts, techniques, and ethics involved in biological sciences laboratory work. Pass/Not Pass only.

H195 Honors Seminar in Biological Sciences (1) S. Seminar. Contemporary research problems in biological sciences. Participating students and faculty present their research findings as well as examine and discuss research in related fields. Writing instruction for participation in Excellence in Research takes place during required workshops in the fall quarter. Limited to students in the Biological Sciences Honors Program.

196 Writing for Biology Research (4) W. Lecture, two hours; laboratory, two hours. A science writing and critical reasoning course to be taken the quarter prior to participation in the Excellence in Research Program. Students work in a computer laboratory with full access to writing, library, and network resources and prepare and review a formal scientific paper. Prerequisites: two quarters of Biological Sciences 199; satisfaction of the lower-division writing requirement. Enrollment preference given to students who have taken two or more quarters of Biological Sciences 197.

198A-B-C Directed Group Studies (1 to 5) F, W, S. Small group experimental laboratory or fieldwork performed under the influence of a faculty member. Prior to beginning group studies, each student must submit an abstract which must be filed in the Biological Sciences Student Affairs Office and renewed yearly, if applicable. A Summary Report must be submitted at the end of each quarter. May be graded In Progress. Prerequisites: Biological Sciences 194S and consent of instructor. May be taken for credit three times.

Independent Study

Independent-study credit for undergraduates is limited to five units per quarter.

197A-B-C Special Study in Biological Sciences (1 to 4 per quarter) F, W, S. Tutorial, one to four hours. Library research, tutorial, and other independent projects under individual professors. Individualized instruction dealing with conceptual or theoretical problems in the biological sciences, rather than technical problems. Regularly scheduled meetings between student and faculty member and successful completion of a written report. Prerequisite: consent of instructor. An abstract form must be filed in the Biological Sciences Student Affairs Office. May be graded "IP." May be repeated for credit.

199 Independent Study in Biological Sciences Research (1 to 5 per quarter) F, W, S. Individual experimental laboratory or field research under a professor's direction. Required for participation in the Excellence in Research Program. Further information and a booklet describing many prospective projects are available in the Biological Sciences Student Affairs Office. Prerequisites: Biological Sciences 194S and consent of instructor. An abstract form must be filed in the Biological Sciences Student Affairs Office. May be repeated for credit as topics vary. Formerly Biological Sciences 199A.

GRADUATE STUDY IN BIOLOGICAL SCIENCES

The School of Biological Sciences offers graduate study in a wide variety of fields ranging across the spectrum of the biological sciences. The four Departments of the School of Biological Sciences (Developmental and Cell Biology, Ecology and Evolutionary Biology, Molecular Biology and Biochemistry, and Neurobiology and Behavior) and five basic science Departments of the School of Medicine (Anatomy and Neurobiology, Biological Chemistry, Microbiology and Molecular Genetics, Pathology and Laboratory Medicine, and Physiology and Biophysics), representing respective concentrations of study under the Ph.D. degree in Biological Sciences, cooperate in the conduct of graduate education administered by the School of Biological Sciences. Although students are admitted to the Doctor of Philosophy (Ph.D.) degree program, the Master of Science (M.S.) degree may be earned in pursuit of the Ph.D. Additionally, a master's program in Biotechnology (M.S. degree in Biological Sciences) and a master's program in Ecology and Evolutionary Biology (M.S. degree in Biological Sciences) are offered. Each department has a graduate advisor whom students may consult in regard to the technical details of the individual programs.

Applications for admission to graduate study are evaluated by the department or program to which the student has applied on the basis of letters of recommendation, Graduate Record Examination scores, grades, research experience, and other relevant qualifications of the applicant. Candidates for graduate admission are urged to consult the particular department or program whose faculty and expertise best fit their interests and background.

MASTER OF SCIENCE AND DOCTOR OF PHILOSOPHY IN THE BIOLOGICAL SCIENCES

While both the Master of Science and Doctor of Philosophy programs are offered, emphasis at the graduate level is on the Ph.D. programs, with the exception of the master's programs in Biotechnology and in Ecology and Evolutionary Biology. Most training takes place within one of the departments, although full facilities and curricular offerings are available to all graduate students in all departments of the Biological Sciences. Interdisciplinary study and research are encouraged.

Students are expected to maintain a B average at all times. The normal time to degree for the master's degree is two years, and five years for the doctoral degree. A master's degree, however, is not a prerequisite for the Ph.D. degree.

During the first part of the initial year of graduate work, the student plans an academic program in consultation with the graduate advisor or a small committee. Faculty advisors are changed if the specific interests of the student change. In addition, it is possible for students to transfer to another program in the School, subject to the approval of the Dean of Graduate Studies, provided they are accepted into that program. Students are encouraged to consult with other faculty members with regard to their research and academic interests.

During their graduate training all students will serve some time as teacher apprentices under the direction of advanced teaching assistants and faculty. Advanced graduate students may work closely with faculty in the planning and execution of the teaching program. The amount and exact nature of the teaching experience varies with the department.

Master of Science

Depending upon the program, there are two plans by which a Master of Science degree may be obtained.

Plan I: Thesis Plan. The student completes seven upper-division and graduate courses including a minimum of five nonresearch courses. The student then presents a thesis based upon research done while in the School.

Plan II: Comprehensive Examination Plan. The student completes a minimum of nine upper-division and graduate courses. At least six must be graduate courses (numbered 200–299) in the student's field of specialization. This program is terminated with a comprehensive final examination.

Doctor of Philosophy

Comprehensive Examination-First Year. The student attains this level by completing oral or written examinations at the discretion of the department. The examination is generally taken at the end of the first year of graduate study.

Advancement to Candidacy. The advancement to candidacy examination is generally taken in the third year of graduate study. It evaluates whether the student has identified a tractable dissertation research problem. A committee for the purpose of administering this examination is appointed by the School, on behalf of the Dean of Graduate Studies and the Graduate Council.

Once this examination is completed, the student is advanced to candidacy for the degree and is considered to have formally begun dissertation research. The student submits a dissertation on this research and defends it at an oral examination during the final year of graduate study. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Graduate student status or consent of instructor is a prerequisite for all 200–299 courses.

Master of Science with a Concentration in Biotechnology

Department of Molecular Biology and Biochemistry
3205 McGaugh Hall; (949) 824-6034
E-mail: biotech@uci.edu
World Wide Web: http://www.bio.uci.edu/
Thomas E. Lane, **Director**

The field of biotechnology has developed explosively since the discovery of gene cloning and sequencing methods in the mid-1970s. The field is now embodied by many successful companies and an intense demand has developed for well-trained people with up-to-date research techniques in the manipulation of nucleic acids, proteins, immunological reagents, and pathogenic organisms. The program in Biotechnology (M.S. degree in Biological Sciences) provides extensive training from both teaching laboratories and actual research settings (individual faculty laboratories). Focus is placed on techniques relevant to industry and seminar exposure to the nature of industry. The program is designed to train students to enter the field of biotechnology as skilled laboratory practitioners. Emphasis is placed on learning state-of-the-art technology in protein isolation and characterization, animal and microbial cell culture, and recombinant DNA methodology. Students are trained in experimental rationales for solving actual research problems and are encouraged to take summer internships in industry during the course of their studies.

The Department of Molecular Biology and Biochemistry evaluates applicants to the program on the basis of grades, letters of recommendation, GRE scores, and other relevant qualifications. Applicants should have successfully completed a B.S. degree or equivalent. Courses should include general chemistry with laboratory, calculus, physics, organic chemistry, genetics, biochemistry, molecular biology, microbiology, immunology, and virology, as well as laboratory courses in biochemistry, molecular biology, microbiology, and either animal virology or immunology.

The program emphasizes training in laboratory and research environments. First-year students are required to enroll in a series of laboratory courses (Molecular Biology and Biochemistry 221L, 224L, 250L, and 251L) that are designed to teach them techniques in recombinant DNA methodology, protein isolation and characterization, animal and microbial cell culture, immunology, and virology. In addition, students are trained rigorously in data recording and presentation as the laboratory notebooks are reviewed and graded by laboratory course instructors. Students are taught formal course work in nucleic acids, proteins, genetic engineering, and molecular/cellular biology. Emphasis during the second year is devoted exclusively to research projects in faculty laboratories, with the exception of one required elective course each quarter (e.g., Developmental and Cell Biology 210, 231B, Molecular Biology and Biochemistry 206, 207). The program is terminated at the end of the second year.

While the Biotechnology program is designed to produce skilled laboratory practitioners for industrial positions, some students may wish to continue in a Ph.D. degree program. The Department of Molecular Biology and Biochemistry is a member of the interdisciplinary graduate program in Molecular Biology, Genetics, and Biochemistry, a program which offers the Ph.D. degree in Biological Sciences. Biotechnology program students who wish to enter the interdisciplinary graduate program upon completion of the M.S. degree should apply for admission during their second year.

INTERDISCIPLINARY GRADUATE PROGRAMS

The School is structured in a manner that encourages an interdisciplinary approach to scientific problems. Interaction and cooperative efforts across traditional institutional boundaries are especially evident in the School's participation in various organized research units (described in the previous Research and Graduate Studies section) and in the interdepartmental/interschool graduate programs described below.

Graduate Program in Molecular Biology, Genetics, and Biochemistry

110 Biological Sciences Administration; (949) 824-8145
E-mail: gp-mbgb@uci.edu
World Wide Web: http://www.bio.uci.edu/academic/grad/mbgb.html
Peter J. Bryant, **Director**

The combined graduate program in Molecular Biology, Genetics, and Biochemistry (MBGB) provides the first year of instruction for graduate students entering Ph.D. programs in seven departments of the School of Biological Sciences and the School of Medicine. It provides a year-long Basic Training course as well as four didactic courses in the key areas of Protein Structure and Function, Structure and Biosynthesis of Nucleic Acids, Cell Biology or Neurobiology, and Genetics. During the first year the students also undertake introductory research in at least two laboratories. The year culminates in a comprehensive preliminary examination and evaluation.

At the beginning of the second year the student selects a research advisor from over 100 faculty from the participating departments of Anatomy and Neurobiology, Biological Chemistry, Developmental and Cell Biology, Microbiology and Molecular Genetics, Molecular Biology and Biochemistry, Pathology and Laboratory Medicine, and Physiology and Biophysics. Each faculty member's area of research is described at the beginning of the departmental sections on the following pages. Regular teaching of undergraduates is part of graduate student training, at least in the first and second years of study. During the second year and beyond, students participate in the journal club and seminar series of the department in which they have elected to carry out their dissertation work, as specified by the departmental requirements. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years. Further information is available in the *Catalogue* sections of the participating departments and through the MBGB program office.

Applicants should have significant laboratory experience and be well prepared in calculus, physics, organic chemistry, and biochemistry.

Interdepartmental Neuroscience Program

145 Biological Sciences Administration; (949) 824-8145
E-mail: gp-inp@uci.edu
World Wide Web: http://www.inp.uci.edu
Frank LaFerla, **Director**

The Interdepartmental Neuroscience Program (INP) is a first-year graduate program that brings together more than 70 faculty from the Schools of Biological Sciences, Medicine, and Social Sciences, including participation from the Departments of Anatomy and Neurobiology, Cognitive Sciences, Developmental and Cell Biology, Neurobiology and Behavior, and Pharmacology. INP faculty have broad research interests in behavioral neuroscience, brain aging, developmental neurobiology, genetics, learning and memory, molecular neurobiology, neural injury/disorders/repair, neuropharmacology, plasticity, and sensation and perception. Neuroscience as a discipline requires scientists to have a detailed understanding of at least one field, and a broad understanding of many other fields. INP provides breadth early on, followed by specialization in years two through five of predoctoral training.

INP organizes and coordinates a core curriculum that provides a foundation in Neuroscience; this forms the basis of future specialized instruction in a participating departmental degree-granting program. This curriculum includes course work and laboratory rotations. Each trainee is assigned a Student Advisory Committee, consisting of three participating faculty members, to assist trainees in tailoring an appropriate course of study based on academic background, interests, and research foci. After successfully completing the core curriculum, students select an advisor from the participating faculty and then are guaranteed automatic admission to the Ph.D.-granting program in their advisor's home department. In this way, INP serves not as a degree-granting program, but as a "gateway" to further graduate training.

In particular, the program will provide trainees an opportunity: (1) to begin training in Neuroscience with a broad academic introduction, (2) to receive individualized attention to curricular needs, (3) to conduct initial research projects with a large and diverse group of faculty in a wide variety of departments, and (4) to conduct dissertation research in any of a large and diverse group of laboratories in a wide variety of departments.

In the first year of study, students must successfully complete one course from each of the molecular, systems, and cellular neuroscience categories. All trainees also participate every quarter in a two-unit course called Foundations of Neuroscience. This mandatory course meets in the fall, winter, and spring quarters and is intended to expose students to critical reading and analysis of the primary literature. Grades are assigned on a Satisfactory/Unsatisfactory only scale. Students are encouraged to carry out three laboratory rotations of 10 weeks each. With permission from their Advisory Committee, students may carry out fewer rotations. Rotations are graded on a Satisfactory/Unsatisfactory only scale. Trainees are judged as having successfully completed the program provided that they have: (1) achieved at least a B^+ (3.3) average in the core courses, (2) achieved a satisfactory grade in each quarter of Foundations of Neuroscience, (3) achieved satisfactory grades in all rotations, and (4) identified a participating faculty member who has agreed to serve as their thesis advisor.

The ideal INP candidate will have had a substantial subset of the following courses: biology, chemistry, physics, calculus, neuroscience, psychology, biochemistry, and genetics. Preference will be given to applicants who have had laboratory research experience.

Graduate Program in Protein Engineering

1121 McGaugh Hall; (949) 824-8145
E-mail: protengr@uci.edu
World Wide Web: http://www.bio.uci.edu/
Larry E. Vickery, **Director**

Faculty

Dana W. Aswad: Regulation of protein function by covalent modification
Ralph A. Bradshaw: Growth factor action; signal transduction; protein processing
Richard Chamberlin: Site-directed mutagenesis with non-natural amino acids
Charles G. Glabe: Amyloid Ab peptide in Alzheimer's pathogenesis; gamete recognition
Agnes H. Henschen-Edman: Protein structure, function, post-translational modification; fibrinogen
Janos K. Lanyi: Structure and function in bacterial rhodopsins
James S. Nowick: Study of protein structure in synthetic chemical model systems
Thomas L. Poulos: Protein engineering and crystallography
Michael E. Selsted: Host defense systems in phagocytic leukocytes and mucosal epithelium
Donald F. Senear: Interactions of proteins and DNA in transcriptional regulation
Athan J. Shaka: New techniques in high-resolution multi-dimensional NMR
Larry E. Vickery: Metalloproteins; steroid hormone biosynthesis and receptors; molecular chaperones
Stephen H. White: Protein folding in membranes

The new discipline of protein engineering has emerged, combining biochemistry, physical and organic chemistry, recombinant DNA technology, structural biology, and biochemical engineering. This has provided new approaches to the basic study of protein structure and function, as well as the opportunity to design and produce proteins with a broad spectrum of industrial and health-related applications. The School of Biological Sciences, in conjunction with the Department of Chemistry in the School of Physical Sciences and the Department of Chemical Engineering and Materials Science in The Henry Samueli School of Engineering, offer an interdisciplinary graduate program. The program brings together faculty with research interests in: structure/function of enzymes, metalloproteins, receptors, and growth factors; protein folding and design; bioremediation; protein modification with non-natural amino acids; NMR spectroscopy; and X-ray crystallography. The program offers the Ph.D. degree in Biological Sciences, Chemistry, or Engineering with a concentration in Protein Engineering Science.

Upon entrance to the program, students choose a Protein Engineering curriculum leading to one of the three degrees. First-year students take courses in molecular biology and protein chemistry, structure, and engineering, and complete three laboratory rotations of their choice. Additional elective courses, current literature seminars, and research presentations are used to broaden training in subsequent years. A qualifying examination is administered at the end of the first year for students in the Schools of Biological Sciences and Engineering. For students in Chemistry, a written examination is administered early in the second year. Students are then expected to select a laboratory and begin work toward completion of a Ph.D. dissertation based upon their own original research. Students advance to candidacy for the Ph.D. by presenting their dissertation proposal to an examining committee which also guides and advises the students and monitors research progress throughout their graduate training. The normal time for completion of the Ph.D. is five years.

DEPARTMENT OF DEVELOPMENTAL AND CELL BIOLOGY

5205A McGaugh Hall; (949) 824-1721
Arthur D. Lander, **Department Chair**

Faculty

Joseph Arditti *(Emeritus)*: Developmental physiology of orchids
Kavita Arora: *Drosophila* development; TGF-b signal transduction; cell signaling
Lee Bardwell: Intracellular signaling in development and disease
Bruce Blumberg: Gene regulation by nuclear hormone receptors in vertebrate development and adult physiology
Hans R. Bode: Pattern formation and stem cell differentiation
Carrie Brachmann: Spatial and molecular regulation of developmental apoptosis
Peter J. Bryant: Tumor-suppressor genes of *Drosophila* and humans
Susan V. Bryant: Molecular basis of limb development and regeneration
Richard D. Campbell *(Emeritus)*: Morphogenesis; biology of *Hydra;* fractal geometry of biological forms
Ken W.-Y Cho: Molecular mechanisms of axis specification in *Xenopus*
Aimee L. Edinger: Cancer biology, cellular growth control, apoptosis
Donald E. Fosket *(Emeritus)*: Regulation of cytoskeleton formation and function
Steven Gross: Force Generation by molecular motors in living cells
Patrick L. Healey *(Emeritus)*: Plant cellular differentiation and morphogenesis; ultrastructure and histochemistry of secretory systems; early reproductive development
Franz Hoffmann: Regeneration of cultured plant cells; somatic cell genetics
Daniel J. Knauer: Human antithrombins and related serine protease inhibitors
Stuart M. Krassner: Developmental transitions of hemoflagellates
Arthur D. Lander: Molecular mechanisms of cell and axon guidance; proteoglycans
Eva Y.-H. P. Lee: DNA repair and tumor suppressor genes; cancer biology
Howard M. Lenhoff *(Emeritus)*: Biology of *Hydra;* immobilized enzymes; history of experimental biology
Diane C. Lin: Cell and molecular biology of proteins involved in cytoskeletal and motile functions
Shin Lin: The combined use of biochemistry, cell biology, molecular biology, and molecular biophysics to study the structure and function of proteins involved in cytoskeletal/contractile functions and signal transduction in muscle and nonmuscle cells
Grant MacGregor: Mammalian reproduction biology
J. Lawrence Marsh: Molecular genetics of development in *Drosophila* and humans
Ronald L. Meyer: Development of nerve connections, nerve injury and regeneration
R. Michael Mulligan: RNA editing in plant mitochondria and chloroplasts
Diane K. O'Dowd: Electrical excitability and synaptic connectivity during development
Maike Sander: Transcriptional control of CNS and pancreas development mouse genetics
Thomas F. Schilling: Zebrafish development, vertebrate genetics, and craniofacial development
Christine Suetterlin: Golgi dynamics during the cell sumoylation
Rahul Warrior: Genetics and cell biology of nuclear migration of growth factor signaling
Tau-Mu Yi: G-protein signaling; systems biology

Research programs of the Department of Developmental and Cell Biology focus on molecular aspects of the development of eukaryotic organisms, on the molecular interaction of cells in tissue differentiation, and expression and function of genes related to the biogenesis of organelles and cellular constituents. The main emphasis of research training is in the molecular aspects of cells and development, and the utilization of biotechnology. The Department maintains facilities for research that include genetic, molecular, and biochemical techniques and also has facilities in advanced electron optics, microsurgery, microinjection, and neurophysiology.

The Department offers graduate study in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), and the Interdepartmental Neuroscience Program, which are described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year. Students participate in the Developmental or Cell Biology Journal Club and the departmental seminar series, which meet weekly during the academic year. In the fall of their third year, students take the advancement-to-candidacy examination by presenting and defending a proposal for specific dissertation research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Courses in Developmental and Cell Biology

200A-B-C Research in Developmental and Cell Biology (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. Prerequisite: consent of instructor.

201A-C Advanced Topics in Developmental Biology (2-2) F, S. Seminar, two hours. Advanced study in various fields of organismic biology. Prerequisite: consent of instructor. May be repeated for credit.

202A-B-C Basic Training (4-4-4) F, W, S. Lecture, two hours. Provides students with skills and knowledge needed to make a rapid start in productive research in molecular biology, genetics, and biochemistry. Includes experimental design; laboratory safety; literature management; microscopy; statistics; patents; grantsmanship; publication; presentation; teaching; and responsible conduct of research. Satisfactory/Unsatisfactory only.

203A-B-C Graduate Tutorial in Developmental and Cell Biology (4-4-4) F, W, S. Advanced study in areas not represented by formal courses. May involve individual or small group study through discussion, reading, and composition. Time and subject matter arranged individually.

204 Advanced Topics in Developmental Neurobiology (2) F, W, S. Seminar, two hours. Discussion of recent papers in the area of molecular aspects of cellular and developmental neurobiology. Prerequisite: consent of instructor. May be repeated for credit. Satisfactory/Unsatisfactory only.

205 Molecular Motors and the Cytoskeleton (4) F, W, S. Lecture, three hours; discussion, one hour. Cells use nano-machines (molecular motors) to organize themselves and transport cargo. This interdisciplinary course studies these motors and the rails they move along. Examines their biological function and how they function at the single-molecule level as machines. Prerequisite: Biological Sciences D103 or consent of instructor. Concurrent with Biological Sciences D115.

206A-B-C Advanced Topics in Cell Biology (2-2-2) F, W, S. Seminar, two hours. Advanced study of various topics in cell biology. Prerequisite: consent of instructor. May be repeated for credit.

209 Molecular Genetics Journal Club (2) F, W, S. Seminar, one and one-half hours. Advanced topics of current interest in molecular and developmental genetics. May be repeated for credit.

210 Advanced Development Genetics (4). Lecture, three hours. Advanced course on the use of genetic analysis to identify the genes that control cell behavior and development. Formal discussion, by instructor, of genetics and the relationship between genotype and phenotype, followed by student-led discussion based on assigned readings.

211 Faculty Research Colloquium (2) F. Research interests of faculty participating in the graduate program in Molecular Biology, Genetics, and Biochemistry are presented in weekly meetings. Corequisite: enrollment in the graduate program in Molecular Biology, Genetics, and Biochemistry.

231B Developmental and Cell Biology (4) W. Lecture, three hours. An advanced, integrated view of cell biology. Topics include the cell cycle, the cytoskeleton, the extracellular matrix, signal transduction, the cellular basis of development, and the cell biology of cancer. Prerequisite: consent of instructor. Concurrent with Biological Sciences D154.

231C Pattern Formation and Embryogenesis (4) W. Lecture, three hours. Development of animal eggs from fertilization until morphological specialization. Emphasis on two processes: pattern formation and morphogenesis. Patterning is studied genetically, experimentally through regeneration, and theoretically. Morphogenesis is analyzed in terms of cell behavior. Attention to the role of extracellular matrices in both processes. Prerequisite: consent of instructor.

231D Molecular, Cellular, and Developmental Neurobiology (4) W. Lecture, three hours. Molecular aspects of the structure and function of neurons and glia including neurotransmission, synaptic modulation, and channels. Neural development at the cellular and molecular level including neurogenesis, pattern formation, trophic factors, axonal growth, and synaptic rearrangement. Prerequisite: consent of instructor.

231E Plant Cell and Development (4) S. Lecture, three hours. Organization: cell wall; cytoplasm; organelles. Differentiation: meristem; specialized cells. Development: cell division; fertilization; embryogenesis; cell culture. Transport and communication: xylem and phloem; plasmodesma; hormones. Interactions with other organisms: galls and crown gall; symbiosis; pathogens; genetic engineering. Prerequisite: consent of instructor.

233 Topics in Corporate and Translational Research (1) S. Speakers are drawn from biotechnology and pharmaceutical companies and university faculty. Emphasis is on basic and applied research in a corporate environment, and academic research with strong potential for clinical and commercial applications. Satisfactory/Unsatisfactory only. May be repeated for credit.

285 Optical Biology Methods (4) F, W, S. Seminar, three hours. Training and experience in the latest technologies for analyzing and manipulating cell structure and function by advanced optical methods. Includes confocal microscopy, image analysis, video/time-lapse microscopy, functional and physiological imaging, FRET imaging, flow cytometry, cell sorting, and optical scissor/tweezer technologies.

290A-B-C Colloquium in Developmental and Cell Biology (2-2-2) F, W, S. Colloquium, one and one-half hours. Contemporary research problems. Research students, faculty, and other invited speakers introduce research and review topics.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants. Satisfactory/Unsatisfactory only.

DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY

321 Steinhaus Hall; (949) 824-6006
World Wide Web: http://www.bio.uci.edu/
Albert F. Bennett, **Department Chair**

Faculty

Francisco J. Ayala: Population and evolutionary genetics
Albert F. Bennett: Environmental physiology; physiological ecology
Rudi C. Berkelhamer: Director of Instructional Laboratories
Peter A. Bowler: Habitat restoration; wetland ecology
Timothy J. Bradley: Comparative physiology of ion transport epithelia
Adriana D. Briscoe: Molecular evolutionary physiology
Nancy Burley: Behavioral ecology, sexual selection, social organization and communication
Robin M. Bush: Evolution of infectious disease
Diane R. Campbell: Plant population biology; pollination ecology
F. Lynn Carpenter: Community ecology; behavioral ecology
Michael T. Clegg: Plant genetics; molecular evolution and population genetics
Walter M. Fitch: Molecular and genetic evolution
Steven A. Frank: Social behavior and evolutionary genetics
Branden S. Gaut: Plant molecular evolution
Michael L. Goulden: Ecosystem ecology, plant physiological ecology, micrometeorology
Bradford A. Hawkins: Insect population and community ecology
James W. Hicks: Comparative physiology of circulation and gas exchange
George L. Hunt, Jr.: Behavioral ecology, marine ornithology
Chenyang (Sunny) Jiang: Aquatic microbiology and ecology
Robert K. Josephson: Comparative neurophysiology; muscle physiology
Natalia L. Komarova: Mathematical biology, biophysics, evolution of language, models of cancer and viruses
Harold Koopowitz: Conservation of endangered plant species
Anthony D. Long: Quantitative genetics
Laurence D. Mueller: Theoretical and empirical studies of density-dependent natural selection
Diane E. Pataki: Plant physiological ecology, land-atmosphere exchange, global change
Michael R. Rose: Evolution of life histories and genetic systems
Ann K. Sakai: Plant population biology
Georg Striedter: Brain development and evolution; neuroethology
Katherine N. Suding: Community ecology, plant-soil feedbacks
Adam P. Summers: Vertebrate biomechanics
Richard Symanski: Conservation biology
Kathleen K. Treseder: Microbial ecology; global change biology
Neil D. Tsutsui: Molecular and behavioral ecology; genetics of invasive species
Douglas C. Wallace: Molecular and mitochondrial medicine and genetics
Arthur E. Weis: Evolutionary ecology of plant-insect interactions; plant population biology
Stephen G. Weller: Plant reproductive ecology; plant population ecology
Dominik Wodarz: Theoretical biology: dynamics of infectious diseases and cancer

Ecology and evolutionary biology deals with the establishment of adaptations over evolutionary time and with the organismal function in ecological time. Faculty in the Department of Ecology and Evolutionary Biology study questions pertinent at a variety of levels of biological organization, from molecular aspects of evolution, to organismal structure and performance, to the ecology of ocean ecosystems. Research is conducted in both the laboratory and field and includes work on a variety of organisms from phage and bacteria, to higher plants and animals. Primary attention is given to evolutionary, ecological, and functional questions rather than to particular habitats or taxa. Faculty and graduate student research is often collaborative and interdisciplinary in approach. Departmental research activities include physiological ecology energetics, plant-herbivore and plant-pollinator interactions, microbial ecology and coevolution, quantitative genetics, life history evolution, population and reproductive ecology, and community ecology. These research endeavors provide a balance between empirical and theoretical approaches to evolutionary, organismal, and ecological problems.

The graduate program offers both the Plan I M.S. and the Ph.D. in Biological Sciences. A basic course sequence consisting of Ecology and Evolutionary Biology 204, 205, 206, 207, and 208 is recommended for most entering students during their first year. At the end of the first year, students complete an examination based upon three of these courses (205, 206, and 208) and other materials the Department might require. Satisfactory performance on this Comprehensive Examination is required for continuation in the graduate program.

Each entering graduate student chooses a faculty advisor and a three-person advisory committee for guidance, with whom the student meets at least twice each year. All students are encouraged to submit a research proposal to their advisory committee during their first year of residency. A comprehensive proposal is required before the end of the second year. The progress of each student is reviewed by the student's advisory committee, together with the graduate advisor, once each academic year.

Normally, all requirements for the Ph.D. should be completed within five years. No more than seven years will be allowed for completion of the program. All requirements for completion of the M.S. degree should be completed within two years, with a maximum of three years allowed for completion of the program. Advancement to doctoral candidacy by an oral examination is expected during the third year for students entering with a B.A. or B.S. or during the second year for those entering with an M.A. or M.S. Applicants for this program should have a solid undergraduate program in biology and ecology, emphasizing both research and field work. In addition, course work in statistics, mathematics, and physical and chemical sciences is expected. All applicants are required to submit aptitude and advanced biology GRE scores. The deadline for application is January 15.

Courses in Ecology and Evolutionary Biology

200A-B-C Research in Ecology and Evolutionary Biology (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. Prerequisite: consent of instructor.

201 Seminar in Ecology and Evolutionary Biology (2) F, W, S. Invited speakers, graduate students, and faculty present current research in ecology and evolutionary biology. Satisfactory/Unsatisfactory only. Prerequisite: graduate standing. May be repeated for credit. Concurrent with Biological Sciences E107.

203A-B-C Graduate Tutorial in Ecology and Evolutionary Biology (2 to 12 per quarter) F, W, S. Advanced study in areas not represented by formal courses. May involve individual or small group study through reading, discussion, and composition. Prerequisite: consent of instructor.

204 Writing Grant Proposals (2) S. Provides students with hands-on experience writing proposals in their research area of ecology, evolution, organismal biology, or physiology. Prerequisite: graduate standing or consent of instructor.

205 Special Topics in Ecology (4) F. Lecture, four hours. Survey of special topics in ecology. Restriction: graduate students only.

206 Special Topics in Evolution (4) S. Lecture, four hours. Extensive introduction to the primary literature of evolutionary biology. Topics include population genetics, quantitative genetics, neutralism, molecular evolution, evolution of genetic systems, genetic architecture of fitness, speciation, and macroevolution. Restriction: graduate students only.

207 Quantitative Methods in Ecology and Evolutionary Biology (4) W. Lecture, four hours. Statistics for ecologists and evolutionary biologists. Emphasis on specific applications and underlying assumptions rather than on methods of calculation. Topics include experimental design, parametric and nonparametric methods, analysis of variance and covariance, and multiple regression. Prerequisite: at least one quarter of statistics, including regression and analysis of variance. Open to graduate students only.

208 Ecological and Evolutionary Physiology (4) F. Seminar, four hours. A summary of information in organismal biology, comparative and ecological physiology, and the biophysical basis of organismal function. Prerequisite: graduate standing or consent of instructor.

NOTE: Enrollment in the following courses (210–285) may be approved for undergraduate students with advanced standing.

210A-B-C Foundations of Physiology (4-4-4) F, W, S. Lecture and discussion, four to eight hours. Physical and functional principles common to many living forms. Course forms a basis for subsequent specialization in any of the subdisciplines of physiology. May be repeated for credit. Satisfactory/Unsatisfactory only.

218 Advanced Topics in Evolutionary Biology (4) F, S. Seminar, three hours. Content and instructor will vary from quarter to quarter. Possible topics include quantitative genetics, experimental methods of evolutionary studies, mathematical modeling in evolutionary studies, and the evolution of genetic systems. Prerequisite: consent of instructor.

219 Advanced Topics in Ecological Genetics (4) W. Seminar, three hours. Content and instructor will vary from year to year. Possible topics include coevolution, sex-ratio evolution, evolution senescence, plant population biology, and density-dependent selection. Prerequisite: consent of instructor.

221 Topics in Plant Ecology (2 to 4) F, W, S. Weekly discussion of current topics in plant population biology and ecology. Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary.

223 Advanced Applied Statistics (3) W. Lecture, three hours. Applications of general linear models using SAS software. Topics include: theory of general linear models, multiple regression, multivariate analysis, and random effects in mixed models. Sample data come from ecology and evolution and are analyzed using SAS. Prerequisite: Ecology and Evolutionary Biology 207 or consent of instructor. Satisfactory/Unsatisfactory only.

225 Global Biological Change (4) F. Lecture, two hours; field work, one hour. An investigation of the mechanisms that underlie responses of organisms to human-caused environmental changes. Activities include field trips, literature discussions, and lectures. Focuses on issues of interest in Southern California, including nitrogen deposition, invasions, and habitat fragmentation. Same as Earth System Science 260.

227 Seminar in Population/Community Ecology (2) F, W, S. Seminar, two hours. Selected topics in population or community ecology (such as island biogeography, evolution of sex ratios, reproductive biology of marine birds) through discussion of current literature and preparation of papers. Prerequisite: consent of instructor. May be repeated for credit.

228 Seminar in Conservation Biology (2) F, W. Devoted to the application of basic ecological principles to the understanding and resolution of environmental problems of both local and global natures. Current problems approached through a combination of readings, group discussions, and visiting speakers. Prerequisite: graduate standing or consent of instructor.

251 Molecular Evolutionary Methods (4) S of even years. Emphasizes the understanding of basic algorithms used to analyze nucleotide and amino acid sequences, including methods of alignment, phylogeny reconstruction, and the examination of molecular clocks, codon bias, and compositional equilibrium. Includes simple computer problems. Prerequisite: consent of instructor.

275 Coastal Ecosystem Health (4) F. Seminar, three hours. Examines the causes of coastal ecosystem degradation and strategies to restore the ecosystem balance or prevent further coastal ecosystem health degradation. Prerequisite: graduate standing or consent of instructor. Same as Environmental Analysis and Design E205.

285 Topics in Evolutionary Genetics (2). Discussion, one to two hours. Weekly discussion of recent research on evolutionary genetics. Prerequisites: graduate standing and consent of instructor.

398 Teaching Assistant Seminar (2) W. Seminar, two hours. Readings, lectures, workshops, and student presentations designed to help develop teaching skills of graduate students teaching university-level biology classes. Topics vary and may include: course organization, presentation styles, exam design, grading, motivating students, and commonly encountered problems. May be repeated for credit as topics vary.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

DEPARTMENT OF MOLECULAR BIOLOGY AND BIOCHEMISTRY

3205 McGaugh Hall; (949) 824-4915
Timothy F. Osborne, **Department Chair**

Faculty

Dana W. Aswad: Regulation of protein function by covalent modification
Hans-Ulrich Bernard: Papillomavirus/cancer
David Camerini: HIV-1 pathogenesis and molecular biology
Paolo Casali: Human immune response to cancer and viral diseases
Melanie Cocco: Structural studies of proteins and DNA using NMR spectroscopy
Michael G. Cumsky: Mitochondrial protein import; regulation of gene expression in yeast
Rowland H. Davis: Regulation of polyamine metabolism in *Neurospora crassa*
Hung Fan: Molecular biology and pathogenesis of mouse and human retroviruses
David A. Fruman: Signal transduction, immunology, cancer, leukemia, kinase, microarray
Paul Gershon: mRNA transcription and modification
Charles G. Glabe: Amyloid Ab peptide in Alzheimer's pathogenesis; gamete recognition
Gale A. Granger *(Emeritus)*: Immunology and pathogenesis: Cell-mediated immunity; tumor immunology; cytokine action
Barbara A. Hamkalo *(Emerita)*: Molecular basis of differential chromatin condensation
Agnes Henschen-Edman: Protein structure, function, post-translational modification; fibrinogen
Christopher C.W. Hughes: Endothelial cells as initiators and targets of immune responses
Anthony A. James: Malaria parasite development; genetic manipulation of insect vectors

Thomas E. Lane: Molecular/immuno-pathogenic mechanisms of virus-induced demyelinating disease
Hartmut Luecke: Structure-function studies of membrane-associated proteins
Rui (Ray) Luo: Protein structure and noncovalent associations involving proteins
Jerry E. Manning *(Emeritus)*: Major surface proteins and their genes in *Trypanosoma cruzi*
Alexander McPherson: X-ray and atomic force microscopy analysis of protein, nucleic acid, and virus crystals; structural immunology, structural virology; microgravity research on macromolecular crystal growth
Naomi Morrissette: Genetic, cell biological, and structure-function studies of tubulin and microtubules in *Apicomplexan* parasites
Edward Nelson: Tumor immunology
Timothy F. Osborne: Transcriptional regulation of cholesterol biosynthesis
Thomas L. Poulos: Protein engineering and crystallography
Markus Ribbe: Fundamental biochemical processes in microbial systems
Ingrid Ruf: Mechanisms of viral oncogenesis, maintenance of viral latency and regulation of gene expression
Donald F. Senear: Interactions of proteins and DNA in transcriptional regulation
Andrea J. Tenner: Molecular basis of the enrichment of human leukocyte function
Krishna K. Tewari: Chloroplast DNA: replication and transcription
Shiou-Chuan (Sheryl) Tsai: Structural and chemical biology of multisubunit enzyme complexes that make pharmaceutically important natural products
Luis P. Villarreal: Tissue-specific viral and cellular gene expression; viral vectors
Edward K. Wagner: Herpes simplex virus gene expression during productive and latent infection
Craig M. Walsh: T cell function, development, and homeostasis
Clifford A. Woolfolk *(Emeritus)*: General microbiology; enzymology

The research interests of faculty in the Department of Molecular Biology and Biochemistry include structure and synthesis of nucleic acids and proteins, regulation, virology, biochemical genetics, gene organization, nucleic acids and proteins, cell and developmental biology, molecular genetics, biomedical genetics, and immunology.

The Department offers graduate study in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their third year. Participation in an advanced topics seminar series and completion of at least one course per year for three years are expected of all students. Students must advance to candidacy in their third year. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Several faculty in the Department also are members of the graduate program in Protein Engineering, which is described in a previous section.

Courses in Molecular Biology and Biochemistry

200A-B-C Research in Molecular Biology and Biochemistry (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. See areas of interest listed under Faculty. Prerequisite: consent of instructor.

201A-B-C Seminars in Molecular Biology and Biochemistry (2-2-2) F, W, S. Seminar, two hours. Presentation of research from department laboratories or, when pertinent, of other recent developments. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary.

202A-B-C Tutorial in Molecular Biology and Biochemistry (2-2-2) F, W, S. Tutorials in the area of research of a particular professor which relate current research to the literature. May be conducted as journal clubs. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

203 Structure and Biosynthesis of Nucleic Acids (4) W. Lecture, three hours. The structure and properties of nucleic acids. The fundamentals of nucleic acid hybridization and recombinant DNA methodology. Replication and rearrangement of DNA. Prerequisites: Biological Sciences 98 and 99 or the equivalent and Chemistry 51A-B-C or the equivalent. (Coordinator, D. Senear)

204 Protein Structure and Function (4) F. Lecture, three hours. The structure and properties of proteins, enzymes, and their kinetic properties. Prerequisites: Biological Sciences 98 and 99 or the equivalent and Chemistry 51C or the equivalent. (Coordinator, Henschen-Edman)

205 Topics in Viral Gene Expression (4) W. Lecture, three hours. Primary research data on the major DNA and RNA viruses emphasizing strategies of regulation of gene expression. Utilization of viruses as molecular biological tools. Graduate-level knowledge of the biochemistry and molecular biology of macromolecules is required. Prerequisites: Molecular Biology 203 and 204 or the equivalent. (Coordinators, E. Wagner and B. Semler)

206 Regulation of Gene Expression (4) W. Lecture, three hours. Aspects of gene expression including the organization of the eukaryotic nucleus in terms of protein-nucleic acid interaction (i.e., chromatin and chromosome structure); comparisons between prokaryotic and eukaryotic gene expression, the enzymology and regulation of RNA transcription in *E. Coli* and other prokaryotes. Enzymology of transcription in eukaryotes. Prerequisites: Molecular Biology 203, 204, and 205. (Coordinator, R. Sandri-Goldin)

208 Introduction to Proteomics (3) S. Introduces students to concepts and methods of proteomics including protein identification, expression proteomics, and protein-protein interactions. Prerequisite: Molecular Biology and Biochemistry 204. Same as Physiology and Biophysics 252.

209 Literature in Protein Engineering (1) F, W, S. Seminar, one hour, discussion, half-hour. Students review current papers in the field of protein engineering and present the ideas contained therein to other students and faculty. May be repeated for credit. Same as Physiology 209.

210A-B Basic Medical Biochemistry (10-10) F, W. Lecture, ten hours. Classical and molecular biochemistry, including structure, function, and biosynthesis of macromolecules; metabolic interrelations and control mechanisms; and biochemical genetics. Application of recent advances in knowledge of molecular bases for cellular function to disease states (diagnosis, prevention, and treatment). Prerequisite: consent of instructor.

211 Magnetic Resonance in Biology (4). Lecture, three hours. Basic principles of magnetic resonance. Survey of applications in biology including: protein and nucleic acid structure determination and dynamics, electron paramagnetic resonance and magnetic resonance imaging. Prerequisite: consent of instructor. Concurrent with Biological Sciences M133.

212 Chromosome Dynamics in Eukaryotes (4) S of even years. Focuses on experimental approaches currently in use to investigate mechanisms by which eukaryotes carry out essential chromosomal functions. A combination of lectures and student presentations focus on these problems from the fields of genetics, cell biology, biochemistry, and molecular biology. Prerequisites: Molecular Biology and Biochemistry 203 and 204.

217A Principles of Cancer Biology I (4) W of even years. Lecture, three hours. Oncogenes and tumor suppressor genes are studied from molecular viewpoints. Also studies their role in cancer; viral carcinogenesis. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions. Prerequisites: Molecular Biology and Biochemistry 203 and 204.

217B Principles of Cancer Biology II (4) W of odd years. Lecture, three hours. Topics include cancer cell growth and metastasis, chemical carcinogenesis, and cancer genetics and epidemiology. Designed for graduate students interested in cancer research. Format includes lectures and student-led discussions. Prerequisites: Molecular Biology and Biochemistry 203 and 204.

218 Clinical Cancer (3) F of even years. Lecture, two hours. Designed to acquaint students in basic life science with clinical cancer. Restricted to graduate and postdoctoral students. May be repeated for credit. (Coordinator, H. Fan)

219 Fundamental Immunology II (4). Lecture, three hours. Lectures and discussions to achieve a basic understanding of immunoglobulin class switching and somatic hypermutation and response to infections; immunological memory; inherited and acquired immunodeficiencies, mechanisms of allergic reactions; response to self-antigens, tolerance and loss of tolerance, immune response to tumors. Prerequisite: Microbiology and Molecular Genetics 215.

220 Structure and Synthesis of Biological Macromolecules Journal Club (2). Seminar, one hour. Advanced topics in macromolecular structure and synthesis as related to biological problems. Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary.

221 Advanced Topics in Immunology (4) F. Lecture, three hours. Literature-based, interactive discussions focused on review of seminal historic and recent immunology literature. Student responsibilities include reading, critical evaluation, and discussion of manuscripts.

221L Advanced Immunology Laboratory (4) S. Laboratory, four hours. An advanced course in immunology for graduate students enrolled in the Biotechnology master's program. Emphasis is placed on learning modern techniques in immunology such as ELISAs, western blotting, immunofluorescent staining assays. Prerequisite: graduate standing. Concurrent with Biological Sciences M121L. Formerly Molecular Biology and Biochemistry 221.

223 Introduction to Computational Biology (4) S. Lecture, three hours; laboratory, two hours. The use of theories and methods based on computer science, mathematics, and physics in molecular biology and biochemistry. Basics in biomolecular modeling. Analysis of sequence and structural data of biomolecules. Analysis of biomolecular functions. Concurrent with Biological Sciences M123.

224 Virus Engineering Laboratory (4) S. Laboratory, four hours. An advanced laboratory for graduate students enrolled in the Biotechnology master's program. Students learn to engineer recombinant eukuryotic viruses and express genes in mouse tissue. Prerequisite: graduate standing. Concurrent with Biological Sciences M124L.

227 Immunology Journal Club (2) F, W, S. Seminar and discussion, one hour. Advanced topics in immunology as related to an understanding of human disease. Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary.

228 Genetic Engineering and Biotechnology (4) S. An advanced course in genetic engineering and biotechnology for graduate students enrolled in the Biotechnology master's program. Emphasis is placed on learning advanced methods in assembling the gene for expression in bacteria, yeast, and human cells.

229 Research-in-Progress Seminars (1) F, W, S. Seminar and discussion, one hour. Two half-hour presentations by graduate students and postdoctorals to the department on their current research projects. Satisfactory/Unsatisfactory only. May be taken for credit 15 times.

240 Macromolecular Structure, Function, and Interaction (4) F. Lecture, three hours; discussion, one hour. Chemistry of macromolecules; emphasis on proteins. Physical and chemical properties of proteins, forces that maintain protein structure, relationship between structure and function, interactions of proteins with ligands and other macromolecules, and experimental methods to study structure, function, and interactions. Prerequisites: Molecular Biology 203 and 204. Concurrent with Biological Sciences M140. (Coordinators: D. Senear and T. Poulos)

244 Biochemistry of Synaptic Plasticity (4) S. Lecture, two hours; discussion, one hour. Use of the primary literature to explore recent developments in the biochemistry of synaptic transmission that pertain to plasticity, memory, and learning, with a particular emphasis on the role of protein phosphorylation and related signal transduction pathways. Same as Neurobiology and Behavior 244.

250 Advanced Topics in Biotechnology–Nucleic Acids (2) F. Lecture, two hours. Taken concurrently with 250L, supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature. Corequisite: Molecular Biology and Biochemistry 250L. Limited to Biotechnology concentration M.S. students or consent of instructor.

250L Biotechnology Laboratory–Nucleic Acids (8) F. Laboratory, eight hours. Nucleic acid techniques and recombinant DNA technology. Extraction and purification of nucleic acids, cloning and subcloning, PCR, site-directed mutagenesis, nucleic acid hybridization, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results. Corequisite: Molecular Biology and Biochemistry 250. Limited to Biotechnology concentration M.S. students or consent of instructor.

251 Advanced Topics in Biotechnology–Protein Purification and Characterization (2) W. Lecture, two hours. Taken concurrently with 251L, supplements laboratory curriculum with scientific background behind experimental methods. Format consists of lectures and the presentation and analysis of relevant papers from the scientific literature. Corequisite: Molecular Biology and Biochemistry 251L. Prerequisites: Molecular Biology and Biotechnology 250 and 250L. Limited to Biotechnology concentration M.S. students or consent of instructor.

251L Biotechnology Laboratory–Protein Purification and Characterization (8) W. Laboratory, eight hours. Major techniques of handling proteins and antibodies. Protein engineering, expression and large-scale purification of recombinant proteins from bacteria, HPLC, antibody purification, western blotting, additional associated procedures. Students must demonstrate accurate documentation of data (laboratory notebook) detailing experience and results. Corequisite: Molecular Biology and Biochemistry 251. Prerequisites: Molecular Biology and Biotechnology 250 and 250L. Limited to Biotechnology concentration M.S. students or consent of instructor.

254 Protein Crystallography (3) S of even years. Lecture, three hours. Introduces students to the theory and practice of macromolecular crystallography. Covers all aspects, including protein crystallization, space groups, phasing methods, electron density map interpretation, refinement and preparation of results for publication. Corequisite: calculus. Prerequisite: consent of instructor. Same as Physiology and Biophysics 211.

255 Structure-Function Relationships of Integral Membrane Proteins (4) W. Lecture, three hours. Integral membrane proteins such as voltage and ligand-gated ion channels, water channels, pumps, cotransporters, and receptors (e.g., GPCRs). The emphasis is on the relationship between atomic structure and the functional properties of these proteins. Prerequisites: a grade of B or better in Biological Sciences 98 and 99; Biological Sciences M120 and Molecular Biology and Biochemistry 254 recommended. Concurrent with Biological Sciences M160.

280 Advanced Topics in Biochemistry and Molecular Biology (3) F. Lecture, three hours. Selected topics in specified areas of concentration, e.g., nucleic acids, protein biochemistry, genetic expression, biochemical genetics. Specific topics announced in advance. Prerequisites: Biological Sciences 98 and 99 and consent of instructor. Normally taken with Molecular Biology and Biochemistry 205A. Open to advanced undergraduates.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

DEPARTMENT OF NEUROBIOLOGY AND BEHAVIOR

2205 McGaugh Hall; (949) 824-8519
Thomas J. Carew, **Department Chair**

Faculty

Jorge Busciglio: Cellular and molecular mechanisms of neuronal degeneration in Down's syndrome and Alzheimer's disease
Lawrence F. Cahill: Brain mechanisms of emotion and memory
Thomas J. Carew: Cellular and molecular mechanisms of memory
Frances S. Chance: Sensory processing by cortical circuitry; single neuron integration; computational modeling or neural networks
Susana Cohen-Cory: Nervous system development; development of synaptic connectivity, neurotrophic factors, *in vivo* imaging
Carl Cotman: Brain aging, Alzheimer's, cell biology, biochemistry
Karina S. Cramer: Mechanisms of nervous system development; axonal target selection; development of auditory brainstem pathways
Ron D. Frostig: Functional organization of cortex
Christine M. Gall: Regulation of neuronal gene expression
Robert K. Josephson: Design of skeletal muscle
Claudia H. Kawas: Clinical neurology
Herbert P. Killackey: Developmental neuroanatomy
Frank LaFerla: Alzheimer's, neural apoptosis, transgenic animal modeling
Michael Leon: Brain development
John Marshall: Neuropharmacological approaches to behavioral analysis
James L. McGaugh: Neurobiology of learning and memory
Raju Metherate: Synaptic physiology and plasticity in sensory neuroprocesses
Ricardo Miledi: Molecular neurobiology and physiology of ion channels and receptors
Ian Parker: Intracellular calcium and cell signaling
Michael D. Rugg: Cognitive and neural bases of human memory
George Sperling: Cognition, vision, and visual perception
Arnold Starr: Cognitive and sensory neuroprocesses

Oswald Steward: Mechanisms of synapse growth and plasticity
Georg Striedter: Neuroethology, behavioral neuroscience, evolutionary neurobiology
Katumi Sumikawa: Molecular neurobiology of synapses
Shao Jun Tang: Molecular mechanisms of synaptic plasticity during learning and memory
Norman M. Weinberger: Neural bases of attention and learning
John H. Weiss: Excitatory amino acids in neural signaling and neurodegeneration
Pauline Yahr: Behavioral neuroendocrinology

Neurobiology and Behavior is concerned with the biology of the nervous system and behavior. The Department of Neurobiology and Behavior emphasizes the adaptive aspects of neural and behavioral plasticity. The faculty's research interests include the biochemical, endocrinological, genetic, and experiential determinants of nervous system function and behavior. Focal topics include synaptic processes, neurophysiology, neuroendocrinology, neuroanatomy, molecular neurobiology, neuropharmacology, theoretical neurobiology, arousal and attention, learning and memory, reproductive behavior, and communication. The importance of developmental and comparative approaches to these problems is stressed. The Department also participates in the Interdepartmental Neuroscience Program, described in a previous section.

The Department of Neurobiology and Behavior offers the Ph.D. degree in Biological Sciences. Graduate students must complete a sequence of core courses (lectures and laboratories) during their first year, and maintain an overall GPA of 3.3 or better. They also must take a minimum of four advanced courses before graduation and participate in directed research each year and teaching during their first, second, and third years. Students will advance to candidacy for the Ph.D. at the end of their third year by means of a written critical review of the literature in the area in which they plan to do their dissertation, a research proposal, and an oral examination. Graduation depends on successful preparation and oral defense of a dissertation based on the student's research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Ideally, applicants for this program should have taken undergraduate courses in biology (one introductory year plus some advanced work), psychology (experimental, physiological, and learning), chemistry through biochemistry, introductory physics, calculus, and statistics. They also must submit GRE Aptitude test scores. Because graduate training emphasizes research, preference is given to applicants having laboratory research experience as undergraduates. Applicants with substantial outside commitments that would curtail laboratory research or prolong the time to degree are not accepted. The deadline for application is January 3.

Courses in Neurobiology and Behavior

200A-B-C Research in Neurobiology and Behavior (2 to 12 per quarter) F, W, S. Individual research supervised by a specific professor. Prerequisite: consent of instructor.

201A-B-C Research in Neurobiology and Behavior (2 to 12 per quarter) F, W, S. Individual research supervised by a specific professor. Prerequisite: consent of instructor.

206 Molecular Neuroscience (5) F. Surveys molecular and cellular mechanisms involved in neuronal function, including control of gene expression, post-transcriptional and post-translational processing, RNA and protein targeting, cell death mechanisms, and the molecular genetic basis of neurological disorders. Overview of the molecular aspects of developmental neurobiology. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor. May be taken for credit twice.

207 Cellular Neuroscience (5) W. Neurophysiological and neurochemical mechanisms of electrical and chemical signaling in neurons. Topics include generation of resting- and action-potentials, voltage- and ligand-gated ion channels, second messenger systems, and synaptic transmission and integration. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor. May be taken for credit twice.

207L Cellular Neuroscience Laboratory (2) W. Intensive hands-on laboratory experience of contemporary techniques for studying ion channels and synaptic function. Experiments include microelectrode recording, patch clamp, quantal analysis of synaptic transmission, heterologous expression of genes for channels and receptors, brain slice, and fluorescence calcium imaging. Satisfactory/Unsatisfactory only. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor. May be taken for credit twice.

208A-B Systems Neuroscience (5-5) F, W. Study of the mammalian nervous system at the systems level. Anatomy and physiology of sensory, motor, and integrative functions. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor. May be taken for credit twice. Same as Anatomy and Neurobiology 210A-B.

209 Behavioral Neuroscience (5) S. Overview of fundamental conceptual and experimental issues in behavioral neuroscience, emphasizing behavioral endocrinology, aggression, emotion, the neurobiology of learning and memory, and addiction. The approach is a cross-level integration of research in molecular-genetic, cellular, circuit, systems, and behavioral analyses. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor. May be taken for credit twice.

239 Functional Imaging of the Nervous System (4). Lecture and seminar, three hours. Overview of technical and applied aspects of imaging techniques available for studying the nervous system. The areas emphasized are cellular and subcellular imaging of neural function, systems-level imaging of brain function, and imaging of the human brain.

240 Advanced Analysis of Learning and Memory (4). Lecture and seminar, three hours. Advanced analysis of contemporary research concerning the nature and neurobiological bases of learning and memory. Special emphasis is given to time-dependent processes involved in memory storage. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

241 Advanced Analysis of Hormones and Behavior (4). Lecture and seminar, two hours. Advanced analysis of contemporary research on the sites and mechanisms through which hormones act to modify the brain and behavior developmentally and in adulthood. The focus is on steroid hormones and social behaviors, particularly those related to reproduction or communication. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

242 Development of Synaptic Functions (4). Lecture and seminar, two hours. Analysis of the ontogenetic development of synaptic functions in the brain and peripheral nervous system. Emphasis at the molecular and cellular levels. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

243 Principles of Brain Evolution (4). Lecture and seminar, three hours. Brains obviously differ between different species, yet many commonalities exist. Surveys species similarities and differences in brain organization, then extracts some general principles of how brains evolve. Emphasis placed on vertebrate brains and on the functional implications of neuroanatomical change. Concurrent with Biological Sciences N117.

244 Biochemistry of Synaptic Plasticity (4). Lecture and seminar, three hours. Use of the primary literature to explore recent developments in the biochemistry of synaptic transmission that pertain to plasticity, memory, and learning, with a particular emphasis on the role of protein phosphorylation and related signal transduction pathways. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor. Same as Molecular Biology and Biochemistry 244.

245 Advanced Topics in the Neurobiology of Aging (4). Lecture and seminar, three hours. Covers the major topics and rapidly advancing areas in the molecular and cellular events leading to brain aging and dementia. Lectures are presented by investigators active in the fields of aging and neurodegeneration. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

246 Advanced Analysis of Attention and Learning (4). Lecture and seminar, three hours. Consideration of behavioral and neural aspects of attention. Examination of the concept of "attention" from a behavioral point of view, and classical and current approaches to brain mechanisms which form the substrates of behavioral attention.

248 Topics in Neurobiology and Behavior (4). Studies in selected areas of neurobiology and behavior. May be taken for credit three times.

249 Electronics for Biologists (4). Lecture, three hours; laboratory, four hours. Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences. Same as Physiology and Biophysics 205.

250 Basal Ganglia and Movement Disorders (4). Lecture and seminar, three hours. Principles underlying the organization and functions of the basal ganglia and amygdala are considered. The circuitry, neurotransmitters, and influences on cortex and brainstem motor regions are discussed. Clinical disorders of the basal ganglia, including parkinsonism and ballism, are included. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

251 Clinical Neurology for Neuroscientists (4). Lecture and seminar, three hours. Presentation of problems of clinical neurology through patient presentation, examination, and discussion. Patients with lesions or defects at various levels of the nervous system are examined. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

252 Chemical Senses (4). Lecture and seminar, three hours. Advanced analysis of contemporary research on the organization and functioning of the olfactory, taste, vomeronasal, and trigeminal systems. The focus is on how chemosensory information is coded and used for behavioral responses. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

253 Mechanisms of Sensory Cortex Function (4). Lecture and seminar, three hours. Examination of sensory cortex functions, focusing on auditory cortex. Its cellular mechanisms are examined and compared to those of other sensory modalities and subcortical regions. Physiological approaches are emphasized, but anatomical, molecular, and behavioral approaches are also considered. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

254 Molecular Neurobiology (4). Lecture and seminar, three hours. The application of genetic and recombinant DNA technology to neurobiology. Topics include the study of neuronal proteins which play important roles in the formation of synapses and synaptic transmission. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

255 History of Neuroscience (4). An overview of the conceptual and technical foundations of contemporary neuroscience from ancient times to the present. The subjects include synapses, neurons, brain organization, sensory, motor and regulatory systems, learning and memory, human brain function and dysfunction. Concurrent with Biological Sciences N119. May be taken twice for credit.

256 Seminar in Excitotoxicity and Neuronal Injury (4). Lecture and seminar, three hours. A review of recent theories concerning mechanisms of neuronal death in brain diseases. Focuses on recent breakthroughs and controversies in the field, with a special emphasis on the role of the excitatory neurotransmitter, glutamate. Same as Anatomy and Neurobiology 225.

258 Advanced Analysis of Neurogenetics (4). Lecture and seminar, three hours. Analysis of the genetic basis of neurological development and disorders. Emphasis on the approaches used to identify novel, neurologically relevant genes and analysis on the molecular level. Focuses on understanding how genetic changes alter cellular functions and the clinical consequences that ensue. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

259 Cortical Plasticity (4). Lecture and seminar, three hours. Consideration of research on anatomical, physiological, and behavioral aspects of plasticity in the cerebral cortex during development, recovery of function and learning, emphasizing visual, somatosensory, and auditory cortices. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor.

267 Seminar in Neurobiology and Behavior (1.3). Open only to Neurobiology and Behavior graduate students. May be repeated for credit.

290 Colloquium in Neurobiology and Behavior (1.3) F, W, S

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants. May be repeated for credit.

400E Spinal Cord Injury Research Techniques (4) Summer. Intensive four-week training course in experimental approaches to spinal cord injury. Laboratory techniques cover pathophysiology, experimental models used, and accepted outcome measures (both functional and anatomical). Lectures and seminars by invited speakers and distinguished scholars-in-residence. Prerequisites: Neurobiology and Behavior graduate student and consent of instructor. Satisfactory/Unsatisfactory only. Same as Anatomy and Neurobiology 400E.

DEPARTMENT OF ANATOMY AND NEUROBIOLOGY

364 Medical Surge II; (949) 824-6050
E-mail: anatomy@uci.edu
World Wide Web: http://www.ucihs.uci.edu/anatomy/index.html
Leonard Kitzes, **Acting Department Chair**

Faculty

Aileen J. Anderson: Mechanisms of neurodegeneration and inflammation after central nervous system injury
Tallie Z. Baram: Developmental neurobiology of excitation and excitotoxicity; CNS mechanisms of stress response
Robert H. Blanks *(Emeritus):* Vestibular physiology and anatomy
Ralph A. Bradshaw: Growth factor action; signal transduction; protein processing
Anne L. Calof: Developmental neurobiology; molecular mechanisms of neurogenesis and programmed cell death
James H. Fallon: Neuronal growth factors and neurotransmitter interactions
Christine M. Gall: Regulation of neuronal gene expression; neurotropic factors
Roland A. Giolli, *Department Vice Chair:* Experimental neuroanatomy; visual system
Hans S. Keirstead: Axon and myelin regeneration following spinal cord injury
Herbert P. Killackey: Developmental neuroanatomy; somatosensory system
Leonard M. Kitzes: Auditory system physiology and development
Frances M. Leslie: Effects of drugs of abuse on central nervous system development
Diane K. O'Dowd: Regulation of neuronal excitability; development of functional synaptic connections
Charles E. Ribak: Changes in the neural circuitry in the epileptic brain
Richard T. Robertson: Developmental neurobiology; forebrain development
Martin A. Smith: Cellular and molecular mechanisms of synapse formation
Ivan Soltesz: Molecular and cellular neurobiology
Oswald Steward: Mechanisms of recovery from CSN injury
John E. Swett *(Emeritus):* Peripheral nervous system, spinal cord, pain mechanisms
Ji Sze: Molecular neurobiology; gene expression in *C. Elegans*
John H. Weiss: Mechanisms of neural degeneration
Fan-Gang Zeng: Auditory prostheses

Research programs in the Department of Anatomy and Neurobiology focus on the neurosciences. Faculty interests range across the broad field of neuroscience research, including cellular and molecular neurobiology, mechanisms of development, experimental neuroanatomy, structure and function of sensory and motor systems, and response to injury and regeneration. The Department maintains facilities for electron microscopy, laser confocal microscopy, and computer-based imaging and informatics. Students performing graduate work in the Department are encouraged to become proficient in multiple areas of neuroscience using interdisciplinary techniques.

The Department offers graduate training in neuroscience under the auspices of the School of Biological Sciences in the Neurobiology track of the combined program in Molecular Biology, Genetics, and Biochemistry (MBGB). The program offers the Ph.D. degree in Biological Sciences. In concert with several other departments, a combined neuroscience core curriculum has been developed which includes course offerings in systems neurobiology, neurophysiology, and cellular, molecular, and developmental neurobiology. These courses may be taken as complete or partial fulfillment of the elective requirements of the Ph.D. program.

The Department also participates in the Interdepartmental Neuroscience Program. Students who select a focus in Neuroscience and a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year. Students are required to attend departmental seminars and participate in the Department's Journal Club. The dissertation research topic is chosen by the student in consultation with the research advisor. The majority of the third and fourth years are devoted to research. By the end of the third year, students take their advancement-to-candidacy examination by presenting and defending a proposal for specific dissertation research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Courses in Anatomy and Neurobiology

200 Research in Anatomy (2 to 12) F, W, S, Summer. Individual research supervised by a particular faculty member. Prerequisite: consent of instructor. May be repeated for credit.

201 Human Gross Anatomy (8) F, W, S. Lecture, three hours; laboratory, nine hours. Study and dissection of the human body, including muscular, skeletal, nervous, and cardiovascular systems. Emphasis on both normal and abnormal structure and function. Prerequisites: graduate standing, consent of instructor.

202B Human Neuroscience (4) S. Lecture, three hours; discussion, one hour; laboratory, one hour. Study of the human nervous system at the systems level including the physiology and anatomy of sensory, motor, and integrative functions. Prerequisite: Anatomy 202A and consent of Department.

203A-B Human Microscopic Anatomy (3-3) F, W. Lecture, two hours; laboratory, three hours. Lecture and laboratory course on human microscopic anatomy. Emphasis is on functional implications of structure of cells and tissues. Prerequisites: graduate standing, consent of instructor.

206 Tutorial in Anatomy. Tutorial, three hours. Series of tutorials on advanced topics in anatomy. Each may be repeated for credit.

206A Surgical Anatomy (3) F. Exploration of topics in gross anatomy. Dissection/library work required. Prerequisites: Anatomy 201A-B.

206B Neuroanatomy (3) W. Exploration of special topics in neuroanatomy. Primarily library work, but study of prepared slides also included. Prerequisite: Anatomy 202.

206C Microanatomy (3) S. Special topics in microanatomy. Primarily library work, but study of prepared histological slides and photographs included. Prerequisites: Anatomy 203A-B.

207 Auditory System: Information Processing and Neurobiology (2). Seminar focused on the neurobiology of the auditory system. Topics include signal processing, anatomy, physiology, plasticity, development, cochlear prosthetics, psychoacoustics, pathology, and speech. Publications related to hearing are presented and discussed.

210A-B Systems Neuroscience (5-5) F, W. Study of the mammalian nervous system at the systems level. Anatomy and physiology of sensory, motor, and integrative functions. Prerequisite: Neurobiology and Behavior graduate student or consent of instructor. May be taken for credit twice. Same as Neurobiology and Behavior 208A-B.

225 Seminar in Excitotoxicity and Neuronal Injury (4) S. A review of recent theories concerning mechanisms of neuronal death in brain diseases. Focuses on recent breakthroughs and controversies in the field, with a special emphasis on the role of the excitatory neurotransmitter, glutamate. Same as Neurobiology and Behavior 256.

400E Spinal Cord Injury Research Techniques (4) Summer. Intensive four-week training course in experimental approaches to spinal cord injury. Laboratory techniques cover pathophysiology, experimental models used, and accepted outcome measures (both functional and anatomical). Lectures and seminars by invited speakers and distinguished scholars-in-residence. Prerequisites: Anatomy and Neurobiology graduate student and consent of instructor. Satisfactory/Unsatisfactory only. Same as Neurobiology and Behavior 400E.

DEPARTMENT OF BIOLOGICAL CHEMISTRY

Building D, Room 240, Medical Sciences I; (949) 824-6051
Suzanne B. Sandmeyer, **Department Chair**

Faculty

Bogi Andersen: Transcriptional regulation in Epithelial tissues
Pierre Baldi: Computation biology, bioinformatics, probabilistic modeling, machine learning
Rainer K. Brachmann: Cancer genetics, chromatin and transcriptional regulation, tumor suppressor gene p53
Jefferson Y. Chan: The role of CNC-bZIP transcription factors in oxidative stress response and the genesis of cancer
Phang-Lang Chen: Signal transduction in response to DNA damage and tumor genesis
Xing Dai: Transcriptional control of cellular differentiation in mice
Peter Kaiser: Cell cycle regulation by ubiquitin
Eva Y.-H. P. Lee: Breast cancer and DNA damage checkpoint control
Wen-Hwa Lee: Molecular cancer genetics, mainly the mechanism of tumor suppressor gene functions, cancer progression and novel therapy
Ellis R. Levin: The plasma membrane estrogen receptor (ER) and its effects on the biology of estrogen action
Steven Lipkin: Cancer genetics and genomics
Haoping Liu: Signal transduction, cell cycle regulation, hypha development in yeast
Calvin S. McLaughlin: Functional genomic analysis
Frank Meyskens: Carcinogenesis and molecular biology of melanoma and chemoprevention of human cancer
Robert K. Moyzis: Human genomics and complex neurogenetic disorders
Masayasu Nomura: RNA polymerase I; nucleolus and ribosome synthesis; nuclear structure and function
Suzanne B. Sandmeyer: Retrovirus-like elements in yeast
Robert E. Steele: Evolution of multicellular animals and their genomes
Leslie M. Thompson: Molecular/biochemical analysis of skeletal dysplasias and Huntington's disease
Paul Vrana: Genetics, control and evolution of genomic imprinting, growth control and placental development
Douglas C. Wallace: Molecular and mitochondrial medicine and genetics
Kyoko Yokomori: Chromosome structure organization and its role in genome function and stability

Faculty research interests in the Department of Biological Chemistry are in the structure and function of chromosomes, signal transduction and its role in cell growth control, regulation of gene expression (transcription, protein synthesis, and protein localization), and the molecular basis of development. Genome sequencing projects are making it possible for faculty to exploit information learned about gene function in model organisms for understanding human disease processes. Students are exposed to technical expertise in all facets of current research in molecular biochemistry from protein chemistry to genetic engineering and gene mapping. Currently, researchers in the Department are using new DNA array technology and bioinformatics to understand global changes in gene expression in response to the environment.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin thesis research in the second year. Students are required to attend and participate in the departmental research seminars. In addition, students are required to complete three advanced-level graduate courses subsequent to entering the Department's Ph.D. concentration. In the third year, students take the advancement-to-candidacy examination for the Ph.D. degree by presenting and defending a proposal for specific dissertation research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Courses in Biological Chemistry

200A, B, C Research in Biological Chemistry (2 to 12) F, W, S. Individual research under the supervision of a professor. May be repeated for credit.

202A, B, C Laboratory Seminar Series (1, 1, 1) F, W, S. Study within a laboratory group including research and journal presentations. Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary.

207 Advanced Molecular Genetics (4) S. Lecture, three hours. Introduction to genetic analysis using model organisms such as yeast. Topics include basic concepts and techniques of genetic analysis, prions, signaling, cell differentiation, cell cycle, ubiquitin/proteasome pathway, genomics, and using yeast as a toolbox. Prerequisite: Molecular Biology and Biochemistry 203. May be taken for credit two times.

210A Medical Biochemistry (4 to 12) F. Lecture, four hours. Biological chemistry for first-year medical and graduate students. Presents the metabolism and molecular biology relevant to human health and disease that form the foundation of medical science for the next century. Prerequisite: consent of instructor.

211A Molecular Cell Biology (4 to 12) F. The molecular and cellular mechanisms responsible for cell division. Emphasizes DNA, RNA, protein biosynthesis, and the future of molecular medicine including recombinant DNA technology. Fundamental principles of molecular and cell biology. Application of morphological and molecular relationships to problems of the human body. Weekly clinical correlate and seminar groups with student presentations.

212 Signal Transduction and Growth Control (4) S. Lecture, one and a half hours; discussion, one and a half hours. Covers various eukaryotic signaling pathways (tyrosine kinase, ras-raf-MAPK, TGF-ß, wnt, JAK-STAT, and FAS) with an emphasis on the experimental underpinnings. The material is covered in lectures and discussions of pertinent papers. Prerequisite: consent of instructor. *Offered every other year.*

215 Advanced Mouse Developmental Genetics (4) S. Lecture, three hours. Introduction to the use of the mouse in contemporary biomedical research. The biology and development of the laboratory mouse, methods for manipulation of the mouse genome and embryos, and examples of application of these methods to understanding mammalian development and homeostasis. Prerequisite: graduate standing or consent of instructor.

218 Human Molecular Genetics (4) S. Topics of current interest in human molecular genetics, with emphasis on an understanding of the methods and results generated by the Human Genome Project (HGP) and associated disease gene discoveries. Prerequisite: graduate standing or consent of instructor. *Offered every other year.*

225 Chromatin Structure and Function (4) W. Lecture, three hours. Focuses on the role of chromatin/nuclear structure organization in eukaryotic genome regulation. The effects of histone and DNA modification, chromatin remodeling, higher order chromatin structure and nuclear organization on gene regulation, and DNA replication and repair are discussed. Prerequisites: graduate standing and Molecular Biology and Biochemistry 203 and 204, or consent of instructor.

285 Redox Transcriptional Factors in Health and Disease (2) S. Transcription factors such as NFKB and AP families are in part controlled by cellular redox status. Such signals affect viral, inflammatory, immunological, and malignant responses. Consists of a few background lectures followed by student presentations. Prerequisite: consent of instructor.

291 Topics in Gene Regulation (2) F, W, S. Seminar, two hours.

293A, B, C Cancer Biology Journal Club (1, 1, 1) F, W, S. Focuses on molecular mechanisms that underlie the development and progression of cancers. Covers a variety of cancer-related research areas, such as cell cycle control, apoptosis, DNA repair, metastasis, angiogenesis, and others. Satisfactory/Unsatisfactory only.

DEPARTMENT OF MICROBIOLOGY AND MOLECULAR GENETICS

Building B, Room 240, Medical Sciences I; (949) 824-5261
Bert L. Semler, **Department Chair**

Faculty

Hoda Anton-Culver: Epidemiology studies
Ruslan D. Aphasizhev: Molecular parasitology and biochemistry of RNA editing
Alan G. Barbour: Microbial pathogenesis and ecology of infectious diseases
Victoria Camerini: Pathways of intestinal T cell development
K. George Chandy: Potassium channels; structure, function and therapeutics
Dennis D. Cunningham: Proteases and protease nexins: regulation of neural cells
Michael Demetriou: The molecular biology and glycobiology of T cell dysfunction in organ-specific autoimmunity
Alan L. Goldin: Molecular analysis of ion channels and their roles in human diseases
Sidney H. Golub: Immunology of human cancer; science policy and ethics
George A. Gutman: Potassium channel and immunoglobulin super-family genes
G. Wesley Hatfield: Computational biology, effects of DNA topology on gene expression
Klemens J. Hertel: Regulation of gene expression by alternative splicing
Anthony A. James: Genetic manipulation of insect vectors; control of transmission of dengue and malaria
Janos K. Lanyi: Structure and function in bacterial Rhodopsins
Masayasu Nomura: RNA polymerase I; nucleous and ribosome synthesis; nuclear structure and function
Andre Oullette: Mechanisms of innate immunity in the mammalian intestinal epithelium
W. Edward Robinson: Molecular pathogenesis of lentivirus infection and drug discovery against HIV
Suzanne Sandmeyer: Retrovirus-like elements in yeast
Rozanne M. Sandri-Goldin: Regulatory functions of a post-transcriptionally acting herpes virus protein
Michael E. Selsted: Innate immunity mediated by phagocytic leukocytes and mucosal epithelium
Bert L. Semler: Replication and translation of picornavirus RNAs; RNA-protein and protein-protein interactions
Eric J. Stanbridge: Tumor suppressor genes and oncogenes in human cancer
Ming Tan: Bacterial pathogenesis; gene regulation in Chlamydia
Marian L. Waterman: WNT signaling in cancer and lymphocytes

The Department of Microbiology and Molecular Genetics provides advanced training to individuals interested in the regulation of gene expression and the structural and functional properties of proteins encoded by these genes. The research in the Department covers a wide range of topics with special emphasis on: bacterial gene expression and pathogenesis, viral gene expression and host interactions, nuclear-cytoplasmic transport, eukaryotic gene expression, mRNA splicing, editing, and processing, cancer genetics, ion channel expression and function, genomics, and bioinformatics.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the MBGB program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

Participation in the Department's seminar series and completion of at least one advanced topics course per year for three years are expected of all students. In their third year, students take the advancement-to-candidacy examination for the Ph.D. degree by presenting and defending a proposal for specific dissertation research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Courses in Microbiology and Molecular Genetics

200A-B-C Research in Microbiology and Molecular Genetics (2 to 12 per quarter) F, W, S. Individual research supervised by a particular professor. Prerequisite: consent of instructor. May be repeated for credit.

201A-B-C Research Topics in Microbiology and Molecular Genetics (1-1-1) F, W, S. Lecture and seminar. Seminars presented by graduate students and faculty of the Department which explore research topics in specialized areas of microbiology and molecular genetics. Opportunity for students to gain experience in the organization, critical evaluation, and oral presentation of current research developments. Prerequisite: consent of instructor. May be repeated for credit. Satisfactory/Unsatisfactory only.

203A-B-C Advanced Studies in Microbiology and Molecular Genetics (1-1-1) F, W, S. Organized within each laboratory group, one to four hours. Advanced study in areas related to faculty research interests. Involves small group study based on readings, discussions, and guest speakers. May be conducted as journal clubs. Satisfactory/Unsatisfactory only. May be repeated for credit.

210A-B Medical Microbiology (4-6) F, S. Lecture, five hours; laboratory, three hours. Advanced course for medical students in the School of Medicine. Biochemical and genetic properties of infectious agents, identification and behavior of pathogens, activities of toxins, chemotherapy, biochemical genetics of drug resistance, humoral and cell-mediated immunity, introduction to diagnosis, treatment, and epidemiology of infectious diseases. Prerequisites: prior course work in microbiology and biochemistry and consent of instructor.

215 Fundamental Immunology I (4) F. Lecture/seminar, three hours. Discussion and student presentation with the aim of achieving a basic understanding of the haematopoietic system, and the cellular and molecular basis of adaptive immunity. Prerequisite: consent of instructor.

216 Pathogenic Microbiology (4) F. Lecture, four hours. Biochemical and genetic properties of infectious agents; identification and behavior of pathogens; activities of toxins; the chemotherapy, biochemistry, and genetics of drug resistance; and epidemiology of infectious diseases. Prerequisite: consent of instructor.

219 Medical Virology (4) F. Lecture, four hours. Animal viruses as disease causing agents, including mechanisms of infection at both the cellular and organismic levels. Topics include comparative studies of different groups of viruses, viral transformation, and mechanisms of viral gene expression. Prerequisite: consent of instructor.

221 Immunopathogenic Mechanisms of Disease (3) W. Examination of the mechanisms underlying disease states mediated by immune dysregulation. Topics include innate and adaptive immunity, autoimmunity, immunodeficiency, inflammatory disorders, and certain infectious diseases. Emphasis on biological basis of immunopathologies taught from reports in the original scientific literature. Prerequisite: Microbiology and Molecular Genetics 215. Same as Pathology 221.

222 Molecular Pathogenesis of Viral Infections (4) S. Features lectures by faculty on the molecular aspects of viral pathogensis, highlighting both viral and cellular functions. Students give oral presentations and write a research proposal on a selected topic. Prerequisite: Microbiology and Molecular Genetics 205.

225 Molecular Mechanisms of Human Disease (3) S. Provides an overview of the molecular mechanisms of human diseases, including neurologic, hematologic, neoplastic, and infectious diseases. Students gain an understanding of these mechanisms, as well as models of human diseases. Same as Pathology 225.

240 M.D./Ph.D. Tutorial (1) F, W, S. Explores a variety of topics that impact careers of medical scientists (M.D./Ph.D students). Topics range from scientific, such as recent advances in particular research areas, to ethical problems brought on by increased technology and intervention in the disease process. May be repeated for credit.

250 Responsible Conduct of Research (2) S. Each session includes a formal presentation by faculty/invited speaker followed by a discussion of case studies related to the topic under consideration. Satisfactory/Unsatisfactory only.

280A-B-C Tutorial in Microbiology and Molecular Genetics (2-2-2) F, W, S. Tutorial, two hours. Presented by various members of the faculty; relates current laboratory research to the literature.

DEPARTMENT OF PATHOLOGY AND LABORATORY MEDICINE

Building D, Room D440, Medical Sciences I; (949) 824-6574
Michael E. Selsted, **Department Chair**

Experimental Pathology Faculty

Rainer K. Brachmann: Cancer genetics; chromatin and transcriptional regulation; tumor suppressor gene p53
Jefferson Y. Chan: Regulation of genes associated with oxidative stress
K. George Chandy: Molecular biology and structure of ion channels; novel therapeutic agents
Luis M. de la Maza: Chlamydia trachomatis vaccines and sexually transmitted diseases
Robert A. Edwards: Mucosal immunology, inflammatory bowel disease, G-proteins, prostaglandins, and chemokines
Agnes Henschen-Edman: Protein structure, function, post-translational modification; fibrinogen
Taosheng Huang: Molecular basis of genetic diseases in human
Anthony A. James: Malaria parasite development; genetic manipulation of insect vectors
John J. Krolewski: Signal transduction pathways regulating the growth and death of normal and neoplastic cells
J. Lawrence Marsh: Regulation of growth factor signaling in patterning, regeneration and oncogenesis
Edwin S. Monuki: Cerebral cortex development and disease
Andre Ouellette: Mechanisms and regulation of innate immunity in mammalian epithelia
Ellena M. Peterson: Chlamydia vaccine development
W. Edward Robinson: Pathogenesis of retrovirus infections; molecular mechanisms of integration
Michael K. Samoszuk: Eosinophils in human disease
Michael E. Selsted: Molecular effectors of mammalian innate immunity
Andrea J. Tenner: Innate immunity; the roles of complement and phagocytes in health and disease
Ping Wang: Molecular hormone actions in the normal and diseased heart

The Department of Pathology and Laboratory Medicine offers a Ph.D. in Biological Sciences with a concentration in Experimental Pathology. The graduate program emphasizes experimental approaches to better understand the molecular and cellular mechanisms of disease. Students work in laboratories studying topics ranging from infectious processes such as cryptococcosis and the acquired immune deficiency syndrome to innate immunity, including studies on granulocytes and antimicrobial peptides. The principal areas of research investigated by faculty in the Experimental Pathology concentration range from developmental neurobiology to cancer, including prostate cancer.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

Experimental pathology makes extensive use of both animal models of human disease and studies on human tissues from human subjects. Therefore, the curriculum is heavily weighted on experimental models, including animal models, of human disease. The didactic teaching components of the track are supplemented by a twice-monthly Pathology research conference, in which postdoctoral fellows and graduate students present "research in progress" seminars. This seminar series allows trainees the opportunity to gain invaluable experience in presenting their research to other scientists and provides a mentoring process through which students gain insights from diverse scientific viewpoints.

Students must advance to candidacy during their third year. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Courses in Pathology

200A-B-C Research in Experimental Pathology (2 to 12) F, W, S. Independent research for the Ph.D. program within the laboratories of graduate training faculty in the Department of Pathology and Laboratory Medicine. Corequisite: Pathology 203A-B-C. May be repeated for credit as topics vary.

203A-B-C Advanced Studies in Experimental Pathology (1-1-1) F, W, S. A tutorial course for Ph.D. students in the Department of Pathology entailing attendance at Departmental seminars and critical reading of the scientific literature. Corequisite: Pathology 200A-B-C. May be repeated for credit.

204A, B, C Experimental Pathology Research Seminar (1, 1, 1) F, W, S. Seminar series for graduate students in Experimental Pathology. Students attend seminars and, beginning in their third year of graduate study, present one formal seminar on their graduate research. May be repeated for credit as topics vary.

221 Immunopathogenic Mechanisms of Disease (3) W. Examination of the mechanisms underlying disease states mediated by immune dysregulation. Topics include innate and adaptive immunity, autoimmunity, immunodeficiency, inflammatory disorders, and certain infectious diseases. Emphasis on biological basis of immunopathologies taught from reports in the original scientific literature. Prerequisite: Microbiology and Molecular Genetics 215. Same as Microbiology and Molecular Genetics 221.

225 Molecular Mechanisms of Human Disease (3) S. Provides an overview of the molecular mechanisms of human diseases, including neurologic, hematologic, neoplastic, and infectious diseases. Students gain an understanding of these mechanisms, as well as models of human diseases. Same as Microbiology and Molecular Genetics 225.

230D Principles of Experimental Pathology (4) F. Introduces graduate students to the general pathologic processes that mediate disease. Topics include cell injury and repair, inflammation, immunopathology, neoplasia, and genetic diseases. Combines lecture, small group discussion, and oral presentations.

231A Pathology of Cardiovascular Diseases (2) F. For graduate students interested in human cardiovascular disease. Students receive training in physiology, anatomy, and pathologic processes of the heart and blood vessels. Experimental approaches to study such processes are emphasized.

232A Pathology of Pulmonary Diseases (1.5) F. For graduate students interested in pulmonary disease. Students receive training in physiology, anatomy, and pathologic processes of the lungs and airways. Experimental approaches to study such processes are emphasized.

233A Pathology of Renal Diseases (1) F. For graduate students interested in renal disease. Students receive training in physiology, anatomy, and pathologic processes of the kidneys. Experimental approaches to study such processes are emphasized.

234A-B Pathology of Gastrointestinal Diseases (2-2) F, W. For graduate students interested in gastrointestinal disease. Students receive training in physiology, anatomy, and pathologic processes of the gastrointestinal tract. Experimental approaches to study such processes are emphasized. In-progress grading.

235A-B Pathology of Genitourinary Tract Diseases (2-2) F, W. For graduate students interested in genitourinary tract or breast disease. Students receive training in physiology, anatomy, and pathologic processes of the breast and genitourinary tract. Experimental approaches to study such processes are emphasized. In-progress grading.

236B Graduate Neuropathology (1.5) W. For graduate students interested in diseases of the nervous system. Students receive training in physiology, anatomy, and pathologic processes of the central and peripheral nervous system. Experimental approaches to study such processes are emphasized.

271A, B Molecular Physiology and Disease (4, 4). F of even years, 271A; F of odd years, 271B. Introduces students to concepts of molecular physiology and pharmacology related directly to human diseases. Prerequisite: consent of instructor. Same as Pharmacology 271A, B and Physiology and Biophysics 271A, B.

DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS

Building D, Room D340, Medical Sciences I; (949) 824-5863
Janos K. Lanyi, **Department Chair**

Faculty

Nancy L. Allbritton: Signal transduction by second messengers and protein kinases
Kenneth M. Baldwin: Developmental, hormonal, and exercise factors regulating striated muscle gene expression
Ralph A. Bradshaw: Structure and function of polypeptide growth factors and their receptors; mechanisms of protein turnover
Michael D. Cahalan: Ion channels and Ca^{2+} signaling in the immune system
Vincent J. Caiozzo: Cellular and molecular mechanisms regulating the mechanical properties of skeletal muscle
K. George Chandy: Molecular biology of ion channels and their role in immune cells
J. Jay Gargus: Molecular analysis of membrane signaling proteins
Alan L. Goldin: Molecular biology of neural channels and receptors
George A. Gutman: Molecular and evolutionary studies of immunoglobulin and ion channel genes
Harry T. Haigler: Structure, function, and topography of annexin calcium binding proteins on membranes
James E. Hall: Biophysics of membrane channels, gap junctions and water channels
Lan Huang: Developing and employing mass spectrometry-based proteomic approaches for study of signal transduction networks, identification of protein complexes and characterization of their post-translational modifications
Frances A. Jurnak: Macromolecular crystallography; biochemical and structural studies of a model G protein; EF-Tu; structure/function of plant virulence factors
Janos K. Lanyi: Transport, structure, and energy coupling in bacteriorhodopsin and halorhodopsin
Shin Lin: Cellular and molecular biophysics of proteins involved in membrane-associated cytoskeletal functions and signal transduction
Kenneth J. Longmuir: Intracellular metabolism, sorting, and transport of lipid in mammalian cells; membrane fusion
John A. Longhurst: Integrative biology and sensory signaling systems important in cardiovascular regulation; central neural regulation of autonomic outflow inactivation of cardiac afferents and the influence of electroacupuncture
Hartmut Luecke: Protein crystallography; structure and function of membrane-associated proteins
Alexander McPherson: X-ray diffraction analyses of enzymes, viruses; antibodies and protein-nucleic acid complexes; crystallization methods; microgravity crystallization
Thomas L. Poulos: Protein crystallography; protein engineering; heme enzyme structure and function
Irwin A. Rose: Studies on the mechanism of two enzymes: fumarase and glyoxalase III
Hamid M. Said: Cellular and molecular mechanisms and regulation of intestinal and renal vitamin transporters
Christopher Sims: Development and application of innovative technologies for biomedical research and clinical applications
Ivan Soltesz: Plasticity and modulation of inhibitory synaptic neurotransmission
Bruce J. Tromberg: Optical spectroscopy of tissues and cells
Nosratola D. Vaziri: Vascular biology and role of nitric oxide and reactive oxygen species in regulation of blood pressure; molecular basis of lipid disorders
Larry E. Vickery: Molecular chaperones and protein folding; protein engineering
Ping H. Wang: Molecular actions of insulin-like growth factor I (IGF) in cardiac muscle; complications of diabetes
Stephen H. White: Protein folding in membranes; peptide-bilayer interactions; membrane structure

The Department of Physiology and Biophysics offers research opportunities in the molecular biophysics of membranes and proteins, ion channels and signal transduction, endocrinology, molecular and cell biology, developmental neurobiology, and exercise physiology.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

The faculty conducts quarterly reviews of all continuing students to ensure that they are maintaining satisfactory progress within their particular academic program. Students participate in a literature review course designed to strengthen research techniques and presentation skills, and attend the weekly Department colloquium. Students advance to candidacy during the third year; each student presents a seminar on a topic assigned by the formal candidacy committee. Following the seminar, the committee examines the student's qualifications for the successful conduct of doctoral dissertation research. Each student must submit a written dissertation on an original research project and successfully defend this dissertation in an oral examination. Interdisciplinary dissertation research involving more than one faculty member is encouraged. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Several faculty in the Department are also members of the graduate program in Protein Engineering, which is described in a previous section.

Courses in Physiology and Biophysics

200 Research in Physiology and Biophysics (2 to 12 per quarter) F, W, S. Individual research directed toward doctoral dissertation and supervised by a particular professor. Prerequisite: consent of instructor. May be repeated for credit.

201 Introduction to Physiology Research (1 to 4 per quarter) F, W, S. Introduction to research in physiology and related sciences. Students concentrate on techniques emphasized in the various laboratories of the Department. Prerequisite: consent of instructor. May be repeated for credit.

203 Review of the Literature of Physiology and Biophysics (2) F, W, S. Students review papers in the current literature and present ideas contained therein to other students and faculty. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit.

204 Concepts of Biophysics (3) S. Lecture, two hours; laboratory, one hour. Principles of crystallography; introduction to time-resolved absorption and fluorescence spectroscopy; the concepts of kinetic order and kinetic rate theory. Prerequisites: graduate standing in Biological Sciences and consent of instructor. Formerly Physiology 204B. *Offered only if sufficient demand exists.*

205 Electronics for Biologists (4) W. Lecture, three hours; laboratory four hours. Basic principles of electricity; properties and use of discrete components and integrated circuits; circuit analysis and design. Intended for advanced students in the life sciences. Same as Neurobiology and Behavior 249.

206A-B Introduction to Medical Physiology (5-6) W, S. Lecture, six hours; discussion, two hours; other, two hours. Vertebrate physiology with emphasis on humans and on the relationship between the function of normal tissues and the processes of disease. Fundamental principles of physiology and the interrelationships which control organ function. Prerequisite: Physiology 202 and consent of Department.

209 Literature in Protein Engineering (1) F, W, S. Seminar, one hour, discussion, half-hour. Students review current papers in the field of protein engineering and present the ideas contained therein to other students and faculty. May be repeated for credit. Same as Molecular Biology 209.

210 Molecular Pathophysiology (3) S. Guided seminar format. Topics selected illustrate investigations into range of disease phenotypes from the organ, cell, and molecular level. Students present and guide discussion based upon assigned papers, additional research, and faculty discussions. Goal is to formulate plan of investigation. Prerequisite: consent of instructor.

211 Protein Crystallography (3) S of even years. Lecture, three hours. Introduces students to the theory and practice of macromolecular crystallography. Covers all aspects, including protein crystallization, space groups, phasing methods, electron density map interpretation, refinement and preparation of results for publication. Corequisite: calculus. Prerequisite: consent of instructor. Same as Molecular Biology and Biochemistry 254.

232 Physiology of Ion Channels (4) F. Lecture, one and half hours; discussion, three hours. Discusses how ion channels work (molecular/structural biophysics level) and what ion channels do in diverse cell types (cell physiology level). From generating electrical signals in the nervous system to regulating immune system function, channels are everywhere in the body doing important work. Prerequisite: consent of instructor.

242 Protein Engineering (3) W of even years. The design of novel proteins and their production by genetic manipulation. Principles of protein structure and function and techniques of molecular biology relevant to protein engineering. Applications of protein technology. Prerequisites: Molecular Biology and Biochemistry 203 and 204, Engineering CBEMS112; or consent of instructor. Same as Engineering CBEMS242.

252 Introduction to Proteomics (3) W. Introduces students to concepts and methods of proteomics including protein identification, expression proteomics, and protein-protein interactions. Prerequisite: Molecular Biology and Biochemistry 204. Same as Molecular Biology and Biochemistry 208.

261 Protein Stability and Structure (3) S of even years. Lecture, discussions, demonstrations; three hours. Fundamental biophysical principles of the folding and structure of proteins in aqueous and membrane environments. Analysis of key papers concerned with general structural features of proteins, protein folding, and protein structure prediction. Prerequisites: physical chemistry, graduate course in biochemistry; consent of instructor.

271A, B Molecular Physiology and Disease (4, 4). F of even years, 271A; F of odd years, 271B. Introduces students to concepts of molecular physiology and pharmacology related directly to human diseases. Prerequisite: consent of instructor. Same as Pharmacology 271A, B and Pathology 271A, B.

290 Colloquium in Physiology (1-1-1) F, W, S. Seminar, one and one-half hours. Contemporary research problems in physiology. Research students, faculty, and other invited speakers introduce research and review topics. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit.

299 Dissertation in Physiology and Biophysics (2 to 12 per quarter) F, W, S, Summer. Preparation and completion of the dissertation required for the Ph.D. or Master of Science degree. Prerequisite: consent of instructor. May be repeated for credit.

DEPARTMENT OF EDUCATION

David A. Brant, **Chair**

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Faculty

Robert J. Beck, Ph.D. University of Chicago, *Professor Emeritus of Education*
Henry J. Becker, Ph.D. The Johns Hopkins University, *Professor of Education* (instructional use of computers, survey and evaluation research)
Liane Brouillette, Ph.D. University of Colorado, Boulder, *Associate Professor of Education* (educational leadership, qualitative research, arts in education)
Penny Chiappe, Ph.D. Ontario Institute for Studies in Education, University of Toronto, *Assistant Professor of Education* (psychology of reading, reading acquisition, and reading disabilities)
Gilberto Q. Conchas, Ph.D. University of Michigan, *Assistant Professor of Education* (race and social equality, sociocultural processes)
Alan R. Hoffer, Ph.D. University of Michigan, *Professor Emeritus of Education*
James Kim, Ed.D. Harvard University, *Assistant Professor of Education* (education policy, program evaluation, quantitative methods)
Michael E. Martinez, Ph.D. Stanford University, *Co-Director of the CSU/UCI Joint Ed.D. Program and Associate Professor of Education* (psychology of learning, intelligence, assessment)
Jack McCullough, Ph.D. United States International University, *Lecturer with Security of Employment Emeritus*
Carol Booth Olson, Ph.D. University of California, Los Angeles, *Senior Lecturer with Security of Employment and Academic Coordinator* (UCI Writing Project, language arts education)
Rita W. Peterson, Ph.D. University of California, Berkeley, *Senior Lecturer with Security of Employment Emerita*
Timothy M. Tift, M.A. Pepperdine University, *Lecturer with Security of Employment* (health, physical education, undergraduate minor in Educational Studies)
Mark Warschauer, Ph.D. University of Hawaii, *Associate Professor of Education and Informatics* (language, literacy, technology)

Affiliated Faculty

Ann DeVaney, Ph.D. University of Southern California, *Adjunct Professor of Education*

Credential Programs Directors and Coordinators

Kimberly Burge, Ed.D. University of California, Irvine, *Director of the Master of Arts in Teaching Program and Lecturer* (applied technology, art education)
Judith Conroy, M.A. University of California, Irvine, *Director of the Single Subject Credential Program*
Dennis Evans, Ed.D. University of Southern California, *Director of the Administrative Services Credential Program, Graduate Advisor Ed.D. Programs, and Academic Coordinator*
Anne Ford-Johnson, M.Ed. University of California, Los Angeles, *Multiple Subject Credential Program Coordinator*
Karol Gottfredson, M.A. State University of New York, Albany, *Intern Program Coordinator*
Julie Kim, M.Ed. Columbia Teachers College, *Multiple Subject Credential Program Coordinator*
Pat McCabe, M.A. California State University, Long Beach, *Single Subject Credential Program Coordinator*
Susan M. Meyers, M.S. University of Wisconsin, *Director of the Multiple Subject Credential Program*
Donna Taggart, M.A. California State University, Long Beach, *Single Subject Credential Program Coordinator*

Lecturers

Bruce Baron, M.S. Pepperdine University, *Lecturer* (social science education)
Suzanne Charlton, Ph.D. Claremont Graduate School, *Lecturer*
Jacqueline D'Warte, M.Ed. Sydney University, *Lecturer* (reading, language, multicultural education)
Susan Guilfoyle, M.S. University of Southern California, *Lecturer* (reading, language and literacy)
Valerie Henry, Ed.D. University of California, Irvine, *Lecturer* (mathematics education)
Bradley Hughes, B.S. University of California, San Diego; B.A. University of California, Irvine, *Lecturer* (science education)
Thomas W. Jacobson, Ed.D. University of Southern California, *Lecturer* (professional administration, school finance)
Jeffrey Johnston, M.S. University of Illinois; M.A. University of Southern California, *Lecturer* (ethics in education, elementary physical education and health education)
Bhasha Leonard, B.A. Adelaide University, *Lecturer* (test preparation)
Adam M. Ormond, Ed.D. University of California, Irvine, *Lecturer* (educational technology)
Jeanne Stone, M.A. California State University, Long Beach, *Lecturer* (language arts and mathematics education)
Ronald Wenkart, J.D. University of La Verne, *Lecturer* (school law, labor relations)

The Department of Education is dedicated to academic scholarship and the application of research to educational practice. The Department offers credential programs for teaching or administration in the public schools of California, a minor in Educational Studies, an M.A.T. degree in Elementary and Secondary Education, and an Ed.D. degree in Educational Administration and Leadership.

Faculty associated with the Department of Education include researchers and scholars of national and international reputation. Many faculty have taught or served as administrators in public schools, and all are committed to the continued improvement of education through conducting research and the development of more effective approaches to teaching.

At the heart of the Department's mission is a commitment to understand and deliver the kinds of educational transformations needed in today's world. This underlying theme is implemented in five main areas of research: language, literacy, and culture; learning, instruction, and assessment; teacher education and development; information and communication technologies in education; and educational policy and leadership and their social contexts. Research projects address a variety of areas, including information and communications technologies; cognition in science; race and urban education; educational policy and school reform; program evaluation; reading, language, and literacy; arts education; and intelligence theory. Graduate and postbaccalaureate teacher preparation programs develop the same theme for new scholars and practitioners in the field of education.

Teaching and Service Credential Programs

The Department of Education offers teacher and school administrator professional preparation programs for California teaching and service credentials.

The Department is authorized by the California Commission on Teacher Credentialing (CCTC) to offer full-time programs for California's two basic teaching credentials—the Multiple Subject Credential and the Single Subject Credential. There are two paths available to obtain each of these teaching credentials: the Intern Teacher Credential Program and the Student Teacher Credential Program. Additionally, in cooperation with University Extension, the Department offers Administrative Services Credential programs.

MULTIPLE SUBJECT TEACHING CREDENTIAL

A Multiple Subject Teaching Credential authorizes teaching in multiple-subject environments, as well as designated classrooms with English Language Learners, as commonly practiced in California elementary schools.

A Preliminary Multiple Subject Teaching Credential is awarded by the State upon completion of a baccalaureate degree and the State-approved UCI teacher education program which includes student or intern teaching and a Teaching Event. Students must also complete a college-level course or pass an examination on the U.S. Constitution, pass the California Basic Educational Skills Test (CBEST), and verify subject-matter competence. In addition, candidates for a Multiple Subject Credential are required to pass the Reading Instruction Competence Assessment (RICA). This test may be taken during or immediately following completion of the teacher education program.

To prove subject matter competence, multiple subject candidates must pass the California Subject Examination for Teachers (CSET). Students are tested in the following areas: reading, language and literature, history, social science, science, mathematics, physical education, human development, and visual and performing arts. Multiple subject students must pass all subtests of the CSET.

SINGLE SUBJECT TEACHING CREDENTIAL

A Single Subject Credential authorizes teaching in a single-subject environment, as well as in designated classrooms with English Language Learners, as is commonly practiced in California high schools and middle/intermediate schools. UCI offers Single Subject Teaching Credentials in art, English, languages other than English, mathematics, music, sciences, and social science.

A Preliminary Single Subject Teaching Credential is awarded by the California Commission on Teacher Credentialing (CCTC) upon completion of a baccalaureate degree and the State-approved UCI teacher education program which includes student or intern teaching and a Teaching Event. Students must also complete a college-level course or pass an examination on the U.S. Constitution, pass the California Basic Educational Skills Test (CBEST), and verify subject-matter competence.

California requires all credential candidates to demonstrate subject-matter competence. Single subject candidates achieve this by passing the appropriate CSET examination in their subject area or by completing a CCTC-approved subject-matter program in the teaching area. For specialized science candidates, completion of a postbaccalaureate degree from a regionally accredited institution in the requested credential area, or a closely related area deemed equivalent by the CCTC, may also satisfy the subject-matter requirement. UCI offers CCTC-approved subject-matter programs in English, History/Social Science, and Latin, which are available to undergraduate students majoring in English, History or Social Science, and Classics, respectively. Single Subject students must pass all subtests of the CSET or complete an approved subject-matter program prior to student or intern teaching. Consult an academic counselor in the Department of Education for more detailed information.

INTERN TEACHER PROGRAM

Through the intern program, a student may earn a stipend through a sponsoring school district for one year of teaching while completing either the Multiple Subject or Single Subject Credential requirements. To serve as an intern, the student must be admitted to the Department of Education Intern Teacher Program, receive an internship offer from a participating school district, and be eligible for an Intern Credential. Intern candidates are selected by UCI and receive internship offers from participating school districts based upon qualifications of the candidate and the current fluctuating needs of the school districts. Eligibility requirements for an Intern Credential include: a baccalaureate degree, current tuberculin test clearance, Certificate of Clearance, passage of the CBEST, verification of subject-matter competence, and passage of a course or college-level examination on the U.S. Constitution.

Multiple Subject Interns are required to take the following courses: 173†, 311, 313, 319, 321–329, 331, 332.

Single Subject Interns are required to take the following courses: 173†, 315, 317, 319, 335, 336–341* (students enroll in the section of their proposed credential authorization), 347, 349, 351.

† Education 173 is a prerequisite for the Intern Teacher Credential Program and must be successfully completed prior to beginning the program. Education 176 may substitute for 173. For students not matriculated at UCI, Education 173 is offered online.

* Section is dependent upon content area.

A grade of B or better is required in all courses and in intern teaching for successful completion of the program. If competence has been demonstrated by the conclusion of the intern teaching program and all other requirements are met, the student is eligible for a preliminary credential recommendation by UCI.

For further information see an academic counselor or the intern program coordinator in the Department of Education.

STUDENT TEACHER PROGRAM

Candidates who enroll in the Multiple Subject Student Teacher Credential program at UCI generally are required to take the following courses: Education 173†, 303, 304, 321–326, 327**, 328, 329, 331, 332.

Sample Fifth Year—Multiple Subject Student Teachers
Alternate schedules may be available for some courses.

FALL	WINTER	SPRING
Ed. 304	Ed. 303	Ed. 303
Ed. 322	Ed. 321	Ed. 325
Ed. 323	Ed. 324	Ed. 328
Ed. 326	Ed. 332	
Ed. 327**		
Ed. 329		
Ed. 331		

Candidates who enroll in the Single Subject Student Teacher Credential program at UCI generally are required to take the following courses: Education 173†, 305, 307, 335, 336–341 (students enroll in the section of their proposed credential authorization), 342, 346, 347**, 348, 349, 351, 352.

Sample Fifth Year—Single Subject Student Teachers
Alternate schedules may be available for some courses.

FALL	WINTER	SPRING
Ed. 305	Ed. 307	Ed. 307
Ed. 335	Ed. 342	Ed. 342
Ed. 336–341	Ed. 351	Ed. 346
Ed. 347**		
Ed. 348		
Ed. 349		
Ed. 352		

† Education 173 is a prerequisite for the Student Teacher Credential Program and must be successfully completed prior to beginning the program. Education 176 may substitute for 173. For students not matriculated at UCI, Education 173 is offered online.

* Section is dependent upon content area.

**May be taken fall, winter, or spring.

Student teaching for Multiple Subject candidates (grades K–6) is defined as a full-day, four-day-per-week assignment during the first quarter of student teaching and a full-day, five-day-per-week assignment during the second quarter of student teaching. Assignments will include two levels within the K–6 range in elementary schools.

Student teaching for Single Subject candidates (grades 7–12) is defined as a full-day, five-day-per-week assignment, for one full public school semester in an appropriate classroom setting in middle or high schools.

Clearances for student teaching are processed by the Department of Education and are contingent upon a Certificate of Clearance, a current tuberculin test clearance, academic preparation clearances including CBEST, and verification of subject-matter competence.

Advancement to student teaching is limited to those candidates who are adjudged to be professionally ready to assume such responsibilities. Such readiness shall be determined by, but not be limited to, the candidate's academic work, professional deportment, and potential for success in teaching. Failure to be advanced to student teaching will be considered good cause for removal and/or a leave of absence from the program.

A grade of B or better is required in all courses and in student teaching for successful completion of the program. If competence has been demonstrated by the conclusion of the student teaching program and all other CCTC and Departmental requirements are met, the student is eligible for a preliminary credential recommendation by UCI.

STUDENT TEACHER PROGRAM WITH BCLAD (SPANISH) EMPHASIS

Students who are bilingual in Spanish (as ascertained through testing) may be eligible for the Bilingual Crosscultural, Language, and Academic Development (BCLAD, emphasis in Spanish) credential. Students should consult an academic counselor in the Department of Education for more detailed information.

SUPPLEMENTARY AND ADDITIONAL TEACHING AUTHORIZATIONS

After acquiring a basic credential, it is possible to add further teaching authorizations. Students wishing to be authorized in more than one subject area may qualify in either of two ways:

1. Students may complete additional units in specific college-level course work to qualify for a supplementary authorization or a subject-matter authorization to teach in areas other than the major teaching area. Consult an academic counselor in the Department of Education for details.
2. Students may pass the appropriate examinations in any area of their choice and successfully complete specified additional course work. Subject to approval by CCTC, they will then qualify for the additional teaching authorization in that subject.

PREPARATION FOR APPLYING TO THE CREDENTIAL PROGRAMS

Eligibility for admission is supported by passing the CBEST, providing evidence of possession of/application for a Certificate of Clearance, and successfully completing the appropriate subject area examinations or an approved subject-matter program.

Registration for examinations must be made well in advance of test dates. Students are urged to contact the Department of Education for information about the tests and test dates at least one year before credential program application deadlines.

The Department of Education requires appropriate field experiences or other professional life experiences that are preparation for the teaching profession, prior to entering the program. Course credit for field experience is available through, for example, Education 100, 103, and 160/160L, as well as through other University programs. Field experience can also be earned by other appropriate activities, e.g., tutoring, assisting in public school classrooms.

Admission to the Credential Programs

Information is available from the Department of Education, 2000 Berkeley Place. Prospective students may apply online by accessing the Department's Web site at http://www.gse.uci.edu/doehome/AcadProg/application_info.html. Admission is based on a broad index, including but not limited to the following:

Academic Achievement. Completion of a baccalaureate degree from an accredited institution and a minimum grade point average of 3.0 will support consideration of admission to the Department of Education. Undergraduates who enroll in courses leading to a credential are not guaranteed admission to the program; admission through the regular graduate admissions process is required.

Written Recommendations. Three letters of recommendation are required for admission. These letters should relate to the student's potential for success in teaching or administration and should indicate the student's ability to perform academic work. For applicants to the teaching credential programs, at least one letter should focus on experiences related to teaching.

CBEST. Evidence of having passed the California Basic Educational Skills Test must accompany the application for admission.

Absence of Criminal Conviction that Would Preclude the Issuance of a Credential. All students are required by law to obtain a Certificate of Clearance from the California Commission on Teacher Credentialing (CCTC). Applicants must provide evidence of filing for this Certificate along with their application for admission to the Department of Education. Contact an academic counselor in the Department of Education for advice on how to handle this process.

ADMINISTRATIVE SERVICES CREDENTIAL

Administrative Services credentials are issued by the State in pupil personnel services, administrative services, health services, library services, and clinical-rehabilitative services. UCI offers programs leading to the Administrative Services Credential generally required for school administrators.

There are two tiers of the Administrative Services Credential. In the first tier, a candidate obtains the Preliminary Administrative Services Credential by completing the approved program of 36 quarter units and a comprehensive examination. This credential also requires a valid basic credential, three years of full-time teaching or services experience, and passage of the CBEST. This credential program is jointly offered by the Department of Education and University Extension.

After an administrative position is obtained, the individual must begin the Professional Clear Administrative Services Credential (tier two) program. The UCI Professional Clear program requires two years of successful full-time school administrative experience in a position, the Preliminary Administrative Services Credential, and six (6) quarter units (Induction and Final Evaluation, Education 398A-B) which provide structured mentoring, self assessment, and formative/summative evaluating of the candidate.

Students interested in these credentials should make an appointment with an academic counselor in the Department of Education.

Undergraduate Minor in Educational Studies

The minor in Educational Studies allows students to explore a broad range of issues in the field of education, and provides a strong foundation for K–12 teaching. The program consists of a coordinated set of courses which includes an introductory level course and several advanced courses in the field of education. A number of the minor's elective courses are offered by other academic units.

Students who plan to apply for admission to a credential program in the UCI Department of Education (or at other institutions) will enhance their admissibility through taking the minor's coordinated set of courses and will acquire a strong basic foundation for their advanced work. Students who do not eventually choose education as a career path will have gained a valuable knowledge base applicable to many other occupations and to roles as citizens, parents, and volunteers.

Requirements

The minor requires completion of a minimum of seven courses (at least five of which must be upper-division) totaling 28 units drawn from the four required areas of study shown below and from the approved electives. No more than two courses from the student's major area of study may be used for completion of the minor.

Area 1. Educational systems, issues, and reforms: Origins, Purposes, and Central Issues in K–12 Education (Education 50).

Area 2. Learning and the learning process: *either* Cognition and Learning in Educational Settings (Education 173) *or* Psychology of Learning, Abilities, and Intelligence (Education 176). Each of these courses also fulfills a prerequisite requirement for the Department's fifth-year teacher credential programs.

Area 3. Educational contexts and influences: There are two requirements in Area 3: (1) a course that focuses on K–12 education/schooling and (2) fieldwork in K–12 schools. To satisfy the fieldwork requirement, students must be involved in at least 20 clock hours of verified observation and/or service in the schools.

Courses which include fieldwork are: Educational Strategies for Tutoring and Teacher Aiding (Education 100), Advanced Tutoring (Education 103), Preparation for Teaching Fine Arts in K-12 Schools (Education 104D), Multimedia and the Arts in the Multicultural Classroom (Education 104E), Science Education Teacher Apprentice Field Experience (Education 114), Multicultural Education in K–12 Schools (Education 124), and Practicum in After-School Learning and Inquiry (Education 160, 160L).

Department of Education courses that meet the course requirement in this area but do not include fieldwork are: Origins, Purposes, and Central Issues in K-12 Education (Education 50), Foundations of Elementary School Mathematics (Education 122A-B-C), Children, Schools and Cinema (Education 125), Ethics and Education (Education 126), Changing the High School Experience (Education 150), Issues and Controversies in Secondary Mathematics (Education 172A), Teaching and Learning Secondary Mathematics (Education 172B), Foundations of Education (Education 175). Courses from other academic units, such as History of Chicano Education (Social Science 173H), may also be appropriate in this area. Taking one of these courses in combination with 20 clock hours of verified observation and/or service in the schools under the auspices of campus outreach programs or through independent observation or service in K–12 schools will fulfill both requirements in this area.

Area 4. Subject-matter content and pedagogy: This area requires completion of one course focusing on an academic discipline of the student's choice which has direct applicability to K–12 instruction. A list of courses approved for Area 4 is available in the Department of Education.

NOTE: In addition to the approved courses shown, a variety of other courses may be appropriate for Areas 3 and 4. Students must have these additional courses pre-approved by the Department of Education Faculty Advisor. Only two courses may be chosen from the student's major area of study.

Electives. The remaining courses needed to complete the seven-course minor may be selected from any approved courses that are not used to meet an area requirement or from other courses deemed appropriate by the Faculty Advisor.

Residence Requirement for the Minor: At least four upper-division courses must be successfully completed at UCI.

Statement of Intent: A Statement of Intent is required of all students wishing to enroll in this minor; forms are available in the Department office, 2000 Berkeley Place.

Graduate Degree Programs

MASTER OF SCIENCE IN CHEMISTRY OR MATHEMATICS WITH A TEACHING CREDENTIAL

In cooperation with the Departments of Chemistry and Mathematics, the Department of Education offers coordinated programs for the California Single Subject Teaching Credential and a Master of Science degree in Chemistry or Mathematics. Additional information is available from the Department of Education counseling office and the graduate affairs office in the Departments of Chemistry and Mathematics.

MASTER OF ARTS IN SOCIAL SCIENCE WITH A TEACHING CREDENTIAL

In cooperation with the School of Social Sciences, students enrolled in a graduate program offered by the School may choose to pursue a teaching credential while working toward their degree. After completion of the requirements for an M.A. degree, students may apply for admission into the credential program administered by the Department of Education. A detailed description of the program may be obtained from the Department of Education counseling office and the Social Sciences Graduate Office.

MASTER OF ARTS IN TEACHING IN ELEMENTARY AND SECONDARY EDUCATION

The Department of Education offers an M.A.T. degree program in Elementary and Secondary Education. The 15-month program is designed for candidates with a baccalaureate degree who wish to earn a teaching credential in conjunction with an advanced degree. The M.A.T. program consists of a one-year teacher credential program of the student's choice (Multiple Subject or Single Subject), and a total of six additional courses spread over the summers before and after the credential program. The combination of the M.A.T. courses with the UCI credential program provides a theoretical and empirical framework for candidates who may later be interested in working toward National Board for Professional Teaching Standards Certification, after three years of successful teaching.

Admission

Successful candidates must meet the general admission requirements of the UCI Office of Research and Graduate Studies and must be admitted to a credential program offered by the Department of Education. Selection of candidates is based on the overall strength of each applicant's undergraduate preparation, three letters of recommendation from individuals who are familiar with the applicant's ability to pursue graduate study, and scores on the Graduate Record Examination (GRE), the California Basic Educational Skills Test, and the CSET. (The CSET may be waived if a candidate has successfully completed an approved subject-matter program in his or her content area).

Program of Study

During the summer prior to beginning the credential program, students admitted to the M.A.T. program enroll in three courses: Teachers' Lives and the Policy Environment of Teaching (Education 201), Outcomes of Schooling and Student Assessment (Education 202), and Advanced Concepts in Learning and Cognition (Education 203). In the summer following completion of their credential program, M.A.T. candidates enroll in three courses: Critical Assessment of Teaching Practice and Learning (Education 205), Cognition and Pedagogy in Specific School Subjects (Education 206) or Cognition and Pedagogy in Quantitative Literacy (Education 207), and Instructional Design and Educational Technologies (Education 240).

Residency. Full-time study for one year and two summers is required.

Comprehensive Examination

A comprehensive examination is completed by M.A.T. candidates during the second summer. The examination consists of a structured paper built out of weekly assignments in Education 205 that is reviewed by a faculty committee of two who teach in the M.A.T. program.

CSU/UC IRVINE JOINT ED.D. IN EDUCATIONAL ADMINISTRATION AND LEADERSHIP

The UC Irvine Department of Education and the California State Universities at Fullerton, Long Beach, Los Angeles, and Pomona have developed a joint doctoral program leading to the Doctor of Education (Ed.D.) degree in Educational Administration and Leadership. This collaborative program offers a regional approach to preparing outstanding leaders for K–12, community college, and higher education.

The CSU/UCI Joint Ed.D. program emphasizes a range of interdisciplinary frameworks and research methodologies relevant to the study of education. These provide a broad base of knowledge applicable to leadership positions. Emphasis is placed on using theory and research to select, implement, and foster useful and effective educational practices. It is expected that graduates will be able to articulate and accomplish important transformations in educational practice while attending to the complex demographic, social, and economic challenges facing education in Southern California.

The CSU/UCI Joint Ed.D. in Educational Administration and Leadership offers doctoral study building on the mutual programmatic and faculty strengths of the participating California State University campuses and UC Irvine. Four different emphases are available, each associated with a particular CSU campus: K–12 Instructional Leadership (CSUF); Higher Education and Community College Leadership (CSULB); Pre/K–12 Urban Educational Leadership (CSULA); and Educational Technology Leadership (CPP).

Graduates of the program will be uniquely prepared to participate effectively in leadership positions in areas such as management, instruction, technology, and research and evaluation in schools, school districts, community colleges, universities, and other education-related agencies. They will also be prepared to establish and sustain cultures that embrace and value collaboration as a means of building quality educational programs and systems.

Admission

Applicants must complete a master's degree in education or a closely related field at one of the participating California State Universities. In exceptional cases, students may be admitted who have earned a master's degree from a rigorous program at another institution. Applicants submit transcripts for all post-secondary academic work, Graduate Record Examination (GRE) General Test scores, and three letters of recommendation from individuals who have knowledge of the applicant's professional competency and leadership potential. Other requirements include samples of written work and a description of research experience.

Program of Study

The program is designed primarily for working professionals. Twelve quarter units of course work at UC Irvine are offered each summer for three consecutive summers. Academic-year courses are offered for two consecutive years at the CSU Emphasis Campus. Consult the CSU/UCI Joint Ed.D. program Web site at http://www.gse.uci.edu/csu-uci-edd for information about campus emphasis courses.

Summer One

The following courses are required during the first summer: Perspectives on Learning and Cognition (Education 259A), Research Epistemologies (Education 222), and Scholarship Tools and Information and Communication Technologies for Doctoral Students (Education 292).

Academic Year One: CSU

The following courses are taken on the California State University campuses during year one: Organizational Theory, Qualitative Research I, Qualitative Research II, and Ethics of Leadership. For descriptions of the CSU campus emphasis I and II courses, consult the program Web site at http://www.gse.uci.edu/csu-uci-edd.

Students will complete a written qualifying paper after the first full year of doctoral study.

Summer Two

The following courses are required during the second summer at UCI: Preparation for Qualifying Paper (Education 259B), Studies of Diversity and Inequality in Education (Education 278B), and Survey Research Methods in Education (Education 284).

Academic Year Two: CSU

The following courses are taken on the California State University campuses during year two: Issues in Educational Policy, Issues in Educational Reform, and research and emphasis elective courses, which are dependent on the individual campus. For descriptions of the CSU campus research elective I and II courses and the emphasis elective III and IV courses, consult the program Web site at http://www.gse.uci.edu/csu-uci-edd.

Summer Three

The following courses are required during the third summer: Preparation for Candidacy Examination (Education 259C) and Evaluation of Educational Programs (Education 281).

Examinations and Dissertation

Upon completion of course work after the third summer, candidates submit their dissertation proposal. An oral candidacy examination is held in which the candidate is examined on the proposal by a joint candidacy committee. Following research and writing of the dissertation, the final examination is conducted during which the candidate defends the dissertation before a joint dissertation committee.

Time to Degree. Normal time for advancement to candidacy is three years. Normal time for completion of the degree is four years, and the maximum time permitted is seven years.

NOTE: The joint Ed.D. program with UCLA is being replaced by the CSU/UCI Joint Ed.D program and other doctoral programs under development and is no longer accepting new applications.

Courses in Education

UNDERGRADUATE

50 Origins, Purposes, and Central Issues in K–12 Education (4) F, W, S. An introduction to the role of education in U.S. society and to central issues in K–12 education. Education is studied from four different perspectives: social, historical, philosophical, and political.

100 Educational Strategies for Tutoring and Teacher Aiding (4) F, W, S. Placement in a public elementary or secondary school to gain experience as a tutor or teacher aide. Emphasis on cognitive learning and the development of instructional strategies and resources which can be used in effective cross-age and cross-cultural experiences. May be taken for credit three times. Same as Engineering ENGR197A.

103 Advanced Tutoring (4) S. Lectures/discussions and 40 hours public school experience provide advanced strategies for tutoring under-achieving pupils; guidance using case studies to examine a range of factors that contribute to public school failure among elementary, middle, and secondary pupils. Prerequisite: Education 100 or consent of instructor.

104D Preparation for Teaching Fine Arts in K–12 Schools (4). Arts education, theory, curriculum and methods for university students specializing in studio art, digital arts, dance, music, and/or drama. Includes lesson planning and teaching strategies based on California and national frameworks and content standards, and fieldwork in K–12 settings.

104E Multimedia and the Arts in the Multicultural Classroom (4) S. Multiculturalism and underrepresented U.S. minorities and the visual and performing arts: perspectives in artistic perception, creative expression, historical and cultural context, and aesthetic valuing, and media literacy in the interpretation and production of multimedia arts products and applications for K–12 classrooms. Same as Studio Art 149. **(VII-A)**

114 Science Education Teacher Apprentice Field Experience (4). Students assist public school classroom teachers in laboratory demonstrations and experiments, tutoring individuals or small groups. May be taken for credit twice. Same as Physical Sciences 114.

122A-B-C Foundations of Elementary School Mathematics I, II, III (4-4-4) F, W, S. Provides understanding of fundamental mathematics necessary to teach for conceptual understanding and higher-level reasoning and problem solving. Conceptual understanding of place value, fractions, proportionality, geometry, algebra, functions, probability, statistics, and measurement. Instructional applications of these concepts in grades K-8 teaching.

124 Multicultural Education in K–12 Schools (4) F, W, S, Summer. Provides a theoretical and empirical overview of educational issues affecting low-income immigrant and U.S.-born minority student populations in an increasingly diverse and changing society. **(VII-A)**

125 Children, Schools, and Cinema (4). Using popular films as the vehicle, essential aspects of school dynamics and the interaction of schools with students, teachers, and the public are analyzed. Melding educational studies and film studies provides a deeper understanding of the methods used to transmit information and attitudes about schools to the lay public.

126 Ethics and Education (4) F, W, S. Examination of ethics in education and how ethicists frame moral problems. Presentation of major ethical themes that affect education. Analysis of specific models for dealing with ethical goals and developing morality for K–12 students. Offers models for solving ethical dilemmas within an educational context. Prerequisite: Education 50.

130 Introduction to the History of Science for Prospective Teachers (4). A pedagogically oriented approach to case studies that illuminate the emergence of modern science since 1500 and the impact of science-based technology on society. Designed for students interested in teaching science. Education 130 and History 60 may not both be taken for credit.

132 Thinking Mathematically: Learning and Teaching Mathematics (4). The primary focus is on the psychological and historical development of mathematical thinking. Intended for prospective teachers and for all those with an interest in understanding mathematics and thinking mathematically.

140A Methods for Elementary Bilingual Teachers (4). Direct observation of bilingual classrooms in local elementary schools, classroom lectures, discussions, and presentations on the culture and language of the bilingual student. Prerequisite: Spanish 10A or equivalent. Same as Spanish 106A.

140B Methods for Secondary Teachers of Spanish (4). Communicative approaches to teaching Spanish at the secondary school level. Theory and practice of oral proficiency acquisition techniques. Requires field work. Emphasis placed on training differences for native versus nonnative Spanish speakers. Prerequisite: Spanish 10A or equivalent. Same as Spanish 106B.

150 Changing the High School Experience (4) S. Analysis of problems in high school education (e.g., student disengagement and underachievement of disadvantaged) and proposals for changing curriculum, instruction, and school organization. Students suggest own reforms and conduct research (including school observations and interviews) to inform their proposals.

152F Teaching Mathematics with Technology (4) W. A survey of the capabilities of mathematics software. Instructional design using technology in demonstration stations, laboratory explorations, workstations, and group work. Implications of the use of software to change the dynamics of teaching and learning of mathematics. Prerequisites: Mathematics 2A-B-C or consent of instructor. May be taken for credit twice.

155 Special Topics in Educational Issues and Asian Americans (4). Critical analysis of a variety of historical and contemporary educational issues facing Asian Americans. May be repeated for credit as topics vary. **(VII-A)**

160 Practicum in After-School Learning and Inquiry (4) F, W, S. Prepares students to work with children in after-school, technology-based learning programs at community centers. This experiential learning with children then informs student inquiries on issues of multiculturalism, schooling, and literacy development as reported in weekly field notes. Corequisite: Education 160L. May be taken for credit three times. NOTE: This course can be substituted for Education 124 as a prerequisite for the CLAD/BCLAD emphasis. (with successful completion of Education 160L: **VII-A)**

160L Community Field Work (2) F, W, S. Community-based practicum. UCI students work with under-served children (ages 6–12) in after-school venues, assist with their literacy development through technology-based play and story-telling activities, and develop field notes including data from interviews with the children. Corequisite: Education 160. May be taken for credit three times.

170A Issues and Controversies in Secondary History-Social Studies (4) W. Examines passionate debates about what adolescents should learn in history and social studies classes. Competing priorities between history and current social issues; "heritage" education or critical history; social studies vs. social science; wars over curriculum standards; teaching about moral issues.

170B Teaching and Learning Secondary History-Social Studies (4) S. How adolescents understand history and social issues. Pioneering research on their reasoning about history, politics, and related areas. Examination of typical practices in history and social studies teaching. Improving students' learning through historiographic investigation and information technology resources.

172A Issues and Controversies in Secondary Mathematics (4) W. Examines different perspectives on what mathematical competencies should be emphasized in secondary schools, and how they should be taught. Particular attention to problem solving, algebra and geometry, and issues of equity. Introduction to research on mathematical cognition and teacher beliefs.

172B Teaching and Learning Secondary Mathematics (4) S. How children and adolescents learn to understand mathematics. Research on mathematical cognition, particularly on mathematical problem solving and the learning of algebra, geometry, and calculus. Examination of several innovative instructional programs derived from research on mathematics learning. Formerly Education 172F.

173 Cognition and Learning in Educational Settings (4) F, W, S, Summer. Foundational concepts in cognition and development as applied to student learning. Primary topics include historical behaviorism, basic cognitive structure and processes, complex cognition, cognitive development, and motivation. Prerequisite for the UCI teacher credential program.

175 Foundations of Education (4). Foundational questions of education are viewed from newly emerging developmental perspectives which treat cognition as embodied action and learning as cultural recapitulation. Historical, sociological, psychological, and philosophical implications of these views toward various aspects of teaching, learning, curriculum, and pedagogy are considered.

176 Psychology of Learning, Abilities, and Intelligence (4) S. Overview of classic positions on the mind, human abilities, and intelligence, especially as related to academic achievement. Contrasting views: psychometric versus information processing; experimental versus correlational research. Prerequisite: introductory course in psychology, or consent of instructor. This course may substitute for Education 173 as a prerequisite for the teacher credential program. Same as Psychology 142I.

179 Advanced Composition for Teachers (4). Principles of formal composition and problems of teaching. Selecting handbooks and ancillary reading, marking papers, making assignments, and conducting workshops and tutorials. Same as English WR 179.

188 Teaching of History as an Academic Discipline

188A History: A Way of Knowing the World (2). Provides a grounding in the history of the discipline, exploring such topics as history's authors, kinds of history, historical debates, and roles of historians in the processes of making determinations of legitimacy. Same as History 188A.

188B Historical Argument: Making Your Case (2). Explores the construction of historical argument, grounded in the California history standards, by analyzing historical sources, categories of analysis, evidence, and a range of arguments that pertain to and uncover major issues in U.S. and World History. Prerequisite: Education 188A. Same as History 188B.

188C Teaching the Past: History-Specific Pedagogy (2). Explores the important link between authentic historical inquiry and critical pedagogies that can be used to teach history effectively in the K–12 setting. Class discussions focus on attempting to link historical scholarship and research techniques to history pedagogy. Prerequisite: Education 188B. Same as History 188C.

198 Directed Upper-Division Research in Education (2 to 8) F, W, S, Summer. Faculty-led research-oriented course for upper-division students in the minor in Educational Studies. Individually or in small groups, students are exposed to and participate in work related to a faculty member's research and scholarship.

199 Individual Study (1 to 4 per quarter) F, W, S, Summer. Intensified advanced study in areas in which a student has considerable background, under the direction of a faculty member who will guide and evaluate the study.

GRADUATE COURSES

201 Teachers' Lives and the Policy Environment of Teaching (4). Examines research and biographical studies on the nature of teaching and teacher development. Discusses forms of professional development including communities of practice and national board certification. Examines the influence of political structure and educational policy on the lives of teachers. Limited to M.A.T. students only.

202 Outcomes of Schooling/Student Assessment (4). Focuses on establishment of learning goals and assessment tools that are valid for all students, inform educational decisions, and promote educational success. Provides critical examination of different forms of assessment used in K–12 schools, including developmental assessments and appropriate interventions. Limited to M.A.T. students only.

203 Advanced Concepts in Learning and Cognition (4). Theories of cognition and their application to thinking and learning in school settings. Topics include memory, information processing, knowledge representation, problem solving, meta-cognition, and intelligence. Prerequisite: Education 173 or equivalent undergraduate course in learning theory or educational psychology. Limited to M.A.T. students only.

205 Critical Assessment of Teaching Practice and Learning (4). Student articulates a problem in instructional practice and uses research on cognition, assessment, and other tools to understand the problem. Capstone course emphasizes practices of teacher inquiry, reflection, and professional collaboration. Student's written analyses are evaluated as the program's Comprehensive Examination. Limited to M.A.T. students only.

206 Cognition and Pedagogy in Specific School Subjects (4). Reviews cognitive research on comprehension, conceptualization, reasoning, critical thinking, planning, and problem-solving with applications to pedagogy in a specific area of the secondary curriculum. Required for M.A.T. single subject students, unless substitution of Education 207 is authorized by the Department.

207 Cognition and Pedagogy in Quantitative Literacy (4). Reviews research on cognition in elementary mathematics, including numeracy, fractions, probability, proportionality, measurement, geometry, algebra. Emphasizes instructional approaches consistent with this research knowledge. Required for M.A.T. multiple subject students, unless substitution of Education 206 is authorized by the Department.

222 Research Epistemologies and Methodologies (4). Introduction to epistemological underpinnings of educational research and to a range of research methodologies in education. Includes examination of quantitative and qualitative studies through reading and analyzing contemporary research. Critique of selected research studies pertinent to educational practice and policy. Doctoral students only.

232 Graduate Seminar in Mathematical Cognition and Learning (4). Selected topics in the foundations of mathematical cognition. Draws upon results in the development of mathematical cognition from various disciplines such as history, psychology, phenomenology, neuroscience, and linguistics, and focuses on implications of these developments for mathematics education.

240 Instructional Design and Education Technology (4). Design of high-quality instructional units consistent with current theory and research in cognitive psychology and constructivist-compatible instructional practice and infused with appropriate uses of computer and video technologies. Students design a complete instructional unit using these principles. Limited to M.A.T. students only.

250 History of School Innovations and Current School Reform Movements (4). Offers an analysis of major school reform movements, both ongoing and those from the past century. Study of the underlying dynamics affecting the interrelationship between schools and society and the implications of these relationships. Limited to doctoral and/or Professional Administrative Services Credential students. May be taken for credit twice.

251 Issues in Educational Policy and Reform (4). An in-depth study of topics relevant to educational reform and policy-making. Topics include: the policy-making process, the role of values and interest groups, policy analysis, equality of educational opportunity, systemic reform, implementation, and politics at the school site. Doctoral students only. May be taken for credit twice.

259A Perspectives on Learning and Cognition (4). Introduction to conceptual foundations of learning and cognition. Through these topics, explores such foundations for doctoral study as the nature of inquiry in educational research, standards of evidence, scholarly writing, and participation in a field of scholarship. Doctoral students only.

259B Preparation for Qualifying Paper (4). Prepares doctoral students to write a qualifying paper in form of a scholarly review of literature on a research topic of the student's choice. Components of the literature review as well as applicable evaluative rubrics are addressed. Doctoral candidates only.

259C Preparation for Candidacy Examination (4). Graduate seminar focusing on designing, writing, and defending doctoral dissertation proposals. Includes information on selection of dissertation topic; content, genre, and format of dissertation proposals; and protocol preparation for human subjects research. Doctoral candidates only.

260 Functional, Interpretive, and Critical Analyses of Schooling (4). Understanding the processes of schooling from functional, interpretative, and critical perspectives. Study of paradigms in educational administration research and practice. Review of conceptual orientation to the study of educational administration. History of the knowledge base of educational administration. Doctoral students only.

269 Technology for Administrators (2). Contemporary issues and implications for educational administrators in the use of information and multimedia technologies in teaching and learning, communications, and management. Legal, ethical, and ergonomic considerations in the planning, funding, professional development needs, and evaluation related to the use of educational technology. Limited to Preliminary Administrative Services Credential students.

270 New Information and Communication Technologies for Administrators (2 to 4) S. Provides practical and intellectual expertise about instructional software, video and multimedia technologies, computer literacy education, electronic communication networks, and technology for school and district administration. Limited to doctoral and/or Preliminary Administrative Services Credential students.

271 Organizational Theory, Planning, and Application (4) F. Basic theories, attributes, and functions of human organizations. Understanding and managing the dynamics of group behavior and human relations. Structuring and leading groups in a variety of organizational settings. Application of organizational theories to central issues in K-12 education. Limited to doctoral and/or Professional Administrative Services Credential students.

272 Philosophy and Ethics of Educational Leadership (4). Philosophy, ethics, and moral values of educational leadership for school administrators. Theory and philosophy of educational change. Research about ethical and moral leadership in schools. Limited to doctoral and/or Professional Administrative Services Credential students.

273A Student Assessment (2 to 4). Purposes for conducting educational assessment. Overview of new assessments, including complex constructed responses, portfolios, other "authentic" measurements. How assessment can help to monitor and strengthen educational programs and inform educational policy. Limited to doctoral and/or Professional Administrative Services Credential students.

274 Studies of Professional and Staff Development (4). Research and theory of effective strategies for professional and staff development. Topics include: adult learning as related to professional growth of teachers, staff development as vehicle for systemic reform, reforms to enhance teacher professionalization and empowerment. Limited to doctoral and/or Professional Administrative Services Credential students.

275A School Law and Political Relations (2 to 4) W. Legal framework of schools and public education. Political jurisdictions affecting educational policy. Influence of legal aspects to educational control. Political and sociological forces directly and indirectly affecting school practices. Theory of individual and group dynamics in achieving compromise, consensus, and coalitions to achieve educational goals. Limited to doctoral and/or Preliminary Administrative Services Credential students.

276A Fiscal Management at the Site and District Level (2) F. Organizations and management of financial and business operations. Funding sources and problems affecting financing at State and local levels. Business office operations, utilizations of personnel, budget preparation, financial management strategies and control, analysis of financial effects of contractual obligations. Identification of appropriate computer technology. Limited to doctoral and/or Preliminary Administrative Services Credential students.

276B Studies of School Finance and Political Economy (2 to 4). Fundamental fiscal concepts applied to schooling. Topics include equity and inequalities in resource allocation, public school revenue sources and expenditure patterns, the politics of school finance, public versus private-sector supply of schooling, and the supply and demand for teachers. Doctoral students only.

277A Management of Human and Material Resources (2). Concepts, theories, and application for the development and management of human resources. Effective staff utilization patterns in consideration of personnel competencies, organizational constraints, and available resources. Emerging considerations in developing and implementing effective personnel policies. Short- and long-term planning for filling personnel needs. Limited to doctoral and/or Preliminary Administrative Services Credential students. May be taken for credit twice.

277B School Restructuring and Resource Allocation (2 to 4). Concepts and research on school change at the site level. Topics include: structure and use of physical environment, organization of school day and use of time, use of teachers and other staff, changes in governance and school-community relations. Doctoral students only.

278A Cultural and Socioeconomic Diversity (2). Contemporary issues of cultural and socioeconomic diversity in public education. Ethnic, racial, and religious composition of the State and local community. Concepts of cultural values and language diversity. Programs and procedures for meeting instructional needs of limited English proficient pupils. Principles and procedures for involving the family in school activities. Limited to doctoral and/or Preliminary Administrative Services Credential students.

278B Studies of Diversity and Inequality in Education (2 to 4). Study of relationships between individual diversity, social inequality, and education. How differences in socioeconomic status, race, culture, and gender translate in the educational process and affect educational outcomes. Addresses issues such as educational access, social mobility, and social reproduction. Limited to doctoral and/or Professional Administrative Services Credential students.

279 Research Applied to Administrative Practice (4). Examination of research strategies pertinent to administrative decision-making in education. Includes attention to quantitative and qualitative research methods, experimental design, sampling techniques, questionnaire and interview construction, observation methods, data analysis and interpretation. Special attention to nonexperimental and quasi-experimental research designs. Doctoral students only.

280 Special Topics in Education (2 to 8). Provides practitioners at the advanced degree level with insight and leadership skills for working with increasingly diverse school populations. Content varies with interest of the students and instructors. May focus on specific populations or broader content area such as education reform in California. Doctoral students only. May be taken for credit three times as topics vary.

281 Evaluation of Educational Programs (4). Alternative approaches to formative and summative evaluation of educational programs. Standards for effective evaluations. Epistemological, political, and practical issues in designing and conducting evaluations. Students critique specific studies relevant to educational administration and policy-making and design an evaluation. Corequisite: Education 279. Doctoral students only.

282 Graduate Seminar in the History of the Philosophy of Education (4). Draws upon results in the historical development of the philosophy of education from Plato, Quintillian, Augustine, Locke, Rousseau, to more contemporary thinkers such as Dewey, Freire, Egan, and Rorty.

284 Survey Research Methods in Education (4). Examination of survey research methods and their applications to educational research and evaluation. Attention to types of surveys, research design and sampling, survey construction, development of survey questions, response formats, data collection, analysis of survey data, and reporting survey results. Doctoral students only.

285A-B Applications to Education of Social and Psychological Theories and Research Methods (4-4). Sociological and psychological theories and research applicable to issues facing school administrators. Theories of learning and of individual, social, and organizational behavior. Research about social context of schools, human development, cognition, motivation. Studies of student behavior, classroom practices, school organization. Doctoral students only.

287 Data Analysis in Education Research and Evaluation (4). Instruction and practice in statistical aspects of survey-based evaluations and quantitative research in education. Includes sampling, coding open-ended information, data management, scale construction, statistical analysis, and presentation of findings. Students analyze two data sets—a district-based evaluation and a national survey—using SPSS. Prerequisites: Education 279 and 281. Doctoral students only.

290A-B-C Seminar in Field Research in Education (1-1-1). Addresses conceptual frameworks and literature relevant to effective school leadership and management. Focus on identifying, carrying out, analyzing and interpreting field research in education toward the purpose of improving school practice. Prerequisite: concurrent enrollment in 291A-B-C. Doctoral students only.

291A-B-C Directed Field Research in Educational Administration (1 to 3). Research in settings such as school sites, districts, county departments of education, and other K–12 educational agencies. Integration of educational administration knowledge with a range of analytic tools in designing and conducting a significant field research project. Corequisite: concurrent enrollment in Education 290A-B-C. Doctoral students only.

292 Scholarship Tools and Information and Communication Technologies for Doctoral Students (4). Examination of doctoral study tools, including computer applications, multimedia presentation technologies, digital libraries and electronic search techniques, graduate study resources on the World Wide Web, bibliographic software, and collaborative online communities and listserves. Doctoral students only.

298 Individual Study (2 to 8). Individual research on topics related to educational leadership and practice. Taken in addition to regular Ed.D. course of study. Does not fulfill degree requirements. May be repeated for credit for a total of 24 units.

299 Dissertation Research (2 to 8) F, W, S. Specifically designed for students researching and writing their dissertations. Doctoral students only. Satisfactory/Unsatisfactory only. May be repeated for credit.

CREDENTIAL COURSES

303 Student Teaching in the Elementary School (4 to 12) F, W, S. Student teaching experiences including orientation, seminars, and preparation for and assumption of classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with second semester of public school calendar. Limited to students accepted into the Teacher Credential Program. May be repeated for credit unlimited times. Formerly Education 303A.

304 Observation and Participation in Diverse K–6 Schools (4). Fieldwork experiences especially designed to provide student teacher candidate with an active learning context prior to student teaching with emphasis on diversity, expert teaching, procedures and routines of schooling, and knowledge about student developmental levels and educational needs. Limited to students accepted into the Teacher Credential or M.A.T. programs. Formerly Education 194.

305 Observation and Participation in Diverse Secondary Schools (4) F. Fieldwork experiences especially designed to provide student teacher candidates with an active learning context prior to student teaching with emphasis on diversity, expert teaching, procedures and routines of schooling, and knowledge about student developmental levels and educational needs. Limited to students accepted into the Teacher Credential Program. Formerly Education 174.

306 Supervised Teaching in Bilingual Education, Elementary (4 to 12) F, W, S, Summer. Student teaching experiences in bilingual public school classrooms to include orientation, regular seminars, and preparation for bilingual classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with the public school calendar. Limited to students accepted into the Teacher Credential Program. May be repeated for credit unlimited times. Formerly Education 306C.

307 Student Teaching in Intermediate/Secondary School (4 to 12) W, S. Student teaching experience to include orientation, seminars, and preparation for and assumption of secondary school classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with the public school calendar. Five full days a week in both winter and spring quarters. Limited to students accepted into the Teacher Credential Program. May be repeated for credit unlimited times. Formerly Education 307A.

309C-D-E Supervised Teaching in Bilingual Education, Secondary (4-4-4) F, W, S. Student teaching experiences in bilingual public school classrooms to include orientation, regular seminars, and preparation for bilingual classroom instructional responsibilities in accordance with State credentialing requirements and in conjunction with the public school calendar. Limited to students accepted in the Teacher Credential Program. Formerly Education 370C-D-E.

311 Preparation for Teaching in the Elementary School (4) S. Elementary curriculum and methodology, including instructional planning, teaching strategies, classroom management, evaluation, cultural and linguistic considerations, and interpersonal skills. Application of these to fieldwork experience in preparation for teaching responsibilities assumed in elementary schools. Limited to students accepted into the Teacher Credential Program. Formerly Education 183.

313 Intern Teaching in the Elementary School: Multiple Subject Instruction (4 to 12) F, W, S. Must be admitted to the UCI Department of Education and offered an intern teacher contract from a cooperating school district. Limited to students accepted into the Teacher Credential Program. May be repeated for credit unlimited times. Formerly Education 313A.

315 Preparation for Teaching in the Secondary School (4) S. Secondary curriculum and methodology, including instructional planning, teaching strategies, classroom management, evaluation, cultural and linguistic considerations and interpersonal skills. Application of these to fieldwork experience in preparation for teaching responsibilities assumed in secondary schools. Limited to students accepted into the Teacher Credential Program. Formerly Education 180.

317 Intern Teaching in the Secondary School: Single Subject Instruction (4 to 12) F, W, S. Must be admitted to the UCI Department of Education and offered an intern teacher contract from a cooperating school district. Limited to students accepted into the Teacher Credential Program. May be repeated for credit unlimited times. Formerly Education 317A.

319 Direct Field Experiences (4) S. Observation, participation, and teaching in diverse public school classrooms. Application of theory and pedagogy in fieldwork classrooms. Limited to students accepted into the Teacher Credential Program. Formerly Education 184A.

321 Curriculum and Methods for Elementary School Social Studies (3) W. Description, scope, sequence, and methods of teaching social studies and inquiry in grades K–8. Includes utilization of California State Framework for Teaching History/Social Science and addresses current aspects and trends in multicultural education. Limited to students accepted into the Teacher Credential Program. Formerly Education 110A.

322 Curriculum and Methods for Elementary School Mathematics (3) W. Scope, sequence, and methods of teaching mathematics at all levels of elementary school. Presented through lectures, discussions, demonstrations, and exploration of a variety of materials. Covers how to plan lessons, motivate students, diagnose difficulties, and evaluate learning in mathematics. Limited to students accepted into the Teacher Credential Program. Formerly Education 110B.

323 Curriculum and Methods for Elementary School Science (3) F. Prospective elementary teachers learn how to teach science in grades K–8. Covers State science requirements, a variety of teaching methods, criteria for selecting science curricular materials, and how to plan science lessons, units, experiments, projects, and demonstrations. Limited to students accepted into the Teacher Credential Program. Formerly Education 110C.

324 Curriculum and Methods for Elementary School Language Arts (3) W. An integrated approach to language arts instruction at the K–8 level emphasizing tenets of California State English/Language Arts Framework. Focus on the concept of writing as a process and the role of the reading/writing connection in fostering critical thinking. Limited to students accepted into the Teacher Credential Program. Formerly Education 110D.

325 Teaching the Visual and Performing Arts and Physical Education in Elementary School (3) W. Issues and practice in integrating California curriculum frameworks topics in elementary visual and performing arts and physical education with an emphasis on multicultural and computer-based resources and teaching strategies in the elementary school. Limited to students accepted into the Teacher Credential Program. May be taken for credit twice. Formerly Education 104A.

326 Curriculum and Methods for Elementary School Reading (4) F. Teaching an integrated reading/language arts program in the elementary classroom. Implementing theories, principles, and methods which are research and reality-based. Creating a child-centered, language-rich program to meet needs of children in multicultural/multilingual settings. Limited to students accepted into the Teacher Credential Program. Formerly Education 105A.

327 Foundations of Equity and Diversity for Elementary School Teachers (4). Principles of educational equity and diversity. Professional responsibilities of teachers and pedagogy for implementation in elementary school practices and subject matter content that provides all students equitable access to core curriculum. Limited to students accepted into the Teacher Credential Program. Formerly Education 123B.

328 Theory and Methods of Instruction of Special Populations in the General Education Classroom, Elementary (2). Knowledge, skills, and strategies to teach special populations at the elementary level. Categories of disability and exceptionality. Legislation pertaining to the education of special populations. Role of general education teacher in special education process. Differentiated instruction and inclusive environments. Limited to students accepted into the Teacher Credential Program. Formerly Education 163B.

329 Theories and Methods of English Language Development Applied to Elementary Students (4). Theories and methods of English language development and the instruction of English language learners, with a focus on elementary students. Includes language acquisition theory, language and content, assessment strategies, and preparation of curricula and instruction for grades K–6 English language learners. Limited to students accepted into the Teacher Credential or M.A.T. programs, or consent of instructor. Formerly Education 168B.

331 Instructional Technology: Resources for the Multiple Subject Classroom (3). Issues and techniques in uses of computer-based and media technologies in the multiple subject classroom: social implications and professional responsibilities, productivity tools to enhance student thinking skills, and strategies for instruction and management. Limited to students accepted into the Teacher Credential Program. Formerly Education 301A.

332 Creating a Supportive and Healthy Environment for Student Learning in the Elementary Classroom (2). Creation of healthy environments for student learning in elementary classrooms. Personal, family, school, community, environmental factors. Academic, physical, emotional, social well-being of students. Legal responsibilities of teachers related to student health, safety. Communication with family and use of community resources. Limited to students accepted into the Teacher Credential Program. Formerly Education 381B.

335 Secondary School Curriculum (4) F. An introduction to the historical, philosophical, and legal antecedents of secondary school education. Emphasis on the contextual nature of schooling and how various influences and issues impact the school curriculum. National, state, and local standards regarding specific curricular areas are examined. Limited to students accepted into the Teacher Credential Program. Formerly Education 101.

336 Methods of Teaching Languages other than English in the Secondary Schools (4) F. Prepares future teachers of foreign language or primary/home language. Emphasizes hands-on, practical strategies for communication-based instruction and authentic assessment, in reading, writing, listening, speaking, and culture. Limited to students accepted into the Teacher Credential Program. Formerly Education 102A.

337 Methods of Teaching Social Science in the Secondary School (4) F. Theories, strategies, and methodologies related to the teaching of history and social science in the secondary school. Emphasis on the planning, delivery, and assessment of lessons reflecting an understanding of the History-Social Science Framework for California. Limited to students accepted into the Teacher Credential Program. Formerly Education 102B.

338 Methods of Teaching English in the Secondary School (4) F. Introduction to teaching reading, writing, and speaking skills in the secondary school. Emphasis upon an integrative approach to the teaching of literature, composition, and grammar consistent with the California State Framework. Practice in the design of lesson plans that are both integrated and cumulative. Limited to students accepted into the Teacher Credential Program. Formerly Education 102C.

339 Methods of Teaching Visual and Performing Arts in the Secondary Schools (4) F. Theory, curriculum, and strategies for teaching visual and performing arts in the secondary school. Emphasis on the planning, delivery, and assessment of lessons consistent with California State Framework and content standards. Limited to students accepted into the Teacher Credential or M.A.T. programs. Formerly Education 102E.

340 Methods of Teaching Mathematics in Secondary School (4) F. Theories, strategies, and methodologies related to the teaching of mathematics in the secondary school. Emphasis on the planning, delivery, and assessment of lessons reflecting an understanding of the Mathematics Framework for California and the recommendations of professional organizations. Limited to students accepted into the Teacher Credential Program. Formerly Education 102F.

341 Methods of Teaching Science in Secondary School (4) F. Theories, strategies, and methodologies related to the teaching of science in the secondary school. Emphasis on the planning, delivery, and assessment of lessons reflecting an understanding of the Science Framework for California and the recommendations of professional organizations. Limited to students accepted into the Teacher Credential Program. Formerly Education 102G.

342 Applied Instructional Strategies in Secondary Schools (2) W, S. Application of pedagogy and research to practice teaching experiences in the secondary schools. A continuation of the Education 340 series with an emphasis on the needs of students with culturally diverse backgrounds. In Progress grading. Pass/Not Pass only. Corequisites: Education 320A, B, C, D, and E. Limited to students accepted into the Teacher Credential Program. May be taken twice for credit. Formerly Education 102H.

343 Pre-Intern Methods of Teaching Subject Matter (1) S. Preliminary issues in teaching subject matter in the secondary schools. Centered on development of competencies needed to assume intern teaching position and concurrent with intensive fieldwork prior to internship, this course explores theories, strategies, and methodologies related to subject matter teaching with an emphasis on diversity of students. Pass/Not Pass only. Corequisites: Education 315 and 319. Formerly Education 102I.

346 Reading and Writing in the Middle School and High School Classrooms (4) F. Emphasis is placed upon understanding the literacy processes (listening, speaking, thinking, reading, and writing) as they relate to all Single Subject areas. Teachers are guided to integrate literacy-related strategies with curriculum-based goals supported in the California State Frameworks. Limited to students accepted into the Teacher Credential Program. Formerly Education 105B.

347 Foundations of Equity and Diversity for Secondary School Teachers (4). Principles of educational equity and diversity. Professional responsibilities of teachers and pedagogy for implementation in secondary school practices and subject matter content that provides all students equitable access to core curriculum. Limited to students accepted into the Teacher Credential Program. Formerly Education 123A.

348 Theory and Methods of Instruction of Special Populations in the General Education Classroom, Secondary (2). Knowledge, skills, and strategies to teach special populations at the secondary level. Categories of disability and exceptionality. Legislation pertaining to the education of special populations. Role of general education teacher in special education process. Differentiated instruction and inclusive environments. Limited to students accepted into the Teacher Credential Program. Formerly Education 163A.

349 Theories and Methods of English Language Development Applied to Secondary Students (4). Theories and methods of English language development and the instruction of English language learners, with a focus on secondary students. Includes language acquisition theory, language and content, assessment strategies, and preparation of curricula and instruction for grades 7–12 English language learners. Limited to students accepted into the Teacher Credential or M.A.T. programs, or consent of instructor. Formerly Education 168A.

351 Instructional Technology: Resources for the Single Subject Classroom (3). Issues and techniques in uses of computer-based and media technologies in the single subject classroom: social implications and professional responsibilities, productivity tools to enhance student thinking skills, and strategies for instruction and management. Limited to students accepted into the Teacher Education Credential Program. Formerly Education 302A.

352 Creating a Supportive and Healthy Environment for Student Learning in the Secondary Classroom (2). Creation of healthy environments for student learning in secondary classrooms. Personal, family, school, community, environmental factors. Academic, physical, emotional, social well-being of students. Legal responsibilities of teachers related to student health, safety. Communication with family and use of community resources. Limited to students accepted into the Teacher Credential Program. Formerly Education 381A.

354 Governance, Organization, and Administration of Public Schools (4). Political, social, and economic forces affecting public school systems. Concepts of authority, power, and influence. Federal, State, and County mandates and policies, funding requirements, court decisions and other influences including school boards, administrators, unions, professional organizations, and pressure groups. Open to Preliminary Administrative Services Credential students only.

355 School Management in a Community Setting (4). School management, problem solving, decision making. Role of staff, community (including minorities) in assessing needs, establishing/implementing action plans. Management of support systems, internal/external communications, application of information technology. Conflict resolution, stress management, school site councils, community relations, parent involvement. Open to Preliminary Administrative Services Credential students only.

380 Health Education for Teachers (4). Includes an introduction to the health status of the elementary and secondary child, school health services, special health concerns, CPR training, and health resources. Course meets State requirement for Professional Clear Teaching Credentials.

382 Mainstreaming Special and General Education (4) F, W, S, Summer. Analysis of legal requirements and educational issues surrounding the integration of special and general education; framework and strategies for establishing mainstreaming teams of regular teachers, special education teachers, and school administrators; methods for teaching mainstreamed students in regular classrooms. Course meets State requirements for Professional Clear Teaching Credentials. Formerly Education 162.

383 Instruction in Computer-Based Technology and Classroom Usage (5). Classroom uses of computer-based technologies. Includes study of hardware and software systems and components. Emphasizes computer-based technologies as tools to enhance student thinking skills, for instruction in subject areas at proper grade levels, and in management programs. Formerly Education 301C.

390 Curriculum Design and Management in Public Schools (4). Historical and contemporary principles of curriculum development. Basis for curriculum decisions: theories and techniques of curriculum planning. Development of educational programs: multicultural and socioeconomic considerations, evaluation, and staff development. Principles of curricular alignment including delivery, materials, and assessment. Open to Preliminary Administrative Services Credential students only.

391 Educational Leadership (4). Theories of leadership, organizational behavior, judgment, and decision making. Comparison of management and leadership perspectives. Role of the leader in various contexts. Analysis of approaches to issues such as decentralization, the change process, and student rights. Open to Preliminary Administrative Services Credential students only.

397A-B Supervised and Administrative Field Work (4-4). A field experience in administration or supervision in the public school. The school district, student, and UCI jointly plan the work experience, its supervision, and accompanying academic work. Open to Preliminary Administrative Credential students only.

397D-E-F Professional Field Experience (4-4-4) Theory and practice in a school setting under the supervision of a practicing school administrator. Opportunity to apply and refine knowledge and skills in areas of primary interest or need in the educational domains specified for this credential. Open to Professional Administrative Credential students only.

398 Special Topics (3). Meets the induction and program planning requirements for students enrolled in the Professional Administrative Services Credential. Also serves as the final course in the program, wherein the candidate, the University instructor, and a representative of the involved school district assess and evaluate candidate competency. Open to Professional Administrative Services Credential students only. May be taken for credit twice.

399 University Teaching (1 to 4) F, W, S, Summer. Limited to teaching assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

THE HENRY SAMUELI SCHOOL OF ENGINEERING

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Overview

The academic mission of The Henry Samueli School of Engineering has been developed to be consistent with the missions and goals set for it by the State of California, the University of California, and the University of California, Irvine (UCI) campus. Specifically, the academic mission of the School is to provide a stimulating academic environment for individuals interested in the application of science and the development of new technologies for the benefit of society, and to provide a supportive environment for each program to meet its unique objectives.

The individual engineering and related programs have published program objectives that are consistent with the missions and goals of the University of California and UCI, The Henry Samueli School of Engineering, and the Accreditation Board for Engineering and Technology (ABET) General Criteria for Accrediting Programs in Engineering in the United States.

The School offers undergraduate majors in Aerospace Engineering (AE), Biomedical Engineering (BME), Biomedical Engineering: Premedical (BMEP), Chemical Engineering (ChE), Civil Engineering (CE), Computer Engineering (CpE), Computer Science and Engineering (CSE, a joint program with the Donald Bren School of Information and Computer Sciences), Electrical Engineering (EE), Engineering (a general program, GE), Environmental Engineering (EnE), Materials Science Engineering (MSE), and Mechanical Engineering (ME). The majors in Aerospace, Chemical, Civil, Computer, Electrical, Environmental, and Mechanical Engineering are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Aerospace Engineering considers the flight characteristics, performance, and design of aircraft and spacecraft. An upper-division series of courses in aerodynamics, propulsion, structures, and control follows a common core with Mechanical Engineering. The skills acquired in those courses are integrated in the capstone aerospace design course. The intent of the program is to produce highly proficient engineers who can tackle the aerospace engineering challenges of the future. See page 224.

Biomedical Engineering applies fundamental engineering principles to solve complex problems that are fundamentally medical in nature, and focuses at improving the quality of health care by advancing technology and reducing costs. Examples include advanced biomedical imaging systems, the design of microscale diagnostic systems, drug delivery systems, and tissue engineering. Two bachelor's degree programs are offered—Biomedical Engineering and Biomedical Engineering: Premedical. The former contains more engineering content and less biology whereas the latter is geared toward preparing students for admission to medical school. See page 188.

Chemical Engineering applies the knowledge of chemistry, mathematics, physics, biology, and humanities to solve societal problems in areas such as energy, health, the environment, food, textiles, shelter, semiconductors, and homeland security. Employment opportunities exist in various industries such as chemical, petroleum, polymer, pharmaceutical, food, textile, fuel, consumer products, and semiconductor, as well as in local, state, and federal governments. See page 193.

Civil Engineering addresses the challenges of large-scale engineering projects of importance to society as a whole, such as water distribution, transportation, and building design. Specializations are provided in General Civil Engineering, Environmental Hydrology and Water Resources, Structural Engineering, and Transportation Information and Control Systems. See page 202.

Computer Engineering addresses the design and analysis of digital computers, including both software and hardware. Computer design includes topics such as computer architecture, VLSI circuits, data base, software engineering, design automation, system software, and data structures and algorithms. Courses include programming in high-level languages such as Python, Java, C, C++; use of software packages for analysis and design; design of system software such as editors, compilers, debuggers, and operating systems; application of computers in solving engineering problems, and laboratories in both hardware and software experiences. See page 212.

Computer Science and Engineering is designed to provide students with the fundamentals of computer science, both hardware and software, and the application of engineering concepts, techniques, and methods to both computer systems engineering and software system design. The program gives students access to multidisciplinary problems in engineering with a focus on total systems engineering. Students learn the computer science principles that are critical to development of software, hardware, and networking of computer systems. From that background, engineering concepts and methods are added to give students exposure to circuit design, network design, and digital signal processing. Elements of engineering practice include systems view, manufacturing and economic issues, and multidisciplinary engineering applications. The program is administered jointly by the Department of Electrical Engineering and Computer Science and the Donald Bren School of Information and Computer Sciences. See page 213 and page 321.

Electrical Engineering is one of the major contributors to the modernization of our society. Many of the most basic and pervasive products and services are either based on or related to the scientific and engineering principles taught at the Department of

Electrical Engineering and Computer Science. Students can specialize in three general areas of studies—Electro-optics and Solid-State Devices, Power Electronics and Power Systems, and Systems and Signal Processing—all at the forefront of technological advancement. See page 214.

The major in **Engineering** is a special program of study for upper-division students who wish to combine the study of engineering principles with other areas such as the physical and biological sciences, social and behavioral science, humanities, and arts. Students may construct their own specialization. See page 180.

Environmental Engineering concerns the development of strategies to control and minimize pollutant emissions, to treat waste, and to remediate polluted natural systems. Emphasis areas include air quality and combustion, water quality, and water resources engineering. See page 204.

Materials Science Engineering is concerned with the generation and application of knowledge relating the composition, structure, and synthesis of materials to their properties and applications. During the past two decades, Materials Science Engineering has become an indispensable component of modern engineering education, partly because of the crucial role materials play in national defense, the quality of life, and the economic security and competitiveness of the nation; and partly because the selection of materials has increasingly become an integral part of almost every modern engineering design. Emphasis in the Materials Science Engineering curriculum is placed on: the synthesis, characterization, and properties of advanced functional materials; analysis, selection, and design related to the use of materials; the application of computers to materials problems; and the presence of an interdisciplinary theme that allows a qualified student to combine any engineering major with the Materials Science Engineering major. See page 194.

Mechanical Engineering considers the design, control, and motive power of fluid, thermal, and mechanical systems ranging from microelectronics to spacecraft to the human body. Specializations allow students to focus their technical electives in the areas of Aerospace Engineering, Energy Systems and Environmental Engineering, Flow Physics and Propulsion Systems, and Mechanical Systems, Design, and Computation. See page 225.

The School offers M.S. and Ph.D. degrees in Biomedical Engineering; Chemical and Biochemical Engineering; Civil Engineering; Electrical and Computer Engineering, with concentrations in Electrical Engineering, Computer Networks and Distributed Computing, and Computer Systems and Software; Engineering, with concentrations in Arts, Computation, and Engineering, Environmental Engineering, Materials Science and Engineering, and Protein Engineering Science; Materials Science and Engineering; and Mechanical and Aerospace Engineering. Specialized research opportunities are available within each of these programs. Bioreaction and bioreactor engineering, recombinant cell technology, and bioseparation processes are research areas in Biochemical Engineering. In Civil Engineering, research opportunities are provided in structural/earthquake engineering, reliability engineering, transportation systems engineering, environmental engineering, and water resources. Research opportunities in Electrical and Computer Engineering are available in the areas of parallel and distributed computer systems, VLSI design, computer architecture, image and signal processing, communications, control systems, and optical and solid-state devices. Research in combustion and propulsion sciences, laser diagnostics, supersonic flow, direct numerical simulation, computer-aided design, robotics, control theory, parameter identification, material processing, electron microscopy, and ceramic engineering are all available in Mechanical and Aerospace Engineering.

Additional publications describing undergraduate and graduate academic study and research opportunities are available through The Henry Samueli School of Engineering, and the Departments of Biomedical Engineering, Chemical Engineering and Materials Science, Civil and Environmental Engineering, Electrical Engineering and Computer Science, Mechanical and Aerospace Engineering, and the graduate programs in Biomedical Engineering and Protein Engineering.

DEGREES

Aerospace Engineering	B.S.
Biomedical Engineering	B.S., M.S., Ph.D.
Biomedical Engineering: Premedical	B.S.
Chemical and Biochemical Engineering	M.S., Ph.D.
Chemical Engineering	B.S.
Civil Engineering	B.S., M.S., Ph.D.
Computer Engineering	B.S.
Computer Science and Engineering[1]	B.S.
Electrical and Computer Engineering	M.S., Ph.D.
Electrical Engineering	B.S.
Engineering	B.S., M.S., Ph.D.
Environmental Engineering	B.S.
Materials Science and Engineering	M.S., Ph.D.
Materials Science Engineering	B.S.
Mechanical and Aerospace Engineering	M.S., Ph.D.
Mechanical Engineering	B.S.
Networked Systems[1, 2]	M.S., Ph.D.

[1] Offered jointly with the Donald Bren School of Information and Computer Sciences.

[2] See the Interdisciplinary Studies section of the *Catalogue* for information.

UNDERGRADUATE STUDY

Student Affairs Office
101 Engineering and Computing Trailer; (949) 824-4334
John LaRue, **Associate Dean**

PLANNING A PROGRAM OF STUDY

Advising

Academic advising is available from academic counselors and peer advisors in the School's Student Affairs Office, 101 Engineering and Computing Trailer, and from faculty advisors. *Students must realize, however, that ultimately they alone are responsible for the planning of their own program and for satisfactory completion of the graduation requirements.* Students are encouraged to consult with the academic counselors in the Engineering Student Affairs Office whenever they desire to change their program of study. All Engineering majors are required to meet with their faculty advisor at least once each year.

Some engineering students will need *more than four years* to obtain their B.S. degree, particularly if part-time employment or extracurricular activities make heavy demands on their time. Normally, such students can stay on track, and are encouraged to do so, by enrolling in summer sessions at UCI or at other institutions when a petition has been approved in advance.

High-achieving students may declare a second major. Early consultation with the School is advisable.

Required courses may be replaced by other courses if the student substantiates the merits of the program of study and obtains prior approval from faculty in the School.

Students should be aware that most Engineering courses require the completion of prerequisites. The sample programs shown in each departmental description constitute preferred sequences which take into account all prerequisites.

School policy does not permit the addition or deletion of Engineering courses after the second week of the quarter.

Undergraduate students who have high academic standing, who have completed the necessary prerequisites, and who have obtained permission from the School may qualify to take certain graduate-level courses.

Students are required to complete UCI's lower-division writing requirement (see the Requirements for a Bachelor's Degree section) during the first two years. Thereafter, proficiency in writing and computing (using a higher-level language such as FORTRAN, Python, C, C++, Java, or with MATLAB) is expected in all Engineering courses.

Students in the School, in accordance with general campus policy, are permitted to take courses in certain areas on a Pass/Not Pass basis. With respect to programs in Engineering, such areas are courses which do not fulfill the major requirements and the breadth courses (*except* for courses taken in fulfillment of the UC Entry Level Writing requirement).

Admissions

The sequential nature of the Engineering program and the fact that many courses are offered only once a year make it beneficial for students to begin their studies in the fall quarter. Applicants wishing to be admitted for the fall quarter, 2006 must have submitted their completed application forms during the priority filing period (November 1–30, 2005).

High school students wishing to enter the UCI Engineering program must have completed four years of mathematics through precalculus or math analysis and are advised to have completed one year each of physics and chemistry. That preparation, along with honors courses and advanced placement courses, is fundamental to success in the Engineering program and is vital to receiving first consideration for admittance to an Engineering major during periods of restricted enrollments. Students applying for admission for fall quarter should complete their examination requirements during May or June of their junior year or during their senior year, but no later than the December test date. (Typically, this means that students will take either the SAT Reasoning Test or the ACT Assessment plus Writing test in October or November, and will take two SAT Subject Tests in November or December.) Applicants must apply for admission to a specific Engineering major.

If enrollment limitations make it necessary, unaccommodated Engineering applicants may be offered alternative majors at UCI.

Transfer students may be admitted to The Henry Samueli School of Engineering either from another major at UCI or from another college or university. A student seeking admission to The Henry Samueli School of Engineering from colleges and schools other than UCI must satisfy University requirements for admission with advanced standing and should complete appropriate prerequisites for their major of choice. It is to the student's advantage to complete the Intersegmental General Education Transfer Curriculum (IGETC) or UCI breadth and lower-division requirements prior to transfer. Since requirements vary from major to major, those contemplating admission with advanced standing to the School should consult each Department's *Catalogue* section and the UCI Office of Admissions and Relations with Schools, (949) 824-6703, for the specific requirements of each program. All transfer students should arrange for early consultation with The Henry Samueli School of Engineering Student Affairs Office at (949) 824-4334.

Change of Major. Students who wish to change their major to one offered by the School should contact the Engineering Student Affairs Office for information about change-of-major requirements, procedures, and policies. Information is also available at http://www.due.uci.edu/Change_of_Major.html.

Proficiency Examinations

A student may take a course by examination with the approval of the faculty member in charge of the course and the Dean of the School. Normally, ability will be demonstrated by a written or oral examination; if a portion of the capability involves laboratory exercises, the student may be required to perform experiments as well. The proficiency examination is not available for any course a student has completed at UCI.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

All students in The Henry Samueli School of Engineering must fulfill the following requirements.

University Requirements: See pages 56–60.

School Requirements

The minimum subject-matter requirements for graduation are:

Mathematics and Basic Science Courses: Students must complete a minimum of 48 units of college-level mathematics and basic sciences.

Engineering Topics Courses: Students must complete a minimum of 72 units of engineering topics. *Engineering topics* are defined as courses with applied content relevant to the field of engineering.

Design Units: All undergraduate Engineering courses indicate both a total and a design unit value. Design unit values are listed at the end of the course description. Each student is responsible for the inclusion of courses whose design units total that required by the program of study.

The Academic Plan and Advising Requirements to remain affiliated with The Henry Samueli School of Engineering: All students enrolled in The Henry Samueli School of Engineering are required to meet annually with their designated faculty advisor and to have an academic plan on file with the Student Affairs Office which has been approved by their academic counselor. Students who do not have a plan on file, or deviate from this plan without approval from an academic counselor will be subject to probation. Students on probation for two consecutive quarters who do not have a plan on file, or deviate from this plan without approval from an academic counselor will be subject to disqualification. Students who fail to meet with a faculty advisor each year will be subject to disqualification.

Duplication of Subject Material: Students who take courses which involve considerable duplication of subject material may not receive full graduation credit for all units thus completed.

Residence Requirement: In addition to the University residence requirement, at least 36 upper-division engineering units specified by each major must be completed successfully at the University of California.

Variations: Variations from the general School degree requirements may be made subject to the approval of the faculty of the School. Students wishing to obtain variances should submit petitions to the School's Student Affairs Office.

Undergraduate Programs

Specific information about courses fulfilling School and major requirements can be found on the following pages. Note that some majors require more units than the School requirements.

MINORS OF INTEREST TO ENGINEERS

Minor in Earth and Atmospheric Sciences

The minor in Earth and Atmospheric Sciences focuses on the application of physical, chemical, and biological principles to understanding the complex interactions of the atmosphere, ocean, and land through climate and biogeochemical cycles. See the Department of Earth System Science in the School of Physical Sciences section of this *Catalogue* for more information.

Minor in Global Sustainability

The interdisciplinary minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet. See the Interdisciplinary Studies section of this *Catalogue* for more information.

CAREER ADVISING

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information. In addition, special career planning events are held throughout the year including an annual Career Fair. Individual career counseling is available, and students have access to the Career Library which contains information on graduate and professional schools in engineering, as well as general career information.

HONORS

Graduation with Honors. Undergraduate honors at graduation in The Henry Samueli School of Engineering are computed by using 50 percent of the overall UCI GPA and 50 percent of the upper-division Engineering GPA. (Engineering E190 is not used in the calculation of the upper-division GPA.) A general criterion is that students must have completed at least 72 units in residence at a University of California campus by the end of the winter quarter of the academic year in which they graduate. Approximately 1 percent of the graduating class shall be awarded *summa cum laude,* 3 percent *magna cum laude,* and 8 percent *cum laude,* with no more than 12 percent being awarded honors. Other important factors are considered (see page 52).

Dean's Honor List. The quarterly Dean's Honor List is composed of students who have received a 3.5 GPA while carrying a minimum of 12 graded units.

Gregory Bogaczyk Memorial Scholarship. This scholarship was established in memory of Gregory Bogaczyk, a former UCI Mechanical Engineering student, and is contributed by the Bogaczyk family and friends. An award is given each year to a junior or senior Mechanical Engineering student.

Haggai Memorial Endowed Scholarship. This memorial fund was established in honor of Ted Haggai, an electrical engineer. This scholarship is awarded to an outstanding senior electrical engineering student and member of Tau Beta Pi. Primary consideration will be given to members of Tau Beta Pi who have contributed outstanding service to both UCI and The Henry Samueli School of Engineering.

Christine Jones Memorial Scholarship. This scholarship was established in memory of Christine Jones, an Electrical Engineering graduate, Class of 1989. The primary focus of this scholarship is to provide financial support to a female undergraduate student in The Henry Samueli School of Engineering.

Deborah and Peter Pardoen Memorial Scholarship. This scholarship is awarded each year to a graduating senior in Mechanical Engineering or in Aerospace Engineering. The scholarship is based on outstanding service to The Henry Samueli School of Engineering and the community.

Henry Samueli Endowed Scholarship. This premier scholarship, established by Henry Samueli, is awarded to outstanding freshmen and transfer students in The Henry Samueli School of Engineering. Recipients are chosen by the School based on their academic excellence. The award is renewable up to four years for freshmen and up to two years for transfer students.

Additional awards in other categories are made throughout the academic year.

CENTER FOR OPPORTUNITIES AND DIVERSITY IN ENGINEERING

101 Engineering and Computing Trailer; (949) 824-2077
Robin Jeffers, **Director**

The Center for Opportunities and Diversity in Engineering (CODE) houses a comprehensive recruitment, retention, and placement program in The Henry Samueli School of Engineering which attempts to provide academic support and professional development to students from backgrounds which have traditionally had limited access to the engineering profession. Services provided include: advisement, tutoring, study rooms, notification of research opportunities, fellowships, guest speakers, and employment opportunities. At the core of its activity is the focus on community building, and students are encouraged to bond around their common interests and goals.

SPECIAL PROGRAMS AND COURSES

Campuswide Honors Program

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

Engineering 199

Every undergraduate student in The Henry Samueli School of Engineering has the opportunity to pursue independent research under the direct supervision of a professor in the School. Interested students should consult with a faculty member to discuss the proposed research project. If the project is agreed upon, the student must fill out a 199 Proposal Form and submit it to the Engineering Student Affairs Office.

Undergraduate Research Opportunities Program

The Undergraduate Research Opportunities Program (UROP) encourages and facilitates research and creative activities by undergraduates. Research opportunities are available not only from every discipline, interdisciplinary program, and school, but also from many outside agencies, including national laboratories, industrial partners, and other universities. UROP offers assistance to students and faculty through all phases of the research activity: proposal writing, developing research plans, resource support, conducting the research and analyzing data, and presenting results of the research at the annual spring UCI Undergraduate Research Symposium. Calls for proposals are issued in the fall and spring quarters. Projects supported by UROP may be done at any time during the academic year and/or summer, and the research performed must meet established academic standards and emphasize interaction between the student and the faculty supervisor. In addition, all students participating in faculty-guided research activities are welcome to submit their research papers for faculty review and possible publication in the annual *UCI Undergraduate Research Journal.* For more information, contact the UROP Office, 1100 Student Services II; telephone (949) 824-4189; e-mail: urop@uci.edu; World Wide Web: http://www.urop.uci.edu/.

Accelerated M.S. Program or Ph.D. Program in The Henry Samueli School of Engineering

Exceptionally promising UCI undergraduate Engineering students with a minimum cumulative 3.5 GPA may, during their junior or senior year, apply for accelerated admissions into the M.S. or Ph.D. programs within The Henry Samueli School of Engineering. Accelerated admission would allow a student to petition for exemption from UCI's Graduate Record Examination (GRE) requirement for graduate school admission. (The exemption applies only to current UCI students applying for admission to one of the M.S. programs in The Henry Samueli School of Engineering; other graduate schools may still require the GRE. Non-engineering students in related disciplines are encouraged to apply to the accelerated program. However, these particular applicants must have performed research with a faculty member in the School, as well as identified a research advisor for their graduate studies. Admissibility of these students depends on the discretion of the faculty.)

The student would request GRE exemption at the time of applying. Accelerated admission applicants would in all other ways be evaluated in the same manner as other applicants to the School's graduate programs. Occasionally, a candidate for accelerated admission may be required by the faculty to submit GRE scores in support of the graduate application.

Students offered accelerated admission, upon completion of the undergraduate degree program, may petition to credit toward the M.S. degree up to 18 units (with a grade of B or better) or graduate-level course work completed in excess of requirements for the UCI bachelor's degree.

A UCI undergraduate whose ultimate goal is a Ph.D. may apply for the accelerated M.S. program, however, a GRE score must be submitted.

Education Abroad Program

Upper-division and graduate Engineering students may participate in a number of programs which offer unique opportunities for education and training abroad. The University's Education Abroad Program (EAP) offers engineering course work for UCI academic credit at a number of universities. Some of the EAP-affiliated engineering schools require proficiency in the host country's language, while others are English speaking. Study abroad may postpone the student's graduation for one or two quarters, depending primarily on the student's language preparation (which can begin in the freshman year), but the added experience can add to the student's maturity and professional competence. EAP students pay regular UCI fees and keep any scholarships they may have. Additional information is available in the Education Abroad Program section.

STUDENT PARTICIPATION AND ORGANIZATIONS

Faculty and committee meetings (except those involving personnel considerations) are open meetings; in addition to designated student representatives, all students are encouraged and expected to participate in the development of School policy. Student evaluation of the quality of instruction for each course is requested each quarter.

Engineering students may join any of a number of student organizations. Most of these organizations are professionally oriented and in many instances are local chapters of national engineering societies. A primary function of these groups is to provide regular technical and social meetings for students with common interests. Most of the groups also participate in the annual Engineering Week activities and in other School functions.

Associated General Contractors (AGC). A student chapter of the national organization, ACG at UCI is an academic engineering club for students interested in the construction field.

American Institute of Aeronautics and Astronautics (AIAA). The AIAA is a technical society of 40,000 professional and student members devoted to science and engineering in the field of aerospace. The local chapter's primary activities include seminars, tours of industries, and mentoring for students by professional members.

American Institute of Chemical Engineers (AIChE). AIChE, a student chapter of the national organization, provides Chemical Engineering majors with the opportunity to interact with faculty and professionals in the field.

American Society for Civil Engineers (ASCE). One of the larger engineering clubs, ASCE at UCI is a student chapter of the national organization. The ASCE focuses its efforts on interactions with professional engineers, sponsorship of Engineering Week activities, and participation in the annual ASCE Southwest Conference.

American Society for Materials (ASM). The student chapter of ASM at UCI provides the opportunity for Materials Science Engineering (MSE) students to meet engineers and scientists from local industry, attend seminars organized by the Orange Coast Chapter of ASM International, and organize discussion sessions that focus on progress and advances in the MSE field and that promote interactions between MSE students and materials faculty.

American Society of Mechanical Engineers (ASME). The student chapter of ASME at UCI provides the opportunity for Mechanical Engineering majors to meet with professors, organize social events, and participate in events and competitions supported by the ASME national organization.

Biomedical Engineering Society. The student chapter of BMES at UCI is an academic club for students in the field of Biomedical Engineering.

Chi Epsilon. This organization is a national engineering honor society which is dedicated to the purpose of promoting and maintaining the status of civil engineering as an ideal profession. Chi Epsilon was organized to recognize the characteristics of the individual that are fundamental to the successful pursuit of an engineering career.

Electric Vehicle Association/UCI (EVA/UCI). EVA/UCI gives students an opportunity for hands-on work on electric car conversions coupled with design experience.

Engineering Student Council (ESC). The ESC is the umbrella organization that provides a voice for all Engineering student chapters. A significant activity of the Council is organizing UCI's annual Engineering Week celebration.

Eta Kappa Nu. A student chapter of the National Electrical Engineering Honor Society, Eta Kappa Nu's purpose is to promote creative interaction between electrical engineers and give them the opportunity to express themselves uniquely and innovatively to project the profession in the best possible manner.

Filipinos Unifying Student-Engineers in an Organized Network (FUSION). FUSION is the merging of diverse, distinct, or separate elements into a unified whole. The mission of FUSION is to promote the academic and professional development of student engineers by providing an organized network of support.

Institute of Electrical and Electronic Engineers (IEEE). A student chapter of a multinational organization, IEEE at UCI encompasses academic, professional, and social activities.

Institute of Transportation Engineers (ITE). ITE is a student chapter of a national group of transportation engineering professionals. Offering opportunities to meet both professionals and other students, ITE focuses its activities on an annual project with practical applications.

Mexican-American Engineering Society (MAES). Open to all students, MAES is a student and professional organization with the purpose of aiding students in their academic, professional, and social endeavors.

National Society of Black Engineers (NSBE). The NSBE, with almost 6,000 members, is one of the largest student-managed organizations in the country. The Society is dedicated to the realization of a better tomorrow through the development of intensive programs to increase the recruitment, retention, and successful graduation of underrepresented students in engineering and other technical majors.

Omega Chi Epsilon. The student chapter of the National Chemical Engineering Honor Society aims to recognize and promote high scholarship, original investigation, and professional service in chemical engineering.

Phi Sigma Rho. This national sorority is open to women who are in engineering and engineering technology majors. Its purpose is to provide social opportunities, promote academic excellence, and provide encouragement and friendship.

Pi Tau Sigma. The mechanical engineering honor society, Pi Tau Sigma is committed to recognizing those of high achievement. The aim of the organization is to develop the complete engineering student through academic and social activities.

Society of Hispanic Professional Engineers (SHPE). SHPE is both a student and professional organization. The UCI SHPE chapter works to recruit, retain, and graduate Latino engineers by providing a comprehensive program which includes high school visitations, coordinated study sessions, and industry speakers and tours. At the professional level there are opportunities for career positions and scholarships for members who are enrolled in undergraduate and graduate engineering and computer science programs.

Society of Automotive Engineers (SAE). Members of the SAE chapter at UCI participate in technical expositions, mini-Baja buggy races, student competitions, and social activities.

Society of Women Engineers (SWE). SWE is a national service organization dedicated to the advancement of women in engineering. UCI's student chapter encourages academic and social support, and membership is open to both men and women in technical majors interested in promoting camaraderie and in helping to make engineering study a positive experience.

Structural Engineers Association of Southern California (SEAOSC). The UCI student chapter of SEAOSC introduces students to the field of structural engineering through tours, speakers, and SEAOSC dinners with professional members of the organization.

Tau Beta Pi. The national Engineering honor society, Tau Beta Pi acknowledges academic excellence in the wide variety of engineering disciplines. Tau Beta Pi at UCI sponsors community service activities, social events, and technical and nontechnical seminars.

SCHOOLWIDE PROGRAM

Faculty in the Departments of Biomedical Engineering, Chemical Engineering and Materials Science, Civil and Environmental Engineering, Electrical Engineering and Computer Science, and Mechanical and Aerospace Engineering also teach courses in the major in Engineering program.

Descriptions and requirements for the undergraduate majors in Aerospace Engineering (AE), Biomedical Engineering (BME), Biomedical Engineering: Premedical (BMEP), Chemical Engineering (ChE), Civil Engineering (CE), Computer Engineering (CpE), Computer Science and Engineering (CSE), Electrical Engineering (EE), Engineering (a general program, GE), Environmental Engineering (EnE), Materials Science Engineering (MSE), and Mechanical Engineering (ME) may be found in subsequent sections.

General Undergraduate Major in Engineering

101 Engineering and Computing Trailer; (949) 824-4334

The Henry Samueli School of Engineering offers a general undergraduate major in Engineering to upper-division students who wish to pursue broad multidisciplinary programs of study or who wish to focus on a special area not offered in the four departments. Examples of other areas that may be of interest are: biochemical engineering, electromechanical engineering, project management, or hydrology. The program of study in any area, aside from the established specializations, is determined in consultation with a faculty advisor.

ADMISSIONS

The general major in Engineering is only open to junior-standing students who have completed the required lower-division courses with a high level of achievement. Freshmen are not eligible to apply for this major. The sequential nature of the Engineering program and the fact that many courses are offered only once a year make it beneficial for students to begin their studies in the fall quarter.

Transfer students. The general Engineering major is a specialized program for students who are seeking careers in areas other than traditional engineering disciplines and is open to upper-division students only. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory), one course in computational methods (FORTRAN, C, C++), and two additional approved courses for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN ENGINEERING

Credit for at least 180 units, and no more than 196 units. All courses must be approved by a faculty advisor and the Associate Dean of Student Affairs prior to enrollment in the program.

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B-D, 2J, and 3D. Physics 7A-B, 7LA-LB. With the approval of a faculty advisor and the Associate Dean, students select all additional Mathematics and Basic Science courses.

Engineering Topics Courses: Engineering EECS10. With the approval of a faculty advisor and the Associate Dean, students select all additional Engineering Topics courses.

Design unit values are indicated at the end of each course description. The faculty advisors and the Student Affairs Office can provide necessary guidance for satisfying the design requirements.

PROGRAM OF STUDY

Students should keep in mind that the program for the major in Engineering is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students must have their programs approved by an academic counselor in

Engineering. A sample program of study is available in the Student Affairs Office.

Courses in Engineering

LOWER-DIVISION

NOTE: With the exception of ENGR5 and ENGR54, the courses listed below are open only to students in The Henry Samueli School of Engineering. All other majors must petition for permission to enroll.

ENGR1 Freshman Seminar in Engineering (1). An introduction to the engineering profession. Weekly seminars by both faculty and representatives from industry present an overview of each engineering discipline. Students learn about current trends and issues in engineering, and career and academic options. (Design units: 0)

ENGR2 Energy Sources, Energy Uses (4). Technical aspects of energy extraction, transport, use, and environmental effects. Devices for energy conversion. (Design units: 0) *Not offered every year.*

ENGR5 Exploring the Engineering Mind: Building Bicycles (4). Structured to introduce students to the engineering mind—how engineers analyze problems and design solutions. Topics include how materials work, how nature designs materials (such as seashells and eggshells), and how engineers design using the example of the bicycle. May not be taken by Engineering students to fulfill major requirements. **(II)**

ENGR10 Computational Methods in Engineering (4). Procedures and procedure followers, algorithms and flow charts, computer languages, subprograms. Computer macro- and microelements, number systems. Methods of differentiation, integration, curve fitting, list processing. Error analysis. Must qualify in BASIC and FORTRAN at end of course through computer use. Corequisite or prerequisite: Mathematics 2A. Only one course from ENGR10, CEE10, MAE10, EECS10, and EECS12 may be taken for credit. (Design units: 0). *Not offered every year.*

ENGR20 Energy and Society (4). The social, economic, and political aspects of how we obtain energy, get it to where we need it, use it, dispose of the wastes, and pay for these activities. Examination of alternatives. (Design units: 0) *Not offered every year.*

ENGR30 Statics (4) F, Summer. Addition and resolution of forces, distributed forces, equivalent systems of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Corequisite or prerequisite: Mathematics 2D. Prerequisite: Physics 7A. Same as Engineering CEE30 and MAE30. (Design units: 0)

ENGR54 Principles of Materials Science and Engineering (4) W, S. Materials—topics range from superconductors to biodegradable polymers. Structure and properties of materials, including metal, ceramics, polymers, semiconductors, composites, traditional materials. Atomic structure, bonding, defects, phase equilibria, mechanical properties, electrical, optical, and magnetic properties. Brief introduction to materials processing and synthesis. Prerequisites: Chemistry 1A and Physics 7B. (Design units: 0)

ENGR69 Energy Facilities Inspection (0). Inspection of power-generating stations of various types, oil and gas processing facilities, and end-use facilities. One unit of workload credit. Prerequisites: ENGR2, consent of instructor. May be repeated for credit as topics vary. (Design units: 0) *Not offered every year.*

ENGR80 Dynamics (4) W, Summer. Introduction to the kinetics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken. Prerequisites: Mathematics 2D and Physics 7B. Same as CEE80 and MAE80. (Design units: 0.5)

ENGR92 Engineering and Computer Educational Laboratory (0) F. Comprehensive academic support designed primarily for underrepresented or underprepared students in Engineering, ICS, or selected areas of the physical sciences. Typical program activities: tutoring, study skills, career planning, self-esteem enhancement, library research techniques. Pass/Not Pass only. Students may receive a maximum of 12 units of workload credit only. (Design units: 0)

ENGR93 Public and Professional Service in Engineering (0). Student participation in public and professional service activities related to engineering. One to four units of workload credit only.

ENGR98 Group Study (1 to 4). Group study of selected topics in engineering. Prerequisite: consent of instructor. May be repeated for credit. (Design units: varies)

UPPER-DIVISION

ENGR150 Mechanics of Materials (4) F, W, S, Summer. Stresses and strains, strain-stress diagrams, axial deformations, torsion, bending and shear stresses in beams, shear force and bending moment diagrams, combined stresses, principal stresses, Mohr's circle, deflection of beams, columns. Prerequisite: CEE30 or ENGR30 or MAE30. Same as CEE150. ENGR150/CEE150 and ENGRH150/CEEH150 may not both be taken for credit. (Design units: 1)

ENGRH150 Mechanics of Materials (4) F, W, S, Summer. Covers the same material as ENGR150 but in greater depth. Prerequisite: CEE30 or ENGR30 or MAE30. Same as CEEH150. ENGRH150/CEEH150 and ENGR150/CEE150 may not both be taken for credit. (Design units: 1)

ENGR169 Energy Systems Field Trip (3). A ten-day to two-week inspection trip to energy extraction facilities, large-scale energy users, research laboratories, and design offices. Prerequisites: ENGR2 and ENGR20 or consent of instructor. (Design units: 0)

ENGR190 Communications in the Professional World (4) F, W, S, Summer. Workshop in technical and scientific writing. Oral presentation with video monitoring. Communication with various publics. Real-world professionalism. Students must be of junior or senior standing in Engineering and have completed the lower-division writing requirement. (Design units: 0)

ENGR192 Ethical Issues in Engineering (4) S. Application of ethical theory to moral problems confronted by engineers, scientists, and managers, e.g., conscience and free expression within corporations; professional obligations to the public; the role of values in safety decisions; ethics codes; whistle-blowing. Examination of case studies. Prerequisite: completion of lower-division writing requirement. Same as Philosophy 131D. (Design units: 0)

ENGR193 Engineering Leadership (3). Introduction to the human dimensions of engineering, including societal, financial, governmental, legal, and ethical considerations. Typical areas: project management, product marketing, communication skills, intellectual property, business financing, and government relations. Characteristics and skills of effective leaders are delineated. (Design units: 0)

ENGR195 Special Topics in Engineering (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topics vary.

ENGR196 Engineering Thesis (4) F, W, S. Preparation of final presentation and paper describing individual research in Engineering completed in one or more quarters of individual study (i.e., ENGR199). Prerequisites: completion of lower-division writing requirement, consent of ENGR199 instructor, and completion of at least four units of Individual Research in Engineering. (Design units: varies)

ENGRH196 Honors Thesis (4) F, W, S. Preparation of final presentation and paper describing individual research in Engineering. For participants in the Campuswide Honors Program. Prerequisites: ENGRH199 and consent of instructor. (Design units: varies)

ENGR197A Educational Strategies for Tutoring and Teacher Aiding (4). Placement in a public elementary or secondary school to gain experience as a tutor or teacher aide. Emphasis on cognitive learning and the development of instructional strategies and resources which can be used in effective cross-age and cross-cultural experiences. Pass/Not Pass only. May be taken for credit three times. Same as Education 100. (Design units: 0)

ENGR199 Individual Study (1 to 4) F, W, S. Supervised independent reading, research, or design for undergraduate Engineering majors. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. Prerequisite: consent of instructor. May be repeated for credit. (Design units: varies)

ENGRH199 Individual Study for Honors Students (1 to 5) F, W, S. Supervised research in Engineering for participants in the Campuswide Honors Program. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. Prerequisites: consent of instructor; open only to members of Campuswide Honors Program. May be repeated for credit. (Design units: varies)

GRADUATE STUDY

Student Affairs Office
101 Engineering and Computing Trailer; (949) 824-3562
John LaRue, **Associate Dean**

ADMISSIONS

For information on requirements for admission to graduate study at UCI, contact the appropriate Engineering department or the Student Affairs Office in The Henry Samueli School of Engineering. Additional information is available in the *Catalogue* section entitled Research and Graduate Studies. Admission to graduate standing in The Henry Samueli School of Engineering is generally accorded those possessing a B.S. degree in engineering or an allied field obtained with an acceptable level of scholarship from an institution of recognized standing. Those seeking admission without the prerequisite scholarship record may, in some rare cases, undertake remedial work; if completed at the stipulated academic level, they will be admitted to full graduate standing. Those admitted from an allied field may be required to take supplementary upper-division courses in basic engineering subjects. The Graduate Record Examination General Test is required of all applicants.

FINANCIAL SUPPORT

Teaching assistantships and fellowships are available to qualified applicants (who should contact the Department to which they are applying for information). Research assistantships are available through individual faculty members. Although not required, it is beneficial for applicants to contact the faculty member directly to establish the potential for research support. Early applications have a superior chance for financial support.

PART-TIME STUDY

Those students who are employed may pursue the M.S. degree on a part-time basis, carrying fewer units per quarter. Since University residency requirements necessitate the successful completion of a minimum number of units in graduate or upper-division work in each of at least three regular University quarters, part-time students should seek the advice of a counselor in The Henry Samueli School of Engineering Graduate Student Affairs Office and the approval of the Graduate Advisor in their program. M.S. programs must be completed in four calendar years from the date of admission. Students taking courses in University Extension prior to enrollment in a graduate program should consult the following section on Transfer of Courses.

TRANSFER AND SUBSTITUTION OF COURSES

Upon petition, a limited number of *upper-division undergraduate or graduate-level courses* taken through University Extension, on another campus of the University, or in another accredited university may be credited toward the M.S. degree after admission. The applicability of transfer or substitution courses must be approved by the student's department and the Graduate Dean of the University, in accordance with Academic Senate regulations. Also in accordance with UC Academic Senate policy, transfer credit for the M.S. degree cannot be used to reduce the minimum requirement in strictly graduate (200 series) courses.

Graduate Programs

Specific information about program requirements can be found on the following pages.

The M.S. and Ph.D. degree program in Networked Systems is supervised by an interdepartmental faculty group. Information is available in the Interdisciplinary Studies section of the *Catalogue.*

Graduate Concentration in Arts Computation Engineering (ACE)

Arts Computation Engineering (ACE) Building; (949) 824-2109
Simon Penny, **Director**

Faculty

James E. Bobrow *(Mechanical and Aerospace Engineering):* Robotics, applied nonlinear control, optimization methods
Beatriz da Costa *(Studio Art, Electrical Engineering and Computer Science):* Robotic art, tactical gizmology, biotech initiatives, surveillance projects, collaborative practice, social change
John Crawford *(Dance, Digital Arts Minor):* Videodance, documentary, interactive performance, motion capture, digital arts
Christopher Dobrian *(Music, Informatics):* Electronic music, composition
J. Paul Dourish *(Informatics):* Human-computer interaction, computer-supported cooperative work
Falko Kuester *(Electrical Engineering and Computer Science, Biomedical Engineering):* Virtual reality, computer graphics, large-scale data visualization and computer-aided geometric design
Antoinette LaFarge *(Studio Art):* Digital media
Cristina Videira Lopes *(Informatics):* Programming languages, acoustic communications, operating systems, software engineering
Gloria Mark *(Informatics):* Computer-supported cooperative work, human-computer interaction
Gopi Meenakshisundaram *(Computer Science):* Geometry and topology for computer graphics, image-based rendering, object representation, surface reconstruction, collision detection, virtual reality, telepresence
Joerg Meyer *(Electrical Engineering and Computer Science and Biomedical Engineering):* Computer graphics, scientific visualization, large-scale rendering, biomedical imaging, virtual reality
Bonnie Nardi *(Informatics):* Interactive and collaborative technology: human-computer interaction/computer-supported cooperative work, educational technology
Lisa Marie Naugle *(Dance):* Modern dance, choreography, dance and digital technology, improvisation, motion capture
Robert Nideffer *(Studio Art, Informatics):* Electronic intermedia, interface theory and design, technology and culture, contemporary social theory
Simon Penny *(Electrical Engineering and Computer Science, Studio Art, Informatics):* Electronic media art: practice, history and theory; technologies for embodied interaction; cultural applications of emerging technologies; multi-camera machine vision, immersive environments, robotics and motion control
Kavita Philip *(Women's Studies):* Science and technology studies, South Asian studies, political ecology, critical studies of race, gender, colonialism, new media, and globalization
Mark S. Poster *(History, Film and Media Studies):* Theory and history of the media, theory of technology and culture, and Internet studies
Bill Tomlinson *(Informatics, Drama):* Autonomous characters, computational social behavior, interactive media, real-time animation

As digital technologies infiltrate increasingly diverse aspects of cultural practice, and human culture at large is influenced by the presence of digital technologies, there is a profound need for a new type of professional in the entertainment industry, in education, and in the arts, who can help to construct, manage, and monitor these changes. Such a professional must be technically skilled, artistically skilled, and theoretically skilled, all at an equally high and rigorous level. The goal of the M.S. in Engineering with a concentration in Arts Computation Engineering is to provide students with a broad-based and interdisciplinary training at the intersection of digital technology and cultural and artistic practices. The ACE program is coordinated across the Donald Bren School of Information and Computer Sciences, The Henry Samueli School of Engineering, and the Claire Trevor School of the Arts, and places equal emphasis on technical, artistic, and critical proficiency. Strongly practical in composition, it provides students with the opportunity to explore in detail topics such as telematic performance, immersive and augmented environments, embodied interaction, and the cultural impact of new technologies.

Graduation is by publicly presented thesis project and written thesis, in addition to completion of course work.

The ACE concentrations in all three fields consist of a two-year curriculum. The following courses are required:

ACE Core: five ACE interdisciplinary theory seminars (Engineering 270), four ACE studio/labs (Engineering 271–277), two ACE project internships (Engineering 279), and one quarter of ACE thesis research (Engineering 279).

(NOTE: A total of 48 units of Core courses must be completed. Any of the ACE core category courses may be reduced by one and replaced with a different ACE core course or an elective, in consultation with the student's advisor.)

Electives: a minimum of four graduate electives in Engineering (12-16 units, depending on whether the courses carry credit of three or four units), which will support the student's area of specialization and must be approved by the student's Engineering faculty advisor.

Two additional breadth electives: that may be chosen by the student in consultation with an advisor, and/or may be assigned by the ACE program committee in consultation with the student. These courses will compensate for lacunae in the student's background and may include upper-division undergraduate courses when appropriate and approved in advance by the candidate's advisor.

A program faculty member from Engineering will advise on elective selection and may be on the thesis committee.

Graduate Courses in Arts Computation Engineering

ENGR270 Arts Computation Engineering Interdisciplinary Theory Seminar: Special Topics (4). Counterposes technological discourses with fine arts discourses and practices, with a focus on historical contextualization, utilizing critical theory and science and technology studies perspectives. Topics vary and are not repeated in any three-year period. May be repeated for credit as topics vary. Same as Informatics 270 and Arts 270.

ENGR271 Arts Computation Engineering Studio/Laboratory: Interactive Installation and Performance Design Workshop (4). Designing persuasive spatialized interactive experiences: spatially and temporally distributed narratives. User-system relationships. "Freedom" in interaction: authoriality and control. Audience and the spectator. Sensors, behavior logics, and multi-modal output. Machine learning and autopedagogic systems. Training in relevant technologies. May be taken twice for credit. Same as Informatics 271 and Arts 271.

ENGR272 Arts Computation Engineering Studio/Laboratory: Games and Algorithmic Systems in Literature and the Arts (4). Explores the cultural tradition of the game and game play with particular reference to the automation of games in computational systems and the close relation between gaming, improvisation, hypertext, and interactive art. Game programming techniques and projects. May be taken twice for credit. Same as Informatics 272 and Arts 272.

ENGR273 Arts Computation Engineering Studio/Laboratory: Spatial Interaction: Sensors and Input/Output (4). Designing and building sensor and effector systems for cultural applications. Sensors, sensor combinations, sensor data collection and interpretation, input/output techniques and devices. Same as Informatics 273 and Arts 273.

ENGR274 Arts Computation Engineering Studio/Laboratory: Real Space Interaction (4). Designing and building machine artworks, motion control, mechatronic, animatronic, and mobile robotic projects. Mechanics, electromechanics, electronics, microcontrollers, motor control. Aesthetico-critical as well as technical aspects subject to assessment. Same as Informatics 274 and Arts 274.

ENGR275 Arts Computation Engineering Studio/Laboratory: Cultural Practice in Immersive Media (4). Examines and moves beyond existing paradigms of virtuality. Sensor and input devices, their logics and limitations. Embodied and symbolic interaction. Panoramic and stereoscopic image technologies. Stereoscopic graphics and spatialized sound. Technical components and their integration. Collaborative projects. Same as Informatics 275 and Arts 275.

ENGR276 Arts Computation Engineering Studio/Laboratory: Telematic Performance and Teleoperative Art (4). Art and performance projects utilizing real time and quasi-real time distance interaction. Synchronous performance and distributed choreography. Network technologies and protocols. Speed, bandwidth, latency. Web-based technologies. Video and sound. Teleoperation/remote machine control. Same as Dance 276, Informatics 276, and Arts 276.

ENGR277 Arts Computation Engineering Studio/Laboratory: Special Topics (4). Focuses on currently emerging technologies, techniques, and cultural and critical issues. May be repeated for credit as topics vary. Same as Informatics 277 and Arts 277.

ENGR278 Arts Computation Engineering Thesis Research (4 to 12). Independent research for thesis and thesis project. May be taken for a total of 36 units. Same as Informatics 278 and Arts 278.

ENGR279 Special Topics in the Arts Computation Engineering (4). Prerequisites vary. May be repeated for credit as topics vary. Same as Informatics 279 and Arts 279.

Graduate Concentration in Environmental Engineering

101 Engineering and Computing Trailer; (949) 824-3562
Brett F. Sanders, **Director**

Faculty

Constantinos V. Chrysikopoulos: Subsurface solute transport, nonaqueous phase liquid dissolution in porous media, mathematical modeling
Donald Dabdub: Mathematical modeling of air pollution dynamics, parallel computing applied to environmental problems
Nancy A. Da Silva: Bioremediation, genetic engineering
Derek Dunn-Rankin: Combustion pollutants, incineration, aerosol inhalation and deposition
Carl A. Friehe: Boundary-layer meteorology, atmospheric turbulence, air-sea energy exchange
Stanley B. Grant: Marine and fresh water quality, biocolloid stability and transport, molecular biotechnology
Juan Hong: Separation processes, bioremediation, bioreactor analysis
Henry C. Lim: Bioreactor control optimization, genetic engineering, bioremediation
Scott Samuelsen: Combustion, pollutant formation, energy efficiency and utilization, air quality, environmental ethics
Brett F. Sanders: Environmental and computational fluid dynamics, water resources engineering
Jan Scherfig: Biological treatment, water reclamation and reuse, waste treatment
William A. Sirignano: Combustion, pollutant formation, fire spread, noise suppression

Environmental Engineering addresses the development of strategies to control anthropogenic emissions of pollutants to the atmosphere, waterways, and terrestrial environment; the remediation of polluted natural systems; the design of technologies to treat waste; fire safety; noise suppression; energy efficiency; and the evaluation of contaminant fate in urban environments. Environmental engineering issues are now an important component in the development of many engineering technologies and consequently are an important aspect of an engineering education. The discipline itself is interdisciplinary and requires a curriculum that provides students with an understanding of fundamentals in air- and water-quality sciences, contaminant fate and transport, and design concepts for pollutant emission control and treatment. To avoid the development of environmental engineering solutions which only transform one form of pollution to another, modern engineering education programs must require exposure and familiarity with a greater number of subjects than ever before.

Environmental engineers with an interdisciplinary background are particularly sought to address the complex infrastructure needs of today's society, where they must be able to communicate with teams of scientists and engineers from different disciplines. Environmental engineering graduates who meet this description can expect to remain in strong demand in the private and public employment sectors, and their range of career opportunities is highly diverse. Examples of career fields and activities include the development of new technologies to genetically engineer microorganisms for waste treatment, design of combustion and control processes that minimize pollutant emissions and maximize energy efficiency, resolution of complex pollutant transport processes in naturally heterogeneous systems, development of new physical-chemical treatment approaches, and characterization of pollutant transformation mechanisms in natural systems.

Curricular and research subjects of interest in Environmental Engineering include environmental air and water chemistry, environmental microbiology, combustion technologies, aerosol science, transport phenomena, reactor theory, unit operations and systems design, mathematical modeling, energy systems, soil physics, fluid mechanics, hydrology, and meteorology. Interdisciplinary research endeavors commonly bridge many of these different subjects and a current focus is maintained on new and emerging technologies. Curriculum objectives have also been set to maintain a balance between the depth and breadth of program scope for each student.

Students may pursue either the M.S. or Ph.D. degree in Engineering.

Required Background

The interdisciplinary nature of the program allows students with a variety of backgrounds to undertake studies in this field. Students with a background in engineering—particularly chemical, civil, environmental, and mechanical engineering—as well as scientists from biology, chemistry, environmental science, and physics, are encouraged to participate.

Students admitted to the program are expected to have had rigorous undergraduate exposure to a number of relevant subject areas including air quality, environmental chemistry, fluid mechanics, microbial processes, and reactor theory and design. The degree to which each student meets the program's background requirement is determined by participating faculty at the time of admission. Students with an insufficient background who are offered admission will be required to take a set of appropriate prerequisite courses. Prerequisite work typically involves at least two and frequently as many as five or six upper-division, undergraduate courses each of which must be completed with a final grade of B or better. Occasionally, lower-division work in chemistry, mathematics, or physics is required. The student's specific prerequisite course work requirement, if any, is stated the letter of admission.

The background requirement establishes a common foundation for graduate study in the program. Not all students are required to take prerequisite course work; those who are may do so following matriculation in the graduate program. In addition, M.S. students may use a limited amount of upper-division course work taken to meet the background requirement in partial fulfillment of graduate degree requirements.

Although this list is not exhaustive, commonly required prerequisite courses within each of the required background areas are as follows:

Air Quality: Engineering MAE110, MAE162, or MAE164.

Environmental Chemistry: CEE162 or Earth System Science 102.
Environmental Microbiology: CBEMS112 or CBEMS116/216.
Fluid Mechanics: CEE170, CBEMS120A, or MAE130A.
Reactor Theory and Design: CBEMS110.

Core Requirement

Students must complete an advanced mathematics course, either CBEMS230 (Applied Engineering Mathematics I), CEE283 (Mathematical Methods in Engineering Analysis), or MAE200B (Engineering Analysis II).

Areas of Emphasis

Each student selects a primary area of emphasis within Environmental Engineering: Water Quality, Water Resources, or Air Quality and Combustion. To achieve the interdisciplinary objectives of the program, students are required to take at least two electives outside their primary area, one each in two different areas. These outside electives may also be taken from approved courses in other academic units, including the Schools of Social Ecology, Physical Sciences, and Medicine. Electives within each of the emphasis areas in Engineering are listed below.

Water Quality: CBEMS210 (Reaction Engineering), CBEMS214 (Bioremediation), CBEMS216 (Field Practicum), CBEMS218 (Bioengineering with Recombinant Organisms), CBEMS220 (Transport Phenomena), CBEMS234 (Bioreactor Engineering), CEE263 (Advanced Biological Treatment Processes), CEE265 (Advanced Physical-Chemical Treatment Processes), CEE266 (Aqueous Geochemistry), CEE267 (Advanced Treatment Models), CEE269 (Hazardous Waste Treatment and Disposal), Earth System Science 201B (Global Biogeochemistry).

Water Resources: CEE271 (Flow in Unsaturated Media), CEE272 (Stochastic Geohydrology), CEE274A (Transport Phenomena in Saturated Porous Media), CEE274B (Transport Phenomena in Unsaturated Porous Media and Fractures), CEE275 (Coastal Engineering), CEE276 (Surface Water Hydrology), CEE277 (Transport in Rivers and Estuaries), CEE278 (Flow in Rivers and Estuaries), CEE279A (Computations in Environmental Hydrologies), CEE279B (Computation in Subsurface Hydrology), Earth System Science 201C (Earth System Change).

Air Quality and Combustion: MAE210 (Advanced Fundamentals of Combustion), MAE215 (Advanced Combustion Technology), MAE230A (Advanced Incompressible Fluid Dynamics I), MAE231 (Fundamentals of Turbulence), MAE232 (Atmospheric Turbulence), MAE233 (Turbulent Free Shear Flows), MAE260 (Issues Related to Atmospheric Processes), MAE261 (Air Pollution Modeling), MAE264 (Combustion Particulates and Aerosols), MAE280 (Digital Data Acquisition and Analysis), Earth System Science 201A (Physical Climate).

MASTER OF SCIENCE DEGREE

Two options are available for M.S. degree students: a thesis option and a comprehensive examination option. Both options require the completion of 36 units of study. Study plans for both options must also include two graduate courses from outside the student's primary area of emphasis.

Plan I. Thesis Option

A thesis option is available to students who prefer to conduct a focused research project. Students selecting this option must complete an original research investigation and a thesis, and obtain approval of the thesis by a thesis committee. Of the 36 required units, at least 20 must be graduate courses (numbered 200-289), including either CBEMS230, MAE200B, or CEE283. A maximum of eight M.S. research units and up to eight units of upper-division undergraduate elective courses may be applied to the degree with the prior approval of a faculty advisor.

Plan II. Comprehensive Examination Option

Alternatively, students may select a comprehensive examination option in which they must successfully complete 36 units of study and pass a comprehensive examination. At least 24 units must be graduate courses (numbered 200-289), including either CBEMS230, MAE200B, or CEE283. Up to 12 units may be taken as upper-division undergraduate elective courses.

DOCTOR OF PHILOSOPHY DEGREE

The Ph.D. concentration in Environmental Engineering requires the achievement of original and significant research that advances the discipline. Doctoral students are selected on the basis of an outstanding record of scholarship and potential for research excellence.

The doctoral study program is tailored to the individual student in consultation with a faculty advisory committee. There are no specific course requirements, however, additional mathematics courses beyond those required for a M.S. degree are generally required, reflecting the student's specific research interests. Within this flexible framework, the School maintains specific guidelines that outline the milestones of a typical doctoral program. All doctoral students should consult the Environmental Engineering program guidelines for details, but there are several milestones to be passed: admission to the Ph.D. program by the faculty, passage within the first year of a preliminary examination or similar assessment of the student's background and potential for success, research preparation, formal advancement to candidacy by passing a qualifying examination in the third year (or second year for students who entered with a master's degree), completion of a significant research investigation, and the submission and oral defense of an acceptable dissertation.

Committees for preliminary and Ph.D. qualifying examinations and the doctoral committee must have at least one Environmental Engineering faculty member from outside the student's area of emphasis. The student's dissertation topic must be approved by the student's doctoral committee. The degree is granted upon the recommendation of the doctoral committee and the Dean of Graduate Studies. The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

M.S. and Ph.D. in Engineering with an Interdisciplinary Concentration in Materials Science and Engineering

101 Engineering and Computing Trailer; (949) 824-3562
Farghalli A. Mohamed, **Director**

Faculty

Peter J. Burke: Quantum electronics, high-speed semiconductor technology
James C. Earthman: Fatigue behavior and cyclic damage, automated materials testing, high-temperature fracture, biomaterials, cellular networks
Hideya Gamo: Quantum electronics, electromagnetics
Noo Li Jeon: Biomaterials
John C. LaRue: Fluid mechanics, micro-electrical-mechanical systems (MEMS), turbulence, heat transfer, instrumentation
Chin C. Lee: Electronic packaging, thermal management, integrated optics
Henry P. Lee: Optoelectronic materials, growth, and devices
Guann Pyng Li: Optoelectronic devices, integrated circuit fabrication and testing, high-speed semiconductor technology
Jia Grace Lu: Nanostructured materials, nanoscale electronics
Marc J. Madou: Fundamental aspects of micro/nano-electro-mechanical systems (MEMS/NEMS), biosensors, nanofluidics, biomimetics
Martha L. Mecartney: Electron microscopy, ceramics, interfacial engineering
Farghalli A. Mohamed: Mechanical properties, creep, superplasticity, correlations between property and microstructure
Daniel R. Mumm: Thermo-mechanical behavior of materials, interfaces and microstructure, materials for power and propulsion, cellular materials, morphing structures, micro/nano-mechanics
Melissa E. Orme: Fluid mechanics of materials synthesis, netform manufacturing
Andrew A. Shapiro *(Adjunct)*: Electronic properties of materials; electronic packaging materials, processes, and characterization
Frank G. Shi: Optoelectronics packaging, packaging materials, photonic glass and nanocomposites
Victoria L. Tellkamp *(Adjunct)*: Nanostructured materials, sol-gel processing, biomaterials
Chen S. Tsai: Integrated optic devices, circuits, materials; acoustic microscopy with applications to materials, device characterization
Albert Yee: Nanofabrication of soft materials, physics of polymer thin films, nanomechanical properties of polymers, ultra-low-k dielectrics, fracture and toughening of polymer nanocomposites

Materials Science and Engineering (MSE) is concerned with the generation and application of knowledge relating the composition, structure, and processing of materials to their properties and applications. During the past two decades, MSE has become an important component of modern engineering education, partly because of the increased level of sophistication required of engineering materials in a rapidly changing technological society, and partly because the selection of materials has increasingly become an integral part of almost every modern engineering design. In fact, further improvements in design are now viewed more and more as primarily a materials issue. Both the development of new materials and the understanding of present-day materials demand a thorough knowledge of basic engineering and scientific principles including, for example, crystal structure, mechanics, mechanical behavior, electronic, optical and magnetic behavior, thermodynamics, phase equilibria, heat transfer, diffusion, and the physics and chemistry of solids.

The field of MSE ranks high on the list of top careers for scientists and engineers. The services of these engineers and scientists are required in a variety of engineering operations dealing, for example, with design of semiconductors and optoelectronic devices, development of new technologies based on composites and high-temperature superconductivity, biomedical products, performance (quality, reliability, safety, energy efficiency) in automobile and aircraft components, improvement in nondestructive testing techniques, corrosion behavior in refineries, radiation damage in nuclear power plants, and fabrication of steels.

Subjects of interest in Materials Science and Engineering cover a wide spectrum, ranging from metals, optical and electronic materials to superconductive materials, ceramics, advanced composites, and biomaterials. In addition, the emerging new research and technological areas in materials are in many cases interdisciplinary. Accordingly, the principal objective of the graduate curriculum is to integrate a student's area of emphasis—whether it be structural materials, chemical processing, mechanics of solids, or electronic devices—into the whole of material science and engineering. Such integration will breed familiarity with other disciplines and provide students with the breadth they need to face the challenges of current and future technology.

Students may pursue either the M.S. or Ph.D. degree in Engineering with a concentration in MSE.

Recommended Background

Given the nature of Materials Science and Engineering as an interdisciplinary program, students having a background and suitable training in either Materials, Engineering (Mechanical, Electrical, Civil, Chemical), or the Physical Sciences (Physics, Chemistry, Geology) are encouraged to participate. Recommended background courses include an introduction to materials, thermodynamics, mechanical behavior, and electrical/optical/magnetic behavior. A student with an insufficient background may be required to take remedial undergraduate courses following matriculation as a graduate student.

Core Requirement

Because of the interdepartmental nature of the concentration, it is important to establish a common foundation in Materials Science and Engineering for students from various backgrounds. This foundation is sufficiently covered in MSE courses that are listed below and that deal with the following topics:

Crystal Structure and Crystal Defects: MSE200 (Atomic Structure and Properties of Materials).

Physical and Electrical Properties: MSE205 (Materials Physics).

Thermodynamics and Transport Phenomena: one course from MSE252 (Theory of Diffusion), MSE253 (Kinetic Phenomena in Materials), CBEMS240 (Chemical Engineering Thermodynamics), or Chemistry 230 (Classical Mechanics and Electromagnetic Theory).

Processing of Materials: one course from EECS176 (Fundamentals of Solid-State Electronics and Materials), MSE255A (Design with Ceramic Materials), or MSE270 (Materials Processing).

Electives

These electives represent courses in areas of emphasis. Typical examples for elective courses in various areas of emphasis are listed below.

Chemical Processing: CBEMS210 (Reaction Engineering), CBEMS220 (Transport Phenomena), CBEMS230 (Applied Engineering Mathematics I), CBEMS240 (Chemical Engineering Thermodynamics), MSE210 (Materials Characterization Techniques and Analysis).

Electronic and Photonic Materials: EECS277A-B (Advanced Semiconductor Devices I, II), EECS285A (Optical Communications), EECS285B (Lasers and Photonics), EECS280A-B (Advanced Engineering Electromagnetics I, II).

Mechanics of Solids: CEE242 (Advanced Strength of Materials), CEE243 (Mechanics of Composite Materials), CEE246 (Structural Performance and Failure), CEE281 (Finite Element Method in Continuum Mechanics).

Optoelectronics Packaging: CEE281 (Finite Element Method in Continuum Mechanics), CBEMS280 (Optoelectronics Packaging), EECS188 (Optical Electronics), EECS279 (Micro Sensors and Actuators), EECS285A (Optical Communications), EECS285B (Lasers and Photonics), EECS285C (Integrated and Fiber Optics), MSE272 (Microelectronic and Photonic Materials and Technology).

Physics and Chemistry of Materials: Chemistry 213 (Chemical Kinetics), Chemistry 225 (Polymer Chemistry), Chemistry 230 (Classical Mechanics and Electromagnetic Theory), Chemistry 252 (Special Topics in Physical Chemistry), Physics 221 (Elasticity), Physics 239A (Plasma Physics), Mathematics 292A (Applied Mathematics).

Structural Materials: MSE210 (Materials Characterization Techniques and Analysis), MSE251 (Dislocation Theory), MSE255A (Design with Ceramic Materials), MSE255B (Science of Composite Materials), MSE256A (Fracture of Engineering Materials), MSE259 (Transmission of Electron Microscopy), MSE263 (Computer Techniques in Experimental Materials Research), MAE200B (Engineering Analysis).

It should be noted that specific course requirements within the areas of emphasis are decided based on consultation with the Director of the MSE concentration and the faculty advisor; that in selecting electives, students are encouraged to take courses which are not in their area of emphasis; and that MSE courses which are not selected to satisfy the core requirement can also serve as electives under the Structural Materials emphasis. Furthermore, students in the MSE concentration who are interested in an area of emphasis other than Structural Materials are urged to take one course which covers aspects related to mechanical behavior such as Dislocation Theory (MSE251) and Fracture of Engineering Materials (MSE256B).

MASTER OF SCIENCE DEGREE

A minimum of 36 units is required for the M.S. degree. Two options are available, a thesis option and a comprehensive examination option. For the thesis option, students are required to complete a research study of great depth and originality and obtain approval for a complete program of study. A committee of three full-time faculty members is appointed to guide development of the thesis. At least 21 units must be taken from courses numbered 200–289, among which 12 units are from MSE core courses and nine units are in the area of emphasis approved by the faculty advisor and the graduate advisor. Up to eight units of CBEMS296, EECS296, or CEE296 and up to eight units of undergraduate elective courses taken as a graduate student at UCI can be applied toward the 36-unit requirement. For the comprehensive examination option, students are required to complete 36 units of study. At least 24 units must be taken from courses numbered 200–289, among which 12 units are from MSE core courses and 12 units are in the area of emphasis approved by the faculty advisor and the graduate advisor. Up to eight units of undergraduate elective courses taken as a graduate student at UCI can be applied toward the 36-unit requirement.

DOCTOR OF PHILOSOPHY DEGREE

The Ph.D. concentration in Materials Science and Engineering requires a commitment on the part of the student to dedicated study and collaboration with the faculty. Ph.D. students are selected on the basis of outstanding demonstrated potential and scholarship. Applicants must hold the appropriate prerequisite degrees from recognized institutions of high standing. After substantial academic preparation, Ph.D. candidates work under the supervision of faculty advisors. The process involves extended immersion in a research atmosphere and culminates in the production of original research results presented in a dissertation.

Milestones to be passed in the Ph.D. program include the following: acceptance into a research group by the faculty advisor during the student's first year of study; successful completion of the Ph.D. preliminary examination; preparation for doing research, completion of The Henry Samueli School of Engineering teaching requirements, and the development of a research proposal; passing the qualifying examination which assesses the candidate's preparation for research and evaluates the proposed research; successful completion of the research; development and approval of the dissertation; presentation of the dissertation and a final examination on its contents. There is no foreign language requirement.

The preliminary examination, to be taken during the second year of the Ph.D. program, is based on the core courses in MSE and courses taken in the area of emphasis. The examination committee is appointed by the MSE Director with subsequent approval by the School's Associate Dean of Graduate Studies. Students must advance to candidacy in their third year (second year for those who entered with a master's degree). The degree is granted upon the recommendation of the doctoral committee and the Dean of Graduate Studies. The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

Graduate Concentration in Protein Engineering

145 Biological Sciences Administration; (949) 824-6686

The Henry Samueli School of Engineering, in conjunction with the School of Biological Sciences and the Department of Chemistry in the School of Physical Sciences, participates in the joint graduate program in Protein Engineering. This interdisciplinary graduate program offers students the opportunity to work with the approximately 20 faculty in any of the participating academic units; take course work in the areas of protein structure, function, and molecular biology; and earn the Ph.D. in Engineering, Biological Sciences, or Chemistry with a concentration in Protein Engineering Science. Additional information is available in the School of Biological Sciences section of the *Catalogue* and through the Graduate Program in Protein Engineering office in the Biological Sciences Administration Building.

Graduate Courses in Engineering

ENGR250 Calit2 Seminar: Trends in Optical Communication (1 to 4). Addresses the current status and future trends of fiberoptic materials, components, systems, and manufacturing that are the foundation of the ongoing fiberoptic communication revolution, through weekly seminar presentations by leading experts from both industry and academia. Prerequisites: graduate standing and consent of instructor.

ENGR295 Special Topics in Engineering (1 to 4). Prerequisites vary. May be repeated for credit as topics vary.

ENGR296 Master of Science Thesis Research (4 to 12). Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

ENGR297 Doctor of Philosophy Dissertation Research (4 to 12). Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

ENGR299 Individual Research (1 to 12). Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor. May be repeated for credit.

DEPARTMENT OF BIOMEDICAL ENGINEERING

204 Rockwell Engineering Center; (949) 824-4051
Steven C. George, **Department Chair**

Faculty

Michael W. Berns: Photomedicine, laser microscopy, biomedical devices
James P. Brody: Bioinformatics, micro-nanoscale systems
Zhongping Chen: Biomedical optics, optical coherence tomography, bioMEMS, and biomedical devices
Vittorio Cristini: Mathematical modeling and computer simulation, complex fluids, materials and biostructures
Steven C. George: Physiological modeling, gas exchange, computational methods, tissue engineering
Noo Li Jeon: Soft lithography in fabricating devices, bioMEMS, microfluidics, biomaterials, tissue engineering, cell migration
Tibor Juhasz: Laser-tissue interactions; high-precision microsurgery with lasers; laser applications in Ophthalmology; corneal biomechanics
Ghassan Kassab: Vascular networks, coronary circulation in health disease, tissue remodeling, simulation of complex biological systems.
Abraham Lee: Microelectromechanical Systems (MEMS), microfluidics, catheter-based microsurgical devices, microactuators for medical and optical applications, microfabrication processes, directed nanoscale self-assembly for biomolecular transducers
Joerg Meyer: Computer graphics, scientific visualization, large-scale rendering, biomedical imaging, virtual reality
Andrew J. Putnam: Cellular signaling in engineered extracellular micro-environments; biomaterials; cell and tissue engineering
William Tang: Microelectromechanical systems (MEMS) nanoscale engineering for biomedical and wireless communications, microsystems integration, microimplants
Bruce Tromberg: Photon migration, biophysics, optical microscopy, fiber-optic sensors

Affiliated Faculty

Nancy Allbritton: Intracellular signaling and biophysical optics
Mark Bachman: Micro-electro-mechanical systems (MEMS) BIOMEMS, and optoelectronics nonstandard chip processing, physics of small systems
Pierre Baldi: Bioinformatics/computational biology and probabilistic modeling/machine learning
Lubomir Bic: Distributed computing, parallel processing in biological systems
Bruce Blumberg: Biorobotics, functional genomics
Peter Burke: Quantum electronics, high-speed semiconductor technology
Zang-Hee Cho: Multidimensional imaging; NMR tomography and positron emission tomography
Carl Cotman: Computational methods in brain aging, Alzheimer's disease
Nancy A. Da Silva: Molecular biotechnology, metabolic engineering, environmental biotechnology
Rui J. P. de Figueiredo: Biomedical signal and image processing and analysis
James Earthman: Biomaterials, dental, and orthopaedic implants
Gregory Evans: Tissue engineering
Ron Frostig: Optical methods for brain imaging, functional organization of the cortex
Steven Gross: In-vivo function of molecular motors, optical tweezers
Zhibin Guan: Chemistry of biomaterials
Ranjan Gupta: In-vivo models for chronic nerve injury
Christopher C. W. Hughes: Endothelial cells as initiators and targets of immune responses
Joyce Keyak: Bone mechanics, finite element modeling, computed tomography
Falko Kuester: Virtual reality, computer-aided geometric design
Baruch D. Kupperman: Diabetic retinopathy, age-related macular degeneration, the ocular complications of AIDS
Richard Lathrop: Computational methods in protein engineering
Thay Lee: Orthopaedic biomechanics
Guann-Pyng Li: Microelectromechanical systems for biomedical applications
Shin Lin: Combined use of biochemistry, cell biology, molecular biology, and molecular biophysics to study the structure and function of proteins involved in cytoskeletal/contractile functions and signal transduction in muscle and nonmuscle cells
John Longhurst: Cardiovascular neural reflex control mechanisms from somatic and visceral regions including the heart and abdominal organs; integrative, central neural regulation of the autonomic outflow, with reference to cardiovascular reflex responses and including the reflex basis of acupuncture
Rui (Ray) Luo: Protein structure and noncovalent associations involving proteins
Mark Madou: Fundamental aspects of micro/nano-electro-mechanical systems (MEMS/NEMS), biosensors, nanofluidics, biomimetics
Sabee Molloi: Digital radiography, application of digital subtraction angiography to cardiac imaging, coronary artery flow measurement, digital image processing
J. Stuart Nelson: Phototherapy, dermatology, cell biology, biomedical device development
Qing Nie: Computational applied mathematics
David Reinkensmeyer: Skeletal muscle control, biorobotics, rehabilitation
Phillip C.-Y. Sheu: Biomedical database management, Intranet/Internet technologies
Andrei Shkel: Silicon integrated micro-electro-mechanical sensors and actuators
Harry Skinner: Orthopaedic implant devices, minimally invasive surgical systems
Padhraic Smyth: Applied statistics, pattern recognition, and data mining with applications to time-series and image data
Adam Summers: Impact of material properties on the form and structure of organisms
Vasan Venugopalan: Application of laser radiation for medical diagnostics, therapeutics, and biotechnology; laser-induced thermal, mechanical, and radiative transport processes
Szu-Wen Wang: Biomolecular engineering, interfacial engineering, biomaterials, drug delivery
Brian Wong: Biomedical optics, tissue engineering, and development of surgical instrumentation
Albert Yee: Nanofabrication of soft materials, physics of polymer thin films, nanomechanical properties of polymers, ultra-low-k dielectrics, fracture and toughening of polymer nanocomposites
Tau-Mu Yi: Systems biology of G-protein signaling
Fan-Gang Zeng: Cochlear implants and auditory neuroscience

Affiliated faculty are from the Schools of Biological Sciences, Physical Sciences, and Medicine; the Donald Bren School of Information and Computer Sciences; and The Henry Samueli School of Engineering.

Biomedical engineering combines engineering expertise with medical needs for the enhancement of health care. It is a branch of engineering in which knowledge and skills are developed and applied to define and solve problems in biology and medicine. Students choose the biomedical engineering field to be of service to people, for the excitement of working with living systems, and to apply advanced technology to the complex problems of medical care. Biomedical engineers may be called upon to design instruments and devices, to bring together knowledge from many sources to develop new procedures, or to carry out research to acquire knowledge needed to solve new problems.

During the last 20 years, we have witnessed unprecedented advances in engineering, medical care, and the life sciences. The combination of exploding knowledge and technology in biology, medicine, the physical sciences, and engineering, coupled with the changes in the way health care will be delivered in the next century, provide a fertile ground for biomedical engineering. Biomedical engineering, at the confluence of these fields, has played a vital role in this progress. Traditionally, engineers have been concerned with inanimate materials, devices, and systems, while life scientists have investigated biological structure and function. Biomedical engineers integrate these disciplines in a unique way, combining the methodologies of the physical sciences and engineering with the study of biological and medical problems. The collaboration between engineers, physicians, biologists, and physical scientists is an integral part of this endeavor and has produced many important discoveries in the areas of artificial organs, artificial implants, and diagnostic equipment.

The Department offers a B.S. degree in Biomedical Engineering, a four-year engineering curriculum. This program prepares students for a wide variety of careers in Biomedical Engineering in industry, hospitals, and research laboratories or for further education in graduate school.

The Department also offers a B.S. degree in Biomedical Engineering: Premedical, a four-year engineering curriculum taken with required premedical courses. It is one of many majors that can serve as preparation for further training in medical, veterinary, or allied health professions. It is also suitable for students interested in pursuing graduate work in Biomedical Engineering and other biomedical areas such as physiology, neurosciences, and bioinformatics. The curriculum has less engineering content but more biological sciences than the Biomedical Engineering major.

Areas of graduate study and research include biophotonics, biomedical nanoscale systems, biomedical computational technologies, and tissue engineering.

Undergraduate Major in Biomedical Engineering

Program Educational Objectives: (1) provide students with a solid foundation and training in the fundamentals of Biomedical Engineering; (2) provide a broad background in engineering sciences and their application to biomedical problems through design and problem-based learning; (3) provide opportunities for teamwork, clinical and industrial rotations, independent research, open-ended problem solving, critical thinking, and lifelong learning; and (4) prepare students for a career in the biomedical engineering industry or graduate school. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

Biomedical Engineering students learn engineering and principles of biology, physiology, chemistry, and physics. They may go on to design devices to diagnose and treat disease, engineer tissues to repair wounds, develop cutting-edge genetic treatments, or create computer programs to understand how the human body works.

The curriculum emphasizes education in the fundamentals of engineering sciences that form the common basis of all engineering subspecialties. Education with this focus is intended to provide students with a solid engineering foundation for a career in which engineering practice may change rapidly. In addition, elements of bioengineering design are incorporated at every level in the curriculum. This is accomplished by integration of laboratory experimentation, computer applications, and exposure to real bioengineering problems throughout the program. Students also work as teams in senior design project courses to solve multidisciplinary problems suggested by industrial and clinical experience.

NOTE: Students may complete only one of the following programs: the major in Biomedical Engineering, the major in Biomedical Engineering: Premedical, or the minor in Biomedical Engineering.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: one year of calculus, one year of engineering physics (with laboratory), one year of chemistry (with laboratory), and one additional approved course for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements

Mathematics and Basic Science Courses: Students must complete a minimum of 48 units of mathematics and basic sciences including:

Core Courses: Mathematics 2A-B, 2D, 2J, 3D, 2E, and Biological Sciences 7; Chemistry 1A-B-C and 1LB-LC; Physics 7A-B-D-E and 7LA-LB-LD; Biological Sciences 194S.

Elective Courses: Students select, with the approval of a faculty advisor, at least one additional basic science course needed to satisfy school and major requirements.

Engineering Topics Courses: Students must complete a minimum of 28 units of engineering design including:

Core Courses: EECS12, CBEMS40A, CEE20, BME1, BME50A-B, BME110A-B, BME111, BME120, BME121, BME130, BME140, BME150, BME160, BME170, BME180A-B.

Engineering Electives: Students select, with the approval of a faculty advisor a minimum of 8 units of engineering topics needed to satisfy school and major requirements.

(The nominal Biomedical Engineering program will require 196 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary).

Optional Specialization in Biophotonics: requires BME135, BME136, and either BME137 or EECS180. These courses will also satisfy the Engineering Electives requirement.

PLANNING A PROGRAM OF STUDY

The sample program of study chart shown is typical for the major in Biomedical Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Biomedical Engineering majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisors.

Sample Program of Study — Biomedical Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
BME1	Breadth	
Sophomore		
Mathematics 2J	Mathematics 3D	Bio. Sci. 7
Physics 7E	EECS12	Mathematics 2E
CBEMS40A	BME50A	CEE20
Breadth	Breadth	BME50B
Junior		
BME110A	BME110B	BME111
BME120	BME121	BME150
BME130	BME140	Bio. Sci. 194S
Breadth	Breadth	Breadth
		Breadth
Senior		
BME180A	BME180B	BME160
Breadth	Technical Elective	Technical Elective
Technical Elective	Breadth	BME170
Breadth	Breadth	

Undergraduate Major in Biomedical Engineering: Premedical

The major program objective is to prepare students for medical school. The curriculum is designed to meet the requirements for admission to medical schools, but is also suitable for those planning to enter graduate school in biomedical engineering, physiology, biology, neurosciences, or related fields. It has less engineering content and more biological sciences than the accompanying Biomedical Engineering major. It is one of many majors that can serve as preparation for further training in medical, veterinary, or allied health professions.

The Biomedical Engineering: Premedical curriculum provides future physicians with a quantitative background in biomechanics, bioelectronics, and biotransport. Such a background is increasingly important because of the heavy utilization of biomedical technology in modern medical practice. The curriculum includes courses in the sciences that satisfy the requirements of most medical schools. The education experience is enriched through a design course where students work as teams to solve Biomedical Engineering problems inspired by the clinical arena at the UCI Medical Center.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: one year of calculus, one year of engineering physics (with laboratory), one year of chemistry (with laboratory), and one additional approved course for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING: PREMEDICAL

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements

Mathematics and Basic Science Courses: Students must complete a minimum of 48 units of mathematics and basic sciences including: Mathematics 2A-B, 2D, 2J, and 3D; Chemistry 1A-B-C, 1LB-LC 51A-B-C, and 51LA-LB; Physics 7A-B-D-E and 7LA-LB-LD. Students select, with the approval of a faculty advisor, any additional basic science course needed to satisfy school and major requirements.

Engineering Topics Courses: Students must complete the following engineering topics including: Biological Sciences 97, 98, 99, D103 or D104, 100L, D111L, 194S, BME1, BME50A-B, BME110A-B, BME111, BME120, BME121, BME130, BME150, BME160. Students select, with the approval of a faculty advisor, at least three additional engineering topics courses needed to satisfy school and major requirements.

(The nominal Biomedical Engineering: Premedical program will require 196 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary).

PLANNING A PROGRAM OF STUDY

The sample program of study chart shown is typical for the major in Biomedical Engineering: Premedical. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Biomedical Engineering: Premedical majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisors.

Sample Program of Study — Biomedical Engineering: Premedical

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
BME1	Breadth	
Sophomore		
Mathematics 2J	Mathematics 3D	Chemistry 51C
Chemistry 51A, 51LA	Chemistry 51B, 51LB	BME50B
Physics 7E	BME50A	Breadth
Breadth	Breadth	Breadth
Junior		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99
BME110A	BME121	BME111
BME120	BME110B	BME150
BME130	Technical Elective	Breadth
Senior		
Bio. Sci. 100L	Bio. Sci. D103 or D104	Bio. Sci. D111L
Bio. Sci. 194S	Technical Elective	BME160
Technical Elective	Breadth	Breadth
Breadth	Breadth	Breadth

MINOR IN BIOMEDICAL ENGINEERING

The minor in Biomedical Engineering requires a total of nine courses—two advanced mathematics courses, five core Biomedical Engineering courses, and two Biomedical Engineering electives. Some of these courses may include prerequisites that may or may not be part of a student's course requirements for their major. Private biomedical industry has indicated a keen interest in engineers that have a more traditional engineering degree (i.e., electrical engineering), but also possess some in-depth knowledge of biomedical systems. Hence, the minor in Biomedical Engineering is designed to provide a student with the introductory skills necessary to perform as an engineer in the biomedical arena.

Admissions. Students interested in the minor in Biomedical Engineering must apply through The Henry Samueli School of Engineering Student Affairs Office and must have a UCI cumulative GPA of 2.5 or higher.

NOTE: Students may not receive both a minor in Biomedical Engineering and a specialization in Biochemical Engineering within the Chemical Engineering major.

Requirements for the Minor in Biomedical Engineering

Mathematics Courses: Mathematics 2J, 3D.

Engineering Topics Courses: BME1, BME50A-B, BME120, BME121.

Technical Electives: Students select, with the approval of a faculty advisor, two technical elective courses: BME110A, BME110B, BME130, BME135 (same as Biological Sciences 130), BME136, BME140, BME160, BME199, CBEMS124, CBEMS126, CBEMS154, EECS179, EECS188.

Graduate Study in Biomedical Engineering

The Biomedical Engineering faculty have special interest and expertise in four thrust areas: Biophotonics, Biomedical Nanoscale Systems, Biomedical Computational Technologies, and Tissue Engineering. Biophotonics faculty are interested in photomedicine, laser microscopy, optical coherence tomography, medical imaging, and phototherapy. Biomedical Nanoscale Systems faculty are interested in molecular engineering, polymer chemistry, molecular motors, design and fabrication of microelectromechanical systems (MEMS), integrated microsystems to study intercellular signaling, and single molecule studies of protein dynamics. Biomedical Computation faculty are interested in computational biology, biomedical signal and image processing, bioinformatics, computational methods in protein engineering, and data mining.

The Department offers the M.S. and Ph.D. degrees in Biomedical Engineering.

Required Background

Because of its interdisciplinary nature, biomedical engineering attracts students with a variety of backgrounds. Thus, the requirements for admission are tailored to students who have a bachelor's degree in an engineering, physical science, or biological science discipline, with a grade point average of 3.0 or higher in their upper-division course work. The minimum course work requirements for admission are six quarters of calculus through linear algebra and ordinary differential equations, three quarters of calculus-based physics, three quarters of chemistry, and two quarters of biology. Students without a physics, chemistry, or engineering undergraduate degree may be required to take additional relevant undergraduate engineering courses during their first year in the program; any such requirements will be specifically determined by the BME Graduate Committee on a case-by-case basis and will be made known to the applicant at the time of acceptance to the program.

The recommended minimum combined verbal and quantitative portion of the GRE is 1200, or a minimum combined MCAT score in Verbal Reasoning, Physical Sciences, and Biological Sciences problems of 30. A minimum score of 600 on the Test of English as a Foreign Language (TOEFL) is recommended of all international students whose native language is not English. In addition, all applicants must submit three letters of recommendation.

Exceptionally promising UCI undergraduates may apply for admission through The Henry Samueli School of Engineering's accelerated M.S. and M.S./Ph.D. program, however, these students must satisfy the course work and letters of recommendation requirements described above.

Core Requirement

All students are required to take a set of core courses which total 22 units: BME 210, BME220, BME221, BME230A, BME230B, and BME240.

Elective Requirement

The remaining 14 units required to fulfill the course requirements for the M.S. and Ph.D. degree are comprised of elective courses offered within The Henry Samueli School of Engineering and the Schools of Biological Sciences, Physical Sciences, and Medicine. A minimum of eight of the elective units must be taken from The Henry Samueli School of Engineering. The group of elective courses must be approved by the BME Graduate Committee, for M.S. students, or, for Ph.D. students, the student's graduate advisory committee, and are chosen to meet the specific needs of each student. The electives must provide breadth in biomedical engineering, but also provide specific skills necessary to the specific research the student may undertake as part of the degree requirements.

Areas of Emphasis

Although a student is not required to formally choose a specific research focus area, four research thrust areas have been identified for the program: Biophotonics, Biomedical Nanoscale Systems, Biomedical Computational Technologies, and Tissue Engineering. These areas capitalize on existing strengths within The Henry Samueli School of Engineering and UCI as a whole, interact in a synergistic fashion, and will train biomedical engineers who are in demand in both private industry and academia.

Biophotonics. This research area includes the use of light to probe individual cells and tissues and whole organs for diagnostic and therapeutic purposes. The research areas include both fundamental investigation on the basic mechanisms of light interaction with biological systems and the clinical application of light to treat and diagnose disease. Current and future foci of the faculty are: (1) microscope-based optical techniques to manipulate and study cells and organelles; (2) development of optically based technologies for the non-invasive diagnosis of cells and tissues using techniques that include fiber-optic-based sensors, delivery systems, and imaging systems; and (3) development of optically based devices for minimally invasive surgery.

Nanoscale Systems. This class of research areas encompasses the understanding, use, or design of systems that are at the micron or submicron level. Current strengths within The Henry Samueli School of Engineering and the UCI faculty as a whole include biomaterials, micro-electromechanical systems (MEMS), and the design of new biomedical molecules. The focus of biomedical engineering research in this area is the integration of nanoscale systems with the needs of clinical medicine. Projected areas of growth include: (1) micro-electromechanical systems (MEMS) for biomedical devices and biofluid assay; (2) programmable DNA/molecular microchip for sequencing and diagnostics; and (3) biomaterials and self-assembled nanostructures for biosensors and drug delivery.

Biomedical Computational Technologies. Biomedical computational technologies include both advanced computational techniques, as well as advanced biomedical database systems and knowledge-base systems. Computational technologies that will be developed in this research area include: (1) methods for biomedical analysis and diagnosis such as physical modeling of light-tissue interactions, atomic-level interactions, image processing, pattern recognition, and machine-learning algorithms; (2) language instruction and platform standardization; and (3) machine-patient interfaces. Areas of research related to biomedical database systems include the development of new technologies which can capture the rich semantics of biomedical information for intelligent reasoning.

Tissue Engineering. The term *tissue engineering* was officially coined at a National Science Foundation workshop in 1988 to mean "the application of principles and methods of engineering and life sciences toward fundamental understanding of structure-function relationships in normal and pathological mammalian tissues and the development of biological substitutes to restore, maintain, or improve tissue function." Tissue engineering draws on experts from chemical engineering, materials science, surgery, genetics, and related disciplines from engineering and the life sciences. Much of the current research in the field involves growing cells in three-dimensional structures instead of in laboratory dishes. For the most part, cells grown in a flat dish tend to behave as individual cells. But grow a cell culture in a three-dimensional structure, and the cells begin to behave as they would in a tissue or organ. Tissue engineers are testing different methods of growing tissue and organ cells in three-dimensional scaffolds that dissolve once the cells reach a certain mass. The hope is that these cell cultures will mature into fully functional tissues and organs.

MASTER OF SCIENCE DEGREE

Two options are available for the M.S. degree: a thesis option and a comprehensive examination option. Both options require the student to specify an area of specialty, and to complete a minimum of 36 units, at least 28 of which must be at the 200 level including the 22 units that comprise the core courses as described above. The degree will be granted upon the recommendation of the Director and The Henry Samueli School of Engineering Associate Dean of Graduate Studies.

Plan I: Thesis Option

A thesis option is available to students who prefer to conduct a focused research project. Students selecting this option must select a thesis advisor and complete an original research investigation including a written thesis, and obtain approval of the thesis by a thesis committee. A maximum of eight M.S. research units (i.e., EECS296) may be applied toward the 36-unit requirement.

Plan II: Comprehensive Examination Option

Alternatively, students may select a comprehensive examination option in which they must successfully complete 36 units of study and pass a comprehensive examination. The preliminary examination in the Ph.D. program, described below, will serve as the comprehensive examination. However, the passing grade to qualify at the Master's competency level will be lower than the grade required for a student to advance in the Ph.D. program.

DOCTOR OF PHILOSOPHY DEGREE

The Ph.D. degree requires the achievement of an original and significant body of research that advances the discipline. Students with a B.S. degree may enter the Ph.D. program directly, provided they meet the background requirements described above. The Graduate Committee will handle applicants on a case-by-case basis, and any specific additional courses required by the student will be made explicit at the time of admission.

Each student is matched with a faculty advisor, and an individual program of study is designed by the student and a faculty advisory committee. There are no additional course requirements beyond that of the M.S. degree. Four milestones are required: (1) successful completion of 36 units of course work beyond the bachelor's degree, at least 28 of which must be at the 200 level including the 22 units of core course requirements; (2) successful completion of a preliminary examination at the Ph.D. competency level; (3) formal advancement to candidacy by successfully passing a qualifying examination; and (4) completion of a significant body of original research and the submission of an acceptable written dissertation and its successful oral defense.

The preliminary examination will normally be taken at the end of the first year (July), but will also be offered in December. A student must take it within two years of matriculating in the program, and must either have passed all of the core courses or have an M.S. degree prior to taking the examination. The Graduate Committee prepares the examination and sets two minimum competency levels, one for awarding the Master's degree and the second for continuing on in the Ph.D. program. Students who fail to pass at the Ph.D. level may retake the examination once within six months of the initial attempt. Students who fail the second attempt will not be allowed to continue in the program. Students who pass either attempt at the Master's competency level will be awarded an M.S. degree. After passing the preliminary examination at the Ph.D. competency level, students are matched with a BME faculty advisor and design an individual program of study with their advisor.

Advancement to candidacy must be completed between the ninth and twelfth quarters of enrollment, usually during a student's third year (second year for students who entered with a master's degree). (Special exceptions can be made, but a formal request with justification must be supplied in writing to the Director.) The qualifying examination follows campus and The Henry Samueli School of Engineering guidelines and consists of an oral and written presentation of original work completed thus far, and a coherent plan for completing a body of original research. The qualifying examination is presented to the student's graduate advisory committee, which is selected by the student and faculty advisor and must have a minimum of five faculty (including the faculty advisor). Of these five faculty, a minimum of three must be affiliated BME faculty. In addition, a minimum of two faculty must have part of their primary appointment in The Henry Samueli School of Engineering.

The Ph.D. is awarded upon submission of an acceptable written dissertation and its successful oral defense. The degree is granted upon the recommendation of the graduate advisory committee and the Dean of Graduate Studies. The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

Courses in Biomedical Engineering

LOWER-DIVISION

BME1 Introduction to Biomedical Engineering (3) F. Introduction to the central topics of biomedical engineering. Offers a perspective on bioengineering as a discipline in a seminar format. Principles of problem definition, team design, engineering inventiveness, information access, communication, ethics, and social responsibility are emphasized. (Design units: 1)

BMEH10 Honors Engineering within the Cell (4) S. An engineer's view of cellular processes. Introduction to the cell; structure and function of DNA, RNA, and protein; thermodynamics; energy and catalysis, conversion of chemical energy to mechanical motion; feedback and control of gene expression; networks and cell-to-cell signaling. Prerequisite: admission to the Campuswide Honors Program.

BMEH11 Honors Molecular Biotechnology (4) S. Overview of engineering applications of cellular analyses; engineering of cells for manufacturing or sensing purposes. Analysis of DNA and protein; DNA sequencing; PCR; cloning; transgenic cells and animals; stem cells, antibodies, engineering and production of fusion proteins. Prerequisite: admission to the Campuswide Honors Program.

BME50A-B Cell and Molecular Engineering (4-4) W, S. Physiological function from a cellular, molecular, and biophysical perspective. Applications to bioengineering design. (Design units: 2-2)

UPPER-DIVISION

BME110A-B Biomechanics I, II (4-4) F, W. Introduction to continuum mechanics of both living and non-living systems. Laws of motion and free-body diagrams. Stresses, deformation, compatibility conditions, and constitutive equations. Properties of common fluids and solids. Field equations and boundary conditions. Applications to bioengineering designs. Prerequisites: Physics 7D, 7LD, 7E. BME110A-B and BMEH110A-B may not both be taken for credit. (Design units: 1-1)

BMEH110A-B Honors Biomechanics I, II (4-4) F, W. Covers the same material as BME110A-B but in greater depth. Prerequisites: Physics 7D, 7LD, 7E and admission to the Campuswide Honors Program. BMEH110A-B and BME110A-B may not both be taken for credit. (Design units: 1-1)

BME111 Design of Biomaterials (4) S. Natural and synthetic polymeric materials. Materials characterization and design. Wound repair, blood clotting, foreign body response, transplantation biology, biocompatibility of materials, tissue engineering. Artificial organs and medical devices. Government regulations. Patenting. Ethical issues. Prerequisites: BME110A-B. (Design units: 3)

BME120 Quantitative Physiology: Sensory Motor Systems (4) F. A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems. Prerequisite: Mathematics 3D or equivalent, or consent of instructor. Concurrent with BME220. Formerly Engineering E110B. (Design units: 2)

BME121 Quantitative Physiology: Organ Transport Systems (4) W. A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems. Prerequisite: Mathematics 3D or equivalent, or consent of instructor. Same as CBEMS104. Concurrent with BME221, CBEMS204. Formerly Engineering E110A. (Design units: 1).

BME130 Biomedical Signals and Systems (4) F. Analog and digitized biomedical signals analyses: characteristics; Fourier Series expansions; difference and differential equations; convolutions. System models: discrete-time and continuous-time linear time-invariant systems; Laplace and Fourier transforms. Use of computer programs for signal and systems analyses. Prerequisites: Mathematics 2J; Mathematics 7 recommended. (Design units: 1)

BME135 Photomedicine (4) F. Studies the use of optical and engineering-based systems (laser-based) for diagnosis, treating diseases, manipulation of cells and cell function. Physical, optical, and electro-optical principles are explored regarding molecular, cellular, organ, and organism applications. Prerequisites: Physics 3A-B-C or 7A-B-D, or EECS10 or consent of instructor. Same as Biological Sciences D130. Formerly ECE175. (Design units: 0)

BME136 Engineering Optics for Medical Applications (4) W. Fundamentals of optical systems design, integration, and analysis used in biomedical optics. Design components: light sources, lenses, mirrors, dispersion elements, optical fibers, detectors. Systems integration: microscopy, radiometry, inteferometry. Optical system analysis: resolution, modulation transfer function, deconvolution, interference, tissue optics, noise. Prerequisite: BME130, BME135, EECS180, or consent of instructor. Formerly ECE176. (Design units: 3)

BME137 Introduction to Biomedical Imaging (4) S. Introduction to imaging modalities widely used in medicine and biology, including x-ray, computed tomography (CT), nuclear medicine (PET and SPET), ultrasonic imaging, magnetic resonance imaging (MRI), optical tomography, imaging contrast, imaging processing, and complementary nature of the imaging modalities. Prerequisite: BME130; BME136 recommended. (Design units: 1).

BME140 Design of Biomedical Electronics (4) W. Analog and digital circuits in bioinstrumentation. Biomedical signals in continuous and discrete systems. Sampling and digital signal processing. MRI; CT; ultrasound; bioelectromagnetics; electrokinetics. Applications to bioengineering design. Prerequisite: BME130. (Design units: 3)

BME145 MEMS and Nanotechnology for Biomedicine (4) F. Basic concepts of MEMS and nanotechnology and its interaction with the human body. Introduction to biocompatibility, reliability, signal transduction, and sensitivity as it relates to MEMS/nanotechnology. MEMS-based biotransducers and nanotechnology, physiological monitoring, drug delivery, implantable systems, and prostheses. (Design units: 1)

BME146 Miniaturization in Biotechnology and Biological Science (4) W. Introduction to the biotechnology industry and the various instruments (e.g., glow cytometry, PCR, centrifuge, electrophoresis, mass spectrometer) that are being miniaturized by MEMS and nanotechnology; fundamental principles of molecular-based sensing, gene chips, microfluidics, and self-assembly of biological molecules. (Design units: 1)

BME150 Biological Mass Transfer (4) S. Mass transfer in gas, liquid and solid with application to biological systems. Free and facilitated diffusion, active transport, convective mass transfer, diffusion-reaction phenomena, biological mass transfer coefficients, steady and unsteady transport, and flux-force relationships. Applications to bioengineering design. Prerequisites: BME110A-B. (Design units: 1)

BME160 Tissue Engineering (4) S. Quantitative analysis of cell and tissue functions. Emerging developments in stem cell technology, biodegradable scaffolds, growth factors, and others important in developing clinical products. Applications to bioengineering design. Prerequisites: BME50A-B, BME121. (Design units: 2)

BME170 Biomedical Engineering Laboratory (4) S. Laboratory experiments involving living systems with the emphasis on biophotonics, nanoscale systems, and physiological systems. Five laboratories are planned including image processing, optical computed tomography, dynamic cooling, respiratory gas exchange, and electroosmotic transport phenomena. Study of possible errors. Prerequisites: BME111, BME120, BME121, BME130, BME140. (Design units: 1)

BME180A-B Biomedical Engineering Design (4-4) F, W. Design strategies, techniques, tools, and protocols commonly encountered in biomedical engineering; clinical experience at the UCI Medical Center and Beckman Laser Institute; industrial design experience in group projects with local biomedical companies; ethics, economic analysis, marketing, and FDA product approval. Prerequisites: BME121 and BME140. Open only to senior BME majors. In-progress grading. (Design units: 4-4)

BME195 Special Topics in Biomedical Engineering (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit. (Design units: varies)

BME196 Biomedical Engineering Thesis (4) F, W, S. Preparation of final presentation and paper describing individual research in biomedical engineering in one or more quarters of individual study (i.e., BME199). Prerequisites: satisfactory completion of lower-division writing requirement, completion of at least four units of BME199, and consent of BME199 instructor. (Design units: varies).

BMEH196 Biomedical Engineering Honors Thesis (4) F, W, S. Preparation of final presentation and paper describing individual research in biomedical engineering. Prerequisites: BMEH199 and consent of instructor. Open only to members of the Campuswide Honors Program who are Biomedical Engineering or Biomedical Engineering: Premedical majors. (Design units: varies)

BME199 Individual Study (1 to 4) F, W, S. Independent research conducted in the laboratory of a Biomedical Engineering core faculty member. A formal written report of the research conducted is required at the conclusion of the quarter. Prerequisites: Biological Sciences 194S and consent of instructor. May be repeated for credit. (Design units: varies)

BMEH199 Individual Study for Honors Students (1 to 4) F, W, S. Independent research conducted in the laboratory of a Biomedical Engineering faculty member for participants in the Campuswide Honors Program. A formal written report of the research conducted is required at the conclusion of quarter. Prerequisites: Biological Sciences 194S and consent of instructor. Open only to members of the Campuswide Honors Program who are Biomedical Engineering or Biomedical Engineering: Premedical majors. May be repeated for credit. (Design units: varies)

GRADUATE

BME200 Introduction to Biomedical Engineering (2). Offers a perspective on bioengineering as a discipline in a seminar format. Principles of problem definition, team design, engineering inventiveness, information access, communication, ethics, and social responsibility are emphasized.

BME210 Cell and Tissue Engineering (4) F. A biochemical, biophysical, and molecular view of cell biology. Topics include the biochemistry and biophysical properties of cells, the extracellular matrix, biological signal transduction, and principles of engineering new tissues. Prerequisite: consent of instructor. Formerly Engineering 205.

BME220 Quantitative Physiology: Sensory Motor Systems (4) F. A quantitative and systems approach to understanding physiological systems. Systems covered include the nervous and musculoskeletal systems. Prerequisite: consent of instructor. Concurrent with BME120. Formerly Engineering 210B.

BME221 Quantitative Physiology: Organ Transport Systems (4) W. A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems. Prerequisite: consent of instructor. Same as CBEMS204. Concurrent with BME121, CBEMS104. Formerly Engineering 210A.

BME223 Advanced Cardiovascular Biomechanics (3). Considers the modern developments in cardiovascular biomechanics at an advanced mathematical level. Selected topics in the dynamics of the heart and blood vessels, pulstatile blood flow, microcirculation, and muscle mechanics. Also considers modeling of boundary value problems in cardiovascular engineering.

BME230A Applied Engineering Mathematics I (4) F. Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics. Prerequisites: CBEMS110, CBEMS120A, and CBEMS120B; or consent of instructor. Same as CBEMS230.

BME230B Applied Engineering Mathematics II (4) W. Advanced engineering mathematics for biomedical engineering. Focuses on biomedical system identification. Includes fundamental techniques of model building and testing such as formulation, solution of governing equations (emphasis on basic numerical techniques), sensitivity theory, identifiability theory, and uncertainty analysis. Formerly Engineering 220B.

BME240 Introduction to Clinical Medicine for Biomedical Engineering (2) S. An introduction to clinical medicine for graduate students in biomedical engineering. Divided between lectures focused on applications of advanced technology to clinical problems and a series of four rotations through the operating room, ICU, interventional radiology/imaging, and endoscopy. Formerly Engineering 240.

BME261 Biomedical Microdevices I (3) S. In-depth review of microfabricated devices designed for biological and medical applications. Studies of the design, implementation, manufacturing, and marketing of commercial and research bio-MEMS devices. Prerequisite: EECS217A or consent of instructor. Formerly BME261A.

BME262 Microfluidics (3). An advanced course on microfluidics research and its application in Biomedical Engineering. Offers in-depth perspective on different fabrication methods and different microfluidic devices that are used in Biomedical Engineering. The principles of microfabrication, surface treatment, device design, and application are covered. Prerequisites: advanced courses in mathematics, physics, and chemistry.

BME263 Microsystem Technologies for Biomolecular Assays (3). Introduction to state-of-the-art micro Total Analysis Systems (mTAS) for biomolecular assays, device design principles for microscale sample preparation, flow transport, biomolecular manipulation/separation/detection, technologies for integrating these devices into microsystems. Applications include clinical medicine, health monitoring, biotechnology, biodetection.

BME295 Special Topics in Biomedical Engineering (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topics vary.

BME296 Master of Science Thesis Research (1 to 12). Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

BME297 Doctor of Philosophy Dissertation Research (1 to 12). Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

BME298 Seminars in Biomedical Engineering (1) F, W, S. Presentation of advanced topics and reports of current research efforts in biomedical engineering. Designed for graduate students in the biomedical engineering program. Prerequisite: consent of instructor. May be repeated for credit. Formerly Engineering 298.

BME299 Individual Research (1 to 12). Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor. May be repeated for credit.

DEPARTMENT OF CHEMICAL ENGINEERING AND MATERIALS SCIENCE

916F Engineering Tower; (949) 824-3426
Stanley B. Grant, **Department Chair**

Faculty

Nancy A. Da Silva: Molecular biotechnology, metabolic engineering, environmental biotechnology
James C. Earthman: Fatigue behavior and cyclic damage, automated materials testing, high-temperature fracture, biomaterials, cellular networks
Stanley B. Grant: Environmental engineering, coastal water quality, coagulation and filtration of colloidal contaminants, environmental microbiology
Juan Hong: Biochemical and separation processes, environmental engineering
Henry C. Lim: Bioreaction and bioreactor engineering
Jia Grace Lu: Nanostructured materials, nanoscale electronics, spintronics, and chemical sensor
Martha L. Mecartney: Oxide thin films for microelectronics, grain boundary engineering of ceramics, solid oxide fuel cell materials
Farghalli A. Mohamed: Mechanical properties, creep, superplasticity, correlations between properties of materials and their microstructure, mechanical behavior at the nanoscale
Daniel R. Mumm: Thermo-mechanical behavior, interfaces and microstructure, materials for power and propulsion, cellular materials, morphing structures, micro/nano-mechanics, biomaterials, electrochemical ceramics
Andrew J. Putnam: Cellular signaling in engineered extracellular micro-environments; biomaterials; cell and tissue engineering
Regina Ragan: Self-assembly of hybrid organic/inorganic nanostructures for nanoelectronic and sensing applications; correlating electron transport and optical properties with atomic and molecular structure
Frank G. Shi: Optoelectronics packaging, packaging materials, photonic glass and nanocomposites
Vasan Venugopalan: Application of laser radiation for medical diagnostics, therapeutics and biotechnology; laser-induced thermal, mechanical, and radiative transport processes
Szu-Wen Wang: Biomolecular engineering, interfacial engineering, biomaterials, drug delivery
Albert Yee: Nanofabrication of soft materials, physics of polymer thin films, nanomechanical properties of polymers, ultra-low-k dielectrics, fracture and toughening of polymer nanocomposites

Affiliated Faculty

G. Wesley Hatfield: Molecular mechanisms of biological control systems
Noo Li Jeon: Soft lithography in fabricating devices
Guann-Pyng Li: High-speed semiconductor technology, optoelectronic devices, integrated circuit fabrication and testing
Roger H. Rangel: Fluid mechanics, heat transfer of multiphase systems including spray combustion, atomization, and metal spray solidification; applied mathematics
William A. Sirignano: Combustion theory and computational methods, multiphase flows, turbulent reacting flows
Victoria L. Tellkamp *(Adjunct)*: Nanostructured materials, sol-gel processing, biomaterials

Affiliated faculty are from The Henry Samueli School of Engineering and the School of Medicine.

The Department of Chemical Engineering and Materials Science offers the B.S. degree in Chemical Engineering, the B.S. degree in Materials Science Engineering, the M.S. and Ph.D. degrees in Chemical and Biochemical Engineering, and the M.S. and Ph.D. degrees in Materials Science and Engineering.

Undergraduate Major in Chemical Engineering

Program Educational Objectives: (1) provide students with a solid foundation and training in chemical engineering fundamentals to enter professional and chemical engineering practice and to enter into graduate study at leading universities; (2) provide a broad background in engineering sciences and their applications to chemical engineering practices as it relates to design, development, research, and teaching in industry, government, or a university; (3) allow students to personalize their curriculum to prepare them for traditional chemical engineering careers and diverse careers in areas such as medicine, biotechnology, the environment, and materials processing; (4) provide opportunities for teamwork, open-ended problem solving, and critical thinking. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

Chemical Engineering uses knowledge of chemistry, mathematics, physics, biology, and humanities to solve societal problems in areas such as energy, health, the environment, food, clothing, shelter, and materials and serves a variety of processing industries whose vast array of products include chemicals, petroleum products, plastics, pharmaceuticals, foods, textiles, fuels, consumer products, and electronic and cryogenic materials. Chemical engineers also serve society in improving the environment by reducing and eliminating pollution.

The undergraduate curriculum in Chemical Engineering builds on basic courses in chemical engineering, other branches of engineering, and electives which provide a strong background in humanities and human behavior. Elective programs developed by the student with a faculty advisor may include such areas as applied chemistry, biochemical engineering, chemical reaction engineering, chemical processing, environmental engineering, materials science, process control systems engineering, and biomedical engineering.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory), one year of general chemistry (with laboratory), and one additional approved course for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN CHEMICAL ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B, 2D, 2J, 3D, and 2E; Chemistry 1A-B-C, 1LB-LC; 51A-B-C, 51LA-LB or 52A-B-C, 52LA-LB; and Physics 7A-B-D and 7LA-LB-LD.

Engineering Topics Courses: Students must complete a minimum of 18 units of engineering design. Chemistry 130A-B-C or 131A-B-C; Engineering MAE10 or CEE10 or EECS10, ENGR54, CBEMS40A-B, CBEMS110, CBEMS120A-B, CBEMS130, CBEMS135, CBEMS140A-B, and CBEMS145. Students select, with the approval of a faculty advisor, any additional engineering topics courses needed to satisfy school and department requirements.

Technical Elective Courses: Students select, with the approval of a faculty advisor, a minimum of 17 units of technical electives. Students may select an area of specialization and complete the associated requirements, as shown below.

(The nominal Chemical Engineering program will require 196 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Specialization in Biochemical Engineering: requires CBEMS112 or CBEMS134 and a minimum of 8 units from: CBEMS114, CBEMS124, CBEMS132, CBEMS199 or H199 (up to 4 units), CEE166, Biological Sciences 98, Biological Sciences 99, or Biological Sciences M128.

Specialization in Environmental Engineering: requires one course from: CBEMS106, CBEMS114, CBEMS116, CBEMS199 or H199 (at least 3 units), CEE161. Also requires a minimum of two courses from: CEE162, CEE163, CEE165, CEE168, CEE171, CEE172, MAE110, MAE115, MAE164.

Specialization in Materials Science: requires a minimum of 12 units from: ENGR150 (requires MAE30, not included in total), CBEMS154, CBEMS155, CBEMS157, CBEMS158, CBEMS159, CBEMS160, CBEMS162, CBEMS163, CBEMS164, CBEMS166, CBEMS167, CBEMS172, CBEMS173, CBEMS174, CBEMS175, CBEMS199 or H199 (up to 4 units).

PLANNING A PROGRAM OF STUDY

The sample program of study chart shown is typical for the major in Chemical Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Chemical Engineering majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisors.

Sample Program of Study — Chemical Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
CEE10 or EECS10 or MAE10	Breadth	Breadth
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 2E
Chemistry 51A, 51LA	Chemistry 51B, 51LB	Chemistry 51C
CBEMS40A	ENGR54	CBEMS40B
	Breadth	Breadth
Junior		
Chemistry 130A or 131A	Chemistry 130B or 131B	Chemistry 130C or or 131C
CBEMS110	CBEMS120B	CBEMS130
CBEMS120A	Technical Elective	Technical Elective
Breadth	Breadth	Breadth
Senior		
CBEMS135	CBEMS140A	CBEMS140B
Technical Elective	Technical Elective	CBEMS145
Breadth	Technical Elective	Technical Elective
Breadth	Breadth	Breadth

Undergraduate Major in Materials Science Engineering

Program Educational Objectives: (1) provide students with a solid background and training in the four primary elements of Materials Science and Engineering: Processing, Structure, Behavior, and Performance; (2) provide students with quality education in Materials Science and Engineering that would enable them to meet the challenges of current and future technology; (3) provide students with a broad education that will enable them to use engineering principles and sciences fundamentals to analyze and solve problems related to energy, environment, and materials selection; (4) train students to seek new information and apply it effectively in engineering projects; (5) provide students with the opportunity for independent work, teamwork, and solving open-ended problems which focus on materials selections in design projects; (6) prepare students to enter the work force or graduate school. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

Since the beginning of history, materials have played a crucial role in the growth, prosperity, security, and quality of human life. In fact, materials have been so intimately related to the emergence of human culture and civilization that anthropologists and historians have identified early cultures by the name of the significant materials dominating those cultures. These include the stone, bronze, and iron ages of the past. At the present time, the scope of materials science and engineering has become very diverse; it is no longer confined to topics related to metals and alloys but includes those relevant to ceramics, composites, polymers, biomaterials, nanostructures, intelligent materials, and electronic devices. In addition, present activities in materials science and engineering cover not only areas whose utility can be identified today, but also areas whose utility may be unforeseen. The services of materials scientists and engineers are required in a variety of engineering operations dealing, for example, with emerging energy systems, design of semiconductors and optoelectronic and nano devices, development of new technologies based on composites and high-temperature superconductivity, biomedical products, performance (e.g., quality, reliability, safety, energy efficiency) in automobile and aircraft components, improvement in nondestructive testing techniques, corrosion behavior in refineries, radiation damage in nuclear power plants, and fabrication of advanced materials.

The undergraduate major in Material Science Engineering (MSE) provides students with a thorough knowledge of basic engineering and scientific principles. The undergraduate curriculum in MSE includes: (a) a core of Chemistry, Physics, and Mathematics; (b) basic Engineering courses; (c) Materials and Engineering core; and (d) technical courses in Materials Science, Engineering, and Sciences.

Because of the interdisciplinary nature of MSE and its intimate relations with other Engineering disciplines (Aerospace, Biomedical, Chemical, Civil, Computer, Electrical, Environmental, and Mechanical Engineering), qualified students will be able to satisfy in a straightforward manner the degree requirements of their Engineering major and the MSE major.

ADMISSIONS

High School Students: See page 177.

Transfer Students: Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory), one year of general chemistry (with laboratory), and one additional approved course for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN MATERIALS SCIENCE ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses:

Core Courses: Mathematics 2A-B, 2D, 2J, 3D, and 2E; Chemistry 1A-B-C and 1LB-LC; and Physics 7A-B-D-E and 7LA-LB-LD.

Elective Courses: Students must complete a minimum of four units from: Chemistry 130A (or 131A), Mathematics 112A, 114A, Physics 111A, 112A. (NOTE: Engineering students must meet all listed prerequisites.)

Engineering Topics Courses: Students must complete a minimum of 22 units of engineering design.

Core Courses: Engineering MAE10, MAE30 (or CEE30), MAE80 (or CEE80), CBEMS40A-B, CBEMS50L, CBEMS120A-B, CBEMS155, CBEMS160, CBEMS165, CBEMS170, CBEMS175, CBEMS189A-B-C, ENGR54, ENGR150, EECS70A, EECS170A.

Engineering Electives: Students must complete a minimum of 12 units from: BME111, CBEMS110, CBEMS130, CBEMS154, CBEMS157, CBEMS158, CBEMS159, CBEMS162, CBEMS163, CBEMS164, CBEMS166, CBEMS167, CBEMS172, CBEMS173, CBEMS174, CBEMS199, EECS170LA, EECS170B, EECS176, EECS180, or MAE157. Students select, with the approval of a faculty advisor, any additional engineering topics courses needed to satisfy school and department requirements.

(The nominal Materials Science Engineering program will require 191 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Specialization in Electronics Processing and Materials. Students majoring in MSE may elect, with the approval of their faculty advisor, to use available engineering electives (four courses with 13 units) for the specialization in Electronics Processing and Materials, which has the following requirements: a Senior Design Project related to the role of materials in this area, CBEMS189A-B-C (5 units); and a minimum of 13 units selected from: CBEMS166, CBEMS172, CBEMS173, CBEMS174, CBEMS199 or CBEMSH199 (up to 3 units), EECS170LA*, EECS170B, EECS174, and EECS176.

* EECS70B is a prerequisite.

MINOR IN MATERIALS SCIENCE ENGINEERING

The interdisciplinary field of materials science and engineering has become critical to many emerging areas of advanced technology and their applications. As a result, there are needs and opportunities for engineers and scientists with education and training in materials science and engineering. The goal of the minor in Materials Science Engineering (MSE) is to provide students at UCI with such education and training that will enable them, upon graduation, to not only participate in projects or programs of an interdisciplinary nature but also address challenging societal needs and complex technological advances.

Admission. Admission in the MSE minor requires a minimum 2.5 overall UCI GPA. Students will need to apply through the Department of Chemical Engineering and Materials Science. Students are required to complete all prerequisites for required courses and selected electives. In particular, students need to complete the following courses before applying: Chemistry 1A and one Chemistry lab; Mathematics 2D, 2J, 2E; Physics 7B and one Physics lab.

Requirements

Eight courses are required to graduate with the MSE minor. These courses are divided into two categories:

Required courses: ENGR54, CBEMS50L, CBEMS155, CBEMS165, CBEMS170, CBEMS175.

Electives: Take two from the following courses: ENGR150, CBEMS154, CBEMS157, CBEMS159, CBEMS160 (same as Chemistry 156), CBEMS162, CBEMS163, CBEMS166, CBEMS172, CBEMS173, CBEMS174, CBEMS 199 (Materials Research; up to four units), EECS170A, EECS176, BME111, MAE157, Chemistry 130A, Chemistry 136, Chemistry 225, Mathematics 112A (or MAE140), Physics 112A, Physics 133, Physics 135.

PLANNING A PROGRAM OF STUDY

A sample program of study chart for the major in Materials Science Engineering is available in the Undergraduate Student Affairs Office. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their faculty advisor. Materials Science Engineering majors must consult at least once every year with the academic counselors in the Undergraduate Student Affairs Office and with their faculty advisors.

Sample Program of Study — Materials Science Engineering

FALL	WINTER	SPRING
Freshmen		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
MAE10		
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 2E
Physics 7E	ENGR54	EECS70A
MAE30	MAE80	CBEMS50L
Breadth	Breadth	Breadth
		Breadth
Junior		
CBEMS40A	CBEMS155	CBEMS40B
ENGR150	Science Elective	CBEMS160
EECS170A	Breadth	CBEMS175
	Breadth	Breadth
Senior		
CBEMS120A	CBEMS120B	CBEMS170
CBEMS189A	CBEMS165	CBEMS189C
Engineering Elective	CBEMS189B	Engineering Elective
Engineering Elective	Engineering Elective	Breadth
Breadth	Breadth	Breadth

Graduate Study in Chemical and Biochemical Engineering

Chemical engineering uses the knowledge of chemistry, mathematics, physics, biology, and social sciences to solve societal problems such as energy, health, environment, food, clothing, shelter, and semiconductors. It serves a variety of processing industries whose vast array of products include chemicals, petroleum products, plastics, pharmaceuticals, foods, textiles, fuels, consumer products, and electronic and cryogenic materials. It also serves society to improve the environment by reducing and eliminating pollution. Chemical engineering is an engineering discipline that has its strongest ties with the molecular sciences. This is an important asset since sciences such as chemistry, molecular biology, biomedicine, and solid-state physics are providing the seeds for future technologies. Chemical engineering has a bright future as the discipline which will bridge science with engineering in multidisciplinary environments.

Biochemical Engineering is concerned with the processing of biological materials and processes that use biological agents such as living cells, enzymes, or antibodies. Biochemical Engineering, with integrated knowledge of the principles of biology and chemical engineering, plays a major engineering role in the rapidly developing area of biotechnology. Career opportunities in Biochemical Engineering are available in a variety of industries such as biotechnology, chemical, environmental, food, petrochemical, and pharmaceutical industries.

The principle objectives of the graduate curriculum in Chemical and Biochemical Engineering are to develop and expand students' abilities to solve new and more challenging engineering problems and to promote their skills in independent thinking and learning in preparation for careers in manufacturing, research, or teaching. These objectives are reached through a program of course work and research designed by each student with the assistance, advice, and approval of a primary faculty advisor and a faculty advisory committee. Programs of study leading to the M.S. and Ph.D. degrees in Chemical and Biochemical Engineering are offered.

MASTER OF SCIENCE DEGREE

Two plans are available for the M.S. degree: a thesis option and a comprehensive examination option. Opportunities are available for part-time study toward the M.S. degree.

Students who enter the program with a B.S. degree in chemical engineering must take at least six graduate-level courses (22 units), while students who enter without undergraduate preparation in chemical engineering are required to take three to five additional prerequisite courses (Mathematics 105A-B-C and Engineering CBEMS40B, CBEMS110, CBEMS112, and CBEMS120A). A detailed program of study for each entering student is formulated in consultation with a faculty advisor and must be approved by the graduate advisor.

Plan I: Thesis Option

The thesis option requires completion of 38 units of study (eight of which can be taken for study in conjunction with the thesis research topic); the completion of an original research project; the writing of the thesis describing it; and successful defense of the thesis.

Plan II: Comprehensive Examination Option

The comprehensive examination option requires a minimum of 36 quarter units in approved courses, at least 28 of which must be from graduate courses in the 200 series in Chemical Engineering and Materials Science.

DOCTOR OF PHILOSOPHY DEGREE

The doctoral program is tailored to the individual needs and background of the student. The detailed program of study for each Ph.D. student is formulated in consultation with an advisory committee which takes into consideration the objectives and preparation of the candidate. The program of study must be approved by the faculty of the School.

There are no specific course requirements, but there are several milestones to be passed: acceptance into a research group by the faculty advisor, successful completion of the Ph.D. preliminary examination, formal advancement to candidacy in the third year (second year for students who entered with a master's degree) by passing the qualifying examination which assesses the candidate's preparation for research and evaluates the proposed original research, successful completion of the research, and presentation and successful defense of the dissertation. There is no foreign language requirement. Ph.D. students have to meet departmental research requirements as a research assistant or equivalent, with or without salary. The degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. For at least the final two years of the doctoral program it is expected that the student will be a full-time resident in the School. The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree. The maximum time permitted is seven years.

Graduate Study in Materials Science and Engineering

Materials Science and Engineering focuses on the development of new materials and new applications for materials in engineering. Current research programs include nanomaterials, nanostructures, nanoelectronics, nanodevices, nanocharacterization, device/system packaging materials, materials for advanced energy and fuel cells, biocompatible materials, soft materials such a biological materials and polymeric materials, electronic and photonic materials, hybrid materials, interfactial engineering of materials, and multifunctional materials. Faculty with relevant research are affiliated with the Integrated Nanofabrication Research Facility, the National Fuel Cell Research Center, the Institute for Telecommunications and Information Technology, and the Materials Characterization Center, among others.

The MSE graduate degree program is hosted by the Department of Chemical Engineering and Materials Science (ChEMS). Faculty who may serve as advisors are listed as affiliated with the ChEMS Department and include faculty with strong materials science and engineering research programs from other departments. The formal degree that is awarded upon successful completion of the program is either the M.S. or Ph.D. in Materials Science and Engineering. The Henry Samueli School of Engineering also offers M.S. and Ph.D. degrees in Engineering with a concentration in Material Science and Engineering (MSE). Students who have broader interests in Engineering should also consider the concentration and consult the list of affiliated faculty and research projects. Students should note that for both the MSE degree program and the concentration, the "outside" faculty senate member of the candidacy committee cannot be affiliated with either the interdisciplinary concentration or the Department of Chemical Engineering and Materials Science.

Recommended Background

Given the nature of Materials Science and Engineering as a cross-disciplinary program, students having a background, and suitable training, in Materials, Engineering (Mechanical, Electrical, Civil, Chemical, Aerospace), and the Physical Sciences (Physics, Chemistry, Geology) are encouraged to participate. A student with an insufficient background may be required to take remedial undergraduate courses. Recommended background courses include an introduction to materials, thermodynamics, mechanical behavior, and electrical/optical/magnetic behavior.

Specific Fields of Emphasis

The Materials faculty at UCI have special interest and expertise in all areas of modern materials and technologies, including: biomaterials, energy materials, advanced ceramics, polymers and nanocomposite materials, structural and nanostructured metallic materials, micro/nano-device materials, device/system packaging materials, multifunctional materials.

Required Courses

Students are required to take one course from each area for the M.S. degree and as a basis for the Ph.D. preliminary examination.

Crystal Structure and Defects: MSE200 (Microstructure of Materials).

Electrical and Optical Behavior: MSE 205 (Materials Physics) or EECS276 (Solid State Electronics).

Mechanical Behavior: one course from MSE251 (Dislocation Theory), MSE256A (Mechanical Behavior of Engineering Materials), MSE256B (Fracture of Engineering Materials), MSE256C (Fatigue of Engineering Materials), MSE261 (High-Temperature Deformation of Engineering Materials), CEE242 (Advanced Strength of Materials), CEE243 (Mechanics of Composite Materials).

Thermodynamics and Kinetics: one course from MSE252 (Theory of Diffusion), MSE253 (Kinetic Phenomena in Materials), MSE265 (Phase Transformations), CBEMS240 (Thermodynamics), MAE216 (Statistical Thermodynamics) MAE217 (Generalized Thermodynamics).

Materials Design/Processing: one course from MSE254 (Polymer Science and Engineering), MSE255A (Design of Ceramic Materials), MSE270 (Materials Processing).

Electives

Faculty advisors should be consulted on the selection of elective courses. Graduate-level courses offered in Engineering and relevant graduate courses from other schools may be taken as electives. Students are encouraged to consult quarterly the *WebSOC, Searchable Schedule of Classes* for relevant graduate courses offered by other departments. Examples of electives taken by graduate students in the past are listed below, but electives are not limited to this list.

CBEMS280 (Optoelectronics Packaging), EECS182 (Monolithic Microwave Integrated Circuit [MMIC] Analysis and Design), EECS188 (Optical Electronics), EECS285A (Optical Communications), EECS285B (Lasers and Photonics), EECS285C (Integrated and Fiber Optics), MAE247 (Micro-System Design), MSE266 (Science of Nanoscale Materials and Devices), MSE272 (Microelectronic and Photonic Materials), Physics 213C (Modern Optics), Physics 266 (Current Topics in Chemical and Materials Physics).

Chemistry 243 (Advanced Instrumental Analysis), MAE210 (Advanced Fundamentals of Combustion), MSE210 (Materials Characterization Techniques and Analysis), MSE220 (Analytical Methods in Materials Science), MSE255A (Design with Ceramic Materials), MSE255B (Science of Composite Materials), MSE263 (Computer Techniques in Experimental Materials Research), MSE264 (Transmission Electron Microscopy), Physics 223 (Numerical Methods), Physics 229A-B (Computational Methods).

CBEMS210 (Reaction Engineering), CBEMS220 (Transport Phenomena), CBEMS230 (Applied Engineering Mathematics I), CBEMS240 (Thermodynamics), Chemistry 249 (Analytical Spectroscopy), MAE214 (Fuel-Cell Fundamentals and Technology).

MSE220 (Analytical Methods in Materials Science), CEE250 (Finite Element Method in Structural Engineering), Chemistry 227 (Molecular Modeling), Chemistry 229A-B (Computational Methods), Mathematics 225A-B-C (Introduction to Numerical Analysis and Scientific Computing).

Chemistry 216 (Organometallic Chemistry), Chemistry 217 (Physical Inorganic Chemistry), Chemistry 218 (Metallobiochemistry), Chemistry 225 (Polymer Chemistry: Synthesis and Characterization of Polymers), Chemistry 247 (Problems in Analytical Chemistry), Chemistry 252 (Special Topics in Physical Chemistry), Chemistry 272 (Industrial Chemistry), Physics 206 (Laboratory Skills).

MASTER OF SCIENCE DEGREE

The M.S. degree reflects achievement of an advanced level of competence for professional practice of materials science and engineering. Two options are available: a thesis option and a comprehensive examination option.

Plan I: Thesis Option

For the M.S. thesis option, students are required to complete a research study of great depth and originality and obtain approval for a complete program of study. A committee of three full-time faculty members is appointed to guide development of the thesis. A minimum of 36 units is required for the M.S. degree. For the thesis option, at least 21 units must be taken from courses numbered 200–289, among which 15 units are from MSE core courses and at least six units are from elective courses approved by the graduate advisor. Up to eight units of 296 and up to eight units of undergraduate elective courses can be applied toward the 36-unit requirement. Full-time graduate students must enroll in the departmental seminar each quarter unless exempt by petition.

Plan II: Comprehensive Examination Option

For the comprehensive examination option, students are required to complete 36 units of study and a comprehensive examination. At least 24 units must be taken from courses numbered 200–289, among which 15 units are from MSE core courses and at least nine units are from elective courses approved by the graduate advisor. Up to eight units of undergraduate elective courses can be applied toward the 36-unit requirement. Full-time graduate students must enroll in the departmental seminar each quarter unless exempt by petition.

DOCTOR OF PHILOSOPHY DEGREE

The Ph.D. degree in Materials Science and Engineering requires a commitment on the part of the student to dedicated study and collaboration with the faculty. Ph.D. students are selected on the basis of outstanding demonstrated potential and scholarship. Applicants must hold the appropriate prerequisite degrees from recognized institutions of high standing. After substantial preparation, Ph.D. candidates work under the supervision of faculty advisors. The process involves extended immersion in a research atmosphere and culminates in the production of original research results presented in a dissertation. Milestones to be passed in the Ph.D. program in order to remain in good standing include the following: acceptance into a research group by the faculty advisor during the student's first year of study; successful completion of the Ph.D. preliminary examination by the end of the second year; preparation for pursuing research and the development of a research proposal culminating in passing the Qualifying Examination by the end of the third year of the Ph.D. program. Students must advance to candidacy in their third year (second year for students who entered with a master's degree).

There are no course requirements for the Ph.D. beyond the M.S. requirements, but students must enroll in the departmental seminar each quarter unless exempt by petition. However, most Ph.D. students take several courses beyond the M.S. degree requirements. The preliminary examination is based on the five core courses for the M.S., and students who have completed an MSE M.S. degree elsewhere must have taken the equivalent courses or take them at UC Irvine.

Final examination involves the oral presentation and defense of an acceptable dissertation in a seminar attended by students and faculty. The Ph.D. degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

Relationship of M.S. and Ph.D. programs. Students applying with the objective of a Ph.D. are admitted to the M.S./Ph.D. program only if they are likely to successfully complete a Ph.D. program. These students do not formally reapply to the Ph.D. program after completing the M.S. degree. Students who apply to the M.S.-only program must formally apply for the Ph.D. program if they desire to continue on for a Ph.D. Financial support is usually reserved for those students who plan to complete the Ph.D. The normal time to complete M.S. and Ph.D. degrees is two and five years, respectively.

Courses in Chemical Engineering and Materials Science

UNDERGRADUATE

NOTE: The undergraduate courses listed below are open only to students in The Henry Samueli School of Engineering. All other majors must petition for permission to enroll.

CHEMICAL ENGINEERING

CBEMS40A Process Engineering Calculations (5) F. Quantitative calculations and applications to process industries using mass and energy balances. Stoichiometric equations, multiple bypasses and recycle streams in process industries, and introduction to the first law of thermodynamics. Prerequisites: Mathematics 2B, Chemistry 1B, and Physics 7A, 7LA. (Design units: 0)

CBEMS40B Chemical Engineering Thermodynamics (5) S. Basic concepts and use of the thermodynamic functions of free energy, enthalpy, and entropy; properties of pure and mixtures; application of dynamic process and efficiencies. Solution thermodynamics and applications to oxidation reactions. Equilibrium phase diagrams and liquid to solid phase transformations. Prerequisites: CBEMS40A, Mathematics 2J; Engineering CEE10, EECS10, or MAE10. CBEMS40B and MAE91 may not both be taken for credit. (Design units: 1)

CBEMS50L Principles of Materials Science and Engineering (1) S. Introduction to the experimental techniques to characterize the properties of engineering materials. Emphasis on understanding the influence of microstructure on elastic, plastic, and fracture behavior. Topics include microstructure characterization, heat treatment, grain size effect, precipitation hardening, and impact loading. Corequisite: ENGR54. (Design units: 0)

CBEMS104 Quantitative Physiology: Organ Transport Systems (4). A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems. Prerequisite: Mathematics 3D or equivalent, or consent of instructor. Same as BME121. Concurrent with CBEMS204 and BME221. (Design units: 1)

CBEMS106 Pollution Control (3). Application of basic pollution control principles to the chemical industry. Selection of environmentally compatible materials, prioritization of pollutants, analysis of material life cycles, design of unit operations to minimize waste, and economics of pollution control. Prerequisite: CBEMS40A or consent of instructor. (Design units: 1)

CBEMS110 Reaction Kinetics and Reactor Design (4) F. Introduction to quantitative analysis of chemical reactions and chemical reactor design. Reactor operations including batch, continuous stirred tank, and tubular reactor. Homogeneous and heterogeneous reactions. Prerequisites: Mathematics 3D, Chemistry 1C, CBEMS40B. (Design units: 2)

CBEMS112 Introduction to Biochemical Engineering (3). Application of engineering principles to biochemical processes. Topics include: microbial pathways, energetics and control systems, enzyme and microbial kinetics, and the design and analysis of biological reactors. Prerequisites: Chemistry 1C, Mathematics 3D; and CBEMS110 or consent of instructor. (Design units: 1)

CBEMS114 Introduction to Bioremediation (3). Introduction to the application of engineering and biological principles toward the remediation of hazardous wastes. Emphasis on genetically-engineered bacteria and biological reactors for degrading recalcitrant compounds. Prerequisite: CBEMS110. (Design units: 0)

CBEMS116 Field Practicum in Environmental Engineering (4). Application of concepts from engineering and microbiology to the characterization and analysis of microbial pollution in coastal waters. Topics include public health microbiology, microbial diversity and ecology, molecular diagnostics of waterborne pathogens. Laboratory exercises and a field-scale experiment. Corequisite: CBEMS110 or CEE162. Concurrent with CBEMS216. (Design units: 2)

CBEMS120A Momentum Transfer (4) F. Macroscopic and differential mass balances; macroscopic and differential linear and angular momentum balances, mechanical energy balances; Ideal fluids, Newtonian and non-Newtonian fluids and turbulence. Applications to chemical processes. Prerequisites: CBEMS40A, Mathematics 3D. (Design units: 1)

CBEMS120B Heat and Mass Transfer (4) W. Macroscopic and differential energy balances. Heat transfer coefficients, convective and radiative heat transfer, applications to equipment design, macroscopic and differential species balances, mass transfer with and without chemical reactions, mass transfer equipment design. Prerequisite: CBEMS120A. (Design units: 1)

CBEMS124 Transport Phenomena in Living Systems (3). An introduction to transport phenomena in cellular and whole organ systems. Application of transport theory including advection and diffusion to the movement of molecules in biological systems, including the cardiovascular system (heart and microcirculation), and the lung. Prerequisite: CBEMS120A or consent of instructor. (Design units: 0)

CBEMS126 Biomedical Photonics (3). Biophysical principles governing the interaction of laser radiation with biological materials, cells, and tissues. Utilization of these principles in several biomedical therapeutic and diagnostic applications is also covered and discussed in detail. Prerequisite: CBEMS120A, CBEMS120B; or consent of instructor. Concurrent with CBEMS226. (Design units: 0)

CBEMS130 Separation Processes (4) S. Application of equilibria and mass and energy balances for design of separation processes. Use of equilibrium laws for design of distillation, absorption, stripping, and extraction equipment. Design of multicomponent separators. Prerequisite: CBEMS40B. (Design units: 3)

CBEMS132 Bioseparation Processes (3). Recovery and purification of biologically produced proteins and chemicals. Basic principles and engineering design of various separation processes including chromatography, electrophoresis, extraction, crystallization, and membrane separation. Prerequisites: CBEMS40A-B, CBEMS120A. (Design units: 1)

CBEMS134 Introduction to Bioreactor Engineering (3). Unique features of bioreactors. Analyses and design of bioreactors of batch, fed-batch, and continuous flow types. Microbial reactors with and without cell recycles. Bioreactor operations for industrial-important biological products and for biological treatment of wastewater. Prerequisites: CBEMS110. (Design units: 1.5)

CBEMS135 Chemical Process Control (4) F. Dynamic responses and control of chemical process equipment, dynamic modeling of chemical processes, linear systems analysis, analyses and design of feedback loops and advanced control systems. Prerequisites: CBEMS110, CBEMS120B. (Design units: 1)

CBEMS140A Chemical Engineering Laboratory I (4) W. Experimental study of thermodynamics, fluid mechanics, and heat and mass transfer. Operation and evaluation of process equipment, data analysis. Prerequisites: CBEMS40B, CBEMS110, and CBEMS120B. (Design units: 1)

CBEMS140B Chemical Engineering Laboratory II (4) S. Continuation of CBEMS140A covering mass transfer operations such as distillation, absorption, extraction. Rate and equilibria studies in simple chemical systems with and without reaction. Study of chemical process. Prerequisites: CBEMS130, CBEMS135, CBEMS140A. (Design units: 3)

CBEMS145 Chemical Engineering Design (5) S. Application of chemical engineering science techniques to design of chemical processes. Introduction to systematic design of separations and the integration of energy requirement. Integration of process economics and optimization. Consideration of retrofit design, design of nontraditional chemical processes, process safety. Prerequisites: CBEMS110, CBEMS120B, CBEMS130. (Design units: 5)

CBEMS154 Polymer Science and Engineering (3). An introduction to organic and physical chemistry polymers, including synthetic methods, reaction mechanisms; configuration and conformation of polymer chains and characterization techniques; visoelasticity and rheology. Special topics in biopolymers and polymer surfaces. Prerequisite: Chemistry 1A-B-C and ENGR54, or consent of instructor. Concurrent with MSE254. (Design units: 0)

CBEMS155 Mechanical Behavior and Design Principles (4) W. Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters. Prerequisite: ENGR54. Same as MAE156. (Design units: 2)

CBEMS157 Composite Materials Design (3). Introduction to fiber-reinforced composites for mechanical applications. Properties of reinforcing fibers. Manufacture of fibers and composites. Micromechanics of fiber composites. Strength criteria and failure modes. Macromechanics in design of laminated composite structures. Prerequisites: ENGR54 and ENGR150. (Design units: 3)

CBEMS158 Ceramic Materials (3). A technical elective for students interested in the materials area. Topics covered include structure and properties of ceramics and design with ceramics. The laboratory component offers hands-on experience. Prerequisite: ENGR54. (Design units: 1)

CBEMS159 Plasticity and Metal Forming (3). Stress and strain analysis, plasticity equations, yielding, integration of plasticity equations, plastic instability, application of plasticity theory to some forming processes. Prerequisites: ENGR54, ENGR150, and MAE30. (Design units: 1)

CBEMS160 Advanced Laboratory in Chemistry and Synthesis of Materials (4) S. Lecture, two hours; laboratory, eight hours. Synthesis and characterization of organic and inorganic materials including polymers, oxides, metal alloys, electronic materials. Techniques include electron microscopy, solid-state NMR, gel permeation chromatography, photolithography, x-ray diffraction, porosity, and thermal analysis. Prerequisites: ENGR54 or Chemistry 130A-B or 131A-B. Same as Chemistry 156. (Design units: 0).

CBEMS162 Environmental Effects and Corrosion (3). Covers the principles of environmental degradation and corrosion including environmental effects, electrochemical aspects, eight forms of corrosion, corrosion testing, oxidation at elevated temperatures, susceptibilities of various engineering materials, and prevention of environmental degradation. Prerequisites: ENGR54 and CBEMS50L. (Design units: 2)

CBEMS163 Computer Techniques in Experimental Materials Research (3). Principles and practical guidelines of automated materials testing. Computer fundamentals, programming languages, data acquisition and control hardware, interfacint techniques, programming strategies, data analysis, data storage, safeguard procedures. Prerequisite: consent of instructor. Concurrent with MSE263. (Design units: 1)

CBEMS164 Scanning Electron Microscopy (3). The theory and operation of the scanning electron microscope (SEM) and x-ray microanalysis. Topics covered include the basic design and electron optics, electron beam-specimen interactions, image formation and interpretation, x-ray spectrometry, and other related topics and techniques. Includes laboratory. Prerequisite: upper-division standing or consent of instructor. Concurrent with MSE264. (Design units: 1)

CBEMS165 Phase Transformations (3) W. Thermodynamics and kinetics of phase transformations, phase diagrams, diffusional and diffusionless transformations. Prerequisites: ENGR54 and CBEMS40B. Concurrent with MSE265. (Design units: 0)

CBEMS166 Science of Nanoscale Materials and Devices (3). Covers the properties of nanoscale materials and aspects of current research on next-generation electronic devices. Topics include nanofabrication, characterization of nanostructure materials, and device concepts that take the advantage of quantum mechanical phenomena on the nanoscale. Prerequisites: ENGR54 and Physics 7D. Concurrent with MSE266. (Design units: 0)

CBEMS167 Environmentally Sustainable Manufacturing (3). Multidisciplinary case study approach to environmentally sustainable manufacturing with a focus on electronic products. Engineering, economic, public policy, and industrial ecology aspects. Design, manufacture, policy, and environmental impact reviewed as a function of the entire life-cycle of the materials from extraction through disposal or recycling. Prerequisite: senior standing or consent of instructor. Concurrent with MSE267. (Design units: 0)

CBEMS170 Materials Processing (4) W. Principles of control of structure, properties, and shape in material processing. Heat flow and structures in castings; nucleation and growth kinetics. Design considerations in manufacturing processes. Rapid solidification and powder metallurgy. Welding, brazing, soldering, and adhesive bonding. Engineering ethics. Prerequisites: ENGR54, CBEMS40B, CBEMS165. Concurrent with MSE270. (Design units: 1)

CBEMS172 Microelectronic and Photonic Materials and Technology (3). Covers materials, processes, and principles involved in manufacturing of microelectronics and photonics after the silicon has been fabricated. Considerations of electronic, optical, thermal mechanical, and reliability properties of the materials are viewed in the context of current microelectronics manufacturing processes. Prerequisites: ENGR54, Chemistry 1C, Mathematics 2J, and Physics 7A-B-D-E. Concurrent with MSE272. (Design units: 1)

CBEMS173 Fiberoptic Manufacturing (3). Introduction to basic fiber optics and optical components used in communication systems, with a strong emphasis on current and evolving manufacturing technologies. Fundamentals of optical fiber as a transmission medium, optical communication components, packaging of optical components, other manufacturing processes. Prerequisite: CBEMS110. (Design units: 1)

CBEMS174 Integrated Circuits and Fiber-Optic Devices Processing (3). Provides an overview of the complete semiconductor and photonic devices manufacturing process. Overview of basic concepts used in integrated circuits processing, followed by a description of process steps required to make an integrated circuit. An introduction to photonic devices manufacturing. Prerequisite: CBEMS135. (Design units: 1)

CBEMS175 Design Failure Investigation (4) S. Survey of the mechanisms by which mechanical devices may fail, including overload, fatigue, corrosion, and wear. Use of fractography and other evidence to interpret failure modes and specify design/manufacturing changes. Students redesign failed parts or structures based on actual parts and/or case histories. Prerequisite: ENGR54. (Design units: 2)

CBEMS189A-B-C Senior Design Project (1-2-2) F, W, S. Group supervised senior design projects that deal with materials selection in engineering design and that involve case studies in ethics, safety, design, failure modes, new products, and patents. Activities conclude with a presentation of the projects. In-Progress grading. Corequisite: CBEMS155. CBEMS189A-B-C must be taken in the same academic year. (Design units: 1-2-2)

CBEMS195 Special Topics in Chemical Engineering and Material Science (1 to 4). Prerequisites vary. May be repeated for credit as topics vary.

CBEMS198 Group Study (1 to 4). Group study of selected topics in engineering. Prerequisite: consent of instructor. May be repeated for credit as topics vary. (Design units: varies)

CBEMS199 Individual Study (1 to 4). For undergraduate Engineering majors in supervised but independent readings, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. Prerequisite: consent of instructor. May be taken up to eight units for letter grade. (Design units: varies)

CBEMS199P Individual Study (1 to 4). Same description as CBEMS199. Pass/Not Pass grading only. Prerequisite: consent of instructor. May be repeated for credit. (Design units: varies)

CBEMSH199 Individual Study for Honors Students (1 to 5). Supervised research in Chemical Engineering for participants in the Campuswide Honors Program. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. Prerequisite: consent of instructor. Open only to members of Campuswide Honors Program who are Chemical Engineering majors. May be repeated for credit as topics vary. (Design units: varies)

GRADUATE

CHEMICAL AND BIOCHEMICAL ENGINEERING

CBEMS204 Quantitative Physiology: Organ Transport Systems (4). A quantitative and systems approach to understanding physiological systems. Systems covered include the cardiopulmonary, circulatory, and renal systems. Prerequisite: consent of instructor. Same as BME221. Concurrent with CBEMS104 and BME121.

CBEMS210 Reaction Engineering (4). Advanced topics in reaction engineering, reactor stability analysis, diffusional effect in heterogeneous catalysis, energy balance, optimization of reactor operation, dispersed in phase reactors. Prerequisite: CBEMS110 or consent of instructor.

CBEMS212 Advanced Biochemical Engineering (3). Engineering studies of biological processes including enzyme reactions and fermentation processes with genetically engineered microorganisms and animal and plant cells. Development of production and recovery processes for biochemicals. Prerequisites: CBEMS110 and CBEMS112; or consent of instructor.

CBEMS214 Bioremediation (3). Application of engineering and biological principles toward remediation of hazardous wastes. Degradation of toxic chemicals using genetically engineered microorganisms emphasized. Biological contacting devices for waste remediation also studied. Prerequisites: CBEMS110 and CBEMS112; or consent of instructor.

CBEMS216 Field Practicum in Environmental Engineering (4). Application of concepts from engineering and microbiology to the characterization and analysis of microbial pollution in coastal waters. Topics include public health microbiology, microbial diversity and ecology, molecular diagnostics of waterborne pathogens. Laboratory exercises and a field-scale experiment. Concurrent with CBEMS116.

CBEMS218 Bioengineering with Recombinant Microorganisms (3). Engineering and biological principles important in recombinant cell technology. Host/vector selection, plasmid propagation, optimization of cloned gene expression, metabolic engineering, protein secretion, experimental techniques, modeling of recombinant cell systems. Prerequisites: CBEMS110, CBEMS112; or consent of instructor.

CBEMS220 Transport Phenomena (4). Heat, mass, and momentum transfer theory from the viewpoint of the basic transport equations. Steady and unsteady state; laminar and turbulent flow; boundary layer theory, mechanics of turbulent transport with specific application to complex chemical engineering situations. Prerequisites: CBEMS120A, CBEMS120B; or consent of instructor.

CBEMS222 Physicochemical Hydrodynamics (3). Principles of the interaction between fluid flow and physical, chemical, and biochemical processes. Focus is on transport and reaction of solutes and colloidal particles in environmental settings. Example applications range from contaminant transport in ocean systems to particle separation. Prerequisite: CBEMS220 or consent of instructor.

CBEMS224 Modeling Biomedical Systems (3). Theoretical model building and testing. Emphasis on biomedical systems including, but not limited to, transport phenomena in physiological systems, biomedical systems, and bioelectronic systems; statistical methods for parameter specification; sensitivity analysis. Prerequisite: consent of instructor.

CBEMS226 Biomedical Photonics (3). Biophysical principles governing the interaction of laser radiation with biological materials, cells, and tissues. Utilization of these principles in several biomedical therapeutic and diagnostic applications is also covered and discussed in detail. Prerequisites: CBEMS120A, CBEMS120B; or consent of instructor. Concurrent with CBEMS126.

CBEMS230 Applied Engineering Mathematics I (4). Analytical techniques applied to engineering problems in transport phenomena, process dynamics and control, and thermodynamics. Prerequisites: CBEMS110, CBEMS120A, and CBEMS120B; or consent of instructor. Same as BME230A.

CBEMS232 Bioseparation Processes (3). Recovery and purification of biologically produced proteins and chemicals. Basic principles and engineering design of various separation processes including chromatography, electrophoresis, extraction, crystallization, and membrane separation. Prerequisite: CBEMS112 or consent of instructor.

CBEMS234 Bioreactor Engineering (3). Modeling, optimization, and control of biochemical and biological reactors. Statics and dynamics of bioreactors containing recombinant cells and multiple species. Prerequisite: consent of instructor.

CBEMS240 Chemical Engineering Thermodynamics (4). Advanced applications of the general thermodynamic methods to chemical engineering problems. First-and second-law consequences, estimation and correlation of thermodynamic properties; phase and chemical equilibria. Prerequisite: CBEMS40B or consent of instructor.

CBEMS242 Protein Engineering (3). The design of novel proteins and their production by genetic manipulation. Principles of protein structure and function and techniques of molecular biology relevant to protein engineering. Applications of protein technology. Prerequisites: CBEMS112, Molecular Biology and Biochemistry 203 and 204; or consent of instructor. Same as Physiology and Biophysics 242.

CBEMS249 Special Topics in Chemical Engineering and Materials Science (1 to 4). Prerequisites vary. May be repeated for credit as topics vary. Formerly CBE249.

CBEMS280 Optoelectronics Packaging (3). Basic and current issues in the packaging of integrated circuits (IC) and fiber-optic devices are discussed. Prerequisite: consent of instructor.

CBEMS295 Seminars in Engineering (1 to 4). Seminars scheduled each year by individual faculty in major field of interest. Satisfactory/Unsatisfactory grading only. Prerequisite: consent of instructor. May be repeated for credit.

CBEMS296 Master of Science Thesis (4 to 12). Individual research or investigation conducted in preparation for the thesis required for the M.S. degree. May be repeated for credit.

CBEMS297 Doctor of Philosophy Dissertation Research (4 to 12). Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree. May be repeated for credit.

CBEMS298 Seminars in Engineering (1). Presentation of advanced topics and reports of current research efforts in chemical engineering and materials science. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

CBEMS299 Individual Research (1 to 12). Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor. May be repeated for credit.

MATERIALS SCIENCE

MSE200 Microstructure of Materials (3). Principles and concepts underlying the study of advanced materials including alloys, composites, ceramics, semiconductors, polymers, ferroelectrics, and magnetics. Crystal structure and defects, surface and interface properties, thermodynamics and kinetics of phase transformations, and material processing, related to fundamental material properties. Prerequisites: Chemistry 1A-B-C, Physics 7A, 7LA.

MSE205 Materials Physics (3). Covers the electronic, optical, and dielectric properties of crystalline materials to provide a foundation of the underlying physical principles governing the properties of existing and emerging electronic and photonic materials.

MSE210 Materials Characterization Techniques and Analysis (3). Introduction to microcharacterization techniques, and their application to the study of bulk and thin-film materials; methods of analysis, including electron beam-induced excitations (SEM, SAM, EDX, STEM), x-ray and photon-induced interactions (PEX, ESCA), ion processes (RSB, SIMS, PIXE), submicron optical techniques, and electromagnetic field-induced methods (STM, AFS). Prerequisites: Chemistry 1A-B-C, Physics 7A, 7LA.

MSE220 Analytical Methods in Materials Science (3). Selected topics in modern analysis and their application to material problems in such areas as thermodynamics, crystallography, deformation and fracture, diffusion, phase transformations. Prerequisite: graduate standing or consent of instructor.

MSE251 Dislocation Theory (3). Theory of elasticity and symmetry of crystals, plasticity and slip systems, stress field of dislocation, dislocation reaction, theories of yielding and strengthening, application of reaction-rate kinetics to thermally activated dislocation motion. Prerequisite: ENGR54 or consent of instructor.

MSE252 Theory of Diffusion (3). Solid-state diffusion, analysis of diffusion in solids, thermodynamics of diffusion, application of diffusion theory to phase transformation and deformation problems. Prerequisite: ENGR54 or consent of instructor.

MSE253 Kinetic Phenomena in Materials (3). Kinetic phenomena materials from a phenomenological viewpoint. Diffusion, chemical kinetics, particle-fluid interactions, adsorption, evaporation, statistical thermodynamics, kinetics of phase transformations, and spinodal decomposition.

MSE254 Polymer Science and Engineering (3). An introduction to organic and physical chemistry polymers, including synthetic methods, reaction mechanisms; configuration and conformation of polymer chains and characterization techniques; visoelasticity and rheology. Special topics in biopolymers and polymer surfaces. Prerequisites: Chemistry 1A-B-C and ENGR54, or equivalent or consent of instructor. Concurrent with CBEMS154.

MSE255A Design with Ceramic Materials (3). Dependence of ceramic properties on bonding, crystal structure, defects, and microstructure. Ceramic manufacturing technology. Survey of physical properties. Strength, deformation, and fracture of ceramics. Mechanical design with brittle, environment-sensitive materials exhibiting time-dependent strengths. Prerequisite: ENGR54 or consent of instructor.

MSE255B Science of Composite Materials (3). Properties of intentionally inhomogeneous materials, especially composites manufactured for extreme environments, elevated temperatures, wear resistance. Chemical compatibility of constituents, microstructural stability, environmental effects. Micromechanics of particulate and fiber-reinforced composites. Strength criteria, toughness, and failure mechanisms. Thermomechanical effects. Prerequisites: ENGR54 and ENGR150 or consent of instructor.

MSE256A Mechanical Behavior of Engineering Materials (3). Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, creep, and fatigue, study of rate-controlling mechanisms and failure modes, fracture of materials. Prerequisite: ENGR54.

MSE256B Fracture of Engineering Materials (3). Fracture mechanics and its application to engineering materials. Elastic properties of cracks, the stress intensity factor, the crack tip plastic zone, the J Integral approach, fracture toughness testing, the crack tip opening displacement, fracture at high temperatures, fatigue crack growth. Prerequisite: CBEMS155 or MAE156; or consent of instructor.

MSE256C Fatigue of Engineering Materials (3). Fatigue deformation and damage in engineering materials. Phenomenological descriptions, the Bauschinger effect, persistent slip bands, extrusions and intrusions, crack nucleation, stage I and II crack growth, threshold effects, crack growth laws, materials selection. Prerequisite: CBEMS155 or MAE156, or MSE256B; or consent of instructor.

MSE257B Recent Developments in Advanced Materials (3). Concepts underlying the evolution of the microstructure and the mechanical behavior of advanced metallic systems during processing; correlation between microstructures and mechanical behavior. Emphasis on current research areas in materials.

MSE259 Transmission Electron Microscopy (4). The theory and operation of the transmission electron microscope (TEM), including the basic construction, electron optics, electron diffraction and reciprocal space, formation of image and image contrast, interpretation of images and electron diffraction information, microanalysis, and specimen preparation. Includes laboratory component. Prerequisite: MSE200 or consent of instructor.

MSE261 High-Temperature Deformation of Engineering Materials (3). Theoretical and practical aspects of creep and superplasticity in metallic and non-metallic systems are presented. Topics include: creep testing methods, diffusional creep, deformation mechanism maps, and superplasticity in non-metallics. Prerequisites: ENGR54; CBEMS155 or MAE156; or consent of instructor.

MSE263 Computer Techniques in Experimental Materials Research (3). Principles and practical guidelines of automated materials testing. Computer fundamentals, programming languages, data acquisition and control hardware, interfacint techniques, programming strategies, data analysis, data storage, safeguard procedures. Prerequisite: consent of instructor. Concurrent with CBEMS163.

MSE264 Scanning Electron Microscopy (3). The theory and operation of the scanning electron microscope (SEM) and x-ray microanalysis. Topics covered include the basic design and electron optics, electron beam-specimen interactions, image formation and interpretation, x-ray spectrometry, and other related topics and techniques. Includes laboratory. Prerequisite: MSE200 or consent of instructor. Concurrent with CBEMS164.

MSE265 Phase Transformations (3). Thermodynamics and kinetics of phase transformations, phase diagrams, diffusional and diffusionless transformations. Prerequisite: consent of instructor. Concurrent with CBEMS165.

MSE266 Science of Nanoscale Materials and Devices (3). Covers the properties of nanoscale materials and aspects of current research on next-generation electronic devices. Topics include nanofabrication, characterization of nanostructure materials, and device concepts that take the advantage of quantum mechanical phenomena on the nanoscale. Prerequisite: ENGR54 and consent of instructor. Concurrent with CBEMS166.

MSE267 Environmentally Sustainable Manufacturing (3). Multidisciplinary case study approach to environmentally sustainable manufacturing with a focus on electronic products. Engineering, economic, public policy, and industrial ecology aspects. Design, manufacture, policy, and environmental impact reviewed as a function of the entire life-cycle of the materials from extraction through disposal or recycling. Prerequisite: graduate standing. Concurrent with CBEMS167.

MSE268 Principles of Coatings, Thin Films, and Multi-layers (3). Principles and concepts underlying the engineering of coating systems, thin films, and multi-layers. Microstructure control, processing approaches, mechanical behavior and thermomechanical characteristics and characterization. Interfacial stability, cracking, delamination, and thermal stress issues. Control of functional properties. Prerequisite: ENGR54.

MSE270 Materials Processing (4). Principles of control of structure, properties, and shape in material processing. Heat flow and structures in castings; nucleation and growth kinetics. Design considerations in manufacturing processes. Rapid solidification and powder metallurgy. Welding, brazing, soldering, and adhesive bonding. Engineering ethics. Prerequisite: consent of instructor. Concurrent with MSE170. (Design units: 1)

MSE272 Microelectronic and Photonic Materials and Technology (3). Covers materials, processes, and principles involved in manufacturing of microelectronics and photonics after the silicon has been fabricated. Considerations of electronic, optical, thermal mechanical, and reliability properties of the materials are viewed in the context of current microelectronics manufacturing processes. Prerequisites: ENGR54, Chemistry 1C, Mathematics 2J, and Physics 7A-B-D-E. Concurrent with CBEMS172. (Design units: 1)

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

E4130 Engineering Gateway; (949) 824-5333
Masanobu Shinozuka, **Department Chair**

Faculty

Alfredo H.-S. Ang: Structural and earthquake engineering, risk and reliability engineering
Constantinos V. Chrysikopoulos: Subsurface solute transport, nonaqueous phase liquid dissolution in porous media, mathematical modeling
Maria Q. Feng: Structural engineering and intelligent control of structural systems
Gary L. Guymon *(Emeritus):* Water resources, groundwater, modeling uncertainty
Medhat A. Haroun *(Emeritus):* Numerical and experimental modeling of the seismic behavior of structural systems for the design and retrofit of liquid storage tanks, bridge-supporting elements, and buildings
Tara C. Hutchinson: Structural and earthquake engineering, foundation design and analysis
R. (Jay) Jayakrishnan: Transportation systems analysis
Michael G. McNally: Travel behavior, transportation systems analysis
Gerard C. Pardoen *(Emeritus)*: Structural analysis, experimental structural dynamics
Wilfred W. Recker: Transportation systems modeling, traffic control, and urban systems analysis
Amelia C. Regan: Logistics, freight and fleet management, intermodal transportation systems
Stephen G. Ritchie: Transportation engineering, advanced traffic management and control systems, development and application of emerging technologies in transportation
Brett F. Sanders: Environmental hydrodynamics, computational fluid dynamics, coastal water quality
Jan Scherfig *(Emeritus):* Water reclamation, waste treatment processes, environmental engineering
Robin Shepherd *(Emeritus):* Structural dynamics, earthquake-resistant design
Masanobu Shinozuka: Continuum mechanics, structural dynamics, system reliability, risk assessment, remote sensing and GIS for disaster assessment
Soroosh Sorooshian: Hydrology, hydrometeorology and hydroclimate modeling, remote sensing, water sources management
Roberto Villaverde *(Emeritus)*: Structural dynamics and earthquake engineering
Jann N. Yang: Structural control, earthquake engineering, structural dynamics, fatigue, reliability and maintainability

Affiliated Faculty

James S. Famiglietti: Hydrologic and climate system modeling, remote sensing in hydrology, soil moisture variability and scaling
Xiaogang Gao: Hydroclimatology, hydrology, fluid dynamics, engineering mathematics
Kuo-lin Hsu: Remote sensing of precipitation, hydologic systems modeling, stochastic hydrology, water resources systems planning
Bisher Imam: Watershed processes, applications of remote sensing and GIS in hydrology and water resources
Sandra Irani: Optimization for transportation/logistics systems; online algorithms for dynamic and stochastic network optimization
Jean-Daniel M. Saphores: Environmental, natural resource, and transportation economics and policy; water resource planning and management
Ann G. Sardo: Structural analysis, earthquake engineering, seismic bridge design

Affiliated faculty are from the Schools of Physical Sciences and Social Ecology, the Donald Bren School of Information and Computer Sciences, and The Henry Samueli School of Engineering.

Civil Engineering is described as the art of sustainably harnessing the great powers of nature for the use and convenience of human beings. The success of this endeavor is evident all around us. The inhospitable arid plain which greeted the early settlers in Southern California has been transformed into a thriving regional community largely by the application of civil engineering.

The goal of the Civil Engineering curriculum is to prepare graduates for a career in practice, research, or teaching. At the undergraduate level a common core of fundamental subjects is provided, and students are required to specialize in their senior year. Specializations are offered in General Civil Engineering, Environmental Hydrology and Water Resource Engineering, Structural Engineering, and Transportation Information and Control Systems. Concentrations are offered in Computer Applications, Engineering Management, Infrastructure Planning, and Mathematical Methods. Graduate opportunities are in three major thrust areas: structural analysis, design, and reliability; transportation systems engineering; and water resources and environmental engineering.

The career opportunities in civil engineering are varied as in any other discipline. Graduates may look forward to long-term careers in major corporations, public bodies, the military, private consulting firms, or to being self-employed in private practice. History has shown a civil engineering education to be a good ground for many administrative and managerial positions.

Environmental Engineering involves designing environmental protection or remediation strategies for multiple resources—water, air, and soil, often with combinations of physical, chemical, and biological treatment methods in the context of a complex regulatory framework.

The goal of the Environmental Engineering curriculum is to prepare graduates with a strong basic science background, particularly in chemistry and biology, and to provide students with a broad exposure to several environmental engineering science disciplines. Courses relating to transport processes, water quality control, air quality control, and process design are included in the core.

Career opportunities in environmental engineering are diverse. Graduates generally find careers related to pollution control and the remediation of air, water, and soil environments.

Undergraduate Major in Civil Engineering

Program Educational Objectives: Graduates of the program will (1) be knowledgeable of the historical context, the state-of-the-art, and emerging issues in the field of civil engineering and its role in contemporary society; (2) demonstrate critical reasoning and requisite quantitative skills to identify, formulate, and resolve civil engineering problems, and to create designs that reflect economic, environmental, and social sensitivities; (3) display a systems viewpoint, critical thinking, effective communication and interpersonal skills, a spirit of curiosity, and conduct reflecting a professional and ethical manner; (4) exhibit a commitment to lifelong learning and professional development, involvement in professional activity and public service, and achievement of professional licensure; (5) reflect a broad intellectual training for success in multidisciplinary professional practice, in civil engineering or diverse related careers, and toward achieving leadership roles in industry, government, and academia. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The curriculum provides the opportunity to obtain a firm foundation in engineering science and to develop the techniques of analysis and design, which are basic for the successful practitioner. Emphasis is placed on developing problem-solving skills.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory), plus one semester of chemistry (with laboratory) or one year of chemistry (with laboratory) plus one semester of engineering physics (with laboratory), and three additional approved courses for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN CIVIL ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B, 2D, 2J, 3D, and 2E; Chemistry 1A and 1LA; Physics 7A-B and 7LA-LB; and either Option 1 or 2.

Option 1: Physics 7D and 7LD. Students must complete one course from the following: Physics 7E, Chemistry 1B and 1LB, Biological Sciences 94, Earth System Science 15, 25, 51, 53, 55, or others as approved by a faculty advisor, *or*

Option 2: Chemistry 1B-C and 1LB.

Additional mathematics and basic science course work may be required depending on the student's applied program.

Engineering Topics Courses: Students must complete a minimum of 24 units of engineering design. Engineering CEE10 or EECS10 or EECS12, CEE11, CEE20, CEE30 or MAE30, CEE80 or MAE80, CEE81A-B, CEE110, CEE111, CEE121, CEE130, CEE130L, CEE150, CEE150L, CEE151A-B-C, CEE161, CEE170 or MAE130A, CEE171, and CEE181A-B-C.

Technical Electives: Students must select one of the areas of specialization or concentration and complete the associated requirements, as shown below. Students select, with the approval of a faculty advisor, any additional engineering topics courses needed to satisfy school and departmental requirements.

Engineering Professional Topics Courses: Social Ecology E8, Economics 20A-B.

(The nominal Civil Engineering program will require 190 units of courses depending on specialization or concentration to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Specialization in General Civil Engineering: Requires four courses from CEE122 or CEE23; CEE152, CEE153, CEE154, CEE155, or CEE156; CEE162 or CEE168; CEE172, CEE176, or CEE178; or CEE55 or courses from an approved list.

Specialization in Environmental Hydrology and Water Resources: Requires four courses from CEE162, CEE163, CEE172, CEE173, CEE176, CEE178, or courses from an approved list.

Specialization in Structural Engineering: Requires CEE153 and three courses from CEE152, CEE154, CEE155, CEE156, and CEE157, or courses from an approved list.

Specialization in Transportation Information and Control Systems: Requires CEE122 and CEE123, and two courses from CEE124, EECS70A, MAE140, MAE170, MAE171, or courses from an approved list.

Concentration in Computer Applications: requires 20–24 units selected from ICS 6A or Mathematics 6A, ICS 21, ICS 22, ICS 23, ICS 52, EECS40, and selected ICS, EECS, and other courses from an approved list.

Concentration in Engineering Management: requires Management 5 and five other courses selected from CEE112, E190, E192, E193, Management 160, 181, 183, 185, 188, and other courses from an approved list. Prospective students must first be admitted to The Paul Merage School of Business undergraduate minor in Management.

Concentration in Infrastructure Planning: requires 24 units selected from CEE112, Environmental Analysis and Design E105U, E107U, E141U, E148U, E151U, E155U, E159U, and other courses from an approved list.

Concentration in Mathematical Methods: requires Mathematics 13 and 140A, and four other courses selected from Mathematics 6A, Mathematics 7, MAE 140, CEE185 or MAE185 or Mathematics 105A and 105LA, Mathematics 105B and 105LB, 107, 112A-B-C, 118A-B-C, 130A-B-C, 131A-B-C, and other courses from an approved list.

In addition, students must aggregate a minimum of 24 design units. Design unit values are indicated at the end of each course description. The faculty advisors and the Student Affairs Office can provide necessary guidance for satisfying the design requirements.

At most an aggregate total of 6 units of 199 or H199 courses may be used to satisfy degree requirements.

PROGRAM OF STUDY

Sample Program of Study — Civil Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD or Chemistry 1B, 1LB
CEE10 or EECS10 or EECS12	Chemistry 1A, 1LA	CEE81A
Breadth	Breadth	Breadth
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 2E
Science Elective or Chemistry 1C	CEE81B	CEE20
CEE30 or MAE30	CEE80 or MAE80	CEE11
Breadth	Breadth	Breadth
Junior		
CEE150, 150L	CEE151A	CEE151B
CEE170 or MAE130A	CEE171	CEE161
CEE121	CEE130, 130L	CEE110
Breadth	Breadth	Breadth

The following sample plans of study are provided for the senior year only; the first three years are common to all specializations.

Senior-Year Sample Programs of Study — Civil Engineering

FALL	WINTER	SPRING
Senior: General Civil Engineering Specialization		
CEE181A	CEE181B	CEE181C
CEE151C	CEE111	Spec. Elective
Spec. Elective	Spec. Elective	Spec. Elective
Breadth	CEE162	Breadth
Senior: Environmental Hydrology and Water Resources Specialization		
CEE181A	CEE181B	CEE181C
CEE151C	CEE111	Spec. Elective
CEE172	Spec. Elective	Breadth
CEE176	Breadth	Breadth
Senior: Structural Engineering Specialization		
CEE181A	CEE181B	CEE181C
CEE151C	CEE111	Spec. Elective
CEE153	Spec. Elective	Spec. Elective
Breadth	Breadth	Breadth
Senior: Transportation Information and Control Systems Specialization		
CEE181A	CEE181B	CEE181C
CEE151C	CEE111	CEE123
Spec. Elective	CEE122	Spec. Elective
Breadth	Breadth	Breadth

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

The sample program of study chart shown is typical for the accredited major in Civil Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. (Students who select the Environmental Engineering specialization within the Civil Engineering major should follow the Civil Engineering sample program.) Students must have their programs approved by their faculty advisor. Civil Engineering majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisors.

Undergraduate Major in Environmental Engineering

Program Educational Objectives: Graduates of the program will (1) be knowledgeable of the historical context, the state-of-the-art, and emerging issues in the field of environmental engineering and its role in contemporary society; (2) demonstrate critical reasoning and requisite quantitative skills to identify, formulate, and resolve environmental engineering problems, and to create designs that reflect legal, social, ecological, and economic sensitivities; (3) display a systems viewpoint, critical thinking, effective communication and interpersonal skills, a spirit of curiosity, and conduct reflecting a professional and ethical manner; (4) exhibit a commitment to lifelong learning and professional development in industry, government, and/or academia; (5) recognize the multidisciplinary nature of environmental engineering and the limitations of disciplinary perspectives in the context of environmental analysis, design, engineering, policy, and management. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The curriculum includes a core of mathematics, physics, chemistry, and biology, as well as engineering mechanics and methods courses. Students may select from a variety of environmental engineering courses to fulfill the remaining portion of the program and to focus their environmental engineering training in one or more of the following areas: water resources engineering, water and wastewater treatment engineering, air pollution control engineering, or pollution prevention engineering. Design experiences are integrated into environmental engineering courses, and seniors enroll in a capstone design course.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one semester in engineering physics (with laboratory), one year of general chemistry (with laboratory), and two additional approved courses for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN ENVIRONMENTAL ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B, 2D, 2J, 3D, and 2E, Physics 7A-B and 7LA-LB, Chemistry 1A-B-C and 1LB-LC, Chemistry 51A and 51LA. With approval of a faculty advisor, students select 8 units of Earth System Science and 8 units of Biological Sciences. Additional mathematics and basic science course work may be required depending on the student applied program.

Engineering Topics Courses: Students must complete a minimum of 19 units of engineering design.

Core Courses: Engineering CEE10 or EECS10 or EECS12 or MAE10, CEE11, CEE81A-B or MAE52, CEE30 or MAE30, CEE80 or MAE80, CBEMS40A-B or MAE91, CEE110, CEE150 and 150L or MAE150, CEE170 or MAE130A or CBEMS120A, CEE162, CEE181A-B-C or MAE 189A-B-C or CBEMS145.

Engineering Elective Courses: Students must take two courses each from two of the following four groups and one course from the remaining groups.

Water Supply and Resources: CEE171, CEE172, CEE176, CEE178, Earth System Science 132.

Waste Water Management: CEE161, CEE163, CEE165.

Atmospheric Systems and Air Pollution Control: MAE110, MAE162, MAE164, Earth System Science 112.

Hazardous Waste Management: CEE69, CEE168, CEE174, CBEMS106, CBEMS114.

All additional engineering topics courses needed to satisfy school and major requirements must be approved by the faculty advisor. Environmental Engineering is an inherently interdisciplinary program. Students interested in pursuing a dual degree with Environmental Engineering may be able to substitute appropriate course work for required courses stated above. Please consult with an Engineering academic or faculty advisor.

Engineering Professional Topics Courses: Social Ecology E8, Economics 20A-B.

(The nominal Environmental Engineering program requires 186 units of courses to satisfy all university and major requirements.

Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

At most an aggregate total of 6 units of 199 or H199 courses may be used to satisfy degree requirements.

PROGRAM OF STUDY

The sample program of study chart shown is typical for the major in Environmental Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their faculty advisor. Environmental Engineering majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisors.

Sample Program of Study — Environmental Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Chemistry 1B, 1LB
CEE10 or EECS10 or EECS12	Chemistry 1A	Science Elective
Breadth	Breadth	Breadth
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 2E
Chemistry 1C, 1LC	Chemistry 51A, 51LA	CEE11
CEE30 or MAE30	CEE80 or MAE80	MAE91
Breadth	CEE81B	CEE81A
Junior		
CEE150, 150L	Science Elective	CEE110
CEE170	CEE162	Engineering Elective
Science Elective	Breadth	Science Elective
Breadth	Breadth	Breadth
Senior		
CEE181A	CEE181B	CEE181C
Engineering Elective	Engineering Elective	Engineering Elective
Engineering Elective	Engineering Elective	Breadth
Breadth	Breadth	Breadth

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

Graduate Study in Civil Engineering

Civil Engineering addresses the technology of constructed environments and, as such, embraces a wide range of intellectual endeavors. The Department of Civil and Environmental Engineering focuses its graduate study and research program on three areas: structural and geotechnical engineering, including aspects of soil mechanics, structural dynamics, earthquake engineering, and reliability and risk assessment; transportation systems engineering, including traffic operations and management, advanced information technology applications, travel behavior, and transportation systems analysis; and water resources and environmental engineering, including hydrology, water resources, contamination management, and pollution control technologies.

The Department offers the M.S. and Ph.D. degrees in Civil Engineering.

Students may also pursue M.S. and Ph.D. degrees in Engineering through The Henry Samueli School of Engineering graduate concentration in Environmental Engineering.

MASTER OF SCIENCE DEGREE

The M.S. degree reflects achievement of an advanced level of competence for the professional practice of civil engineering. Two plans are available to those working toward the M.S. degree: a thesis option and a course work option. Opportunities are available for part-time study toward the M.S. degree.

Plan I: Thesis Option

The thesis option requires completion of 36 units of study (eight of which can be taken for study in conjunction with the thesis research topic); the completion of an original research project; the writing of the thesis describing it; and presentation of the thesis research findings in a public seminar. Of the 36 units, a minimum of 20 units must be in nonresearch, graduate-level courses.

Plan II: Course Work Option

The course work option requires the completion of 36 units of study, at least 30 of which must be in nonresearch graduate-level courses. The remaining six units may be earned as graduate-level course work, individual research, or upper-division undergraduate units.

DOCTOR OF PHILOSOPHY DEGREE

The Ph.D. degree indicates attainment of an original and significant research contribution to the state-of-the-art in the candidate's field, and an ability to communicate advanced engineering concepts. The doctoral program is tailored to the individual needs and background of the student. The detailed program of study for each Ph.D. student is formulated in consultation with a faculty advisor who takes into consideration the objectives and preparation of the candidate. The program of study must be approved by the faculty advisor and the Graduate Advisor of the Department.

There are no specific course requirements. Within this flexible framework, the School maintains specific guidelines that outline the milestones of a typical doctoral program. All doctoral students should consult the Civil Engineering program's guidelines for details, but there are several milestones to be passed: admission to the Ph.D. program by the faculty; early assessment of the student's research potential (this includes a preliminary examination), research preparation, formal advancement to candidacy by passing the qualifying examination in the third year (second year for students who entered with a master's degree), completion of a significant research investigation, and the submission and oral defense of an acceptable dissertation. There is no foreign language requirement. Ph.D. students have to meet departmental research requirements as a research assistant or equivalent, with or without salary. The degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. For at least the final two years of the doctoral program it is expected that the student will be a full-time resident in the School. The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

THE INSTITUTE OF TRANSPORTATION STUDIES

The Institute of Transportation Studies at Irvine (ITS) is part of a multicampus research unit of the University of California. Several faculty studying transportation systems engineering in the Department of Civil and Environmental Engineering participate in the Institute. Students choosing to focus their studies in transportation will find strong interdisciplinary opportunities between the Department and ITS. See the Research and Graduate Studies section of the *Catalogue* for additional information.

THE URBAN WATER RESEARCH CENTER

The Urban Water Research Center focuses on five integrating water issues in urban areas: (1) supply, demand, and distribution; (2) water quality; (3) urban ecology; (4) water reuse; and (5) institutions and public policy. In each of these areas the Center enables the issues to be addressed in an integrated way from the biological and earth, economical, engineering public policy, and public health points of view. The Center is the collaborative effort of the Department of Civil and Environmental Engineering, the Department of Earth System Science, and the School of Social Ecology.

Courses in Civil and Environmental Engineering

LOWER-DIVISION

NOTE: The undergraduate courses listed below are open only to students in The Henry Samueli School of Engineering. All other majors must petition for permission to enroll.

CEE10 Methods I: Computation Methods in Civil and Environmental Engineering (4) F. Introduction to engineering analysis, design, and problem solving from a computational perspective. Fundamentals of computers and structured programming. Develop initial design and programming skills using a high-level programming language (primarily C++ with a brief introduction to FORTRAN). Laboratory sessions. Corequisite or prerequisite: Mathematics 2A. Only one course from CEE10, ENGR10, EECS10, EECS12, and MAE10 may be taken for credit. (Design units: 1)

CEE11 Methods II: Probability and Statistics (4) S. Modeling and analysis of engineering problems under uncertainty. Engineering applications of probability and statistical concepts and methods. Prerequisites: CEE10 or equivalent (EECS10, EECS12, MAE10, ICS21); Mathematics 2J or 3A. (Design units: 1)

CEE20 Engineering Problem Solving (4) S. Introduction to Matlab and its application for engineering analysis and problem solving involving: roots of nonlinear equations, systems of equations, least-squares fitting of curves to data, and integration of ordinary differential equations. Corequisite: Mathematics 3D. Prerequisites: CEE10 or equivalent (EECS10, MAE10, EECS12, ICS21); Mathematics 2J. (Design units: 1)

CEE30 Statics (4) F. Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Corequisite or prerequisite: Mathematics 2D. Prerequisite: Physics 7A. Same as ENGR30 and MAE30. (Design units: 0)

CEE52 Graphics Communication and Computer-Aided Design (4). Methods for communicating design concepts and engineering data using two-dimensional and three-dimensional graphics. Fundamentals of computer-aided drafting using ACAD. Construction of three-dimensional models of structures. Introduction to design. Design project. Laboratory sessions. Prerequisite: CEE10. (Design units: 1)

CEE55 Land Measurements and Analysis (4). Introduction to surveying and land measurements. Use of the level and transit equipment, legal descriptions, subdivisions, topographic surveys, mapping vertical and horizontal curves. Analysis of surveying field data using manual methods, computer programs, and the COGO software system. Laboratory sessions. Prerequisite: CEE10. (Design units: 0)

CEE69 Hazardous Waste Management (3). Introduction to the field of hazardous waste management, including regulatory issues, characterization, and remediation of hazardous waste sites. Corequisites or prerequisites: Chemistry 1C; Mathematics 3D. Prerequisites: Physics 7B; Engineering CEE10. (Design units: 2)

CEE80 Dynamics (4) W. Introduction to the kinetics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken. Prerequisites: Mathematics 2D and Physics 7B. Same as ENGR80 and MAE80. (Design units: 0.5)

CEE81A Civil Engineering Practicum I (3) S. Introduction to civil engineering through presentations and designs of structural, environmental, and transportation systems. Introduction to visualization and communication of design concepts. Fundamentals of Computer-Aided Design (CAD) using AutoCad, CAD for geomatics, introduction to Geographic Information Systems (GIS). Laboratory sessions. (Design units: 2)

CEE81B Civil Engineering Practicum II (2) W. Introduction to the state-of-the-art and future areas of the profession, including applications of advanced technology and computers. Presentations on information and control technology, smart materials, structures, transportation and environmental systems. Laboratory sessions. (Design units: 0)

UPPER-DIVISION

CEE110 Methods III: Modeling, Economics, and Management (4) S. Analysis, modeling and management of civil engineering systems. Statistics and system performance studies, probabilistic models and simulation, basic economics and capital investments, project elements and organization, managerial concepts and network technique, project scheduling. Emphasis on real-world examples. Laboratory sessions. Prerequisites: CEE11. (Design units: 1)

CEE111 Methods IV: Systems Analysis and Decision-Making (4) W. Analysis and optimization for decision-making in civil and infrastructural systems. Topics include: linear programming formulations and solution algorithms, network models, and logistical models. Emphasis is on project-level and managerial decision-making and selection from alternative designs. Prerequisite: CEE110. (Design units: 1)

CEE112 Construction Management and Control (4). Project definition, scheduling and control; material, labor, and equipment allocation; cost analysis; project organization, documentation, and reporting. (Design units: 1)

CEE121 Transportation Systems I: Analysis and Design (4) F. Introduction to analysis and design of fundamental transportation system components, basic elements of geometric and pavement design, vehicle flow and elementary traffic, basic foundations of transportation planning and forecasting. Laboratory sessions. Prerequisites: CEE10 and CEE81B. (Design units: 2)

CEE122 Transportation Systems II: Operations and Control (4) W. Introduction to fundamentals of urban traffic engineering, including data collection, analysis, and design. Traffic engineering studies, traffic flow theory, traffic control devices, traffic signals, capacity and level of service analysis of freeways and urban streets. Laboratory sessions. Prerequisites: CEE11, CEE121. (Design units: 2)

CEE123 Transportation Systems III: Planning and Forecasting (4) S. Theoretical foundations of transportation planning, design, and analysis methods. Theory and application of aggregate and disaggregate models for land use development, trip generation, and destination, mode, and route choice. Transportation network analysis. Planning, design, and evaluation of system alternatives. Laboratory sessions. Prerequisites: CEE11, CEE121. (Design units: 2)

CEE124 Transportation Systems IV: Control (4) S. Introduction to fundamentals of urban traffic control, including traffic monitoring, analysis, and design. Principles of traffic control devices, ramp metering, traffic signals, capacity, and performance analysis of freeways and urban streets. Prerequisites: CEE121, CEE122. (Design units: 2)

CEE130 Soil Mechanics (3) W. Mechanics of soils, composition and classification of soils, compaction, compressibility and consolidation, shear strength, seepage, bearing capacity, lateral earth pressure, retaining walls, piles. Prerequisites: CEE150, CEE170. (Design units: 0)

CEE130L Soil Mechanics Laboratory (2) W. Laboratory procedures of soil testing for engineering problems. Corequisite: CEE130. (Design units: 0)

CEE132 Geology for Engineers and Scientists (4) F. Principles of geology for engineers and applied earth scientists. Rock characteristics and formation, geologic structure, erosion, and groundwater. Interpretation of geological maps and geophysical data. Applications to geologic hazards such as earthquakes, slope stability, and tunneling problems. Prerequisites: Chemistry 1A, Physics 7B; upper-division standing. (Design units: 0)

CEE150 Mechanics of Materials (4) F. Stresses and strains, strain-stress diagrams, axial deformations, torsion, bending and shear stresses in beams, shear force and bending moment diagrams, combined stresses, principal stresses, Mohr's circle, deflection of beams, columns. Prerequisite: CEE30 or ENGR30 or MAE30. Same as ENGR150. CEE150/ENGR150 and CEEH150/ENGRH150 may not both be taken for credit. (Design units: 1)

CEE150L Mechanics of Materials Laboratory (1) F. Experimental methods and fundamentals for mechanics of materials analysis. Corequisites: CEE150. Prerequisite: CEE30. (Design units: 0)

CEEH150 Mechanics of Materials (4) F. Covers the same material as CEE150 but in greater depth. Prerequisite: CEE30 or ENGR30 or MAE30. Same as ENGRH150. CEEH150/ENGRH150 and CEE150/ENGR150 may not both be taken for credit. (Design units: 1)

CEE151A Structural Analysis (4) W. Fundamentals of structural analysis. Strain energy and virtual work. Deformation of statically determinate structures. Influence lines. Fundamentals of indeterminate analysis. Software for structural analysis. Prerequisite: CEE150. (Design units: 0)

CEE151B Structural Design I (4) S. Structural systems. Loads: dead, live, wind, and seismic. Design of timber structures. Beams, columns, beam-columns, roof, and connections. Prerequisite: CEE151A. (Design units: 3)

CEE151C Structural Design II (4) F. Ultimate strength design. Design of reinforced concrete beam sections. Design for shear and deflection. Design of columns. Design of isolated and combined footings. Laboratory sessions. Prerequisites: CEE130; CEE151B. (Design units: 3)

CEE152 Computer Methods in Structural Analysis and Design (4) S. Matrix techniques for indeterminate framed structures. Computer implementation using the stiffness method. Fundamentals of structural dynamics and computer analysis for frequencies and modes. Software packages for design of reinforced concrete, steel, and timber structures. Prerequisite: CEE151C. (Design units: 2)

CEE153 Statically Indeterminate Structures (4). Fundamentals of statically indeterminate structures; strain energy and virtual work; energy theorems; deflections, moment-area methods, conjugate beam, method of virtual work, Castigliano theorem; method of consistent deformations; slope-deflection method; approximate methods; influence lines for indeterminate structures. Prerequisite: CEE151A. (Design units: 0)

CEE154 Reinforced Concrete Design (4) W. Advanced design of RC beam sections. Design of two-way slabs. Design of short and slender columns. Interaction diagrams. Shear walls. Implementation of the concept of ductility in seismic design of concrete structures. Laboratory sessions. Prerequisite: CEE151C. (Design units: 4)

CEE155 Structural Steel Design (4) W. Design in steel of tension members, beams, columns, welded and bolted connections; eccentrically loaded and moment resistant joints; plate girders. Plastic design; load and resistance factor design. Composite construction; introduction to computer-aided design. Laboratory sessions. Prerequisite: CEE151B. (Design units: 4)

CEE156 Foundation Design (4) S. Applications of soil mechanics principles to the analysis and design of shallow foundations, retaining walls, pile foundations, and braced cuts. Design criteria: bearing capacity, working loads and tolerable settlements, structural integrity of the foundation element. Damage from construction operations. Prerequisites: CEE130, CEE151C. (Design units: 3)

CEE157 Lightweight Structures (4) W. Fundamentals of torsion and bending. Analysis and design of thin-wall and composite beams. Applications of energy methods and matrix methods. Stress analysis of aircraft components. Stiffness, strength, and buckling. Prerequisite: ENGR150 or CEE150. Same as MAE157. (Design units: 2)

CEE161 Water and Wastewater Treatment (4) S. Water quality parameters. Water use, reclamation, and reuse. Introduction to modeling and designing of treatment systems. Extensive use of mass balances for system evaluation. Comprehensive group design project. Laboratory sessions. Prerequisites: Chemistry 1A; Engineering CEE11; MAE130A or CEE170. (Design units: 3)

CEE162 Introduction to Environmental Chemistry (4) W. Basic concepts from general, physical, and analytical chemistry as they relate to environmental engineering. Particular emphasis on the fundamentals of equilibrium and kinetics as they apply to acid-base chemistry, mineral, and gas solubility, aerosol formations, redox reactions. Laboratory sessions. Prerequisite: Chemistry 1A. (Design units: 0)

CEE163 Biological Treatment Processes (3) S. Fundamentals and analysis of natural biological processes in the aquatic environment. Design of biological treatment processes with emphasis on suspended growth systems, gas transfer, disinfection. Topics include aerobic and anaerobic treatment systems, biodegradation of contaminants in the environment. Design projects included. Prerequisites: CEE161, CEE162. (Design units: 2)

CEE165 Physical-Chemical Treatment Processes (4) S. Fundamentals and design of physical and chemical treatment processes for water and wastewater. Unit operations, such as coagulation, filtration, adsorption, ion exchange, membrane, gas-transfer, chemical oxidation, and disinfection processes. Applications to physical-chemical processes in natural waters. Design project included. Laboratory sessions. Prerequisite: CEE161, CEE162, or consent of instructor. (Design units: 2)

CEE166 Microbial Processes (4). Fundamentals and design of microbial systems for solving environmental engineering problems. Topics include microbial diversity, growth energetics and kinetics, gene manipulation and genetic engineering, microbial ecology, aerobic and anaerobic treatment processes, and biodegradation of environmental contaminants. Prerequisite: CEE162 or consent of instructor. (Design units: 2)

CEE168 Pollution Prevention and Waste Minimization (3). Study of the methods and impacts of selecting alternative technologies, processes, and/or products so as to reduce the sources of pollution and waste. Includes discussion of recycling, environmental regulations, life-cycle assessment, and economic analysis. Prerequisites: Chemistry 1C and Mathematics 3D. (Design units: 2)

CEE170 Introduction to Fluid Mechanics (4) F. Fluid properties; fluid statics; fluids in motion; control volume approach for mass, momentum, and energy conservation; dimensional analysis; surface resistance. Prerequisites: Physics 7A and Mathematics 3D; CEE80 or ENGR80 or MAE80. Only one course from CEE170, CEEH170, MAE130A, and MAEH130A may be taken for credit. (Design units: 0)

CEEH170 Honors Introduction to Fluid Mechanics (4) F. Covers the same material as CEE170 but in greater depth. Prerequisites: Physics 7A and Mathematics 3D; CEE80 or ENGR80 or MAE80. Only one course from CEEH170, CEE170, MAE130A, and MAEH130A may be taken for credit. (Design units: 0)

CEE171 Infrastructure Hydraulics (4) W. Continuity, energy, and momentum principles applied to flow in closed conduit and open channel infrastructure. Analysis of hydraulic networks. Deterministic and probabilistic factors affecting hydraulic design. Hydrologic design protocols for hydraulic systems. Prerequisites: CEE11; CEE170 or MAE130A. (Design units: 2)

CEE172 Groundwater Hydrology (4) F. Topics include conservation of fluid mass, storage properties of porous media, matrix compressibility, boundary conditions, flow nets, well hydraulics, groundwater chemistry, and solute transport. Design projects and computer applications included. Prerequisites: CEE170 or MAE130A or consent of instructor. (Design units: 2)

CEE174 Transport Phenomena in Porous Media (3) W. Fundamental solute and particle transport in saturated porous media. Development of macroscopic transport equations. Mathematics of diffusion. Effective macroscopic coefficients. Dissolution of nonaqueous phase liquids. Applied mathematical modeling techniques, including Laplace and Fourier transforms and particle tracking solutions. Prerequisite: CEE172 or consent of instructor. (Design units: 0)

CEE176 Surface Water Hydrology (3) F. Analysis of elements in the hydrologic cycle including precipitation, infiltration, and runoff. Frequency analysis of hydrologic phenomena. Consideration of precipitation/runoff relationships. Unit hydrograph theory. Hydrologic and hydraulic routing methods. Stochastic methods in hydrology. Prerequisite: CEE171. (Design units: 2)

CEE178 River and Estuarine Flow (3) S. Continuity, momentum, and energy principles applied to open channels. Flow control. Steady and unsteady flow. Flow resistance. Shallow-water wave theory.Flood waves in rivers and tidal oscillations in coastal wetlands. Computational techniques for flow modeling. Prerequisite: CEE171. (Design units: 1)

CEE181A-B-C Senior Design Practicum (2-2-2) F, W, S. Team designs a land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of road layouts, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/written interim and final design reports. Laboratory sessions. In-Progress grading. Corequisites: CEE121 and CEE151C. Prerequisites: CEE81B, CEE110, CEE161. CEE181A-B-C must be taken in the same academic year. (Design units: 1-2-2)

CEE185 Numerical Methods and Mathematica (4). Numerical solution of problems occurring in engineering practice. Computational errors, direct and iterative methods for linear systems of equations, interpolation, differentiation, quadrature, nonlinear equations, least squares, differential equations. Introduction to and use of Mathematica to develop and use numerical methods. Prerequisites: Mathematics 3D; CEE10 or EECS10 or MAE10. Only one course from CEE185, MAE185, and Mathematics 105A may be taken for credit. (Design units: 0)

CEE195 Special Topics in Civil and Environmental Engineering (1 to 4) F, W, S. Corequisite and prerequisite: varies. May be repeated for credit as topics vary. (Design units: varies)

CEE198 Group Study (1 to 4) F, W, S. Group study of selected topics in Civil and Environmental Engineering. Prerequisite: consent of instructor. May be repeated for credit as topics vary. (Design units: varies)

CEE199 Individual Study (1 to 4) F, W, S. For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. May be repeated for credit for a total six units. (Design units: varies)

CEE199P Individual Study (1 to 4) F, W, S. Same description as CEE199. Pass/Not Pass grading only. May be repeated for credit as topics vary. (Design units: varies)

CEEH199 Individual Study for Honors Students (1 to 5) F, W, S. Independent reading, research, or design under the direction of a faculty member or group of faculty members in Civil Engineering. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. Open only to members of the Campuswide Honors Program who are Civil or Environmental Engineering students. May be repeated for credit as topics vary. (Design units: varies)

GRADUATE

CEE220A Travel Demand Analysis I (3) W. Fundamentals of transportation systems analysis. Theoretical aspects of travel demand. Travel behavior. Modeling of performance characteristics and costs of transportation modes. In-depth presentation of travel demand modeling techniques. Development of travel choice models including mode, route, and destination choice. Equilibration. Prerequisite: knowledge of probability and statistics.

CEE220B Travel Demand Analysis II (3) S. Methods of discrete choice analysis and their applications in the modeling of transportation systems. Emphasis on the development of a sound understanding of theoretical aspects of discrete choice modeling that are useful in many applications in travel demand analysis. Prerequisite: CEE220A.

CEE220C Travel Demand Analysis III: Activity-Based Approaches (3) S. The methodological underpinnings of activity-based travel demand modeling. Presents methodologies within the context of a generalization of discrete choice modeling approaches, emphasizing the distinctions that separate these two approaches and presenting appropriate mathematical and statistical tools to address these distinctions.

CEE221A Transportation Systems Analysis I (3) F. Introduction to mathematical methods and models to address logistics and urban transportation problems. Techniques include stochastic models, queueing theory, linear programming, and introductory non-linear optimization. Prerequisite: basic knowledge of probability theory.

CEE221B Transportation Systems Analysis II (3) S. Advanced mathematical methods and models to address logistics and urban transportation problems. Topics include network flows, advanced optimization techniques, dynamic network models, and geometric models. Prerequisites: CEE221A; graduate standing or consent of instructor.

CEE222 Transit Systems Planning (3) F. Planning methods for public transportation in urban areas. Technological and operating characteristics of vehicles, facilities, and systems. Short-range planning techniques: data collection and analysis, demand analysis, mode choice, operational strategies, financial analysis. Design of systems to improve performance.

CEE223A Artificial Intelligence Techniques in Transportation I (3) F. Introduction to basic concepts and characteristics of knowledge-based expert systems in civil engineering. Scope of expert systems, difference from conventional computer programs, architecture, knowledge representation, knowledge engineering, building and expert system, development tools. Prerequisite: graduate standing or consent of instructor.

CEE223B Artificial Intelligence Techniques in Transportation II (3) W. In-depth study of selected topics in the application of artificial intelligence techniques in transportation engineering, particularly artificial neural networks or knowledge-based expert systems. Prerequisites: graduate standing and CEE223A, or consent of instructor.

CEE224A Transportation Data Analysis I (3) F. Statistical analysis of transportation data sources. Analysis of categorical and ordinal data. Regression and advanced multivariate analysis methods such as discriminant analysis, canonical correlation, and factor analysis. Sampling techniques, sample error and bias, survey instrument design. Prerequisites: knowledge of probability and statistics; graduate standing or consent of instructor.

CEE224B Transportation Data Analysis II (3) W. Advanced methods of statistical analysis of transportation data sources; causal modeling and structural equation models. Analysis of covariance structures involving discrete choice and ordinal scale variables. Prerequisite: CEE224A or equivalent.

CEE225A Transportation Planning Models I (3) F. Analytical techniques for the study of interactions between transportation systems design and the spatial distribution of urban activities. Development of models of demographic and economic activity, land use, and facility location. Forecasting exogenous inputs to existing transportation models. Prerequisite: knowledge of introductory systems analysis.

CEE225B Transportation Planning Models II (3) S. Design and application of comprehensive transportation models. Network development, demand modeling, and equilibrium assignment. Model calibration, validation, prediction, and evaluation. Regional modeling, site impact analysis, and circulation studies. Design of transportation alternatives.

CEE226A Traffic Flow Theory I (3) F. Traffic measurement and fundamental speed-density-flow relationships. Kinematic models. Shock waves. Statistical-kinetic theory of traffic. Introductory car-following principles and stability. Gap acceptance. Platoon dispersion. Two-fluid model. Queueing processes. Multi-regime and catastrophe models. Higher-order continuum models. Microscopic and macroscopic simulation. Prerequisites: knowledge of basic probability and statistics; graduate standing or consent of instructor.

CEE226B Traffic Flow Theory II (3) S. Advanced mathematical analysis of vehicular flow. Detailed treatise on car-following models. Fourier and Laplace analysis of stability problems. Perturbation analysis. Derivation of macroscopic traffic flow relationships from microscopic considerations. Advanced hydrodynamic theory. Prerequisites: CEE226A; graduate standing or consent of instructor.

CEE227A Transportation Logistics I: Introduction to Logistics and Supply Chain Management (3) W. Logistics network configuration, inventory management and risk pooling, the value of information, distribution strategies, international supply chain management, coordinated product and supply chain management, customer value and supply chain management, information technology, decision support systems.

CEE227B Transportation Logistics II (3) S. Optimization applied to freight network modeling. Freight and fleet management including: inventory modeling and planning, and vehicle routing and scheduling under deterministic and stochastic demand. Prerequisite: graduate standing.

CEE227C Transportation Logistics III (3) W. Facility location and routing. Optimization in location analysis, distribution system design, siting for emergency and non-emergency services, location routing with uncertainty, hazardous materials logistics. Prerequisite: graduate standing.

CEE228A Urban Transportation Networks I (3) S. Analytical approaches and algorithms to the formulation and solution of the equilibrium assignment problem for transportation networks. Emphasis on user equilibrium (USE), comparison with system optimal, mathematical programming formulation, supply functions, estimation. Estimating origin-destination matrices, network design problems. Prerequisite: CEE220A or equivalent.

CEE228B Urban Transportation Networks II (3). Advanced analysis, optimization, and modeling of transportation networks. Topics include advanced static and dynamic traffic assignment algorithms, linear and nonlinear multicommodity network flow optimization, network simplex, and network control problems. Prerequisites: CEE221A, CEE228A.

CEE229A Traffic Systems Operations and Control I (3) W. Introduction to operation, control, and analysis of arterial and freeway traffic systems. Control concepts, detectors, local controllers, system masters, incident-detection techniques, advanced traffic measurement technologies, intelligent vehicle-highway systems, advanced transportation management systems, advanced traveler information systems.

CEE229B Traffic Systems Operations and Control II (3) S. Introduction to control theory. Control formulations for corridor and network systems with freeways and arterials. Real-time control and demand management. Development and application of microscopic and macroscopic simulation models for integrated traffic systems. Dynamic models of Intelligent Transportation Systems. Prerequisites: CEE229A.

CEE231 Foundation Engineering (3) W. Essentials for design and analysis of structural members that transmit superstructure loads to the ground. Topics include subsurface investigations, excavation, dewatering, bracing, footings, mat foundations, piles and pile foundations, caissons and cofferdams, other special foundations. Prerequisite: CEE156 or equivalent.

CEE232 Soil Dynamics (3) S. Wave propagation. Soil properties for dynamic loads. Effects of earthquakes on retaining walls, dams, and embankments. Dynamic behavior of footings and pile foundations. Liquefaction of soils. Machine foundations. Prerequisites: CEE156 or consent of instructor, and CEE247.

CEE242 Advanced Strength of Materials (3) W. Beams on elastic foundations. Combined axial and lateral loads. Curved beams. Unsymmetric bending. Shear center. Stresses and strains. Basic equations for theory of elasticity. Energy principles. Theory of torsion. Combined bending and torsion.

CEE243 Mechanics of Composite Materials (3) S. Stress-strain relationship for orthotropic materials; invariant properties of an orthotropic lamina; biaxial strength theory for an orthotropic lamina; mechanics of materials approach to stiffness; elasticity approach to stiffness; classical lamination theory; strength of laminates; statistical theory of fatigue damage. Prerequisite: consent of instructor.

CEE245 Experimental Modal Analysis (3) S. A thorough coverage of modal analysis techniques including digital signal processing concepts, structural dynamics theory, modal parameter estimation techniques, and application of modal measurement methods suitable for practical vibration analysis problems. Prerequisite: CEE247 or equivalent.

CEE247 Structural Dynamics (3) F. Vibration of discrete and continuous mass elastic systems. Isolation and transmissibility. Dynamic recording instruments. Introduction to nonlinear theory of vibration. Response of structures to earthquake, traffic, and wind loads. Response spectra concepts. Normal mode analysis. Numerical integration techniques. Prerequisite: CEE80 or consent of instructor.

CEE248 Wind Engineering (3) S. Essentials for the determination of extreme wind loads on structures. Topics include basic characteristics of wind, engineering aspects of wind, wind loads on structures, wind hazard probabilities, and dynamic effects of wind. Prerequisites: CEE11 or equivalent, and CEE247.

CEE249 Earthquake Engineering (3) W. Earthquake magnitude, intensity, and frequency. Seismic damage to structures. Earthquake load prediction including response spectra, normal mode, and direct integration techniques. The basis of building code earthquake load requirements for buildings. Seismic response of special structures. Lifeline engineering. Prerequisite: consent of instructor.

CEE250 Finite Element Method in Structural Engineering (3) S. Finite element concepts in structural engineering including variational formulations, shape functions, elements assembly, convergence, and computer programming. Stiffness of truss, beam, and frame members; two- and three-dimensional solids; plate and shell elements. Static, vibration, stability, and inelastic analyses. Prerequisite: consent of instructor.

CEE252 Nonlinear Structural Analysis (3). Elements of plasticity theory. Plastic hinge analysis under static loads. Characteristic nonlinear load-deformation curves. Load-deformation models. Simplified nonlinear beam-element models. Dynamic response by step-by-step methods. Axial-load bending moment interaction in flexual members. Methods for analysis of geometrically nonlinear systems. Prerequisites: CEE151B, CEE247.

CEE253 Plates and Shells (3) S. Plates and shells as structural members, using classical differential equations and modern computer techniques. Topics include bending of circular and rectangular plates, shells of revolution, and cylindrical shells. Finite element computer practice. Prerequisite: consent of instructor.

CEE254 Advanced Reinforced Concrete Behavior and Design (3) F. Flexural strength of reinforced concrete elements. Flexural ductility of unconfined and confined members with axial loads. Shear and torsional behaviors. Strength of reinforced concrete ductile frames and shear walls. Reinforced concrete detailing. Prerequisite: consent of instructor.

CEE255 Advanced Behavior and Design of Steel Structures (3) F. Advanced principles of structural steel design. Analysis and design of beam-column members, braced and unbraced frames for buildings, and plate girders. Review of seismic design provisions. Design of connections. Prerequisite: consent of instructor.

CEE256 Seismic Bridge Engineering (3) S. Seismic design philosophy for bridges. Fundamentals of structural dynamics, seismicity, and geotechnical aspects. Ductility. Modeling and design of components: superstructures, bents, foundations, abutments, and restrainers. Isolation and dissipation devices. Retrofit design: column jacketing, superstructure, and foundation.

CEE257 Advanced Structural Analysis (3) W. Flexibility and stiffness methods in the analysis of indeterminate structures. Computer-based techniques. Modeling of structural elements to simulate inelastic behavior. Static and dynamic analyses for lateral loading conditions. Prerequisite: consent of instructor.

CEE258 Earthquake-Resistant Structural Design (3) S. Objectives of seismic design. Cyclic load-distortion characteristics of typical structural elements. Desirable structural form. Ductility and methods of achieving it. Use of energy dissipators. Project involving design of multistory, multibay rigid-jointed plane frame. Prerequisite: consent of instructor.

CEE259 Structural Stability (3) S. Introduction to structural stability emphasizing behavior of simple structural components that illustrate various modes of instability: Euler columns, beam columns, beam torsional and lateral instability, circular ring buckling. Elementary matrix methods compatible with the finite element models now used in industry for complex structures. Prerequisite: consent of instructor.

CEE262 Environmental Chemistry II (4) W. Advanced concepts from physical and organic chemistry as they relate to environmental engineering. Emphasis on equilibrium and kinetics as they apply to redox reactions, coordination, adsorption, gas phase reactions, and ion exchange. Laboratory on GC, GC-MS, and ion chromatography. Prerequisite: CEE162.

CEE263 Advanced Biological Treatment Processes (3) W. Analysis of natural biological processes in the aquatic environment. Design of biological treatment processes with emphasis on suspended growth systems. Aerobic and anaerobic treatment systems, biodegradation of contaminants in the environment. Construction and use of computer models for process design and operation. Prerequisites: CEE161 and CEE162.

CEE265 Advanced Physical-Chemical Treatment Systems (3) S. Analysis of natural chemical processes in the aquatic environment. Modeling of physical-chemical treatment systems. Analysis of chemical processes which affect the fate of contaminants in the natural environment. Computer modeling of several systems included. Prerequisites: CEE161 and CEE162.

CEE266 Aqueous Geochemistry (3) S. Principles of mineral surface chemistry in aqueous systems. Topics include adsorption, surface charge theories, colloid stability, and computer equilibrium models. Soil mineralogy fundamentals. Geochemical processes, including mineral weathering, elemental cycles, salinization, and groundwater contaminant transport factors. Prerequisite: CEE262.

CEE267 Advanced Treatment Models (3) F. Analysis and modeling of advanced water and waste treatment methods. Fixed film and suspended growth biological nutrient removal. Fluidized bed reactors. Analysis of nonideal reactors. Prerequisite: CEE263.

CEE268 Pollution Prevention Through Manufacturing, Materials Selection, and Product Design (3) S. Study of manufacturing, materials selection, and product design alternatives that yield less solid, air, and/or water pollutants. Analytical tools, such as life-cycle analysis and economic analysis, that can be used to compare alternatives are discussed. A case study approach is utilized.

CEE269 Hazardous Waste Treatment and Disposal (3) S. Theory and design of hazardous waste treatment systems. Incineration and landfill approaches. Regulations governing waste disposal. Short- and long-term considerations in design. Extensive use of case studies. Prerequisite: consent of instructor.

CEE271 Flow in Unsaturated Porous Media (3) W. Fluid flow in the unsaturated zone (zone of aeration) of the subsurface. Soil-water physics, flow in regional groundwater systems, miscible displacement, mathematical modeling techniques. Prerequisite: CEE172 or consent of instructor.

CEE272 Stochastic Geohydrology (3) W. Uncertainty and spatial variability in groundwater systems. Probability concepts. Techniques for quantifying and reducing effects of uncertainty. Theory of stationary processes. Kriging as best linear unbiased estimator. Stochastic partial differential equations. Methods of parametric estimation. Resampling techniques. Prerequisite: CEE172 or consent of instructor.

CEE274A Transport Phenomena in Saturated Porous Media (3) F. Solute and particle transport in saturated porous media. Development of macroscopic transport equations. Mathematics of diffusion. Effective macroscopic coefficients. Dissolution of nonaqueous phase liquids. Applied mathematical modeling techniques, including Laplace and Fourier transforms and particle tracking solutions. Corequisite: CEE283. Prerequisite: CEE172 or consent of instructor.

CEE274B Transport Phenomena in Unsaturated Porous Media and Fractures (3) W. Advanced topics in contaminant transport in porous media. Development of macroscopic transport equations for saturated, partially saturated porous media and fractured formations. Colloid transport. Effects of formation heterogeneity on groundwater flow and transport. Applied mathematical modeling techniques, including self similar and small perturbation solutions. Prerequisites: CEE172 or consent of instructor; CEE283 and consent of instructor.

CEE275 Topics in Coastal Engineering (3) S. Linear wave theory. Wave properties: particle kinematics, energy propagation, shoaling, refraction, reflection, diffraction, and breaking. Wave statistics and spectra. Selected topics from: design of coastal structures; harbor engineering; littoral transport and shoreline morphology; and hydrodynamics of estuaries. Prerequisites: CEE11, CEE171, or consent of instructor.

CEE276 Surface Water Hydrology (3) S. Analysis of elements in the hydrologic cycle including precipitation, infiltration, and runoff. Frequency analysis of hydrologic phenomena. Consideration of precipitation/runoff relationships. Units hydrograph theory. Hydrologic and hydraulic routing methods. Stochastic methods in hydrology. Prerequisite: consent of instructor.

CEE277 Transport in Rivers and Estuaries (3) W. Advective, diffusive, and dispersive transport processes. Role of turbulence in transport, length scales associated with mixing. Consideration of point and non-point source pollutant transport in rivers and coastal inlets. Computational techniques for fate and transport predictions. Prerequisite: CEE278 or consent of instructor.

CEE278 Flow in Rivers and Estuaries (3) F. Continuity, momentum, and energy principles applied to open channels. Flow control, Steady and unsteady flow. Flow resistance. Shallow-water wave theory. Flood waves in rivers and tidal oscillations in coastal wetlands. Computational techniques for flow modeling. Prerequisite: consent of instructor.

CEE279A Computations in Environmental Hydraulics (3) W. Numerical solution methods for flow and transport in rivers and estuaries. Stability, accuracy, and convergence properties of schemes. Finite-difference and finite-volume formulations. High-resolution and monotonicity preserving schemes for shallow-water flow and transport. Prerequisite: CEE278 or consent of instructor.

CEE279B Computations in Subsurface Hydrology (3) S. Numerical solution methods for subsurface flow and transport. Finite-difference and finite-element formulations are applied to mathematical models of fluid flow, mass transport, and energy transport in saturated and unsaturated porous media. Prerequisite: consent of instructor.

CEE280 Computational Methods and Software (3) F. Numerical methods and software for engineering and science. Emphasis on problem solving. Use of libraries and high-quality software. FORTRAN used extensively. Errors, linear systems of equations, interpolation, quadrature, nonlinear equations, ODEs, simulation. Prerequisite: consent of instructor.

CEE281 Finite Element Method in Continuum Mechanics (3) W. Strong, weak, and Galerkin formulations of one-, two-, and three-dimensional problems in continuum mechanics. Convergence and accuracy of finite element analyses. Shape functions, transformation, natural coordinates, and numerical integration. Concepts of computer implementation. Introduction to transient and nonlinear problems. Prerequisite: CEE280, CEE283, or consent of instructor.

CEE282 Stochastic Modeling: Analysis and Simulation (3) S. An introduction to techniques for modeling dynamic, stochastic systems and to the mathematical, numerical, and simulation tools used to analyze them. Topics include the role of simulation modeling in the analysis of large-scale stochastic systems, queueing systems, and verification and validation procedures. Prerequisite: knowledge of probability or consent of instructor.

CEE283 Mathematical Methods in Engineering Analysis (3) F. Tensors and matrices; eigenvalue problems; techniques for the solution of ordinary and partial differential equations; boundary value problems; special functions; introduction to complex variables.

CEE284 Engineering Decision and Risk Analysis (3) F. Develops applications of statistical decision theory in engineering. Presents the fundamental tools used in engineering decision making and analysis of risk under conditions of uncertainty. All concepts are presented and illustrated thoroughly with engineering problems. Prerequisite: CEE11 or consent of instructor.

CEE285 Reliability of Engineering Systems I (3) W. Develops the basic concepts for the definition and assessment of safety and reliability of engineering systems. Includes probabilistic modeling of engineering problems, assessment of component reliability, systems reliability, and introduction to probability-based design. Prerequisite: CEE11 or consent of instructor.

CEE287 Random Vibrations (3) W. Stochastic response of linear, single, and multidegree of freedom systems. Probabilistic approach to dynamic response of structures to random loading such as earthquake and wind gusting. Prerequisite: consent of instructor.

CEE289 Analysis of Hydrologic Systems (3) F. Application of systems theory in hydrologic, land surface, and biogeochemical modeling. Design, identification, and calibration of conceptual models. Principles of dynamic systems and modeling approaches, theory of linear systems and mathematical concepts of differential calculus, theoretical concepts of parameter estimation and optimization theory. Same as Earth System Science 238.

CEE295 Seminars in Engineering (1 to 12) F, W, S. Seminars scheduled each year by individual faculty in major field of interest. Prerequisite: consent of instructor. May be repeated for credit.

CEE296 Master of Science Thesis Research (4 to 12) F, W, S. Individual research or investigation conducted in preparation of the thesis required for the M.S. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

CEE297 Doctor of Philosophy Dissertation Research (4 to 12) F, W, S. Individual research or investigation conducted in preparation for the dissertation required for the Ph.D. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

CEE298 Special Topics in Civil Engineering (1 to 4) F, W, S. Presentation of advanced topics and special research areas in civil engineering. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

CEE299 Individual Research (1 to 12) F, W, S. Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor. May be repeated for credit.

DEPARTMENT OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

305 Engineering Tower; (949) 824-4821
Jean-Luc Gaudiot, **Department Chair**

Faculty

Nicolaos G. Alexopoulos: High-frequency integrated circuit antennas, wireless communication, materials
James Arvo: Computer graphics, intelligent user interfaces
Ender Ayanoglu: Communication systems, communication theory, communication networks
Nader Bagherzadeh: Parallel processing, computer architecture, computer graphics, VLSI design
Neil J. Bershad *(Emeritus):* Communication and information theory, signal processing
Peter J. Burke: Nano-electronics, bio-nanotechnology
Pai Chou: Hardware/software co-design, embedded systems, component-based design, specification methodology, interface synthesis, real-time systems
Beatriz da Costa: Robotic art, tactical gizmology, biotech initiatives, surveillance projects, collaborative practice, social change
Rui J. P. de Figueiredo: Machine intelligence and neural and soft computing; applications to signal/image processing and biomedical engineering; applied mathematics
Franco De Flaviis: microwave systems, wireless communications and electromagnetic circuit simulations
Rainer Doemer: System-level design, embedded computer systems, design methodologies, specification and modeling languages
Ahmed Eltawil: Design of system and VLSI architectures for broadband wireless communication; implementations and architectures for digital processing
Leonard A. Ferrari *(Emeritus):* Machine vision, signal processing, computer graphics
Daniel D. Gajski: Embedded systems, software/hardware design, design methodologies and tools, science of design
Hideya Gamo *(Emeritus):* Quantum electronics, electromagnetics
Jean-Luc Gaudiot: Parallel processing, computer architecture, processor architecture
Michael M. Green: Analog/mixed-signal IC design, broadband circuit design, theory of nonlinear circuits
Glenn E. Healey: Machine vision, computer engineering, image processing, computer graphics, intelligent machines
Payam Heydari: Design and analysis of analog, RF, and mixed-signal integrated circuits; analysis of signal integrity and high-frequency effects of on-chip interconnects in high-speed VLSI circuits
Syed A. Jafar: Wireless communication and information theory
Hamid Jafarkhani: Communication theory, coding, data compression
Stephen F. Jenks: Parallel and distributed processing, multithreading, embedded systems
Scott Jordan: Modeling and analysis of behavior, control, and pricing in computer/telecommunication networks
K. H. (Kane) Kim: Real-time object-based programming and system engineering, ultra-reliable distributed and parallel computing, real-time distributed simulation
Stuart Kleinfelder: First integrated sensor/readout arrays for visual, IR, X-ray, and charged particles
Falko Kuester: Virtual reality, computer graphics, large-scale data visualization and computer-aided geometric design
Fadi J. Kurdahi: VLSI system design, design automation of digital systems
Tomas Lang: Numerical processors and multiprocessors, parallel computer systems
Chin C. Lee: Electronic packaging, microwave devices and measurements, thermal management, integrated optics
Henry P. Lee: Optoelectronics semiconductor materials and devices
Guann-Pyng Li: High-speed semiconductor technology, optoelectronic devices, integrated circuit fabrication and testing
Kwei-Jay Lin: Real-time systems, distributed systems, e-commerce
Jia Grace Lu: Nanoscale electronics, nanostructure materials
Joerg Meyer: Computer graphics, scientific visualization, large-scale rendering, biomedical imaging, virtual reality
Simon Penny: Electronic media art: practice, history, and theory; technologies for embodied interaction; cultural applications of emerging technologies; multi-camera machine vision, immersive environments, robotics and motion control
Phillip C-Y. Sheu: Database systems, interactive multimedia systems
Jack Sklansky *(Emeritus):* Digital radiology, pattern recognition, medical imaging, neural learning, computer engineering
Keyue M. Smedley: Power electronics and analog circuit design
Allen R. Stubberud *(Emeritus):* Control systems, digital signal processing, estimation and optimization
Harry H. Tan *(Emeritus):* Communication and information theory, stochastic processes
Chen S. Tsai: Integrated and fiber optics, devices, and materials, integrated acoustooptics and magnetooptics, integrated microwave magnetics, Ultrasonic Atomization for Nanoparticles Synthesis
Wei Kang (Kevin) Tsai: Data communication networks, control systems

Affiliated Faculty

Lubomir Bic: Parallel processing, dataflow systems, database machines
Mark Bachman: Micro-electro-mechanical systems (MEMS), BIOMEMS, and optoelectronics nonstandard chip processing, physics of small systems
Harut Barsamian: Computer systems, architecture and technology
Zhongping Chen: Biomedical optics, optical coherence tomography, bioMEMS, biomedical devices
Nikil D. Dutt: VLSI design automation tools, design methodologies, design languages, high-level synthesis
Magda S. El Zarki: Computer networking, telecommunications networks, wireless networking
Daniel Hirschberg: Analyses of algorithms, concrete complexity, data structures, models of computation
Tara C. Hutchinson: Structural and earthquake engineering, foundation design and analysis
Raymond O. Klefstad: Distributed object-oriented programming
Sabee Molloi: Physics of medical imaging
Mehran Moshfeghi: Image processing, distributed systems, Internet computing, medical imaging and information systems
Orhan Nalcioglu: Nuclear magnetic resonance imaging and spectroscopy, digital radiography, computed tomography, medical imaging
Richard D. Nelson: Sensors, microelectronics, photonics, medical imaging, micro-electro-mechanical systems (MEMS)
Alexandru Nicolau: Architecture, parallel computation, programming languages and compilers
Renato Pajarola: Computer graphics and vision, computational geometry, spatial access structures, object-oriented programming
Peter M. Rentzepis: Physical chemistry, picosecond spectroscopy
Henry Samueli: Digital signal processing, communications systems engineering, CMOS integrated circuit design for applications in high-speed data transmission systems
Issac Scherson: Parallel computing architectures, massively parallel systems, parallel algorithms, interconnection networks, performance evaluation
Carlton H. Scott: Operations research, production management, total quality management, statistics
Frank G. Shi: Optoelectronic packaging and materials
Andrei M. Shkel: Design and advanced control of micro-electro-mechanical systems (MEMS)
Tatsuya Suda: Computer networks, distributed systems, performance evaluation
William C. Tang: Micro- and nanotechnology for wireless communication and micro biomechanics
Homayoun Yousefi'zadeh: Communications networks

Affiliated faculty are from the Schools of Physical Sciences and Medicine, the Donald Bren School of Information and Computer Sciences, and The Henry Samueli School of Engineering.

Electrical and Computer Engineering is a broad field encompassing such diverse subject areas as computer systems, distributed computing, computer networks, control, electronics, photonics, digital systems, circuits (analog, digital, mixed-mode, and power electronics), communications, signal processing, electromagnetics, and physics of semiconductor devices. Knowledge of the mathematical and natural sciences is applied to the theory, design, and implementation of devices and systems for the benefit of society. The Department offers two ABET-accredited undergraduate degrees: Electrical Engineering and Computer Engineering. The Department also offers a joint undergraduate degree in Computer Science and Engineering, in conjunction with the Donald Bren School of Information and Computer Sciences.

Some electrical engineers focus on the study of electronic devices and circuits that are the basic building blocks of complex electronic systems. Others study power electronics and the generation, transmission, and utilization of electrical energy. A large group of electrical engineers studies the application of these complex systems to other areas, including medicine, biology, geology, and ecology. Still another group studies complex electronic systems such as automatic controls, telecommunications, wireless communications, and signal processing.

Computer engineers are trained in various fields of computer science and engineering. They engage in the design and analysis of digital computers and networks, including software and hardware. Computer design includes topics such as computer architecture, VLSI circuits, computer graphics, design automation, system software, data structures and algorithms, distributed computing, and computer networks. Computer Engineering courses include programming in high-level languages such as C++ and Java; use of software packages for analysis and design; design of system software such as compilers, debuggers, and operating systems; and application of computers in solving engineering problems. Laboratories in both hardware and software experiences are integrated within the Computer Engineering curriculum.

The undergraduate curricula in Electrical Engineering and Computer Engineering provide a solid foundation for future career growth, enabling graduates' careers to grow technically, administratively, or both. Many electrical and computer engineers will begin work in a large organizational environment as members of an engineering team, obtaining career satisfaction from solving meaningful problems that contribute to the success of the organization's overall goal. As their careers mature, technical growth most naturally results from the acquisition of an advanced degree and further development of the basic thought processes instilled in the undergraduate years. Administrative growth can result from the development of management skills on the job and/or through advanced degree programs in management.

Graduates of Electrical and Computer Engineering will find a variety of career opportunities in areas including wireless communication, voice and video coding, biomedical electronics, circuit design, optical devices and communication, semiconductor devices and fabrication, power systems, power electronics, computer hardware and software design, computer networks, design of computer-based control systems, application software, data storage and retrieval, computer graphics, pattern recognition, computer modeling, parallel computing, and operating systems.

Undergraduate Major in Computer Engineering

Program Educational Objectives: Graduates of the program will (1) demonstrate the successful practice of, or accomplish advanced study in, computer engineering, including its scientific principles, rigorous analysis, and creative design; (2) have a broad-based knowledge of relevant, state-of-the-art and emerging issues in engineering with emphasis on computer engineering, demonstrated through productive careers in public or private sectors, or the attainment of advanced degrees; (3) demonstrate skills for effective communication and responsible teamwork, show professional attitudes and ethics suitable for a multidisciplinary working environment, and engage in lifelong learning. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Computer Engineering curriculum includes a core of mathematics, physics, and chemistry. Engineering courses in fundamental areas fill in much of the remaining curriculum.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory) including electromagnetism, one course in computational methods (C, C++), and two additional approved courses for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN COMPUTER ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B, 2D, 2J, 3D, and 6A; Physics 7A-B-D-E, 7LA-LB-LD, 51A, 52A-B; Engineering EECS145 or Mathematics 114A.

Engineering Topics Courses: Students must complete a minimum of 26 units of engineering design.

Core Courses: Engineering EECS12, EECS20, EECS31, EECS31L, EECS40, EECS70A, EECS70B, EECS70LB, EECS111, EECS112, EECS112L, EECS114, EECS115, EECS129, EECS140, EECS150A, EECS150B, EECS170A, EECS170LA, EECS170B, EECS170LB. With the approval of a faculty advisor, students select any additional engineering topics courses needed to satisfy school and department requirements.

Engineering Elective Courses: Students select, with the approval of a faculty advisor, a minimum of four courses of engineering topics. At least three courses must be chosen from EECS104, EECS105, EECS106, EECS107, EECS113, EECS116, EECS117, EECS118, EECS123, EECS148, and Information and Computer Science 142. Additionally, EECS101, EECS141, EECS152A, EECS152B, EECS170D, EECS199 or EECSH199 (up to 3 units) are approved as technical electives.

At most an aggregate total of 6 units of 199 or H199 courses may be used to satisfy degree requirements; 199 and H199 courses are open to students with a 3.0 GPA or higher.

(The nominal Computer Engineering program will require 192 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

PLANNING A PROGRAM OF STUDY

The sample program of study chart shown is typical for the major in Computer Engineering. Students should keep in mind that this program is based upon a sequence of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their program approved by their advisor. Computer Engineering majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisor.

Sample Program of Study — Computer Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB,	Physics 7D, 7LD
EECS12	Breadth or EECS12	EECS20
Breadth		Breadth
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 6A
Physics 7E, 52A	Physics 51A, 52B	EECS40
EECS31	EECS70A	EECS70B, 70LB
	EECS31L	Breadth
Junior		
EECS170A, 170LA	EECS170B, 170LB	EECS150B
EECS145 or Math. 114A	EECS150A	EECS112L
EECS114	EECS112	Breadth
Breadth	Breadth	EECS140
Senior		
EECS111	EECS129	Technical Elective
EECS115	Technical Elective	Technical Elective
Breadth	Breadth	Breadth
Technical Elective	Breadth	

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

Undergraduate Major in Computer Science and Engineering

Program Educational Objectives: Graduates of the program will have (1) received a broad fundamental training in the areas of computer science, engineering, mathematics, physical science, and statistics that will serve as the foundation for future professional development; (2) covered in sufficient depth those fundamental areas required to research, develop, and evaluate complex hardware/software systems; (3) gained awareness of contemporary issues in computer science and engineering in a global and societal context and an understanding of the professional and ethical responsibilities of their profession; (4) acquired a skill for effective communication in oral and written forms and responsible multidisciplinary teamwork, to prepare students for a diversified working environment and for lifelong learning. (Program educational objectives are those aspects of computer science and engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

This program is designed to provide students with the fundamentals of computer science, both hardware and software, and the application of engineering concepts, techniques, and methods to both computer systems engineering and software system design. The program gives students access to multidisciplinary problems in engineering with a focus on total systems engineering. Students learn the computer science principles that are critical to development of software, hardware, and networking of computer systems. From that background, engineering concepts and methods are added to give students exposure to circuit design, network design, and digital signal processing. Elements of engineering practice include systems view, manufacturing and economic issues, and multidisciplinary engineering applications. The program is administered jointly by the Department of Electrical Engineering and Computer Science and the Donald Bren School of Information and Computer Sciences.

Career Paths. Most likely careers will involve building the hardware infrastructure—computers, networks, embedded devices, as well as operating systems, compilers, and networking software. The focus is on cooperation between hardware and software to yield the highest performance. Examples of such problem areas would be in traffic management, flight control, earthquake monitoring, automotive control, and smart homes.

ADMISSIONS

High School Students: See page 177.

Students must have completed four years of mathematics through pre-calculus or math analysis and are advised to have completed one year each of chemistry and physics. One semester of programming course work is also advised. That preparation, along with honors courses and advanced placement courses, is fundamental to success in the program.

Beginning with the class of 2006, UCI requires applicants to take two SAT Subject Tests, selected from two different subject areas, for example, science and history/social studies, or literature and language. If one of the selected subject areas is mathematics, applicants must take Math Level 2. Also, The Henry Samueli School of Engineering recommends that freshmen applicants in Engineering majors take the SAT Subject Test, Math Level 2, as one of the two required SAT Subject areas.

Transfer Students. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer, including one year of calculus, one year of engineering physics (with laboratory) including electromagnetism, one year of Java programming, and one additional approved course for the major. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334. NOTE: The major in Computer Science and Engineering will be available to transfer students effective fall 2006.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN COMPUTER SCIENCE AND ENGINEERING

University Requirements: See pages 56–60.

Major Requirements:

Mathematics and Basic Science Courses:

Mathematics Courses: Students must complete a minimum of 32 units of mathematics including Mathematics 2A-B, 2D, 2J, 6A-B, 6C or 3A, and 67.

Basic Science Courses: Students must complete a minimum of 18 units of basic science courses including Physics 7A-B-D and 7LA-LB-LD.

Students select, with the approval of a faculty advisor, one additional basic science course needed to satisfy school and department requirements.

Engineering and Computer Topics Courses:

Students must complete a minimum of 72 units of *engineering topics,* which includes 24 units of engineering design, and a minimum of 60 units of *computer topics,* which includes 36 units of upper-division computer topics. The following courses must be completed:

CSE21, CSE22, CSE23, CSE25, CSE31, CSE31L, CSE70A, CSE90, CSE104, CSE112, CSE120A, CSE121, CSE132, CSE135A, CSE135B, CSE141, CSE142, CSE151, CSE161, CSE181A-B-C, ICS 183 or EECS104, EECS148 or ICS 153.

Students select, with the approval of a faculty advisor, any additional engineering and computer topics courses needed to satisfy school and department requirements.

Tracks: Students must complete one of the tracks listed below.

Algorithms: Students complete ICS 163, ICS 164.

Artificial Intelligence: Students complete ICS 171 and one course from ICS 172, ICS 173, ICS 175A or 175B.

Embedded Systems: Students complete ICS 53, ICS 53L.

Parallel Computing: Students complete EECS117, ICS 158.

(The nominal Computer Science and Engineering program will require 190 units of courses to satisfy all university and department requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary).

NOTE: Students majoring in Computer Science and Engineering may not complete the major in Computer Engineering, the major in Computer Science, the major or minor in Information and Computer Science, or the minor in Informatics.

Sample Program of Study — Computer Science and Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
CSE21	CSE22	Breadth
	CSE25	Breadth
Sophomore		
Mathematics 6A	Mathematics 6B	Mathematics 6C or 3A
Mathematics 2J	CSE23	Science Elective
CSE31	CSE31L	CSE70A
Breadth	CSE90	Breadth
	Breadth	
Junior		
CSE112	CSE104	EECS148 or ICS 153
CSE121	CSE132	CSE120A
CSE161	Mathematics 67	Breadth
Breadth	Breadth	Breadth
Senior		
CSE181A	CSE181B	CSE181C
CSE135A	CSE141	CSE142
CSE151	CSE135B	Breadth
ICS 183 or EECS104	Track	Track

Undergraduate Major in Electrical Engineering

Program Educational Objectives: Graduates of the program will (1) analyze, solve, and apply design principles to Electrical Engineering problems; (2) achieve productive careers in industry, government, or academia; (3) participate in activities designed to further their knowledge and skills within the profession (e.g., conferences, workshops, professional development, and advanced study). (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Electrical Engineering curriculum is built around a basic core of humanities, mathematics, and natural and engineering science courses. It is arranged to provide the fundamentals of synthesis and design that will enable graduates to begin careers in industry or to go on to graduate study. UCI Electrical Engineering students take courses in network analysis, electronics, electronic system design, signal processing, control systems, electromagnetics, and computer engineering. They learn to design circuits and systems to meet specific needs and to use modern computers in problem analysis and solution.

Electrical Engineering majors have the opportunity to select a specialization in Electro-optics and Solid-State Devices; Power Systems; and Systems and Signal Processing. In addition to the courses offered by the Department, the major program includes selected courses from the Donald Bren School of Information and Computer Sciences.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory) including electromagnetism, one course in computational methods (C, C++), and two additional approved courses for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B, 2D, 2J, 3D, and 2E; Chemistry 1A and 1LA; Physics 7A-B-D-E, 7LA-LB-LD, 51A-B, 52A-B-C; Engineering EECS145 or Mathematics 114A.

Engineering Topics Courses: Students must complete each of the following courses and accumulate a minimum of 28 units of engineering design, including at least one course with more than 50 percent design content: Engineering ENGR54 or ENGR80, EECS10, EECS31, EECS31L, EECS70A, EECS70B and EECS70LB, EECS140, EECS150A, EECS150B, EECS160A, EECS160LA, EECS170A, EECS170LA, EECS170B, EECS170LB, EECS170C, EECS170LC, EECS170D (or EECS115), EECS180, EECS189A-B. Students select, with the approval of a faculty advisor, any additional engineering topics courses needed to satisfy school and department requirements.

Technical Elective Courses: Students select, with the approval of a faculty advisor, a minimum of four courses of technical elective courses. Students may select an area of specialization and complete the associated requirements, as shown below.

At most an aggregate total of 6 units of 199 or H199 courses may be used to satisfy degree requirements; 199 and H199 courses are open to students with a 3.0 GPA or higher.

(The nominal Electrical Engineering program will require 195 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Specialization in Electro-optics and Solid-State Devices: 11 units selected from Engineering EECS170D (if not used to satisfy major requirements), EECS174, EECS175A-B, EECS187, EECS188, EECS198 (Special Topics in Electro-optics or Solid State Materials/Devices), EECS199 or EECSH199 (up to 3 units).

Specialization in Power Electronics and Power Systems: 12 units selected from Engineering EECS160B, EECS161, EECS161L, EECS163, EECS163L, EECS166A, EECS166B, EECS199 or EECSH199 (up to 3 units).

Specialization in Systems and Signal Processing: 12 units selected from Engineering EECS101, EECS141, EECS152A, EECS152B, EECS160B, EECS163, EECS163L, EECS198 (Special Topics in Computer Graphics or Digital Signal Processing Laboratory), or EECS199 or EECSH199 (up to 3 units).

PROGRAM OF STUDY

The sample program of study chart shown is typical for the accredited major in Electrical Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their advisor. Electrical Engineering majors must consult with the academic counselors in the Student Affairs Office and with their faculty advisors at least once a year.

Sample Program of Study — Electrical Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
EECS10	Chemistry 1A, 1LA	Breadth
Breadth	Breadth or EECS10	Breadth
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 2E
Physics 7E, 52A	Physics 51A, 52B	Physics 51B, 52C
EECS31, 31L	EECS70A	EECS70B, 70LB
Junior		
EECS170A, 170LA	EECS170B, 170LB	EECS170C, 170LC
EECS180	EECS150A	EECS150B
EECS145 or Math. 114A	ENGR54 or ENGR80	EECS140
Breadth	Breadth	Breadth
Senior		
EECS170D	EECS189B	Technical Elective
EECS160A, 160LA	Technical Elective	Technical Elective
EECS189A	Technical Elective	Breadth
Technical Elective	Breadth	Breadth
	Breadth	

Students must obtain approval for their program of study and must see their faculty advisor at least once each year.

Graduate Study in Electrical and Computer Engineering

The Department offers M.S. and Ph.D. degrees in Electrical and Computer Engineering with a concentration in Electrical Engineering, Computer Networks and Distributed Computing, Computer Systems and Software, or Computer Graphics and Visualization. Because most graduate courses are not repeated every quarter, students should make every effort to begin their graduate program in the fall.

Detailed descriptions of the four concentrations are as follows.

ELECTRICAL ENGINEERING CONCENTRATION (EE)

The Electrical Engineering faculty study the following areas: optical and solid-state devices, including quantum electronics and optics, integrated electro-optics and acoustics, design of semiconductor devices and materials, analog and mixed-signal IC design, microwave and microwave devices, and scanning acoustic microscopy; systems engineering and signal processing, including machine vision, signal processing, power electronics, neural networks, communications networks, systems engineering, and control systems. Related communication networks topics are also addressed by the Networked Systems M.S. and Ph.D. degrees (listed in the Interdisciplinary Studies section of the *Catalogue*).

COMPUTER GRAPHICS AND VISUALIZATION CONCENTRATION (CGV)

The concentration in Computer Graphics and Visualization provides students with a solid base in the design, development, and evaluation of scientific and information visualization systems. Both hardware and software aspects are addressed with a particular focus on the development of algorithms and techniques for the representation of complex scientific data. The main research activities of the faculty in this concentration are in the fields of computer graphics, scientific visualization, computer-aided geometric design, imaging, image processing, and virtual reality. Application areas include computational physics, computational chemistry, computational fluid dynamics, computational and molecular biology, medical and biomedical imaging, civil and environmental engineering, photorealistic rendering, animation, remote sensing, industrial design, and media and arts.

COMPUTER NETWORKS AND DISTRIBUTED COMPUTING CONCENTRATION (CNDC)

The concentration in Computer Networks and Distributed Computing is concerned with the design and evaluation of computer networks and distributed computer systems, and their integration into a comprehensive computing network. Both hardware and software aspects of these systems are covered. Specific topics include computer communication protocols; performance modeling and analysis of computer networks; computer network hardware; reliability, security, and fault tolerance in computer networks and distribution computer systems; distributed operating systems; distributed software architectures, distributed data bases, network-based parallel computing, and programming languages for parallel/distributed processing. Related topics are addressed by the Networked Systems M.S. and Ph.D. degrees (listed in the Interdisciplinary Studies section of the *Catalogue*) and within the Computer Systems and Networks concentration in the Donald Bren School of Information and Computer Sciences.

COMPUTER SYSTEMS AND SOFTWARE CONCENTRATION (CSS)

The Computer Systems and Software Concentration is concerned with the set of engineering principles which are used for design and construction of information-processing systems and software. The engineering design procedures are based on both the computational principles and theories discovered in the field of computer science and new highly integrated component devices made by electrical engineers. The main research activities of the faculty in this concentration are in the areas of fault-tolerant computing, parallel and distributed computer systems, ultra-reliable real-time computer systems, VLSI architectures, computer design automation, numerical processing, and intelligent management.

MASTER OF SCIENCE DEGREE GENERAL REQUIREMENTS

Two plans are offered for the M.S. degree: a thesis option and a comprehensive examination option. For either option, students are required to develop a complete program of study with advice from their faculty advisor. The graduate advisor must approve the study plan. Part-time study toward the M.S. degree is available. The program of study must be completed within four calendar years from first enrollment.

Plan I: Thesis Option

The thesis option requires completion of 36 units of study; an original research investigation; the completion of an M.S. thesis; and approval of the thesis by a thesis committee. The thesis committee is composed of three full-time faculty members with the faculty advisor of the student serving as the chair. Required undergraduate core courses and graduate seminar courses, such as EECS292, EECS293, EECS294, and EECS295, may not be counted toward the 36 units. No more than four units of EECS299 and three units of undergraduate electives may be counted toward the 36 units. Up to 12 of the required 36 units may be from EECS296 (M.S. Thesis Research) with the approval of the student's thesis advisor. Additional concentration-specific requirements are as follows; a list of core and concentration courses is given at the end of this section.

Electrical Engineering Concentration: At least seven core or concentration courses in the Electrical Engineering concentration (EE) must be completed.

Computer Networks and Distributed Computing Concentration: Four core courses in the Computer Networks and Distributed Computing concentration (CNDC) must be completed with a grade of B (3.0) or better. At least three additional core or concentration courses must also be completed.

Computer Systems and Software Concentration: Four core courses in the Computer Systems and Software concentration (CSS) must be completed with a grade of B (3.0) or better. At least three additional core or concentration courses must also be completed.

Computer Graphics and Visualization Concentration: Four core courses in the Computer Graphics and Visualization concentration (CGV) must be completed with a grade of B (3.0) or better. At least three additional core or concentration courses must also be completed.

Plan II: Comprehensive Examination Option

The comprehensive examination option requires the completion of 36 course units and a comprehensive examination. Also, students should take at least 12 courses. Only one EECS299 can be counted if the EECS299 course is three or more units. Undergraduate core courses and graduate seminar courses, such as EECS292, EECS293, EECS294, and EECS295, may not be counted toward the 36 units and 12 courses requirement. No more than three units of EECS299 and six units of undergraduate electives may be counted. In fulfillment of the comprehensive examination element of the M.S. degree program, students will complete two term paper-length reports on the current state-of-the-art of two separate technical fields corresponding to the concentration area. The term papers are completed as part of the end-of-course requirements for EECS294 (Electrical and Computer Colloquium), two units of which are needed to fulfill degree requirements. Each term paper must be completed with a grade of B or better; and each Colloquium section used to meet M.S. degree requirements must be completed with a satisfactory grade. Both Colloquium sections must be completed at the student's first opportunity upon enrollment in the ECE graduate program. Additional concentration-specific requirements are as follows; a list of core and concentration courses is given at the end of this section.

Electrical Engineering Concentration: Students enrolled in the Electrical Engineering (EE) concentration who choose the Comprehensive Examination option must select one of the following plans of study.

Circuits and Devices Plan of Study: At least four courses from the following list must be completed: EECS270A, EECS270B, EECS277A, EECS277B, EECS280A, EECS285A. At least five additional courses from the list of EE concentration courses must be completed.

Systems Plan of Study: At least four courses from the following list must be completed*: EECS240, EECS241A, EECS250, EECS251A, EECS260A, EECS267A. At least five additional courses from the list of EE concentration courses must be completed.

*If all six courses are not offered in an academic year, students who graduate in that year can petition to replace the courses that are not offered by EECS242 and/or EECS224.

Computer Networks and Distributed Computing Concentration: Four core courses in the Computer Networks and Distributed Computing concentration (CNDC) must be completed with a grade of B (3.0) or better. At least four additional core or concentration courses must also be completed.

Computer Systems and Software Concentration: Four core courses in the Computer Systems and Software concentration (CSS) must be completed with a grade of B (3.0) or better. At least four additional core or concentration courses must also be completed.

Computer Graphics and Visualization Concentration: Four core courses in the Computer Graphics and Visualization concentration (CGV) must be completed with a grade of B (3.0) or better. At least four additional core or concentration courses must also be completed.

List of Concentration Courses

(courses denoted with * are also core courses)

Electrical Engineering Concentration: EECS202A-B, EECS203A-B, EECS206, EECS207, EECS213, EECS215*, EECS217, EECS240*, EECS241A-B, EECS242, EECS243, EECS248A-B, EECS250, EECS251A-B, EECS260A*, EECS260B-C, EECS261A-B, EECS262, EECS265, EECS266, EECS267A-B, EECS270A*, EECS270B-C-D, EECS272, EECS274, EECS275A-B, EECS276, EECS277A-B-C, EECS278, EECS279, EECS280A*, EECS280B, EECS282, EECS285A*, EECS285B-C.

Computer Networks and Distributed Computing Concentration: EECS211*, EECS213*, EECS215*, EECS217*, EECS218*, EECS219, EECS221, EECS223, EECS224, EECS248A*, EECS248B, EECS261B, ICS 243B-C-E.

Computer Systems and Software Concentration: EECS207, EECS211*, EECS213*, EECS215*, EECS217*, EECS218*, EECS221, EECS223, EECS224, EECS225, EECS228, EECS229, EECS248A*.

Computer Graphics and Visualization Concentration: EECS 202A, EECS 202B, EECS203A, EECS203B, EECS204*, EECS205, EECS206, EECS207, EECS207A, EECS208, EECS209A, EECS211*, EECS213*, EECS215*, EECS218*, EECS248A*, EECS250, ICS 266, ICS 285.

DOCTOR OF PHILOSOPHY DEGREE GENERAL REQUIREMENTS

The doctoral program in Electrical and Computer Engineering is tailored to the individual background and interest of the student. There are several milestones to pass: admission to the Ph.D. program by the Graduate Committee; Ph.D. preliminary examination on the background and potential for success in the doctoral program; departmental teaching requirement which can be satisfied through service as a teaching assistant or equivalent; original research work; development of a research report and dissertation proposal; advancement to Ph.D. candidacy in the third year (second year for students who entered with a master's degree) through the Ph.D. qualifying examination conducted on behalf of the Irvine Division of the Academic Senate; completion of a significant research investigation; and completion and approval of a dissertation. A public Ph.D. dissertation defense is also required. During the Ph.D. study, four quarters of EECS294 must be completed.

The Ph.D. preliminary examination consists of two parts: a breadth requirement and a depth examination. Detailed requirements for each concentration are specified in the departmental Ph.D. preliminary examination policies, available from the EECS Graduate Admissions Office. The depth examination is conducted during each spring quarter. A student must pass the Ph.D. preliminary examination within two complete academic year cycles after entering the Ph.D. program. A student has only two chances to take and pass the Ph.D. preliminary examination. A student who fails the Ph.D. preliminary examination twice will be asked to withdraw from the program, or will be dismissed from the program, and may not be readmitted into the program.

The Ph.D. degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. Part-time study toward the Ph.D. degree is not permitted. The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

Courses in Computer Science and Engineering

LOWER-DIVISION

CSE21 Introduction to Computer Science I (6). First of a three-quarter introductory course. Introduces fundamental concepts related to computer software design and construction. Develops initial design and programming skills using a high-level programming language (primarily C++/Java). Introduces useful computer-based tools for analysis, expression, discovery. Same as ICS 21. Only one course from CSE21/ICS 21 and ICS H21 may be taken for credit. (V)

CSE22 Introduction to Computer Science II (6). Second of a three-quarter introductory sequence. Abstract behavior of classic data structures (stacks, queues, priority queues, tables, trees), alternative implementations, analysis of time and space efficiency. Recursion. Object-oriented and functional programming. Models of computation. Prerequisite: CSE21/ICS 21 with a grade of C or better. Same as ICS 22. Only one course from CSE22/ICS 22, ICS H22, or Informatics 42 may be taken for credit. (V)

CSE23 Fundamental Data Structures (4). Focuses on implementation and mathematical analysis of fundamental data structures and algorithms. Covers storage allocation and memory management techniques. Prerequisites: CSE22/ICS 22 with a grade of C or better or EECS40; Mathematics 6A or ICS 6A. Same as ICS 23. Only one course from CSE23/ICS 23 and ICS H23 may be taken for credit. (V)

CSE25 Computing Tools for Computer Science and Engineering (2). Introduces computer-based mathematical and engineering tool usage and the C programming language. Prerequisites: CSE21/ICS 21 and Mathematics 2A.

CSE31 Introduction to Digital Systems (4) F, Summer. Digital representation of information. Specifications of combinational and sequential systems. Analysis and design of networks of gates and flip flops. Standard modules and their use. Introduction to algorithmic systems: datapath and control. Prerequisite: CSE21/ICS 21, EECS10, or MAE10. Same as EECS31. (Design units: 2)

CSE31L Introduction to Digital Logic Laboratory (3) W. Introduction to common digital building blocks: gates, memory circuits, MSI components. Operating characteristics, specifications, and applications. Design of simple combinational and sequential digital systems (processors state machines). Construction and debugging techniques, using hardware description languages and CAD tools. Corequisite: CSE31/EECS31. Prerequisites: CSE31/EECS31; EECS10 or EECS 12 or CSE22/ICS 22. Same as EECS31L. Formerly CSE31LB. (Design units: 3)

CSE70A Network Analysis I (4) W, S, Summer. Modeling and analysis of electronic networks. Basic network theorems. Sinusoidal steady state and transient analysis of RLC networks and the impedance concept. Corequisite: Mathematics 2J or 3D. Prerequisites: Physics 7D; CSE21/ICS 21, EECS10, or MAE10. Same as EECS70A. (Design units: 1)

CSE90 Systems Engineering and Technical Communications (2). Introduces systems engineering concepts, including specifications and requirements, hardware and software design, integration, testing, and documentation. Emphasizes organization and writing of reports and effective presentations.

UPPER-DIVISION

CSE104 Principles of Operating Systems (4). Principles and concepts of process and resource management, especially as seen in operating systems. Processes, memory management, protection, scheduling, file systems, and I/O systems are covered. Concepts illustrated in the context of several well-known systems. Prerequisites: CSE23/ICS 23, and ICS 51 or CSE31/EECS31 with grades of C or better. Same as ICS 143. Only one course from CSE104/ICS 143 and EECS111 may be taken for credit.

CSE112 Electronic Devices and Circuits (4) F. Semiconductor properties, carrier transport, P-N junctions, metal-semiconductor junctions, diodes, MOS transistors, transistor equivalent circuits, amplifiers, invertors, digital circuits, CMOS circuits, and logic gates. Prerequisites: Physics 7D, CSE70A/EECS70A. (Design units: 1)

CSE120A Discrete-Time Signals and Systems (4) S. Analysis of discrete-time linear-time-invariant (DTLTI) systems in the time domain and using z-transforms. Introduction to techniques based on Discrete-Time, Discrete, and Fast Fourier Transforms. Examples of their application to digital signal processing and digital communications. Prerequisite: CSE70A/EECS70A. Same as EECS150B. CSE120A/EECS150B and EECSH150B may not both be taken for credit. (Design units: 0)

CSE121 Software Tools and Methods (4). Concepts and techniques of constructing software in a systematic fashion, including detailed design techniques, specifications, programming methods, quality-inducing procedures, development tools, team techniques, testing, estimation, and performance improvement. Laboratory work involves exercises to illustrate important concepts, methods, and tools. Prerequisites: CSE90 or ICS 52 with a grade of C or better; Mathematics 6A or ICS 6A; Mathematics 6B; Mathematics 6C or 3A; or Informatics 43 with a grade of C or better; and satisfactory completion of the lower-division writing requirement. Same as ICS 121 and Informatics 111.

CSE132 Organization of Digital Computers (4) W. Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/out devices and interfaces. Microprogramming and microprocessors. Prerequisite: CSE31L/EECS31L. Same as EECS112. Only one course from CSE132/EECS112, CSEH132/EECSH112, and ICS 152 may be taken for credit. (Design units: 4)

CSEH132 Honors Organization of Digital Computers (4) W. Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/out devices and interfaces, including advanced microarchitecture topics such as: pipelining, superscalar, multithreading, reconfigurable and microprocessor design. Prerequisite: CSE31L/EECS31L. Same as EECSH112. Only one course from CSEH132/EECSH112, CSE132/EECS112, and ICS 152 may be taken for credit. (Design units: 4)

CSE135A Digital Signal Processing (3) F. Nature of sampled data, sampling theorem, difference equations, data holds, z-transform, w-transform, digital filters, Butterworth and Chebychev filters, quantization effects. Prerequisite: CSE120A/EECS150B. Same as EECS152A. (Design units: 2)

CSE135B Digital Signal Processing Design and Laboratory (3) W. Students plan and perform 10 core laboratory exercises covering signal synthesis and analysis with various filter and frequency transform processes. Models of radio and radar/sonar signal processing are included. Prerequisite: CSE135A/EECS152A. Same as EECS152B. (Design units: 3)

CSE141 Concepts in Programming Languages I (4). In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style. Prerequisites: CSE23/ICS 23 and CSE31/EECS31 or ICS 51 with grades of C or better. Same as ICS 141.

CSE142 Compilers and Interpreters (4). Introduction to the theory of programming language processors covering lexical analysis, syntax analysis, semantic analysis, intermediate representations, code generation, optimization, interpretation, and run-time support. Prerequisite: CSE141/ICS 141. Prerequisite for Computer Engineering majors only: EECS40. Same as ICS 142.

CSE151 Introduction to VLSI (4) F. A first course in the design of Very Large Scale Integrated (VLSI) systems and chips. Review of CMOS VLSI technology. Analysis and synthesis of basic and complex CMOS gates. Introduction to CAD methodology and usage of CAD Tools. Prerequisite: CSE132/EECS112. Same as EECS115. (Design units: 4)

CSE161 Design and Analysis of Algorithms (4). Time and space complexity of algorithms. Models of computation, techniques for efficient algorithm design, effect of data structure choice on efficiency of an algorithm. Fast algorithms for problems such as sorting, set manipulation, graph problems, matrix multiplication, Fourier transforms, and pattern matching. NP-complete problems. Prerequisites: CSE23/ICS 23, and CSE31/EECS31 or ICS 51 with grades of C or better; Mathematics 6B; Mathematics 6C or 3A; Mathematics 2B; satisfactory completion of the lower division writing requirement. Same as ICS 161.

CSE181A-B Senior Design Project (3-3). Teaches problem definition, detailed design, integration and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions. Corequisite: CSE135A/EECS152A. Prerequisite: CSE104/ICS 143. (Design units: 3-3)

CSE181C Senior Design Project (3). Completion, documentation, and presentation of projects started in CSE181A-B. Teaches engineering documentation writing and presentation skills. Students write comprehensive project reports individually and participate in a public presentation of the project's results. Prerequisites: CSE181A-B and satisfactory completion of the lower-division writing requirement.

Courses in Electrical Engineering and Computer Science

LOWER-DIVISION

NOTE: The undergraduate courses listed below are open only to students in The Henry Samueli School of Engineering. All other majors must petition for permission to enroll.

EECS10 Computational Methods in Electrical and Computer Engineering (4) F, W, Summer. An introduction to computers and structured programming. Binary Data Representation. Hands-on experience with a high-level structured programming language. Introduction to algorithm efficiency. Applications of structured programming in solving engineering problems. Prerequisite or corequisite: Mathematics 2A. Only one course from EECS10, EECS12, CEE10, ENGR10, and MAE10 may be taken for credit. Formerly ECE10. (Design units: 0)

EECS12 Introduction to Programming (4) F, W. An introduction to computers and programming. Python programming syntax/style, types. Numbers and sequences. Control flow. I/O and errors/exceptions. Function calling, parameter passing, formal arguments, return values. Variable scoping. Corequisite: Mathematics 2A. Only one course from EECS10, EECS12, CEE10, ENGR10, and MAE10 may be taken for credit. Formerly ECE12. (Design units: 0)

EECS20 Computer Systems and Programming in C (4) S, Summer. Introduction to computer systems. Data representation and operations. Simple logic design. Basic computer organization. Instruction set architecture and assembly language programming, Introduction to C. Functions and recursion. Data structures, pointers, and linked lists. Prerequisite: EECS12. Formerly ECE20. (Design units: 1)

EECS31 Introduction to Digital Systems (4) F, Summer. Digital representation of information. Specifications of combinational and sequential systems. Analysis and design of networks of gates and flip flops. Standard modules and their use. Introduction to algorithmic systems: datapath and control. Prerequisite: EECS10, MAE10, or CSE21/ICS 21. Same as CSE31. Formerly ECE31. (Design units: 2)

EECS31L Introduction to Digital Logic Laboratory (3) W. Introduction to common digital building blocks: gates, memory circuits, MSI components. Operating characteristics, specifications, and applications. Design of simple combinational and sequential digital systems (processors and state machines). Construction and debugging techniques using hardware description languages and CAD tools. Corequisite: EECS31/CSE31. Prerequisites: EECS31/CSE31; EECS10 or EECS12 or CSE22/ICS 22. Same as CSE31L. Formerly EECS31LB. (Design units: 3)

EECS40 Object-Oriented Systems and Programming (4) S, Summer. Primitive types and expressions. The class and method definition. Information hiding and encapsulation. Objects and reference. Overloading. Constructors. Inheritance basics. Programming with inheritance. Dynamic binding and polymorphism. Exception handling. An overview of streams and file input/output. Prerequisite: EECS20. Formerly ECE40. (Design units: 2)

EECS70A Network Analysis I (4) W, S, Summer. Modeling and analysis of electronic networks. Basic network theorems. Sinusoidal steady state and transient analysis of RLC networks and the impedance concept. Corequisite: Mathematics 2J or 3D. Prerequisites: Physics 7D; EECS10, MAE10, or CSE21/ICS 21. Same as CSE70A. Formerly ECE70A. (Design units: 1)

EECS70B Network Analysis II (4) S, Summer. Laplace transforms, complex frequency, and the s-plane. Network functions and frequency response, including resonance. Bode plots. Two-port network characterization. Corequisite: EECS70LB. Prerequisites: EECS10, CEE10, or MAE10; EECS70A. Formerly ECE70B. (Design units: 1)

EECS70LB Networks Analysis II Laboratory (1) S. Laboratory to accompany EECS70B. Corequisite: EECS70B. Prerequisites: EECS10, CEE10, or MAE10; EECS70A. Formerly ECE70LB. (Design units: 1)

UPPER-DIVISION

EECS101 Introduction to Machine Vision (3) W. The use of digital computers for the analysis of visual scenes; image formation and sensing, color, segmentation, shape estimation, motion, stereo, pattern classification, computer architectures, applications. Computer experiments are used to illustrate fundamental principles. Prerequisite: EECS150A or consent of instructor. Formerly ECE136. (Design units: 2)

EECS104 Fundamentals of Computer Graphics (4) F. Instruction in the fundamental algorithms and data structures used in computer image generation and manipulation including: output primitives, linear transformations, windowing, hidden-line removal, and shading. Prerequisite: EECS40. Formerly ECE104. (Design units: 2)

EECS105 Fundamentals of Scientific Visualization (4) W. Introduces visualization techniques for various types of measured or computer-simulated data. Typical applications for these visualization techniques include the study of airflows around car bodies, medical data, and molecular structures. Prerequisite: EECS104 or consent of instructor. Formerly ECE105. (Design units: 2)

EECS106 Fundamentals of Computer-Aided Geometric Design (4) W. Interactive graphics techniques for defining and manipulating geometrical shapes used in computer animation, car body design, aircraft design, and architectural design. Prerequisite: EECS104 or consent of instructor. Formerly ECE106. (Design units: 2)

EECS107 Fundamentals of Digital Image Processing (4) S. Introduces theory and practice of digital image processing. Topics presented include two-dimensional signal processing theory, image acquisition, representation, elementary operations, enhancement, filtering, coding, compressing, restoration, and analysis, as well as image processing hardware. Prerequisite: EECS152A or consent of instructor. EECS107 and ICS 181 may not both be taken for credit. Formerly ECE107. (Design units: 2)

EECS111 System Software (4) F. Multiprogramming, interrupt, processes, kernel, parallelism, critical sections, deadlocks, communication, multiprocessing, multilevel memory management, binding, name management, file systems, protection, resource allocation, scheduling. Experience with concurrent programming, synchronization mechanisms, interprocess communication. Prerequisites: EECS112; ICS 23 or EECS114. Only one course from EECS111 and CSE104/ICS 143 may be taken for credit. Formerly ECE142. (Design units: 2)

EECS112 Organization of Digital Computers (4) W. Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/out devices and interfaces. Microprogramming and microprocessors. Prerequisite: EECS31L/CSE31L. Same as CSE132. Only one course from EECS112/CSE132, EECSH112/CSEH132, and ICS 152 may be taken for credit. Formerly ECE132. (Design units: 4)

EECS112L Organization of Digital Computers Laboratory (3) S. Companion laboratory to EECS112. Specification and implementation of a processor-based system using a hardware description language such as VHDL. Hands-on experience with design tools including simulation, synthesis, and evaluation using testbenches. Prerequisite: EECS112. Formerly ECE132L. (Design units: 3)

EECSH112 Honors Organization of Digital Computers (4) W. Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/out devices and interfaces, including advanced microarchitecture topics such as: pipelining, superscalar, multithreading, reconfigurable and microprocessor design. Prerequisite: EECS31L/CSE31L. Same as CSEH132. Only one course from EECSH112/CSEH132, EECS112/CSE132, and ICS 152 may be taken for credit. (Design units: 4)

EECS113 Microprocessor Interface Techniques (3) S. Concepts and techniques for using microprocessor-based systems to gather data and control peripheral devices. Relationship between microprocessor hardware and software, including input/output operations. Experience with a microprocessor system is provided. Functional requirements are realized through software and I/O hardware design. Prerequisite: EECS112L. Formerly ECE143. (Design units: 3)

EECS114 Engineering Data Structures and Algorithms (4) F. Design of efficient algorithms for practical data structures in engineering applications. Models of computation. NP-completeness. Prerequisite: EECS40. Same as ICS 160E. Formerly ECE144. (Design units: 2)

EECS115 Introduction to VLSI (4) F. A first course in the design of Very Large Scale Integrated (VLSI) systems and chips. Review of CMOS VLSI technology. Analysis and synthesis of basic and complex CMOS gates. Introduction to CAD methodology and usage of CAD Tools. Prerequisite: EECS112/CSE132. Same as CSE151. Formerly ECE151. (Design units: 4)

EECS116 Introduction to Data Management (4) F, W. Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming. Prerequisite: ICS 52 or Informatics 43, either with a grade of C or better (for ICS or Informatics majors); EECS114 or ICS 23, either with a grade of C or better (for Computer Engineering majors). Same as ICS 184. Formerly ECE146. (Design units: 1)

EECS117 Parallel Computer Systems (3). General introduction to parallel computing focusing on parallel algorithms and architectures. Parallel models: Flynn's taxonomy, dataflow models. Parallel architectures: systolic arrays, hypercube architecture, shared memory machines, dataflow machines, reconfigurable architectures. Parallel algorithms appropriate to each machine type area also discussed. Prerequisites: EECS20 and EECS112. Formerly ECE137. (Design units: 1)

EECS118 Introduction to Knowledge Management for Software and Engineering (4) S. Introduction of basic concepts in knowledge engineering and software engineering and applications of these concepts for building intelligent engineering systems such as computer-aided circuit design and computer-aided manufacturing. Knowledge representation and reasoning, planning, modeling of engineering objects, declarative and automatic programming, maintenance, case studies. Prerequisite: EECS114 or equivalent. Formerly ECE148. (Design units: 2)

EECS123 Introduction to Real-Time Distributed Programming (4) W. Introduction to the techniques for programming applications involving timing-sensitive actions. Hands-on experiences with object-oriented programming styles. Timing requirements, timing specification, response times, deadlines, application programming interfaces to real-time operating systems and middleware, remote procedure call, and distributed objects. Prerequisites: EECS111, EECS112. Formerly ECE147. (Design units: 2)

EECS129 Senior Design Project (4) W. Conception, planning, implementation, programming, testing of an approved project. Options include: parallel processing, VLSI design, microprocessor-based design, among others. Prerequisite: senior standing. Formerly ECE145. (Design units: 4)

EECS140 Engineering Probability (4) F, S. Sets and set operations; nature of probability, sample spaces, fields of events, probability measures; conditional probability, independence, random variables, distribution functions, density functions, conditional distributions and densities; moments, characteristic functions, random sequences, independent and Markov sequences. Prerequisite: Mathematics 2D. Formerly ECE186. (Design units: 0)

EECS141 Communication Systems (3) S. Introduction to communication systems including effects of noise. Modulation-demodulation for AM, DSB-SC, SSB, VSB, QAM, FM, PM, and PCM with application to radio, television, and telephony. Signal processing as applied to communication systems. Prerequisites: EECS150A and EECS140. Formerly ECE128. (Design units: 1)

EECS144 Antenna Design for Wireless Communication Links (4). Analysis and synthesis of antennas and antenna arrays. Adaptive arrays and digital beam forming for advanced wireless links. Friis transmission formula. Wireless communication equations for cell-site and mobile antennas, interference, slow and fast fading in mobile communication. Prerequisite: EECS180 or consent of instructor. Formerly ECE134. (Design units: 0)

EECS145 Electrical Engineering Analysis (4) F. Vector calculus, complex functions, and linear algebra with applications to electrical engineering problems. Prerequisites: Mathematics 2J and 3D; EECS70B. EECS145 and Mathematics 114A may not both be taken for credit. Formerly ECE180. (Design units: 0)

EECS148 Introduction to Computer Networks (4) S. Network architectures, models, protocols, routing, flow control, and services. Queuing models for network performance analysis. Prerequisites: EECS40 or consent of instructor, EECS112 or consent of instructor, and EECS140 or Mathematics 67. Formerly ECE161. (Design units: 2)

EECS150A Continuous-Time Signals and Systems (4) W. Characteristics and properties of continuous-time (analog) signals and systems. Analysis of linear time-invariant continuous-time systems using differential equation and convolutional models. Analysis of these systems using Laplace transforms, Fourier series, and Fourier transforms. Examples from applications to telecommunications. Prerequisites: EECS70A/CSE70A; EECS145 or Mathematics 114A. Formerly ECE120B. (Design units: 0)

EECS150B Discrete-Time Signals and Systems (4) S. Analysis of discrete-time linear-time-invariant (DTLTI) systems in the time domain and using z-transforms. Introduction to techniques based on Discrete-Time, Discrete, and Fast Fourier Transforms. Examples of their application to digital signal processing and digital communications. Prerequisite: EECS70A/CSE70A. Same as CSE120A. EECS150B/CSE120A and EECSH150B may not both be taken for credit. Formerly ECE120A. (Design units: 0)

EECSH150B Discrete-Time Signals and Systems (4) S. Foundations of discrete-time linear-time-invariant (DTLTI) systems for analysis and design of digital signal processors. Introduction to time-domain techniques based on z-transforms, and Discrete-Time-, Discrete-, and Fast-Fourier Transforms. Unification of concepts achieved by filter design example. Prerequisite: EECS70A/CSE70A. EECSH150B and EECS150B/CSE120A may not both be taken for credit. (Design units: 1)

EECS152A Digital Signal Processing (3) F. Nature of sampled data, sampling theorem, difference equations, data holds, z-transform, w-transform, digital filters, Butterworth and Chebychev filters, quantization effects. Prerequisite: EECS150B/CSE120A. Same as CSE135A. Formerly ECE135A. (Design units: 2)

EECS152B Digital Signal Processing Design and Laboratory (3). Students plan and perform 10 core laboratory exercises covering signal synthesis and analysis with various filter and frequency transform processes. Models of radio and radar/sonar signal processing are included. Prerequisite: EECS152A/CSE135A. Same as CSE135B. Formerly ECE135B. (Design units: 3)

EECS160A Introduction to Control Systems (4) F. Modeling, stability, and specifications of feedback control systems. Root locus, Bode plots, Nyquist criteria, and state-space methods for dynamic analysis and design. Corequisite: EECS160LA. Prerequisites: EECS10, CEE10, or MAE10; EECS170B, EECS170LB; EECS150A. Formerly ECE140A. (Design units: 2)

EECS160LA Control Systems I Laboratory (1) F. Laboratory accompanying EECS160A. Corequisite: EECS160A. Formerly ECE140LA. (Design units: 1)

EECS160B Sampled-Data and Digital Control Systems (3). Sampled-data and digital control systems. Sampling process and theory of digital signals; z-transform and modeling; stability; z-plane, frequency response, state-space techniques of digital control system synthesis. Prerequisites: EECS31; EECS160A, EECS160LA. Formerly ECE140B. (Design units: 2)

EECS161 Electric Machines and Drives (3) S. Magnetic circuits and transformers. Fundamentals of energy conversion. Application to synchronous, induction, commutator, and special purpose machines. Electric drives. Corequisite: EECS161L. Prerequisite: EECS70B or consent of instructor. Formerly ECE160. (Design units: 2)

EECS161L Electric Machines and Drives Laboratory (1) S. Laboratory exercises supplementing the content of EECS161. Corequisite: EECS161. Formerly ECE160L. (Design units: 0)

EECS163 Power Systems (4) F. Generation, transmission, and use of electrical energy. Fault calculation, protection, stability, and power flow. Corequisite: EECS163L. Prerequisite: EECS70B. Formerly ECE163. (Design units: 1)

EECS163L Power Systems Laboratory (1) F. Experiments and field trips relevant to studies in power systems. Corequisite: EECS163. Formerly ECE163L. (Design units: 0)

EECS166A Industrial and Power Electronics (4) W. Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Prerequisites: EECS170C; EECS160A or consent of instructor. Concurrent with EECS267A. Formerly ECE166A. (Design units: 2)

EECS166B Advanced Topics in Industrial and Power Electronics (3). Practical design of switching converters, electromagnetic compatibility, thermal management, and/or control methods. Prerequisite: EECS166A or consent of instructor. Formerly ECE166B. (Design units: 1)

EECS170A Electronics I (4) F. The properties of semiconductors, electronic conduction in solids, the physics and operation principles of semiconductor devices such as diodes and transistors, transistor equivalent circuits, and transistor amplifiers. Corequisite: Physics 7E. Prerequisites: EECS70A, Physics 7D. Formerly ECE113A. (Design units: 1)

EECS170LA Electronics I Laboratory (1) F. For CpE and EE majors. Laboratory accompanying EECS170A to perform experiments on semiconductor material properties, semiconductor device physics and operation principles, and transistor amplifiers to improve experimental skills and to enhance the understanding of lecture materials. Corequisites: EECS170A, Physics 7E. Prerequisites: EECS70A, EECS70B, Physics 7D. Formerly ECE113LA. (Design units: 1)

EECS170B Electronics II (4) W. Design and analysis of single-stage amplifiers, biasing circuits, inverters, logic gates, and memory elements based on CMOS and bipolar transistors. Corequisite: EECS170LB. Prerequisites: EECS70B, EECS170A, EECS170LA. EECS170B and EECSH170B may not both be taken for credit. Formerly ECE113B. (Design units: 2)

EECSH170B Honors Electronics II (4). Covers the same material as EECS170B but in greater depth. Corequisite: EECS170LB. Prerequisites: EECS70B, EECS170A, EECS170LA. EECSH170B and EECS170B may not both be taken for credit. (Design units: 2)

EECS170LB Electronics II Laboratory (1) W. Laboratory accompanying EECS170B. Corequisites: EECS170B. Prerequisites: EECS170A, EECS170LA. Formerly ECE113LB. (Design units: 1)

EECS170C Electronics III (4) S. Principles of operation, design, and utilization of integrated circuit modules, including multi-stage amplifiers, operational amplifiers, and logic circuits. Corequisites: EECS170LC. Prerequisites: EECS170B, EECS170LB. Formerly ECE113C. (Design units: 2)

EECS170LC Electronics III Laboratory (1) S. Laboratory accompanying EECS170C to provide hands-on training in design of digital/analog circuits/subsystems. Corequisites: EECS170C. Prerequisites: EECS170B, EECS170LB. Formerly ECE113LC. (Design units: 1)

EECS170D Integrated Electronic Circuit Design (4) F. Overview of design and fabrication of modern digital integrated circuits. Fabrication of CMOS process; transistor-level design simulation, functional characteristics of basic digital integrated circuits, different logic families including static and dynamic logic, layout and extraction of digital circuits; automated design tools. Prerequisites: EECS170C and EECS170LC. Formerly ECE113D. (Design units: 4)

EECS170E Analog and Communications IC Design (4) S. Advanced topics in design of analog and communications integrated circuits. Topics include: implementation of passive components in integrated circuits; overview of frequency response of amplifiers, bandwidth estimation techniques, high-frequency amplifier design; design of radio-frequency oscillators. Prerequisite: EECS170D. Formerly ECE113E. (Design units: 3)

EECS174 Fundamentals of Semiconductor Devices (4) F. Operation principle and characteristics of a broad range of semiconductor devices including bipolar junction device, field-effect transistors, quantum and nanodevices. Prerequisite: EECS170A. Formerly ECE114A. (Design units: 1)

EECS175A Very Large Scale Integration (VLSI) Project (4) S. Students create VLSI design projects from conception through architecture, floor planning, detailed design, simulation, verification, and submission for project fabrication. Emphasis on practical experience in robust VLSI design techniques. Prerequisites: EECS170D; EECS115 or consent of instructor. Concurrent with EECS275A. Formerly ECE115A. (Design units: 4)

EECS175B Very Large Scale Integration (VLSI) Project Testing (4) F. Test and document student-created Complementary Metal Oxide Semiconductor (CMOS) Very Large Scale Integration (VLSI) projects designed in EECS175A. Emphasis on practical laboratory experience in VLSI testing techniques. Prerequisite: EECS175A or consent of instructor. Concurrent with EECS275B. Formerly 115B. (Design units: 0)

EECS176 Fundamentals of Solid-State Electronics and Materials (4). Physical properties of semiconductors and the roles materials play in device operation. Topics include: crystal structure, phonon vibrations, energy band, transport phenomenon, optical properties and quantum confinement effect essential to the understanding of electronic, optoelectronic, and nanodevices. Prerequisites: EECS170A, EECS170LA. EECS176 and ECE116 may not both be taken for credit. (Design units: 1)

EECS179 Microelectromechanical Systems (MEMS) (4) F. Small-scale machines, small-scale phenomena, MEMS fabrication, MEMS CAD tools, MEMS devices and packaging, MEMS testing. Prerequisite: Physics 51A or consent of instructor. Formerly ECE119. (Design units: 2)

EECS180 Engineering Electromagnetics (4) F. Electromagnetic fields and solutions to problems in engineering applications; Maxwell's equations and plane wave propagation, reflection, and transmission. Corequisites: Mathematics 2D and 3D. Prerequisite: Physics 7E. Formerly ECE170. (Design units: 1)

EECS182 Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design (4) W. Design of microwave amplifiers including low-noise amplifier, multiple stage amplifiers, power amplifiers, and introduction to broadband amplifiers. The goal is to provide the basic knowledge for the design of microwave amplifiers ranging from wireless system to radar system. Prerequisite: EECS180 or consent of instructor. Formerly ECE172. (Design units: 3)

EECS187 Engineering Electrodynamics (4) S. Time-varying electromagnetic fields including waveguides, resonant cavities, radiating systems. Motion of charged particles in electromagnetic fields, radiation by moving charges. Scattering and dispersion. Prerequisite: EECS180. Formerly ECE177. (Design units: 1)

EECS188 Optical Electronics (4) W. Photodiodes and optical detection, photometry and radiometry, geometric optics, lens theory, imaging system, EM wave propagation, optical waveguides and fibers, heterojunction structures, laser theory, semiconductor lasers, and optical transmission system. Prerequisite: consent of instructor. Formerly ECE178. (Design units: 1)

EECS189A-B Electrical Engineering Senior Design Project (2-2) F, W. Design projects for seniors in the Electrical Engineering program. Each project is supervised by a faculty member. Prerequisites: EECS170C, EECS150A, EECS180, and senior standing. EECS189A: In-Progress grading. Formerly ECE189A-B. (Design units: 2-2)

EECS195 Special Topics in Electrical and Computer Engineering (1 to 4) F, W, S, Summer. Prerequisites vary. May be repeated for credit as topics vary. Formerly ECE195. (Design units: varies)

EECS198 Group Study (1 to 4) F, W, S. Group study of selected topics in engineering. Prerequisites vary. Formerly ECE198. (Design units: varies)

EECS198L Group Laboratory (1 to 4) F, W, S. Group laboratory for experimentation or design in connection with special projects or EECS198 courses. Corequisite: EECS198. Formerly ECE198L. (Design units: varies)

EECS199 Individual Study (1 to 4) F, W, S. For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. May be taken for credit for a total of six units. Formerly ECE199. (Design units: varies)

EECS199P Individual Study (1 to 4) F, W, S. Same description as EECS199. Pass/Not Pass grading only. May be repeated for credit as topics vary. Formerly ECE199P. (Design units: varies)

EECSH199 Individual Study for Honors Students (1 to 5) F, W, S. For undergraduate honor students majoring in Electrical Engineering. Independent reading, research, or design under the direction of a faculty member or group of faculty members in Electrical and Computer Engineering. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. *Prerequisite: consent of instructor; open only to Campuswide* Honors students. May be taken for credit four times. Formerly ECEH199. (Design units: varies)

GRADUATE

EECS202A-B Fundamentals of Biomedical Imaging Systems (4-4) F, W. Lecture, three hours. Physical principles and methods of biomedical imaging systems. Linear systems, random processes, projection imaging, computed tomography, x-rays, nuclear medicine, ultrasound, optical imaging, NMR, EEG, MEG imaging and impedance tomography. Same as Physics 233A-B. Formerly ECE237A-B.

EECS203A Digital Image Processing (3). Pixel-level digital image representation and elementary operations; Fourier and other unitary transforms; compression, enhancement, filtering, and restoration; laboratory experience is provided. Prerequisite: EECS152A. Formerly ECE234A.

EECS203B Digital Image Understanding (3). Image and texture segmentation and symbolic representation; three-dimensional modeling; relational structures; three-dimensional object recognition; three-dimensional scene analysis and interpretation. Prerequisites: EECS101, EECS203A. Formerly ECE234B.

EECS204 Advanced Computer Graphics (4). Provides the fundamental understanding of mathematical and physical models used in computer graphics applications: physics of color image formation, polygon approximations, ray tracing, radiosity and image-based modeling and rendering, visualization and geometric modeling. Prerequisite: EECS104 and ICS 183, or consent of instructor. Formerly ECE204.

EECS205 Advanced Scientific Visualization (4). Introduces advanced visualization techniques for various types of measured or computer-simulated data. Typical applications for these visualization techniques include the study of airflows around car bodies, medical data, and molecular structures. Prerequisite: EECS105 or consent of instructor. Formerly ECE205.

EECS206 Advanced Computer-Aided Geometric Design (4). Mathematical background for three-dimensional realistic graphics, CAD/CAM, and geometric modeling. Polynomials, vector spaces, divided differences, techniques for the definition and manipulation of curves and surfaces, Coon's patches, Bezier curves and surfaces, B-spline curves and surfaces, beta-splines, box-splines. Prerequisite: EECS106 or consent of instructor. Formerly ECE206.

EECS207 Modeling and Rendering for Image Synthesis (3) S. Provides the fundamental understanding of mathematical and physical models used in image synthesis applications: geometric models, physics of color image formation, polygon approximations, ray tracing, and radiosity. Formerly ECE207.

EECS207A Advanced Digital Image Processing (4). Introduces image and texture segmentation and symbolic representation, three-dimensional modeling, relational structures, three-dimensional object recognition, three-dimensional scene analysis and interpretation. An application area of particular interest is biomedical imaging. Prerequisite: EECS107 or consent of instructor. Formerly ECE207A.

EECS208 Principles of Virtual Reality (4). Introduces cutting-edge virtual reality technology. Provides an introduction to the physical principles, technological challenges, possibilities, and limitations for the creation of virtual environments. Programming projects emphasize the visualization, exploration, and modification of scientific data in virtual environments. Prerequisite: EECS104 or consent of instructor. Formerly ECE208.

EECS209A Rendering Techniques for Biomedical Imaging (4). Image acquisition techniques (overview), combining different modalities (CT/MRI/fMRI/PET), 2-D image enhancement techniques, image storage (wavelet compression), feature detection, 3-D surface reconstruction, volume rendering, scalability, final project (hands-on experience). Formerly ECE209A.

EECS211 Advanced System Software (3) W. Study of operating systems including interprocess communication, scheduling, resource management, concurrency, reliability, validation, protection and security, and distributed computing support. System software design languages and modeling analysis. Prerequisite: EECS112 and EECS111; or consent of instructor. Formerly ECE231.

EECS213 Computer Architecture (3). Problems in hardware, firmware (microprogram), and software. Computer architecture for resource sharing, real-time applications, parallelism, microprogramming, and fault tolerance. Various architectures based on cost/performance and current technology. Prerequisites: EECS112, EECS112L. Formerly ECE233.

EECS215 Design and Analysis of Algorithms (3). Computer algorithms from a practical standpoint. Algorithms for symbolic and numeric problems such as sorting, searching, graphs, network flow, and FFT considered. Analysis includes algorithm time and space complexity. Formerly ECE235.

EECS217 VLSI System Design (4) S. Overview of integrated fabrication, circuit simulation, basic device physics, device layout, timing; MOS logic design; layout generation, module generation, techniques for very large scale integrated circuit design. Prerequisite: EECS112. Formerly ECE251.

EECS218 Distributed Computer Systems (3) S. Design and analysis techniques for decentralized computer architectures, communication protocols, and hardware-software interface. Performance and reliability considerations. Design tools. Prerequisites: EECS211 and EECS213. Formerly ECE252. Same as Networked Systems 261.

EECS219 Distributed Software Architecture and Design (3). Practical issues for reducing the software complexity, lowering cost, and designing and implementing distributed software applications. Topics include the distributed object model distributed environment, platform-independent software agents and components, the middleware architecture for distributed real-time and secure services. Prerequisite: EECS211. Formerly ECE255.

EECS221 Topics in Computer Engineering (3). New research results in computer engineering. May be repeated for credit. Formerly ECE238.

EECS223 Real-Time Computer Systems (3). Time bases, clock synchronization, real-time communication protocols, specification of requirements, task scheduling. Validation of timelines, real-time configuration management. Prerequisites: EECS211 and EECS213. Formerly ECE253.

EECS224 Fault-Tolerant Computing (4). Various aspects of fault-tolerant computing systems. Includes hardware and software failures, reliability, and mechanism to recover from failures. Prerequisite: EECS211. Formerly ECE254.

EECS225 Advanced Database Systems (3). Advanced data models, distributed database management systems, parallel databases, multimedia and visual databases, Web database management, advanced database applications. Prerequisite: EECS116 or ICS 184. Formerly ECE257.

EECS228 Numerical Processors (3). Number representations. Fast algorithms and implementations for addition, multiplication, division, and square root. Floating-point processors. On-line arithmetic. Function evaluation. CORDIC processors. Residue arithmetic. Prerequisite: EECS112. Formerly ECE258.

EECS229 Microarchitecture and Compilation Techniques for Parallel Processing (3). New advances in microarchitecture and compilation techniques for microprocessors. Static and dynamic instruction-level parallelism (ILP) techniques. Superscalar processors, VLIW processors, multithreaded processors. Code analysis, scheduling, and optimization. Interaction of compiler and architecture. Prerequisites: EECS111 and EECS213. Formerly ECE259.

EECS240 Random Processes (3). Extensions of probability theory to random variables varying with time. General properties of stochastic processes. Convergence. Estimation, including nonlinear and linear minimum mean square error and maximum likelihood. Spectral density and linear filters. Poisson processes and discrete-time Markov chains. Prerequisite: EECS140. Formerly ECE287A.

EECS241A Digital Communications I (3). Concepts and applications of digital communication systems. Baseband digital transmission of binary, multiamplitude, and multidimensional signals. Introduction to and performance analysis of different modulation schemes. Formerly ECE228A.

EECS241B Digital Communications II (3). Concepts and applications of equalization, multicarrier modulation, spread spectrum, and CDMA. Digital communications through fading memory channels. Prerequisite: EECS241A. Formerly ECE228B.

EECS242 Information Theory (3). Fundamental capabilities and limitations of information sources and information transmission systems. An analytical framework for modeling and evaluating communication systems: entropy, mutual information asymptotic equipartition property, entropy rates of a stochastic process, data compression, channel capacity, differential entropy, the Gaussian channel. Prerequisite: EECS240. Formerly ECE225.

EECS243 Error Correcting Codes (3) S. Different techniques for error correcting codes and analyzing their performance. Linear block codes; cyclic codes; convolutional codes. Minimum distance; optimal decoding; Viterbi decoding; bit error probability. Coding gain; trellis coded modulation. Prerequisite: EECS240. Formerly ECE226.

EECS244 Wireless Communications (3). Introduction to wireless communications systems. Wireless channel modeling. Single carrier, spread spectrum, and multi-carrier wireless modulation schemes. Diversity techniques. Multiple-access schemes. Transceiver design and system level tradeoffs. Brief overview of GSM, CDMA (IS-95) and 2.5, 3G cellular schemes. Prerequisite: EECS241B. Formerly ECE224.

EECS245 Space-Time Coding (3). A fundamental study of: capacity of MIMO channels, space-time code design criteria, space-time block codes, space-time trellis codes, differential detection for multiple antennas, spatial multiplexing, BLAST. Prerequisite: EECS242.

EECS248A Internet (4) F. A broad overview of basic Internet concepts. Internet architecture and protocols, including addressing, routing, TCP/IP, quality of service, and streaming. Prerequisite: EECS148, ICS 153, or consent of instructor. Same as ICS 243A and Networked Systems 201.

EECS248B Performance Analysis of Computer Communication Networks (3) W. Mathematical modeling and optimization of network performance and design. Data link layer and media access protocols. Queuing models for communication networks. Routing and congestion control. Prerequisite: EECS248A. Same as Networked Systems 250. Formerly ECE229B.

EECS250 Digital Signal Processing I (3). Fundamental principles of digital signal processing, sampling, decimation and interpolation, discrete Fourier transforms and FFT algorithms, transversal and recursive filters, discrete random processes, and finite-word effects in digital filters. Prerequisites: EECS152A or equivalent. Formerly ECE230A.

EECS251A-B Detection, Estimation, and Demodulation Theory (3-3). Fundamentals of hypothesis testing and Bayes and Maximum Likelihood Estimation. ARMA and state variable models for random time series analysis. Wiener and Kalman filtering and prediction. Adaptive algorithms for identification and tracking of parameters of time-varying models. Prerequisite: EECS240. Formerly ECE227A-B.

EECS252 Adaptive Signal Processing (3). Introduction to adaptive signal processing. Eigenanalysis. Wiener Filters. Linear Prediction. Kalman Filtering. LMS Algorithm. Method of Least Squares. Recursive Least Squares. Prerequisite: EECS250.

EECS260A Linear Systems I (3). State-space representation of continuous-time and discrete-time linear systems. Controllability, observability, stability. Realization of rational transfer functions. Prerequisite: EECS160A. Formerly ECE240A.

EECS260B Linear Systems II (3). Continuation of deterministic linear multivariable systems. Linear state feedback and observers in continuous-time and discrete-time system control. Introduction to stochastic systems. Prerequisite: EECS260A. Formerly ECE240B.

EECS260C Linear Systems III (3). Continuation of stochastic linear multivariable systems. Kalman filtering, prediction, estimation, and smoothing. Prerequisite: EECS260B. Formerly ECE240C.

EECS261A Linear Optimization Methods (3). Formulation, solution, and analysis of linear programming and linear network flow problems. Simplex methods, dual ascent methods, interior point algorithms and auction algorithms. Duality theory and sensitivity analysis. Shortest path, max-flow, assignment, and minimum cost flow problems. Prerequisite: Mathematics 2J or consent of instructor. Same as Networked Systems 253. Formerly ECE281A.

EECS261B Nonlinear Optimization Methods (3). Formulation, solution, and analysis of nonlinear programming problems. Unconstrained optimization, optimization over a convex set, Lagrange multiplier theory, Lagrange multiplier algorithms, duality theory, convex programming, dual methods, and multi-objective optimization theory. Emphasizes mathematical analysis. Prerequisite: Mathematics 2J or consent of instructor. Same as Networked Systems 254. Formerly ECE281B.

EECS262 Network Congestion and Flow Control Theory (3). New research results in congestion and flow control for data networks. Formerly ECE242.

EECS265 Design and Control of Electromechanical Energy Converters (3). Advanced topics in the generalized theory of electrical machines. Design criteria and methodology, including analytical and numerical field analysis. Electronic control of generators and motors. With laboratory where appropriate. Prerequisite: EECS161 or consent of instructor. May be repeated for credit with consent of instructor. Formerly ECE260. *Offered upon sufficient demand.*

EECS266 Advanced Topics in Power Systems (3). Economic dispatch, unit commitment, power system planning and operation, and power production. Power system problems of current interest. Prerequisite: EECS163 or consent of instructor. Formerly ECE263. *Offered upon sufficient demand.*

EECS267A Industrial and Power Electronics (4) W. Power switching devices, pulse width modulation (PWM) methods, switching converter topologies, control, and magnetics. Prerequisite: EECS170C, EECS160A, or consent of instructor. Concurrent with EECS166A. Formerly ECE266A.

EECS267B Topics in Industrial and Power Electronics (3). Practical design of switching converters, electromagnetic compatibility, thermal management, and/or control methods. Prerequisite: EECS267A or consent of instructor. Formerly ECE266B.

EECS270A Advanced Analog Integrated Circuit Design I (3). Basic transistor configurations; differential pairs; active load/current sources; supply/temperature-independent biasing; op-amp gain and output stages; amplifier frequency response and stability compensation; nonidealities in op-amps; noise and dynamic range in analog circuits. Prerequisites: EECS170C and 170LC, or equivalent; or consent of instructor. Formerly ECE213A.

EECS270B Advanced Analog Integrated Circuit Design II (3) W. Advanced transistor modeling issues; discrete-time and continuous-time analog Integrated Circuit (IC) filters; phase-locked loops; design of ICs operating at radio frequencies; low-voltage/low-power design techniques; A/D and D/A converters; AGC circuits. Prerequisite: EECS270A or consent of instructor. Formerly ECE213B.

EECS270C Design of Integrated Circuits for Broadband Applications (3) S. Topics include: broadband standards and protocols; high-frequency circuit design techniques; PLL theory and design; design of transceivers; electrical/optical interfaces. Prerequisite: EECS 270A or consent of instructor. Formerly ECE213C.

EECS270D Complementary Metal-Oxide Semiconductor (CMOS) Radio-Frequency Integrated Circuit Design (3) S. Topics include: CMOS RF component modeling; matching network design; transmission line theory/modeling; Smith chart and S-parameters; noise modeling of active and passive components; high-frequency amplifier design; low-noise amplifier (LNA) design; mixer design; RF power amplifier. Prerequisite: EECS270A or consent of instructor. Formerly ECE213D.

EECS272 Topics in Electronic System Design (3). New research results in electronic system design. May be repeated for credit. Formerly ECE212.

EECS274 Biomedical Microdevices (MEMOS) (3). Construction, lithographic patterning and etching, sealing and connecting, molding, and testing of microdevices. Prerequisite: EECS179 or consent of instructor. Formerly ECE219.

EECS275A Very Large Scale Integration (VLSI) Project (4) S. Students create VLSI design projects from conception through architecture, floor planning, detailed design, simulation, verification, and submission for project fabrication. Emphasis on practical experience in robust VLSI design techniques. (Successful students are expected to take EECS275B.) Prerequisite: EECS170D, EECS115, or consent of instructor. Concurrent with EECS175A. Formerly ECE215A.

EECS275B Very Large Scale Integration (VLSI) Project Testing (4) F. Test and document student-created Complementary Metal Oxide Semiconductor (CMOS) Very Large Scale Integration (VLSI) projects designed in EECS275A. Emphasis on practical laboratory experience in VLSI testing techniques. Prerequisite: EECS275A or consent of instructor. Concurrent with EECS175B. Formerly ECE215B.

EECS276 Solid-State Electronics (3). Covers the fundamentals of solid-state electronics which govern the operating principles of semiconductor devices. Specific topics include crystal structure, energy band, carrier transport, carrier generation and recombination, optical properties, heterostructure, quantum confinement effect, and nanostructures. Prerequisites: EECS170A, EECS180, or consent of instructor. Formerly ECE216. *Offered alternate years.*

EECS277A Advanced Semiconductor Devices I (3) W. Advanced complementary metal-oxide-semiconductor field-effect transistors (CMOSFET), device scaling, device modeling and fabrication, equivalent circuits, and their applications for digital, analog, RF. Prerequisite: EECS174. Formerly ECE217A.

EECS277B Advanced Semiconductor Devices II (3) S. Metal-semiconductor field-effect transistors (MESFET), heterojunction bipolar transistors (HBT), microwave semiconductor devices, equivalent circuits, device modeling and fabrication, microwave amplifiers, transmitters, and receivers. Prerequisite: EECS174. Formerly ECE217B.

EECS277C Nanotechnology (3). Fabrication and characterization techniques of electrical circuit elements at the nanometer scale. Quantized conductance, semiconductor quantum dots, single electron transistors, molecular wires, carbon nanotubes, self-assembly of nano-circuit elements, quantum methods of information processing. Prerequisites: EECS170A and Physics 51A; or consent of instructor. Formerly ECE217C.

EECS278 Micro-System Design (3) W. Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration. Same as MAE247. Formerly ECE247.

EECS279 Micro-Sensors and Actuators (4) S. Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors, actuation principles on micro-scale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices. Same as MAE249. Formerly ECE249.

EECS280A Advanced Engineering Electromagnetics I (3). Stationary electromagnetic fields, Maxwell's equations, circuits and transmission lines, plane waves, guided waves, and radiation. Prerequisite: EECS180 or equivalent. Formerly ECE279A.

EECS280B Advanced Engineering Electromagnetics II (3) W. Two- and three-dimensional boundary value problems, dielectric waveguides and other special waveguides, microwave networks and antenna arrays, electromagnetic properties of materials, and electromagnetic optics. Prerequisite: EECS280A or equivalent. Formerly ECE279B.

EECS282 Monolithic Microwave Integrated Circuit (MMIC) Analysis and Design II (3) S. Design of microwave amplifiers using computer-aided design tools. Covers low-noise amplifiers, multiple stage amplifiers, broadband amplifiers, and power amplifiers. Hybrid circuit design techniques including filters and baluns. Theory and design rules for microwave oscillator design. Prerequisite: EECS 180, EECS182, or consent of instructor. Formerly ECE272.

EECS285A Optical Communications (3). Introduction to fiber optic communication systems, optical and electro-optic materials, and high-speed optical modulation and switching devices. Prerequisite: EECS180 or consent of instructor. Formerly ECE275A.

EECS285B Lasers and Photonics (3) W. Covers the fundamentals of lasers and applications, including Gaussian beam propagation, interaction of optical radiation with matters, and concepts of optical gain and feedback. Applications are drawn from diverse fields of optical communication, signal processing, and material diagnosis. Prerequisite: undergraduate course work in electromagnetic theory and atomic physics. Formerly ECE275B.

EECS285C Integrated and Fiber Optics (3) S. Propagation in dielectric waveguides and in optical fiber, grating structures and their applications in wavelength filtering and multiplexing, dynamic tunable passive components, signal dispersion and compensation, polarization effects, optical switching. Prerequisite: EECS285B or consent of instructor. Formerly ECE275C.

EECS292 Preparation for M.S. Comprehensive Examination (1 to 3) F, W, S. Individual reading and preparation for the M.S. comprehensive examination. Satisfactory/Unsatisfactory only. May be repeated for credit. Formerly ECE292.

EECS293 Preparation for Ph.D. Preliminary Examination (1 to 6) F, W, S. Individual reading and preparation for the Ph.D. preliminary examination. Satisfactory/Unsatisfactory only. May be repeated for credit. Formerly ECE293.

EECS294 Electrical Engineering and Computer Science Colloquium (1 to 4) F, W, S. Guest speakers discuss their latest research results in electrical engineering. Prerequisite: consent of instructor. May be repeated for credit. Formerly ECE294.

EECS295 Seminars in Engineering (1 to 4) F, W, S. Scheduled each year by individual faculty in major field of interest. Prerequisite: consent of instructor. May be repeated for credit. Formerly ECE295.

EECS296 Master of Science Thesis Research (4 to 12) F, W, S. Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit. Formerly ECE296.

EECS297 Doctor of Philosophy Dissertation Research (4 to 12) F, W, S. Individual research or investigation conducted in preparing and completing the dissertation required for the Ph.D. degree in Engineering. Prerequisite: consent of instructor. May be repeated for credit. Formerly ECE297.

EECS298 Topics in Electrical Engineering and Computer Science (3) F, W, S. Study of Electrical and Computer Engineering concepts. Prerequisite: consent of instructor. May be repeated for credit as topics vary. Formerly ECE298.

EECS299 Individual Research (1 to 12) F, W, S. Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor. May be repeated for credit. Formerly ECE299.

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

S4221 Engineering Gateway; (949) 824-5406
Roger H. Rangel, **Department Chair**

Faculty

Satya N. Atluri: Continuum mechanics, computational mechanics, meshless methods, damage tolerance and structural integrity, computational nanoscience and technology

James E. Bobrow: Robotics, applied nonlinear control, optimization methods

Haris J. Catrakis: Turbulence, fluid dynamics, flow optimization and regularization, fluid interfaces, mixing, electromagnetics, aero-optics, laser communications, directed energy, beam propagation, airborne lasers, high-speed flows

Donald Dabdub: Mathematical modeling of urban and global air pollution, dynamics of atmospheric aerosols, secondary organic aerosols, impact of energy generation on air quality, chemical reactions at gas-liquid interfaces

Derek Dunn-Rankin: Combustion, optical particle sizing, particle aerodynamics, laser diagnostics and spectroscopy

Donald K. Edwards *(Emeritus)*: Heat and mass transfer

Said E. Elghobashi: Direct numerical simulation of turbulent, chemically reacting and dispersed two-phase flows

Carl A. Friehe: Fluid mechanics, turbulence, micrometeorology, instrumentation

Faryar Jabbari: Robust and nonlinear control theory, adaptive parameter identification

John C. LaRue: Fluid mechanics, micro-electrical-mechanical systems (MEMS), turbulence, heat transfer, instrumentation

Feng Liu: Computational fluid dynamics and combustion, aeroelasticity, turbomachines, propulsion

Marc J. Madou: Fundamental aspects of micro/nano-electro-mechanical systems (MEMS/NEMS), biosensors, nanofluidics, biomimetics

J. Michael McCarthy: Machine design and kinematic synthesis of spatial mechanisms and robots

Kenneth D. Mease: Flight guidance and control, nonlinear dynamical systems

Melissa E. Orme: Droplet dynamics, fluid mechanics of materials synthesis, netform manufacturing

Dimitri Papamoschou: Compressible mixing and turbulence, jet noise reduction, diagnostics for compressible flow, acoustics in moving media

Roger H. Rangel: Fluid dynamics and heat transfer of multiphase systems including spray combustion, atomization, and metal spray solidification; applied mathematics and computational methods

David J. Reinkensmeyer: Robotics, mechatronics, biomedical engineering, rehabilitation, biomechanics, neural control of movement

G. Scott Samuelsen: Energy, fuel cells, hydrogen economy, propulsion, combustion and environmental conflict; turbulent transport in complex flows, spray physics, NOx and soot formation, laser diagnostics and experimental methods; application of engineering science to practical propulsion and stationary systems; environmental ethics

William E. Schmitendorf *(Emeritus)*: Control theory and applications

Andrei M. Shkel: Design and advanced control of micro-electro-mechanical systems (MEMS); precision micro-sensors and actuators for telecommunication and information technologies; MEMS-based health monitoring systems, disposable diagnostic devices, prosthetic implants

Athanasios Sideris: Robust and optimal control theory and design, neural networks, learning systems and algorithms

William A. Sirignano: Combustion theory and computational methods, multiphase flows, high-speed turbulent reacting flows, flame spread, microgravity combustion, miniature combustors, fluid dynamics, applied mathematics

Affiliated Faculty

Jacob Brouwer: Fuel cell science

Joyce H. Keyak: Orthopaedic surgery

Abraham Lee: Micro-electro-mechanical systems (MEMS), microfluidics, catheter-based microsurgical devices, microactuators for medical and optical applications, microfabrication processes, directed nanoscale self-assembly for biomolecular transducers

Robert H. Liebeck: Advanced aircraft design

Vincent G. McDonell: Droplet transport; Measurement, simulation, control, and analysis of liquid spray and gas fired combustion systems

Farghalli A. Mohamed: Mechanical properties, creep, superplasticity, correlations between properties of materials and their microstructure, mechanical behavior at the nanoscale

Harry Skinner: Bio-materials and design of implants, knee joint proprioception, gait analysis, finite element analysis for fracture prediction in bones

Edriss Titi: Partial differential equations, nonlinear analysis

Frederic Yui-Ming Wan: Applied mathematics

Affiliated faculty are from the Schools of Physical Sciences and Medicine and The Henry Samueli School of Engineering.

The Department of Mechanical and Aerospace Engineering offers two undergraduate B.S. degree programs: one in Mechanical Engineering and the other in Aerospace Engineering. M.S. and Ph.D. degree programs in Mechanical and Aerospace Engineering are also offered.

Mechanical engineers design, manufacture, and control machines ranging from robots to aircraft and spacecraft, design engines and power plants that drive these machines, analyze the environmental impact associated with power generation, and strive to promote environmental quality. To achieve their goals, mechanical engineers use mathematics, physics, and chemistry together with engineering science and technology in areas such as fluid mechanics, heat transfer, dynamics, controls, and atmospheric science. Mechanical Engineering students at UCI learn the problem-solving, modeling, and testing skills required to contribute to advances in modern technology.

Mechanical Engineering undergraduates complete required courses that provide engineering fundamentals and technical electives that allow students to study particular areas of interest. Specializations are available in: Aerospace Engineering, Energy Systems and Environmental Engineering, Flow Physics and Propulsion Systems, Materials Science and Engineering, and Mechanical Systems, Design, and Computation. Independent research opportunities allow students to pursue other avenues for focusing their studies.

Aerospace Engineering deals with all aspects of aircraft and spacecraft design and operation, thus requiring the creative use of many different disciplines. Aerospace engineers work on the forefront of technological advances and are likely to be leaders in scientific discoveries.

The undergraduate curriculum in Aerospace Engineering includes courses in subsonic and supersonic aerodynamics, propulsion, controls and performance, light-weight structures, spacecraft dynamics, and advanced materials. In the senior capstone course, students work in teams on the preliminary design of a commercial jet transport.

Career opportunities for Aerospace Engineering graduates are in the broad range of aerospace industries, including manufacturers of aircraft, spacecraft, engines, and aircraft/spacecraft components; makers of aircraft/spacecraft simulators; and government research laboratories.

Undergraduate Major in Aerospace Engineering

Program Educational Objectives focus on the following key elements: (1) a fundamental understanding of the analytical tools and physical models that provide the foundation of engineering science and problem solving for aerodynamic, thermal, mechanical, and control processes; (2) the synthesis and creative application of engineering science to current research and practical systems in the field of aerospace engineering; (3) a systems view, critical thinking, and an ability to communicate in preparation for leadership roles; (4) a broad intellectual and academic training that develops individuals beyond traditional aerospace engineering disciplinary boundaries. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Aerospace Engineering curriculum includes a core of mathematics, physics, and chemistry. Engineering courses in fundamental areas constitute much of the remaining curriculum.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory), one course in general chemistry (with laboratory), and two additional approved courses for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN AEROSPACE ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B, 2D, 2J, 3D, and 2E; Chemistry 1A-B and 1LA-LB; Physics 7A-B-D-E and 7LA-LB-LD, 52A.

Engineering Topics Courses: Students must complete a minimum of 24 units of engineering design.

Core Courses: Engineering ENGR54, ENGR150, EECS70A, MAE10, MAE30, MAE80, MAE91, MAE106, MAE108, MAE112, MAE120, MAE130A, MAE130B, MAE135, MAE136, MAE140, MAE146, MAE157, MAE158, MAE159, MAE170, and MAE175.

Engineering Elective Courses: Students select, with the approval of a faculty advisor, a minimum of 4 units of engineering electives, incorporating at least 1 unit of design.

At most an aggregate total of 4 units of 199 or H199 courses may be used to satisfy degree requirements.

(The nominal Aerospace Engineering program will require 193 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Design unit values are indicated at the end of each course description. The faculty advisors and the Undergraduate Student Affairs Office can provide necessary guidance for satisfying the design requirements. Selection of elective courses must be approved by the student's faculty advisor and the departmental undergraduate advisor.

PROGRAM OF STUDY

Sample Program of Study — Aerospace Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
MAE10	Chemistry 1A, 1LA	Chemistry 1B, 1LB
Breadth	Breadth	
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 2E
Physics 7E, 52A	MAE80	MAE91
MAE30	ENGR54	Breadth
	EECS70A	Breadth
Junior		
MAE130A	MAE130B	MAE106
MAE140	MAE146	MAE120
ENGR150	Breadth	MAE135
Breadth	Breadth	Breadth
Senior		
MAE108	MAE112	MAE159
MAE136	MAE157	MAE175
MAE170	MAE158	Breadth
Breadth	Breadth	Technical Elective

The sample program of study chart shown is typical for the major in Aerospace Engineering. This program is based upon a set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their faculty advisor. Aerospace Engineering majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisor.

Undergraduate Major in Mechanical Engineering

Program Educational Objectives focus on the following key elements: (1) a fundamental understanding of the analytical tools and physical models that provide the foundation of engineering science and problem solving for fluid, thermal, and mechanical processes; (2) the synthesis and creative application of engineering science to current research and practical systems in the fields of fluid dynamics, energy, control systems, robotics, and environmental processes; (3) a systems view, critical thinking, and an ability to communicate in preparation for leadership roles; (4) a broad intellectual and academic training that develops individuals beyond traditional mechanical engineering disciplinary boundaries. (Program educational objectives are those aspects of engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

The undergraduate Mechanical Engineering curriculum includes a foundation of mathematics, physics, and chemistry. Engineering core courses in fundamental areas fill much of the remaining curriculum; a few electives allow the undergraduate student to specialize somewhat or to pursue broader understanding; a senior capstone design experience culminates the curriculum.

ADMISSIONS

High School Students: See page 177.

Transfer Students. Preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following **required** courses: one year of calculus, one year of engineering physics (with laboratory), one course in general chemistry (with laboratory), and two additional approved courses for the major.

Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact The Henry Samueli School of Engineering at (949) 824-4334.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN MECHANICAL ENGINEERING

University Requirements: See pages 56–60.

School Requirements: See page 177.

Major Requirements:

Mathematics and Basic Science Courses: Mathematics 2A-B, 2D, 2J, 3D, and 2E; Chemistry 1A-B and 1LA-LB; Physics 7A-B-D-E and 7LA-LB-LD, 52A.

Engineering Topics Courses: Students must complete a minimum of 24 units of engineering design.

Core Courses: Engineering ENGR54, ENGR150, EECS70A, MAE10, MAE30, MAE52, MAE80, MAE91, MAE106, MAE107, MAE108 or MAE180, MAE115, MAE120, MAE130A, MAE130B, MAE140, MAE145, MAE147, MAE151, MAE156 or MAE157, MAE170, and a minimum of 3 units of MAE189.

Engineering Elective Courses: Students select, with the approval of a faculty advisor, a minimum of 8 units of engineering topics courses. Students may select an area of specialization and complete the associated requirements, as shown below.

At most an aggregate total of 4 units of 199 or H199 courses may be used to satisfy degree requirements.

(The nominal Mechanical Engineering program will require 196 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary.)

Specialization in Aerospace Engineering: Completion of a Senior Design Project in this area, MAE108, and two courses selected from Engineering MAE112, MAE135, MAE136, MAE158, MAE159, and MAE175.

Specialization in Energy Systems and Environmental Engineering: Completion of a Senior Design Project in this area and one course selected from Engineering MAE110 or MAE117, and one course selected from MAE162, MAE164, CEE112, CEE162, CEE168, CEE173, or CBEMS110.

Specialization in Flow Physics and Propulsion Systems: Completion of a Senior Design Project in this area and two courses selected from: Engineering MAE110, MAE112, MAE131, MAE135, MAE164, MAE185.

Specialization in Mechanical Systems, Design, and Computation: Completion of a Senior Design Project in this area and two courses selected from: Engineering MAE152, MAE171, MAE172, MAE180, MAE183, MAE185, MAE188, BME120.

Design unit values are indicated at the end of each course description. The faculty advisors and the Student Affairs Office can provide necessary guidance for satisfying the design requirements. Selection of elective courses must be approved by the student's faculty advisor and the departmental undergraduate advisor.

PROGRAM OF STUDY

The sample program of study chart shown is typical for the accredited major in Mechanical Engineering. Students should keep in mind that this program is based upon a rigid set of prerequisites, beginning with adequate preparation in high school mathematics, physics, and chemistry. Therefore, the course sequence should not be changed except for the most compelling reasons. Students who are not adequately prepared, or who wish to make changes in the sequence for other reasons, must have their programs approved by their faculty advisor. Mechanical Engineering majors must consult at least once every year with the academic counselors in the Student Affairs Office and with their faculty advisors.

Sample Program of Study — Mechanical Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
MAE10	Chemistry 1A, 1LA	Chemistry 1B, 1LB
Breadth	Breadth	
Sophomore		
Mathematics 2J	Mathematics 3D	Mathematics 2E
Physics 7E, 52A	MAE80	MAE52
MAE30	ENGR54	MAE91
Breadth	EECS70A	Breadth
Junior		
MAE130A	MAE130B	MAE106
MAE140	MAE147	MAE120
ENGR150	MAE156 or 157	MAE145
Breadth	Breadth	Breadth
Senior		
MAE107	MAE151	Technical Elective
MAE115	MAE180	MAE189
MAE170	Technical Elective	Breadth
Breadth	Breadth	Breadth

Mechanical Engineering and Aerospace Engineering Double Major

Students can double major in Mechanical Engineering and Aerospace Engineering by satisfying the degree requirements for both majors. Students may use MAE159 to satisfy MAE189. Students should use MAE108 as a Mechanical Engineering Core Course.

Graduate Study in Mechanical and Aerospace Engineering

The Mechanical and Aerospace Engineering faculty have special interest and expertise in four thrust areas: continuum mechanics; power, propulsion, and environment; micro/nanomechanics; and systems and design.

Continuum mechanics faculty study the physics of fluids, physics and chemistry of solids, and structural mechanics. Areas of emphasis in fluid mechanics include incompressible and compressible turbulent flows, multiphase flows, chemically reacting and other nonequilibrium flows, aeroacoustics, aerooptics, and fluid-solid interaction. In the field of solid mechanics, research and course work emphasize theoretical and computational approaches which contribute to a basic understanding of and new insight into the properties and behavior of condensed matter. General areas of interest are large-strain and large-rotation inelastic solids, constitutive modeling, and fracture mechanics. Computational algorithms center on boundary element methods and the new class of meshless methods. Studies in structural mechanics involve the analysis and synthesis of low-mass structures, smart structures, and engineered materials, with emphasis on stiffness, stability, toughness, damage tolerance, longevity, optimal life-cycle costs and self-adaptivity.

Research in power, propulsion, and environment encompasses aerospace propulsion, combustion and thermophysics, fuel cell technologies, and atmospheric physics and impacts. In aerospace propulsion, particular emphasis is placed in the areas of turbomachinery, spray combustion, combustion instability, innovative engine cycles, and compressible turbulent mixing. The topic of combustion and thermophysics addresses the fundamental fluid-dynamical, heat-transfer, and chemical mechanisms governing combustion in diverse settings. Fuel cell research encompasses the development of fuel-cell technology, hybrid engines, and thermionic devices. Activities cover the thermodynamics of energy systems, the controls associated with advanced energy systems, and systems analyses. The area of atmospheric physics and impacts deals with the modeling and controlling of chemical pollution, particle dispersion, and noise emission caused by energy-generation and propulsion devices. Research on atmospheric turbulence addresses the energy exchanges between the Earth's land and ocean surfaces and the overlying atmosphere.

Micro/nanomechanics encompasses the thrusts of miniaturization engineering, mechatronics, and biotechnology. Miniaturization engineering is relevant to the development of small-scale mechanical, chemical and biological systems for applications in biotechnology, automotive, robotic, and alternative energy applications. It involves the establishment of scaling laws, manufacturing methods, materials options and modeling from the atom to the macro system. Mechatronic design is the integrated and optimal design of a mechanical system and its embedded control system. Main focus research is the design, modeling, and characterization of Micro Electro Mechanical Systems (MEMS). Particular emphasis is placed on analysis and design of algorithmic methods and physical systems that realize sensor-based motion planning. The thematic area of biotechnology involves the understanding, modeling, and application of fundamental phenomena in mechanical engineering, electrical engineering, and chemistry towards the development of bio-sensors and actuators.

Systems and design research is conducted in the areas of dynamic systems optimization and control, biomechanical engineering, robotics and machine learning, and design engineering. Advanced concepts in optimization and control are applied to the areas of biorobotics, flight guidance, learning systems, micro sensors and actuators, flexible structures, combustion, fuel cells, and fluid-optical interactions. Biomechanical engineering integrates physiology with engineering in order to develop innovative devices and algorithms for medical diagnosis and treatment. The focus of robotics and machine learning is the creation of machines with human-like intelligence capabilities for learning. Faculty in design engineering develop methodologies to address issues ranging from defining the size and shape of components needed for force and motion specifications, to characterizing performance in terms of design parameters, cost and complexity.

Aerospace engineering research efforts combine specialties from each of the four thrust areas toward the design, modeling, and operation of complex systems.

The Department offers the M.S. and Ph.D. degrees in Mechanical and Aerospace Engineering.

MASTER OF SCIENCE DEGREE

Two plans are available to pursue study toward the M.S. degree: a thesis option and a comprehensive examination option. Opportunities are available for part-time study toward the M.S. degree. The Plan of Study for both options must be developed on consultation with a Faculty Advisor and approved by the Department Graduate Advisor.

Plan I: Thesis Option

The thesis option requires completion of 36 units of study; the completion of an original research project with a Faculty Advisor, the writing of the thesis describing it; and approval of the thesis by a thesis committee. This plan is available for those who wish to gain research experience or as preparation for study toward the doctoral degree. To complete the required 36 units, students must complete 24 units in graduate courses numbered MAE200–289, 9 units of MAE296, and 3 units of MAE298. With the approval of the Department Graduate Advisor, three courses in the MAE200–289 range may be replaced by technical or scientific graduate courses in other departments and up to one senior-level technical or scientific undergraduate course in Mechanical and Aerospace Engineering or other departments.

Plan II: Comprehensive Examination Option

The comprehensive examination option requires completion of 36 units of study, 33 units of which must be from graduate courses numbered MAE200–289, and 3 units of which must be MAE298. With the approval of the Department Graduate Advisor, four courses in the MAE200–289 range may be replaced by technical or scientific graduate courses in other departments and up to two senior-level technical or scientific undergraduate courses in MAE or other departments. In addition, up to 6 units in the MAE200–289 range may be replaced by an equal number of units of MAE294, which includes execution and documentation of a research or design project.

DOCTOR OF PHILOSOPHY DEGREE

The doctoral program in Mechanical and Aerospace Engineering is tailored to the individual needs and background of the student. The detailed program of study for each Ph.D. student is formulated in consultation with a faculty advisor who takes into consideration the objectives and preparation of the candidate.

Within this flexible framework the Department maintains specific guidelines that outline the milestones of a typical doctoral program. All doctoral students should consult the Departmental Ph.D. guidelines for program details, but there are several milestones to be passed: admission to the Ph.D. program by the faculty; completion of six non-research courses beyond M.S. degree requirements; passage of a preliminary examination or similar assessment of the student's background and potential for success in the doctoral program; course work; meeting departmental teaching requirements, which can be satisfied through service as a teaching assistant or equivalent; research preparation; formal advancement to candidacy in the third year (second year for students who entered with a master's degree) through a qualifying examination conducted on behalf of the Irvine division of the Academic Senate; development of a research proposal; completion of a significant research investigation, and completion and defense of an acceptable dissertation. There is no foreign language requirement. The degree is granted upon the recommendation of the Doctoral Committee and the Dean of Graduate Studies. Students enrolled in the Ph.D. program must take a full-time load (minimum of 12 units). The normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree). The maximum time permitted is seven years.

Before seeking admission, Ph.D. applicants are encouraged to communicate directly and in some detail with prospective faculty sponsors. The student's objectives and financial resources must coincide with a faculty sponsor's research interests and research support. Financial aid in the form of a teaching assistantship or fellowship may not cover the period of several years required to complete the program. During the balance of the period the student will be in close collaboration with the faculty research advisor.

Courses in Mechanical and Aerospace Engineering

LOWER-DIVISION

NOTE: The undergraduate courses listed below are open only to students in The Henry Samueli School of Engineering. All other majors must petition for permission to enroll.

MAE10 Introduction to Engineering Computations (4) W. Introduction to the solution of engineering problems through the use of the computer. Elementary programming in FORTRAN and Matlab is taught. No previous knowledge of computer programming is assumed. Prerequisite or corequisite: Mathematics 2A. Only one course from Engineering MAE10, CEE10, ENGR10, EECS10, and EECS12 may be taken for credit. (Design units: 1)

MAE30 Statics (4) F. Addition and resolution of forces, distributed forces, equivalent system of forces centroids, first moments, moments and products on inertia, equilibrium of rigid bodies, trusses, beams, cables. Corequisite or prerequisite: Mathematics 2D. Prerequisite: Physics 7A. Same as ENGR30 and CEE30. (Design units: 0)

MAE52 Computer-Aided Design (4) S. Develops skills for interpretation and presentation of mechanical design drawings and the use of CAD in engineering design. An integrated approach to drafting based on sketching, manual drawing, and three-dimensional CAD techniques is presented. (Design units: 0.5)

MAE57 Manufacturing Processes in Engineering (2) F, W, S. With laboratory. Machines and processes of mechanical manufacturing. Safety and professional procedures emphasized. Use of measuring instruments, hand tools, lathe, mill, drill press, bandsaw, grinder, welding equipment. Pass/Not Pass only. (Design units: 0)

MAE70 Space Exploration (4) W. Utilizes the challenges in space exploration to demonstrate fundamental principles in physics, engineering, geology, and biology. Topics include propulsion, orbital mechanics, distance and time scales, solar systems basics, planetary geology, and astrobiology.

MAE80 Dynamics (4) W. Introduction to the kinetics and dynamics of particles and rigid bodies. The Newton-Euler, Work/Energy, and Impulse/Momentum methods are explored for ascertaining the dynamics of particles and rigid bodies. An engineering design problem using these fundamental principles is also undertaken. Prerequisites: Mathematics 2D and Physics 7B. Same as ENGR80 and CEE80. (Design units: 0.5)

MAE91 Introduction to Thermodynamics (4) S. Thermodynamic principles; open and closed systems representative of engineering problems. First and second law of thermodynamics with applications to engineering systems and design. Prerequisites: Physics 7B, Mathematics 2D. Engineering MAE91 and CBEMS40B may not both be taken for credit. (Design units: 0.5)

MAE99T Design and Orientation for Transfer Students (1 to 2). Provides a design experience to transfer students in CAD, dynamics, and thermodynamics as well as an overview of the program. (Design units: 0.5–1.5)

UPPER-DIVISION

MAE106 Mechanical Systems Laboratory (4) S. Experiments in linear systems, including op-amp circuits, vibrations, and control systems. Emphasis on demonstrating that mathematical models can be useful tools for the analysis and design of electro-mechanical systems. Prerequisites: MAE140 and EECS70A. (Design units: 2)

MAE107 Fluid Thermal Science Laboratory (4) F. Fluid and thermal engineering laboratory. Experimental analysis of fluid flow, heat transfer, and thermodynamic systems. Probability, statistics, and uncertainty analysis. Report writing is emphasized and a design project is required. Corequisite: MAE120. (Design units: 1)

MAE108 Aerospace Laboratory (4) F. Analytical and experimental investigation in aerodynamics, fluid dynamics, and heat transfer. Emphasis on study of flow over objects and lift and drag on airfoils. Introduction to basic diagnostic techniques. Report writing is emphasized and a design project is required. Prerequisite: MAE130B. (Design units: 2)

MAE110 Combustion and Fuel Cell Systems (4) W. Fundamentals of gaseous, liquid, and coal-fired combustion and fuel cell systems. Fuels, fuel-air mixing, aerodynamics, and combustion and fuel cell thermodynamics. Operating and design aspects of practical systems including engines, power generators, boilers, furnaces, and incinerators. Prerequisite: MAE115. (Design units: 2)

MAE112 Propulsion (4) W. Application of thermodynamics and fluid mechanics to basic flow processes and cycle performance in propulsion systems: gas turbines, ramjets, scramjets, and rockets. Prerequisite: MAE135. (Design units: 1)

MAE115 Applied Engineering Thermodynamics (4) F. Application of thermodynamic principles to compressible and incompressible processes representative of practical engineering problems—power cycles, refrigeration cycles, multicomponent mixtures, air conditioning systems, combustion and compressible flow. Design of a thermodynamic process. Prerequisite: MAE91. (Design units: 2)

MAE117 Solar and Renewable Energy Systems (4). Basic principles, design, and operation of solar and other renewable energy systems including solar photo-voltaic, solar thermal, hydroelectric, wind, and biomass gasification and combustion. Includes power generation and storage, and renewable fuels for transportation and stationary power generation. Prerequisite: MAE115. (Design units: 1)

MAE120 Heat Transfer (4) S. Fundamentals of heat transfer. Conduction, convection in laminar and turbulent flow, radiation heat transfer, and combined heat transfer. Application to insulation requirements and heat exchangers. Prerequisites: Mathematics 2D, Physics 7B, MAE91, each with a grade of C- or better; and MAE130B. (Design units: 0)

MAE130A Introduction to Fluid Mechanics (4) F. Fundamental concepts; fluid statics; fluid dynamics; Bernoulli's equation; control-volume analysis; basic flow equations of conservation of mass, momentum, and energy; differential analysis; potential flow; viscous incompressible flow. Prerequisites: Physics 7A, Physics 7B, Mathematics 2D, Mathematics 2E, MAE30, and MAE80, each with a grade of C- or better. Only one course from MAE130A, MAEH130A, CEE170, and CEEH170 may be taken for credit. (Design units: 0)

MAEH130A Honors Introduction to Fluid Mechanics (4). Fundamental concepts; fluid statics; fluid dynamics; Bernoulli's equation; control-volume analysis; basic flow equations of conservation of mass, momentum, and energy; differential analysis; potential flow, using complex potential; vorticity dynamics; Kelvin-Helmholtz instability; tensor notation; constitutive relations; viscous incompressible flow. Prerequisites: Physics 7A, Physics 7B, Mathematics 2D, Mathematics 2E, MAE30, and MAE80, each with a grade of C- or better. Only one course from MAEH130A, MAE130A, CEE170, and CEEH170 may be taken for credit. (Design units: 0)

MAE130B Introduction to Viscous and Compressible Flows (4) W. Introduction to the analysis of viscous flows including fully developed laminar and turbulent flow in a pipe, viscous flow over immersed bodies, evaluation of boundary layer characteristics, lift and drag, compressible flow in a duct and normal shock waves. Prerequisites: Mathematics 2D, Physics 7B, and MAE91 each with a grade of C- or better; MAE130A and MAE140. (Design units: 1)

MAE131 Introduction to Turbulence (4). Fluid dynamics at high Reynolds numbers; visualization of turbulence; large scales and small scales; organized vortices; Richardson-Kolmogorov laws; fully developed turbulence; shear flows; importance of turbulence in aeronautics, mechanical engineering, and many multidisciplinary fields; experimental or computational design project. Corequisite: MAE130B. Prerequisite: MAE130A. (Design units: 2)

MAE135 Compressible Flow (4) S. Compressibility effects in fluid mechanics. One-dimensional flow with area variation, friction, heat transfer, and shocks. Design of gas supply systems. Two-dimensional flow with oblique shocks and isentropic waves. Supersonic airfoil theory and design, wind-tunnel design. Basic diagnostics. Prerequisites: MAE91, MAE130A, MAE130B. (Design units: 1)

MAE136 Aerodynamics (4) F. Analysis of flow over aircraft wings and airfoils, prediction of lift, moment, and drag. Topics: fluid dynamics equations; flow similitude; viscous effects; vorticity, circulation, Kelvins' theorem, potential flow; superposition principle, Kutta-Joukowski theorem; thin airfoil theory; finite wing theory; compressibility. Prerequisites: MAE130A, MAE130B. (Design units: 1)

MAE140 Introduction to Engineering Analysis (4) F. Analytical methods in engineering. Nonhomogeneous linear ordinary differential equations. Variable coefficient linear ordinary differential equations. Eigenfunction expansions. Laplace transforms. Introduction to Fourier transforms. Linear partial differential equations. Prerequisite: Mathematics 2E or equivalent. (Design units: 0)

MAE145 Theory of Machines and Mechanisms (4) S. Presents the basic mathematical theory of machines. Focuses on the principles of cam design, gearing and gear train analysis, and the kinematic and dynamic analysis of linkages, together with an introduction to robotics. Prerequisites: Engineering MAE80; Mathematics 2J. (Design units: 2)

MAE146 Astronautics (4) W. Motion in gravitational force fields, orbit transfers, rocketry, interplanetary trajectories, attitude dynamics and stabilization, navigation, reentry, the space environment. Prerequisite: MAE80. (Design units: 1)

MAE147 Vibrations (4) W. Analysis of structural vibrations of mechanical systems. Modeling for lumped and distributed parameter systems. Topics: single- and multi-degree of freedom systems, free and forced vibrations, Fourier series, convolution integral, mass/stiffness matrices, and normal modes with design project. Prerequisites: MAE80, MAE140, Mathematics 2E. (Design units: 1)

MAE151 Mechanical Engineering Design (4) W. A comprehensive group design project experience that involves identifying customer needs, idea generation, reverse engineering, preliminary design, standards, prototype development, testing, analysis, and redesign of a product involving fluid, thermal, and mechanical components. Introduces design for manufacturing and the environment. Prerequisites: MAE120, MAE145, and MAE170; senior standing. (Design units: 3)

MAE152 Introduction to Computer-Aided Engineering (4) F. Elements and principles of computer-aided engineering with modern hardware and software are presented with a design focus. Case studies are used to assist in finite-element method techniques. Prerequisites: ENGR150, MAE120. Formerly MAE152A. (Design units: 2). *Not offered every year.*

MAE156 Mechanical Behavior and Design Principles (4) W. Principles governing structure and mechanical behavior of materials, relationship relating microstructure and mechanical response with application to elasticity, plasticity, yielding, necking, creep, and fracture of materials. Introduction to experimental techniques to characterize the properties of materials. Design parameters. Prerequisites: ENGR54. Same as CBEMS155. (Design units: 2)

MAE157 Lightweight Structures (4) W. Fundamentals of torsion and bending. Analysis and design of thin-wall and composite beams. Applications of energy methods and matrix methods. Stress analysis of aircraft components. Stiffness, strength, and buckling. Prerequisite: ENGR150 or CEE150. Same as CEE157. (Design units: 2)

MAE158 Aircraft Performance (4) W. Fundamentals of flight theory applied to subsonic propeller and jet aircraft. Nature of aerodynamic forces, drag and lift of wing and fuselage, high-lift devices, level-flight performance, climb and glide performance, range, endurance, take-off and landing distances, static and dynamic stability and control. Prerequisites: MAE130A. (Design units: 2)

MAE159 Aircraft Design (4) S. Preliminary design of subsonic general aviation and transport aircraft with emphasis on layout, aerodynamic design, propulsion, and performance. Estimation of total weight and weight distribution, design of wings, fuselage, and tail, selection and location of engines, prediction of overall performance. Prerequisites: MAE112, MAE136, MAE158. (Design units: 4)

MAE162 Engineering Meteorology (4) S. Fundamentals and aspects of atmospheric sciences important to engineering and environmental problems. Basic physics and thermodynamics of the atmosphere; dispersion of pollutants. A design problem is included. Prerequisite: MAE91 or CBEMS40B; MAE130A or CEE170 or CBEMS120A or consent of instructor. Same as Earth System Science 126. (Design units: 1)

MAE164 Air Pollution and Control (4). Sources, dispersion, and effects of air pollutants. Topics include emission factors, emission inventory, air pollution, meteorology, air chemistry, air quality modeling, impact assessment, source and ambient monitoring, regional control strategies. Prerequisites: MAE91; MAE130A or CEE170. (Design units: 2)

MAE170 Introduction to Control Systems (4) F. Feedback control systems. Modeling, stability, and systems specifications. Root locus, Nyquist, and Bode methods of analysis and design. Prerequisites: Mathematics 2D, Physics 7B, Engineering MAE80, each with a grade of C- or better; and MAE106. MAE170 and MAEH170 may not both be taken for credit. (Design units: 2)

MAEH170 Honors Introduction to Control Systems (4). Feedback control systems. Modeling, stability, and systems specifications. Root locus, Nyquist, and Bode methods of analysis and design. Contour integration, advanced frequency-domain concepts, and design tools. Prerequisites: Mathematics 2D, Physics 7B, Engineering MAE80, each with a grade of C- or better; and MAE106. MAEH170 and MAE170 may not both be taken for credit. (Design units: 2)

MAE171 Digital Control Systems (4). Methods for analysis and design of discrete-time control systems. Z-transforms, difference equations, discrete Fourier transforms. Sampling theorem and applications. Z-plane stability, frequency response. Digital controller design. Introduction to digital filters. Prerequisite: MAE170. (Design units: 2)

MAE172 Design of Computer-Controlled Robots (4). Students design a small robotic device and program it to exhibit sentient behaviors. The basic aspects of mechatronic design are covered, including motor and sensor selection, control strategies, and microcomputer programming for the implementation of control paradigms. Prerequisites: MAE170, MAE180. (Design units: 3)

MAE175 Dynamics and Control of Aerospace Vehicles (4) S. Equations of motion, linearization, stability derivatives, and longitudinal and lateral modes of motion. Handling qualities, sensors and actuators, and effects of various feedbacks on stability and performance. Autopilot design. Prerequisite: MAE106. (Design units: 3). *Not offered every year.*

MAE180 Electric Circuits and Interfaces (4) W. The use of semiconductor devices, digital and linear circuits in the design of interfaces to mechanical engineering systems. The design of interfaces to mechanical engineering system. Emphasis on design and use of microprocessor interfacing for control and data acquisition. Prerequisite: MAE106. (Design units: 3). *Not offered every year.*

MAE183 Computer-Aided Mechanism Design (4) F. Focuses on the design of planar, spherical, and spatial mechanisms using modern computer workstations. Topics include both exact and approximate, graphical and analytical design techniques. Students use the existing software (and develop algorithms) to design and build various mechanisms for new applications. Prerequisite: Mathematics 2J. (Design units: 4)

MAE185 Numerical Analysis in Mechanical Engineering (4) S. Solution of mechanical-engineering equations by means of numerical methods. Errors in numerical analysis. Nonlinear equations and sets of equations. Numerical differentiation and integration. Ordinary differential equations. Boundary-value problems. Partial differential equations. Prerequisites: MAE10, Mathematics 3D; Mathematics 2E or equivalent. Only one course from MAE185, CEE185, and Mathematics 105A may be taken for credit. (Design units: 2)

MAE188 Engineering Design in Industry (4) F, W, S. Presents the principles of engineering design in the context of an industrial application. Local manufacturing firms define an engineering design project to be completed by students in 10 weeks. Projects include initial brainstorming to final design, with a formal presentation of the result. (Design units: 4)

MAE189 Senior Project (1 to 4) F, W, S. Group or individual senior project of theoretical or applied nature involving design. Corequisite: MAE151. Prerequisite: consent of instructor. May be taken for credit for a total of 12 units. (Design units: 1-4)

MAE195 Seminars in Engineering (1 to 4) F, W, S. Seminars by individual faculty in major fields of interest. Prerequisite: consent of instructor. May be repeated for credit. (Design units: varies)

MAE198 Group Study (1 to 4) F, W, S. Group study of selected topics in engineering. Prerequisite: consent of instructor. May be repeated for credit as topics vary. (Design units: varies)

MAE199 Individual Study (1 to 4) F, W, S. For undergraduate Engineering majors in supervised but independent reading, research, or design. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. May be taken for credit for a total of eight units. (Design units: varies)

MAE199P Individual Study (1 to 4) F, W, S. Same description as MAE199. Pass/Not Pass grading only. May be repeated for credit as topics vary. (Design units: varies)

MAEH199 Individual Study for Honors Students (1 to 5) F, W, S. Independent reading, research, or design under the direction of a faculty member or group of faculty members in Mechanical and Aerospace Engineering. Students taking individual study for design credit are to submit a written paper to the instructor and to the Undergraduate Student Affairs Office in the School of Engineering. Open only to members of the Campuswide Honors Program who are Mechanical or Aerospace Engineering majors. May be repeated for credit. (Design units: varies)

GRADUATE

MAE200A Engineering Analysis I (3) F. Linear algebra, including vector spaces, matrices, linear system of equations, and the eigenvalue problem. Scalar and vector field theory. Calculus of variations and optimization. Notions of stability for linear and nonlinear differential equations.

MAE200B Engineering Analysis II (3) W. Review of ordinary differential equations, including Bessel and Legendre functions. Partial differential equations, including the diffusion equation, Laplace's equation, and the wave equation. Fourier series, Fourier and Laplace transforms and their applications.

MAE205 Perturbation Methods in Engineering (3). Asymptotic expansions of integrals. Regular and singular perturbations. Perturbation methods for ordinary and partial differential equations. Matched asymptotic expansions. Multiple-scale asymptotic expansion schemes. Prerequisites: MAE200A and MAE200B, or equivalent knowledge of linear differential equations. *Not offered every year.*

MAE206 Nonlinear Optimization Methods (3) S. Numerical methods for constrained and unconstrained optimization. Necessary and sufficient conditions for optimimality. Conjugate gradient, variable metric algorithms. Gradient projection, penalty functions, and Lagrange methods. Prerequisite: MAE200A. *Not offered every year.*

MAE210 Advanced Fundamentals of Combustion (3) S. Premixed, non-premixed, and heterogeneous reactions, with emphasis on kinetics, thermal ignition, turbulent flame propagation, detonations, explosions, flammability limits, diffusion flame, quenching, flame stabilization, and particle and spray combustion. Prerequisite: MAE110. *Not offered every year.*

MAE214 Fuel-Cell Fundamentals and Technology (3) S. Fuel-cell systems design, operation, and materials. Electrochemistry and electrocatalysis, cell degradation, nature of fuel-cell electrodes and electrolytes, fuels, and fuel processing. Provides broad insight into fuel-cell science, technology, system design, and operation. Prerequisite: MAE110.

MAE215 Advanced Combustion Technology (3) S. Emphasis on pollutant formation and experimental methods. Formation of gaseous pollutants and soot; transformation and emission of fuel contaminants in gas, liquid, and solid fuel combustion; methods employed to measure velocity, turbulence intensity, temperature, composition, and particle size; methods to visualize reacting flows. Prerequisite: MAE110. *Not offered every year.*

MAE216 Statistical Thermodynamics (3). Statistics of independent particles, development of quantum mechanical description of atoms and molecules, application of quantum mechanics, evaluation of thermodynamic properties for solids, liquids, and gases, statistical mechanics of dependent particles (ensembles). Prerequisites: MAE91, MAE200A. *Not offered every year.*

MAE217 Generalized Thermodynamics (3) S. Generalized thermodynamics develops the laws of continuum thermodynamics from a set of plausible and intuitive postulates. The postulates are motivated qualitatively by a statistical description of matter and are justified by a posterior success for the resulting theory. Prerequisites: MAE91, MAE115 or equivalent. *Not offered every year.*

MAE222 Radiation Heat Transfer (3). Black body radiation. Radiative transport equations for surfaces separated by nonparticipating media. Radiant energy transfer through absorbing, emitting, and scattering media. Radiation-conduction interaction. Radiation-convection interaction. Introduction to numerical methods in radiation. Prerequisite: MAE120.

MAE223A Numerical Methods in Heat, Mass, and Momentum Transport (Laminar Flows) I (3) F. Introduction to the discretization of various types of partial differential equations (parabolic, elliptic, hyperbolic). Finite-volume discretization for one- and two-dimensional flows. Use of a two-dimensional elliptic procedure to predict sample laminar flows. Corequisite or prerequisite: MAE230A. *Not offered every year.*

MAE223B Numerical Methods in Heat, Mass, and Momentum Transport (Turbulent Flows) II (3) W. Introduction to turbulence. Reynolds-averaging of Navier-Stokes equations. Second-order closure of the average equations. Use of two-dimensional elliptic procedure to predict confined turbulent flows. Prerequisite: MAE223A. *Not offered every year.*

MAE224 Convective Mass Transfer (3). Concentrations, velocities, and mass fluxes. Mechanisms of mass transport and transport properties in multicomponent media. Mass transfer problems described by ordinary differential equations. Partial differential transport equations and some solutions of technical importance. Interphase mass transfer formulations and solutions. Prerequisite: MAE120. *Not offered every year.*

MAE226 Special Topics in Fluid and Thermal Sciences (1 to 3). Special topics of current interest in fluid mechanics, heat and mass transfer, multiphase flows, or combustion. Emphasis could be placed on theory, computational methods, or experimental techniques. Prerequisite: consent of instructor.

MAE230A Inviscid Incompressible Fluid Mechanics I (3) F. Equations of motion. Vector notation. Flow kinematics. Potential flow and complex potential. Vorticity and circulation. Bernoulli's theorem. Crocco's theorem. Conformal, Joukowski, and Schwarz-Christoffel transformations. Prerequisite: MAE130A.

MAE230B Viscous Incompressible Fluid Dynamics II (3) W. Review of mass, momentum, energy equations. Stress tensor, constitutive relations. Exact solutions to laminar flows. Stokes and Oseen flows. Concept of self-similarity. Boundary layer theory: thin-layer approximation, Falkner-Skan, Blasius solutions, integral methods. Jet, wake, cavity flows. Introduction to turbulence: instability, Reynolds averaging, mixing length. Prerequisite: MAE230A.

MAE230C Compressible Fluid Dynamics (3) S. One-dimensional unsteady flow: Riemann invariants, acoustics, shock tube. Two-dimensional flow: shock polars, linear theory, similarity rules, method of characteristics. Three-dimensional flow: slender-body theory. Effects of viscosity and conductivity: laminar boundary layer, Crocco-Busemann relations. Prerequisite: MAE230A or MAE230B.

MAE230D Theoretical Foundations of Fluid Mechanics (3). Well-posed problems and boundary, initial, and interface conditions; strong and weak solutions. Similarity, perturbation theory and limit behavior, bifurcations. Wave propagation: dispersive and nondispersive waves, nonlinear acoustics, ship waves, internal gravity waves, water waves. Vortices: mutual interactions and stability. Jets, wakes, cavities. Prerequisites: MAE230A, MAE230B. *Not offered every year.*

MAE231 Fundamentals of Turbulence (3). Phenomenon of turbulence. Reynolds equations. Dynamics of turbulence. Free turbulent shear flows. Wall-bounded turbulent shear flows. Turbulent transport of scalar quantities. Spectral dynamics. Mathematical models of turbulence. Prerequisite: MAE230A, MAE230B.

MAE232 Atmospheric Turbulence (3). Turbulent motion. Statistical and spectral methods. Homogeneous and shear flow problems. Turbulence in the atmosphere. Boundary layer, effects of buoyancy, rotation. Prerequisite: MAE230A. *Not offered every year.*

MAE233 Turbulent Free Shear Flows (3). Practical and theoretical aspects of turbulent free shear flows. Instability, global scaling laws, mixing, and noise generation in incompressible and compressible shear layers, jets, and wakes. Kelvin-Helmoltz instability, near- and far-field growth rates, effect of compressibility, aeroacoustics of jets. Prerequisites: MAE200B, MAE230A, MAE230B.

MAE236 Nonequilibrium Gas Dynamics (3). Molecular description of fluid flow. Boltzmann equation. Chapman-Enskog expansion for flows with translational nonequilibrium. Shock structure. Inviscid flows with chemical and vibrational nonequilibrium. Prerequisite: MAE230C. *Not offered every year.*

MAE237 Computational Fluid Dynamics (3). Mathematical, physical, and computational fundamentals of computational fluid dynamics, numerical methods for solving the Euler and Navier-Stokes equations. Topics include: finite-difference and finite-volume discretization, time marching methods, von Neumann analysis, upwinding, flux splitting, TVD, and other high-resolution shock-capturing schemes. Prerequisite: MAE203, MAE230C, or consent of instructor.

MAE238 Experimental Fluid Dynamics (3) S. Concepts and techniques for measurement of fluid motion. Quantitative and qualitative flow visualization. Flow facilities, shadowgraph, schlieren, interferometer, thermal anemometer. Laser diagnostics, fluorescence, Rayleigh, Raman, Mie scattering. Laser-Doppler, particle-image, and image-correlation velocimetry. Three- and four-dimensional digital imaging. Prerequisite: consent of instructor.

MAE241 Dynamics (3) W. Kinematics and dynamics of three-dimensional motions. Lagrange's equations, Newton-Euler equations. Applications include robot systems and spinning satellites. Prerequisite: MAE147 or equivalent.

MAE242 Robotics (3). Spatial rigid-body transformations. Forward and inverse kinematics. Jacobian of serial and parallel chains. Screw coordinates and transformations. Rate and static analyses using screw theory. Singularity analysis. Trajectory generation. *Offered alternate years.*

MAE244 Theoretical Kinematics (3). Spatial rigid body kinematics is presented with applications to robotics. Orthogonal matrices, Rodrigues' formula, Quaternions, Plücker coordinates, screw theory, and dual numbers are studied using modern projective geometry and multi-linear algebra. Applications include trajectory planning, inverse kinematics, and workspace analysis. *Not offered every year.*

MAE245 Spatial Mechanism Design (3) W. Fundamental kinematic theory required for planar, spherical, and spatial mechanism design. The focus is on algebraic methods for the exact solution of constraint equations. *Offered alternate years.*

MAE246 Algebraic Geometry in Kinematics (3). Examines the algebraic constraint equations that define modern robotic systems. Begins with basic projective geometry, introduces polynomial ideal theory, and applies it to polynomial elimination for the direct kinematics of robotic platforms.

MAE247 Micro-System Design (3) F. Covers the fundamentals of the many disciplines needed for design of Micro-Electro-Mechanical Systems (MEMS): microfabrication technology, structural mechanics on micro-scale, electrostatics, circuit interface, control, computer-aided design, and system integration. Same as EECS278.

MAE248 Differential Kinematics (3). An introduction to differential geometry of rigid motion in the plane, on the sphere, and in three-dimensional space; curvature properties of trajectories of points and lines; and local properties of constraint manifolds that define the workspace of kinematic connections. Prerequisite: consent of instructor.

MAE249 Micro-Sensors and Actuators (4) S. Introduction to the technology of Micro-Electro-Mechanical Systems (MEMS). Fundamental principles and applications of important microsensors and actuation principles on micro-scale. Introduction to the elements of signal processing; processing of materials for micro sensor/actuator fabrication; smart sensors and microsensor/microactuator array devices. Same as EECS279.

MAE250 Biorobotics (3) W. Sensors, actuators, and circuits for biological movement control from an engineering perspective. Current approaches to robotic and mechatronic devices that support and enhance human movement.

MAE252 Fundamentals of Microfabrication (3) F. Introduces Engineering and Science students to the science of miniaturization. Different options to make very small machines (micro and nano size) are reviewed, materials choices are discussed, scaling laws are analyzed, and many practical applications are listed.

MAE253 BIOMEMS (3) W. Introduction of BIOMEMS to engineering and science students. After study of various sensing technique fundamentals, various biosensors are introduced. The biological principles involved are introduced via examples. Nanomachining and biomimetics are also discussed.

MAE260 Current Issues Related to Tropospheric and Stratospheric Processes (4). Examination of current issues related to the atmosphere, including energy usage; toxicology; effects on humans, forest, plants, and ecosystems; particulate matter (PM10); combustion; modeling, and meteorology; airborne toxic chemicals and risk assessment; application of science to development of public policies. Prerequisite: One course selected from Chemistry 245, Earth System Science 202, Engineering MAE164, Engineering MAE261, or consent of instructor. Same as Chemistry 241. *Not offered every year.*

MAE261 Air Quality Modeling (3). Fundamental principles necessary to understand the dynamics of air pollutants. Derivation and description of mathematical techniques for the numerical solution of the atmospheric equation. Formulation and development of air quality models. Prerequisites: MAE230A and MAE230B or consent of instructor; MAE10 or equivalent FORTRAN knowledge. *Not offered every year.*

MAE264 Combustion Particulates and Aerosols (3). Behavior of airborne solid and liquid particles in air resources engineering. Description of air drag, gravity, Brownian motion, light scattering, charging phenomena, coagulation, size distributions. Applications include generation and classification of aerosols, lung deposition, formation and characteristics of atmospheric aerosols. Prerequisites: MAE130A, MAE130B. *Not offered every year.*

MAE270A Linear Systems I (3) F. Input-output and state-space representations of continuous-time linear systems. State transition matrices. Controllability and observability. Irreducible realizations. State feedback and observer design. Prerequisite: MAE170 or EECS160A.

MAE270B Linear Systems II (3). Advanced topics in linear systems: bases, linear operator representations, and Jordan forms. Review of dynamical systems, and stability. Time-varying systems, discrete-time representations, and multi-input/multi-output systems. Introduction to continuous and discrete time linear regulator (LQR) problems. Prerequisite: MAE270A. *Not offered every year.*

MAE271 System Identification (3) F. Covers the latest techniques in system identification. Materials covered encompass techniques in both frequency and time domain. Linear and nonlinear dynamic processes, correlation, regression, stochastic approximation, etc., are among the topics covered. Prerequisite: MAE270A. *Not offered every year.*

MAE272 Robust Control Theory (3). Methods for control design of systems with uncertainty. Feedback stability and small gain theorem. Multivariable stability margins and multiplier theory. H -optimal control, linear matrix inequalities. Prerequisite: MAE270A. *Not offered every year.*

MAE273 Control of Robot Systems (3). Dynamic analysis and control system design of open- and closed-chained mechanisms. Methods for real time control of nonlinear systems. Lyapunov Stability. Advanced motion planning algorithms. Prerequisites: MAE241, MAE270A. Formerly Engineering ME273. *Not offered every year.*

MAE274 Optimal Control (3). Introduction to the principles and methods of optimal control. Topics include: objectives and issues in controlling nonlinear systems; linear variational and adjoint equations; optimality conditions via variational calculus, maximum principle, and dynamic programming; solution methods; applications to control of robots and aerospace vehicles. *Not offered every year.*

MAE275 Nonlinear Feedback Systems (3). Advanced tools for feedback control system analysis and synthesis. Norms, operators, Lp spaces, contraction mapping theorem, Lyapunov techniques along with their extensions. Circle criterion, positivity and passivity. Applications to nonlinear control methods, such as sliding mode or adaptive techniques. Prerequisite: MAE270B. *Not offered every year.*

MAE276 Geometric Nonlinear Control (3). Using the mathematics of differential geometry, a number of the concepts and results of linear systems theory have been extended to nonlinear systems. Describes these extensions and illustrates their use in nonlinear system analysis and design. Prerequisites: MAE200A, MAE270A. *Not offered every year.*

MAE277 Introduction to Neural Control Systems (3). Basic models and learning rules of artificial neural networks: perceptrons, multilayer neural networks and backpropagation, support vector machines, radial basis functions networks, CMAC networks. Introduction to regularization and statistical learning theory. Neural networks in system identification and control.

MAE279 Special Topics in Mechanical Systems (3). Selected topics of current interest in mechanical systems. Topics include robotics, kinematics, control, dynamics, and geometric modeling. Prerequisites: MAE241, MAE270A. May be repeated for credit as topics vary. *Not offered every year.*

MAE284 Fundamentals of Experimental Design (3). Fundamentals and principles of statistical experimental design and analysis. Emphasis addresses understanding and use of designed experiments, response surfaces, linear regression modeling, process optimization, and development of links between empirical and theoretical models. *Not offered every year.*

MAE294 M.S. Project (3) F, W, S. Tutorial in which master's-level students taking the comprehensive examination option undertake a master's-level research project. May be repeated for credit.

MAE295 Special Topics in Mechanical and Aerospace Engineering (1 to 4) F, W, S. Special topics by individual faculty in major fields of interest. May be repeated for credit as topics vary.

MAE296 Master of Science Thesis Research (4 to 12) F, W, S. Individual research or investigation conducted in the pursuit of preparing and completing the thesis required for the M.S. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

MAE297 Doctor of Philosophy Dissertation Research (4 to 12) F, W, S. Individual research or investigation conducted in the pursuit of preparing and completing the dissertation required for the Ph.D. in Engineering. Prerequisite: consent of instructor. May be repeated for credit.

MAE298 Seminars in Mechanical and Aerospace Engineering (1) F, W, S. Presentation of advanced topics and reports of current research efforts in mechanical engineering. Required of all graduate students in mechanical engineering. Satisfactory/Unsatisfactory grading only. May be repeated for credit as topics vary.

MAE299 Individual Research (1 to 12) F, W, S. Individual research or investigation under the direction of an individual faculty member. Prerequisite: consent of instructor. May be repeated for credit.

SCHOOL OF HUMANITIES

Karen R. Lawrence, **Dean**

143 Humanities Instructional Building
Undergraduate Counseling: (949) 824-5132
Graduate Counseling: (949) 824-4303
World Wide Web: http://www.humanities.uci.edu/

The School of Humanities comprises three fundamental areas of knowledge: history; literature, film, and the arts; and philosophy. The intellectual activity of departments and programs in the School reflects the discrete concerns of these basic disciplines and intersections among them. By expanding our knowledge in these three areas and developing skills in rhetoric, expository composition, and foreign languages, humanists influence the fundamental techniques of communication used throughout the modern university and our whole society. They analyze and question those techniques and examine the web of cultural beliefs in which they are practiced.

At the core of the educational mission of the humanities is the goal of imparting to students critical tools of analysis, ways of seeing, knowing, explaining, describing, and understanding, that will allow them to comprehend the world around them. Consider some of the challenges that we all face: the pressures created by demographic change, rapid economic expansion, and increased ethnic and cultural diversity; the development of new technological forms, particularly those related to computers and the Internet; and the increasingly complex problem of human interaction with the environment. Equipping students to understand and analyze such phenomena is precisely what a liberal education in the humanities accomplishes. In the words of a "Manifesto for the Humanities," prepared for the President of the University of California, it is humanities that provide "the ability to express oneself clearly and accurately; the skill of critical evaluation, both of ideas and actions; the courage to make choices based on shared values and priorities; the opportunity to conduct an intensive conversation with the traditions, present and past, that help make us who we are, and above all, who we will be; and as a result, the ability to understand and make sense of other people and their cultures." Humanistic inquiry is in no way isolated from the "real world," cordoned off in some ivory tower; rather its central goal is to equip students to enter into that real world as critically thinking citizens.

Because language is the humanist's essential tool and the traditional medium of historical record, philosophical speculation, and literary creation and criticism, the School of Humanities places special emphasis on language and training in composition. The campuswide Writing Program is housed in the School of Humanities, as are our distinguished programs in creative writing and the Program in Academic English/English as a Second Language.

The School of Humanities also offers programs in over a dozen foreign languages, both classical and modern, and requires that its majors take two years or the equivalent of foreign language study. The pursuit of critical literacy involves analyzing and understanding our immediate culture, and one way to do this is through the study of foreign languages and the cultural systems they entail. We rarely scrutinize or analyze something we know as intuitively as our native language, yet it is by means of this language that we organize and express our thoughts. The "foreignness" of a foreign language permits us to objectify an entire linguistic system, to observe its structure and its usage, and then to make comparisons with our own linguistic situation. The knowledge of one's *native* language, gained by this kind of comparative observation, is the foundation of critical reflection on texts of any nature—historical, philosophical, literary, political, legal, scientific, or other. Serious study of a foreign language is, therefore, crucial to any university education that aims at fostering critical thinking and objective self-reflection. In 2001, the School established the International Center for Writing and Translation, which sponsors research programs that address the importance of "conversations" among languages.

A crucial part of the School's curriculum is the Humanities Core Course, which integrates the study of philosophy, literature, film and the arts, and history along with lower-division writing. Interdisciplinary studies are also an essential feature of the Humanities Honors Program and programs in Film and Media Studies, Comparative Literature, Global Cultures, and Humanities and Arts. The Department of Asian American Studies and the Interdisciplinary Programs in African American Studies, Latin American Studies, and Women's Studies, as well as the interdisciplinary minor in Religious Studies, are also located in the School. With faculties that draw on the Social Sciences as well, these programs are excellent examples of how the Humanities reaches across the boundaries of disciplinary knowledge.

Students majoring in the humanities are particularly well-prepared for careers in all fields in which analysis, judgment, and argument are important. Humanities students have moved into business, the law, education, politics, public policy, academia, and journalism. Employers in all sectors are placing increasing emphasis on the recruitment of college graduates who can write and think. These skills are ultimately more important to many employers than a specific form of technical training, and it is these skills that are imparted most effectively in the School of Humanities. For students who leave the School with a solid grounding in critical analysis, research, and communication, the sky is the limit.

DEGREES

African American Studies	B.A.
Art History	B.A.
Asian American Studies	B.A.
Chinese Language and Literature	B.A.
Classical Civilization	B.A.
Classics	B.A., M.A., Ph.D.
Comparative Literature	B.A., M.A., Ph.D.
East Asian Cultures	B.A.
East Asian Languages and Literatures	M.A., Ph.D.
English	B.A., M.A., M.F.A., Ph.D.
European Studies	B.A.
Film and Media Studies	B.A.
French	B.A., M.A., Ph.D.
German	M.A., Ph.D.
German Studies	B.A.
Global Cultures	B.A.
History	B.A., M.A., Ph.D.
Humanities	B.A.
Humanities and Arts	B.A.
Japanese Language and Literature	B.A.
Literary Journalism	B.A.
Philosophy	B.A., M.A., Ph.D.
Russian*	B.A.
Spanish	B.A., M.A., Ph.D.
Visual Studies	M.A., Ph.D.
Women's Studies	B.A.

*The degree program in Russian is not open to new students at this time.

Honors at Graduation

Students are nominated for honors at graduation on the basis of scholarship and special achievements. To be eligible for nomination students must, by the end of the winter quarter of the senior year, file an Application for Graduation *and* meet the following criteria: (1) achieve a UC grade point average of at least 3.60, (2) complete at least 18 courses (72 units) in residence at a UC campus by the end of the winter quarter of the academic year in which they graduate, and (3) receive strong recommendation from the major department. Eligible students are automatically considered for Honors at Graduation. Other important factors are considered (see page 52).

HUMANITECH

170 Humanities Instructional Building; (949) 824-7445
World Wide Web: http://www.humanities.uci.edu/humanitech

HumaniTech's mission is to work with Humanities faculty and graduate students in the discussion, incorporation, problem solving, and facilitation of technology in their teaching and research. This mission is accomplished through a variety of functions: (1) education and outreach for Humanities faculty through faculty workshops, one-on-one consultations, and group consultations; (2) research, collection, and dissemination of information on intellectual property rights, particularly in digital formats; (3) sponsorship of annual teaching colloquia; (4) sponsorship of technology grants to Academic Coordinators; (5) sponsorship, with the Humanities Research Center, of annual lecture series on intellectual issues regarding the intersection of humanities and technology; (6) liaison with the Humanities bibliographers in the coordination of both the School's and the Library's efforts to support technologically based instruction and research; (7) liaison with the UC system's online library (CDL, or California Digital Library); and (8) liaison with the various technological arms of the UCI campus, such as NACS (Network and Academic Computing Services), the Instructional Resource Center, and EEE (the Educational Electronic Environment).

HUMANITIES CENTER

175 Humanities Instructional Building; (949) 824-3638
World Wide Web: http://www.humanities.uci.edu/hctr/
Michael Szalay, **Director**

The Humanities Center fosters intellectual dialogue between the faculty and students of UCI and the communities of Orange County and beyond. Its goals are to promote a wide range of interdisciplinary work in the humanities, and to facilitate the sharing of that work with audiences within and beyond the disciplinary units that it represents. The Center works to fulfill these goals by awarding grants to Humanities faculty and graduate students for research in the humanities; coordinating and sponsoring lectures, conferences, and other events on campus; and distributing a quarterly e-newsletter to faculty, graduate students, and alumni of the School of Humanities.

HUMANITIES INSTRUCTIONAL RESOURCE CENTER AND COMPUTING FACILITY

The Humanities Instructional Resource Center (HIRC) and the Humanities Computing Facility (HCF) share space in Humanities Hall and provide comprehensive technology support for instruction, research, and faculty and staff development. HIRC and HCF also serve as the center for innovative technology-mediated instruction within the School of Humanities.

HIRC services and facilities include video and audio libraries and audiovisual equipment. HCF includes the computer laboratories, fee-based laser printing, video editing, support for wireless networking in the Humanities quad, and computing consultation. Both facilities provide technology-related research and development assistance for faculty, graduate, and undergraduate students. HCF houses two PC laboratories, one Macintosh laboratory that doubles as a language laboratory, and one drop-in laboratory (with both Macs and PCs). The facility has more than 100 stations. HCF also houses five digital video editing bays, a software library, and a wide range of computer services (scanning, document conversion, workshops, and more).

Both HCF and HIRC laboratories provide a wide variety of instructional resources including, among others, multimedia applications and development stations, foreign language word processing, Web browsing (including support for Chinese, Japanese, and Korean), and language learning materials. All laboratories are connected to a central server and to the campus backbone for access to the Internet, MELVYL®, and other research resources. The laboratories are available to Humanities students, instructors, and staff for class instruction and drop-in purposes.

Additional information may be obtained from the HCF Computer Consultant's Office, 217 Humanities Hall, telephone (949) 824-7609, or the HIRC main offices, 269 Humanities Hall, telephone (949) 824-6344.

HUMANITIES OUT THERE (H.O.T.) PROGRAM

168 Humanities Instructional Building; (949) 824-9735
Julia Reinhard Lupton, **Director**

H.O.T. is an outreach program between UCI's School of Humanities and local schools. The program consists of a series of five-week workshops on selected topics in the humanities. Each quarter, there are at least 20 workshops on topics such as U.S. Literature, World Literature, U.S. History, and World History. Each workshop sends out a team of five or more undergraduates to a K–12 classroom, supervised by faculty and advanced graduate students in the humanities.

Requirements for undergraduates include: attending at least five training sessions at UCI; attending at least five tutoring sessions at a local school; and writing a three- to five-page paper with an academic focus. Undergraduates can earn two units of H.O.T. credit each quarter through Humanities 195.

INTERNATIONAL CENTER FOR WRITING AND TRANSLATION

172 Humanities Instructional Building
World Wide Web: http://www.hnet.uci.edu/icwt
Ngugi wa Thiong'o, **Director**

Established in 2001, the International Center for Writing and Translation (ICWT) in the UCI School of Humanities fosters writing, translation, and criticism in multilingual and international contexts. It links existing faculty research interests in cultural literacy to general discussions about linguistic and cultural issues relevant to the diverse, multiethnic, and multilingual student population at UCI and the population of California more generally. The Center's programs are premised on the principle that knowledge is a result of reciprocal contact and linkages based on quality and respect. In this model, The Center is dedicated to highlighting and supporting literary works, languages, performance, and oral traditions of cultures that span the globe.

The following goals are integral to the general mission of the Center: (1) supporting writers working in various languages and diverse genres, including fiction and creative nonfiction, through grants and residencies; (2) fostering research and discussion of the theory, practice, aesthetics, and politics of translation, broadly conceived; (3) supporting translations of work of literary merit; (4) sponsoring conferences, workshops, and public fora on writing and translation, as well as reading and performances; and (5) supporting activities of UCI faculty, students, and the surrounding community involving the far-reaching themes of cultural and media literacy and cross cultural transposition.

The Center is a partner of the International Institute of Modern Letters at Las Vegas.

Undergraduate Programs

HUMANITIES UNDERGRADUATE STUDY

143 Humanities Instructional Building; (949) 824-5132
World Wide Web: http://www.humanities.uci.edu/undergrad/
Jill Robbins, **Associate Dean**

In addition to 22 majors and 27 minors, the School also offers a formal concentration in Medieval Studies and courses in Italian, Portuguese, and Russian.

The academic counselors in the Humanities Undergraduate Counseling Office, located in 143 Humanities Instructional Building, help all students in planning a program of study. Transfer students in particular need to consult an academic counselor to determine major requirements. Students who expect to pursue graduate study also should consult with appropriate faculty members to ensure proper preparation.

The academic counselors assist freshmen and sophomores who are interested in the humanities but who have not chosen a major in the School. They are especially knowledgeable about University regulations, requirements in and outside the School, course content, options to major, and other matters that may present difficulties. For the first two years, students in Humanities are encouraged to explore the various disciplines represented in the School. During that time the academic counselors are prepared to help the undeclared student keep options to a major open, plan a coherent program of humanistic study, and reach an eventual decision about the major.

Generally each major stipulates a one-year course that is both an introduction to the discipline and a prerequisite to the major itself. Students who plan wisely will construct programs that include a good number of such courses.

NOTE: In many undergraduate courses in the School of Humanities, additional meetings between individual students and the instructor may be required. Many courses are composed of both lectures and *required* discussion sessions.

Undergraduate students in the School of Humanities participate in the affairs of the School in a number of ways: by serving on committees of various departments, by sitting with the faculty in its meetings, by participating as mentors for new Humanities majors, by working as peer academic advisors in the Undergraduate Counseling Office, and by serving on the Humanities Council, which directly advises the Dean.

Humanities Peer Mentor Program

The Humanities Peer Mentor Program is designed to address some of the academic, cultural, and social needs of disadvantaged students in the School of Humanities. The program features two-tiered mentoring, with successful upper-division students mentoring small groups of new students, and the student mentors in turn working with faculty and staff. Another focus of the program is to encourage and assist student mentors to go on to graduate school.

Participants attend workshops on topics such as study skills, library research, time management, and careers, as well as a variety of social events, and keep journals in which they express their ideas and raise issues for their mentors. Call (949) 824-5132 for additional information.

HUMANITIES HONORS PROGRAM

143 Humanities Instructional Building; (949) 824-5132
Victoria A. Silver, **Director**

The Honors Program of the School of Humanities is a two-year, upper-division program designed to challenge superior students from all fields by providing special opportunities for interdisciplinary work within an intellectually charged framework. Small seminars and the opportunity for independent research are some of the advantages offered by the program, which is open by invitation to all UCI students regardless of their majors.

Students in the program benefit from their involvement in the campus community of Humanities scholars. They enjoy a close relationship with the faculty and profit from intense interaction with their intellectual peers. A comprehensive advising program involving Honors faculty advisors as well as specially trained Honors peer advisors ensures that Humanities Honors students continually receive timely, individualized advice about their academic careers. Formal as well as informal gatherings, including student-organized social activities ranging from coffee hours to theater parties, augment a wide range of campus activities. Humanities Honors students have the opportunity to become some of the campus' best informed scholars on a broad range of topics: from artificial intelligence to medical ethics, from Shakespeare to Gilbert and Sullivan, from problems of the ancient Near East to the dilemmas of modernity.

Humanities Honors students complete a two-part course of study. In their junior year, students take three quarters of an interdisciplinary Proseminar (Humanities H120) organized about a single topic or problem, such as crime and punishment, the other, the development of religion in the West, the self, nature, or the American dream. The sequence is designed to compare and contrast modes of analysis and critical thinking in history, literary studies, and philosophy. In a small seminar setting, students are encouraged to become reflective about their own chosen disciplines.

In their senior year, students take a sequence beginning in the fall with a Senior Honors Seminar (Humanities H140), and continuing in the winter and spring with the Senior Honors Thesis (Humanities H141) and the Senior Honors Colloquium (H142), prepared as an independent research project under the direction of a faculty member on a topic chosen by the student. Students present their theses in an informal gathering with their faculty advisors in the spring, and a prize is awarded for the year's outstanding thesis.

In both sequences the Honors students benefit from their close association with exceptional scholars and the challenge and support of their intellectual peers.

Students interested in learning how the Humanities Honors Program will fit into their regular courses of study are encouraged to contact the Senior Academic Counselor in Humanities; telephone (949) 824-5132.

CAMPUSWIDE HONORS PROGRAM

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

HUMANITIES INTERNSHIP PROGRAM

166 Humanities Instructional Building; (949) 824-1392
World Wide Web: http://www.humanities.uci.edu/intern/
Jill Robbins, **Director**

The Humanities Internship Program is designed to bring highly qualified Humanities majors together with public sector employers and nonprofit companies in the Orange County area who are looking for employees with excellent skills in writing and communication. Local employers who participate in the program believe that Humanities students' education in critical thinking, writing, communication, and analysis equip them to be successful employees in their firms.

Interns are placed for the academic year and preceding summer, working 10–15 hours a week for hourly salaries of $10. (No course credit is earned.) Employers offer management-level supervisors to student interns and thus, interns are involved in a meaningful aspect of the firm's ongoing business. The internship relationship can become the basis for long-term employment with the firm.

Interns participate in several quarterly meetings with a program coordinator at UCI to discuss their work experiences and benefit from one another's insights. At the end of each quarter of the internship, the student provides an assessment of the experience. The program coordinator also conducts on-site visits with the interns and their management supervisors.

The Internship Program is open to all Humanities majors who are in good academic standing and will have completed at least two quarters of academic work at UCI as a Humanities major by the end of the quarter in which they are selected for the program. Only students who will have completed the Humanities Core Course (or the Core Course substitution) by the end of that quarter will be eligible.

Applications are available online and in the Humanities Undergraduate Study Office, 143 Humanities Instructional Building, in mid- to late-winter quarter. The deadline for submission of all application materials is early April.

CENTER FOR INTERNATIONAL EDUCATION

The Center for International Education, which includes the Education Abroad Program (EAP) and the International Opportunities Program (IOP), assists students in taking advantage of the many worldwide opportunities that exist for study, work, internship, volunteering, and research. School of Humanities majors and minors can benefit from a broader perspective of their fields by studying for one year at a university in such countries as China, France, Germany, Italy, Japan, Russia, Spain, or the United Kingdom through EAP. Students can also augment their exposure to other cultures with programs sponsored through IOP. See the Center for International Education section of the *Catalogue* or an academic counselor for additional information.

FOREIGN LANGUAGE PLACEMENT AND PROGRESSION

The following policies apply to all UCI students taking foreign language courses.

Foreign Language Progression. Within the beginning and intermediate foreign language instructional sequences (1A-B-C and 2A-B-C, and for Latin and Greek, 1A-B-C and 100A or 100B), students must earn a grade of C or better in order to advance to the next level of instruction.

Foreign Language Placement. Placement tests are required for the following languages: Chinese, Japanese, Korean, and Vietnamese. Contact the UCI Testing Office for information; telephone (949) 824-6207; e-mail: testoff@uci.edu; World Wide Web: http://www.testingoffice.uci.edu/. Placement tests are recommended but not required for German language courses. The purpose of placement testing is to ensure success in UCI language courses.

For other foreign languages, students entering UCI with previous high school foreign language training are placed as follows: in general, one year of high school work is equated with one quarter of UCI work. Thus, students with one, two, three, or four years of high school foreign language will normally enroll in 1B-, 1C-, 2A-, or 2B-level language courses, respectively. Students who opt to "go back" one quarter will earn credit (i.e., a student with three years of high school foreign language may opt to take 1C instead of 2A). If it has been five or more years since the last high school course, the student may begin at 1A for credit. Exceptions must have the approval of the appropriate course director and the Associate Dean, Undergraduate Study. Transfer students will not receive credit for repeating at UCI foreign language courses for which they received credit upon matriculation to UCI even if they are placed by testing into the equivalent of a previously taken course.

Also, of specific note for Humanities majors, once a student begins instruction in a foreign language, the student must complete each course in the sequence until the requirement is satisfied. If any course is skipped, the student will be required to complete an additional course beyond the 2C level in order to meet the School of Humanities foreign language requirement.

Foreign Language Advanced Placement Credit. Students cannot earn units or grade points at UCI in courses from which they have been exempted on the basis of Advanced Placement credit. However, since Advanced Placement awards a maximum of 8 units for scores of 4 and 5, students may elect to take 2C or the equivalent for credit.

Native Speakers of Languages Other Than English. A native speaker of a foreign language, defined by the University as someone who attended the equivalent of secondary school in another country where the language of instruction was other than English, may be exempted from taking third-year language study in that language for some majors offered by the School of Humanities. In this case, the student must *substitute* appropriate upper-division courses in the major to replace the number of exempted courses. For example, if a native speaker of French is exempted from French 100A and 100B, that student must replace those two courses with two other upper-division French courses offered by the Department of French and Italian.

Repeating Deficient Foreign Language Grades. First- and second-year foreign language courses and third-year foreign language composition courses are sequential and each is prerequisite to the next. This is generally true also of fourth-year Chinese, Japanese, Korean, and Russian. Students wishing to repeat a deficient grade in one of these courses must repeat it *prior* to continuing on to the next level of the language. A student may not take a lower-level course for credit once a more advanced level has been completed with a passing grade.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements

Satisfactory completion of the following, which must be taken for *letter grades:* Humanities 1A-B-C, taken in the freshman year*; two years of work in a single acceptable foreign language, either modern or classical (through 2C), or equivalent competence; quarterly consultation with an assigned advisor and the advisor's written approval for the program of study decided upon.

*Transfer students in all majors in the School of Humanities, except Asian American Studies, may substitute for the Humanities Core Course appropriate course work in English composition, literature, history, and philosophy. See the Asian American Studies section for specific information about substitution courses for this major.

Maximum Overlap Between Major Requirements: Students completing double majors within the School of Humanities may count no more than two departmental/major requirements for both majors simultaneously (i.e., a double major in Comparative Literature and Spanish can count only two upper-division Spanish literature courses for both majors).

Maximum Overlap Between Major and Minor Requirements: Students completing majors and minors within the School of Humanities may count no more than two departmental/major requirements for both a major and a minor. No course may be counted for two minors.

Normal Progress in the Major: School of Humanities majors are expected to take at least one course required for their major program each quarter as well as make progress toward the completion of the School's foreign language requirement.

School Residence Requirement: At least five upper-division courses required for each major must be completed successfully at UCI. Completion of a minor program is optional; however, for certification in a minor, at least four upper-division courses required for the minor must be completed successfully at UCI. See individual major and minor requirements for specific courses. Exceptions are considered on a case-by-case basis and decided in consultation with the appropriate department or faculty member.

Off-campus Internship Policy. In most cases, Humanities students are not allowed to earn credit for off-campus internships. However, if a department or program determines that the internship is academically appropriate and promotes the student's academic goals, the student may take the internship as Independent Study and credit will be given.

A maximum of four units total may be earned for internships; however, the units may not be counted toward the student's major requirements. (No credit is given for *paid* internships, such as those offered through the Humanities Internship Program.) The sponsoring department or program and the instructor will in all cases require a substantial academic product, such as a paper, growing out of the internship.

A student who wishes to seek approval for an unpaid off-campus internship and earn course credit must file an Independent Study form with the Humanities Undergraduate Study Office prior to beginning the internship.

Change of Major. Students who wish to change their major to one offered by the School of Humanities should contact the Humanities Undergraduate Counseling Office for information about change-of-major requirements, procedures, and policies. Information is also available at http://www.due.uci.edu/Change_of_Major.html.

Graduate Programs

HUMANITIES GRADUATE STUDY AND RESEARCH

172 Humanities Instructional Building; (949) 824-4303
Cécile Whiting, **Associate Dean**

The School offers a wide program of graduate degrees. Although the Master's degree is offered in most departments, the programs emphasize the Ph.D. and give distinct preference in admission to those students who intend to take that degree. An exception is the two-year Master of Fine Arts in English (Creative Writing). In addition to the seminars offered by the various departments, the School sponsors a number of interdisciplinary seminars annually. These courses are taught by faculty members from various departments. Further, several departments offer a few students the opportunity to do part of their work for the Ph.D. in a related discipline.

A limited number of students are accepted annually to study for teaching credentials. This program is a cooperative effort between the School and the UCI Department of Education.

Graduate students in the School of Humanities participate in the affairs of the School by serving on committees of the various departments and sitting with the faculty in its meetings.

INTERDISCIPLINARY PROGRAM IN AFRICAN AMERICAN STUDIES

300A Murray Krieger Hall; (949) 824-2376
Lindon Barret, **Director**

Participating Faculty

Lindon Barrett, Ph.D. University of Pennsylvania, *Director of African American Studies and Professor of Comparative Literature* (critical theory, African American cultural studies)

Sharon B. Block, Ph.D. Princeton University, *Assistant Professor of History* (early American history, feminist theory and gender studies)

Thelma Foote, Ph.D. Harvard University, *Associate Professor of History and African American Studies* (early America, African American history)

David Theo Goldberg, Ph.D. City University of New York Graduate School and Center, *Director of the UC Humanities Research Institute and Professor of African American Studies and of Criminology, Law and Society* (race, racism, race and the law, political theory, South Africa)

Douglas M. Haynes, Ph.D. University of California, Berkeley, *Associate Professor of History* (social and cultural history of modern Britain, social history of modern medicine)

Ulysses Jenkins, Jr., M.F.A. Otis Parsons Art Institute, *Associate Professor of Studio Art* (film as a primary medium)

Victoria E. Johnson, Ph.D. University of Southern California, *Assistant Professor of Film and Media Studies and of African American Studies* (history and critical theory of U.S. television, popular film, and media; politics of geography, race, gender, and sexuality in popular culture; cultural studies)

Claire Jean Kim, Ph.D. Yale University, *Associate Professor of Asian American Studies and Political Science* (racial and ethnic politics, protest and social movements, contemporary political theory)

Steven Mailloux, Ph.D. University of Southern California, *UCI Chancellor's Professor of Rhetoric* (rhetoric, critical theory, American literature, law and literature)

Donald McKayle, Choreographer/Director, concert, theatre, film, television, *Graduate Choreography Advisor, Artistic Director of UCI Dance, and Claire Trevor Professor of Dance* (choreography, modern dance)

Ngugi wa Thiong'o, *Director of the International Center for Writing and Translation and UCI Distinguished Professor of Comparative Literature and English* (African literature, the politics of culture, performance theory, language in postcolonial theories)

R. Radhakrishnan, Ph.D. State University of New York, Binghamton, *Department Chair and Professor of Asian American Studies and Professor of English and Comparative Literature* (critical theory, Asian American literature and theory, cultural studies, twentieth-century literature, diasporic and ethnic literatures and theories)

Jared Sexton, Ph.D. University of California, Berkeley, *Assistant Professor of African American Studies and of Film and Media Studies* (race and sexuality, policing and imprisonment, contemporary U.S. cinema and political culture, multiracial coalition, critical theory)

Katherine Tate, Ph.D. University of Michigan, *Professor of Political Science* (voting behavior, African American and minority politics, elections)

Judith A. Wilson, Ph.D. Yale University, *Assistant Professor of African American Studies and Art History* (African American visual culture, post-colonial art and theory, race representation in American visual culture)

African American Studies is an interdisciplinary program which offers undergraduate students an opportunity to study those societies and cultures established by the people of the African diaspora. The program's curriculum encourages students to investigate the African American experience from a variety of disciplinary perspectives and theoretical approaches. Among the topics explored in the course offerings are the process of colonization and the forced migration of African people, the positionality of African people in the racialized symbolic and social orders of the western hemisphere, the rhetoric produced by and about African people, and the cultural and aesthetic values associated with "blackness" and "Africanness." The Program offers a B.A. degree program in African American Studies and a minor.

Descriptions for courses offered by the departments are available in the academic unit sections of the *Catalogue* and on the Program Web site at http://www.hnet.uci.edu/afam/.

CAREER OPPORTUNITIES

UCI graduates with a B.A. degree in African American Studies enhance their chances of success in the job market and in the highly competitive arena of graduate and professional school admissions, especially in the fields of medicine and other health professions, law, and business. Employers and admissions officers understand that many of their employees and graduates will one day work in communities with significant African American populations, and for this reason they give due consideration to applicants who have in-depth knowledge of African American culture.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Requirements for the Major

A. Three-quarter core sequence, African American Studies 40A, 40B, 40C; and African American Studies 139.

B. Six courses, five of which must be upper-division, distributed as follows from the lists below: two courses from Historical, Political, and Social Formations; two courses from Discourses; one course from Expressive Forms; and one course from Genders and Sexualities.

C. Four upper-division electives selected from an approved list available in the program office.

Residence Requirement for the Major: A minimum of five upper-division courses required for the major must be completed successfully at UCI.

Examples of courses which have recently been offered for satisfaction of requirement B include the following:

Historical, Political, and Social Formations: African American Studies 110 (Historical, Political, and Social Formations), 139 (The Black Protest Tradition); Anthropology 164A (African Societies), 164K (South Africa); History 144A (Early American Cultural and Intellectual History), 144B (Nineteenth-Century American Cultural and Intellectual History), 148A (Law and Minorities in the United States), 148B (Topics in Multicultural U.S. History*); Political Science 124A (The Politics of Protest in the U.S.), 154C (Comparative Politics: Four Nations, Three Continents); Psychology and Social Behavior P124D (Human Development in Cross-Cultural Perspective); Social Science 70A (U.S. Ethnic and Racial Cultures), 70C (Comparing Cultures), 170E (Society and Culture), 170F (History and Culture), 172B (Afro-American Culture).

Discourses: African American Studies 130 (Special Topics in Discourses); Comparative Literature CL 105 (Multicultural Topics in Comparative Literature*), English E 105 (Multicultural Topics in English-Language Literature*); French 120 (Twentieth-Century French Literature*), 125 (African Literature of French Expression); History 144E (Racial Thought in America); Women's Studies 162 (Race and Gender).

Expressive Forms: African American Studies 111A, B, (African American Art), 160 (Special Topics in Expressive Forms); Art History 165 (Studies in American Art*); Dance 110 (World Dance†); Film Studies 190 (when topic is: Melodrama: Black/White); Music 41 (Great Composers*), 78A, B (History of Jazz), 145 (Studies in Twentieth-Century Music*); Social Science 70B (Introduction to Expressive Forms in American Society), 70T (The History of Minorities in American Films), 176A (Afro-Latin American Music); Studio Art 100 (Special Topics in Studio Art*), 121 (Issues in Race and Representation*), 123 (Issues in Cultural Display*).

Genders and Sexualities: African American Studies 170 (Special Topics in Genders and Sexualities); Women's Studies 180 (Gender, Feminism, and Anthropology*), 181 (Gender, Feminism, and Cognitive Psychology*).

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* When topic is on African American or African diasporic topics.

† Two quarters, when content is on African American or African diasporic topics.

NOTE: Although some courses may be included in one or more of these lists as well as in the elective list, they will count only once toward satisfaction of the program requirements.

Students must meet on a quarterly basis with their designated faculty advisor who will review their plan of study.

Requirements for the Minor

Completion of African American Studies 40A, 40B, 40C and four courses (16 units) selected from Historical, Political, and Social Formations; Discourses; Expressive Forms; and Genders and Sexualities; or from the elective list available in the program office.

Students select their courses in consultation with their designated faculty advisor. No more than two of these courses may be in the student's major department.

Residence Requirement for the Minor: Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

Courses in African American Studies

LOWER-DIVISION

10 Gospel Choir (2). Learning about and performing American spirituals and gospel songs. Approach is one of cultural scholarship rather than "musically straight." Performances are given throughout the year. May be repeated for credit. Same as Music 7.

40A, B, C African American Studies I, II, III (4, 4, 4). Introduction to the main contours of the African American experience, from the importation of Africans into the Americas to the present. **40A:** Focus on the unique expressions of African American society and culture. Same as History 15B. **40B:** Development, characteristics, and significant ideas of "race" in America, from colonial times into the twentieth century. **40C:** African American culture and identity. **(IV, VII-A)**

50 Introductory Topics in African American Studies (4). Introduction to a broad range of topics in African American studies, exploring history, literature, art, culture, politics, and contemporary social issues. Topical organization of courses addresses issues that have been of importance historically and are reshaping the African diaspora today. May be repeated for credit as topics vary.

UPPER-DIVISION

110 Historical, Political, and Social Formations (4). Topics which promote critical investigation into the historical, political, and social formations associated with the African diaspora. May be repeated for credit as topics vary.

111A African American Art: 1650–1900 (4). In Anglo-America, an African visual heritage tied to "pagan" beliefs collided with an iconoclastic Protestant culture. Against the odds, African American architecture, crafts, decorative arts, painting, sculpture, and photography emerged.

111B African American Art: 1900–Present (4). From the "New Negro" to black cybernauts, the twentieth century has seen an explosion of African American visual culture. What artistic and social forces produced a Kara Walker or a Jean Michel Basquiat? Is their art ethnically distinct? Aesthetically valid?

121 African American Politics (4). Examines the politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions. Same as Political Science 124E.

130 Special Topics in Discourses (4). Inscripted systems of ideology, knowledge, and value in literature, philosophy, and science. May be repeated for credit as topics vary.

131 Race and Visual Representations (4). Why is it good to be "color blind" about race? How do race and vision intersect in our increasingly visual culture? These are some of the questions to be explored via theories of representation and histories of art, fashion, film, and photography.

139 The Black Protest Tradition (4). History and discourses of the black protest tradition. Traces the emergence of black protest against racial slavery and white supremacy from the early colonial period to the present and the complex elaboration of identity politics within black communities in the twentieth century. Prerequisites: satisfactory completion of the lower-division writing requirement; upper-division standing. Formerly African American Studies 141.

140 New World Slave Societies and Their Legacies (4). Provides a comparative examination of New World slave societies in the Americas—Mexico, Brazil, Barbados, South Carolina, Jamaica, Haiti, Cuba, and others. Emergence of racial slavery; resistance to European domination; interpenetration of European, African, and Amerindian cultures; legacies of racial slavery.

150 Special Topics in African American Studies (4). Designed to provide students with an opportunity to do advanced work in African American studies. May be repeated for credit as topics vary.

151 Comparative Minority Politics (4). Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements. Same as Asian American Studies 132, Chicano/Latino Studies 147, and Political Science 124C. **(VII-A)**

160 Special Topics in Expressive Forms (4). Expressions of ideology, knowledge, and value in media (e.g., dance, film, music, and others). May be repeated for credit as topics vary.

170 Special Topics in Genders and Sexualities (4). Expressions of genders and sexualities across the spectrum of African American experience and creativity. May be repeated for credit as topics vary.

180 African American Studies Seminar (4). Offers students focused work on a single topic in African American studies. The emphasis is on generating student responses to the material covered in the form of oral and written reports. May be repeated for credit as topics vary.

181 Advanced Studio Topics (4). Provides an intensive and specialized working environment for practice of a variety of fine arts as practiced in African American traditions; painting, drawing, sculpture, photography, video, music, digital arts, and performance. May be repeated for credit as topics vary.

198 Directed Group Study (1 to 4). Special topics through directed reading. Paper required. Prerequisite: consent of instructor. May taken for credit for a total of 24 units.

199 Independent Study (1 to 4). Investigation of special topics through directed reading. Paper required. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

GRADUATE

399 University Teaching (4) F, W, S. Limited to teaching assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

DEPARTMENT OF ART HISTORY

85 Humanities Instructional Building; (949) 824-6635
James D. Herbert, **Department Chair**

Faculty

George Bauer, Ph.D. Princeton University, *Professor of Art History* (Renaissance and Baroque)

Linda Freeman Bauer, Ph.D. Institute of Fine Arts, New York University, *Professor of Art History* (Renaissance and Baroque)

Anna Gonosová, Ph.D. Harvard University, *Associate Professor of Art History* (Byzantine and Medieval art)

James D. Herbert, Ph.D. Yale University, *Department Chair and Professor of Art History* (modern European art, critical theory)

Judy C. Ho, Ph.D. Yale University, *Associate Professor of Art History* (Chinese art, archaeology, common religion, Buddhist art)

Branden W. Joseph, Ph.D. Harvard University, *Assistant Professor of Art History* (contemporary art and critical theory)

Philip Leider, M.A. University of Nebraska, *Senior Lecturer with Security of Employment Emeritus, Art History*

Margaret M. Miles, Ph.D. Princeton University, *Associate Professor of Art History and Classics* (Greek and Roman art, archaeology)

Felicity D. Scott, Ph.D. Princeton University, *Assistant Professor of Art History* (modern and contemporary architecture)

Sally A. Stein, Ph.D. Yale University, *Associate Professor of Art History* (American art, history of photography, feminist theory)

Dickran Tashjian, Ph.D. Brown University, *Professor Emeritus of Art History* (American art and literature, American and European avant-garde, art and technology)

Judith A. Wilson, Ph.D. Yale University, *Assistant Professor of African American Studies and Art History* (African American visual culture, postcolonial art and theory, race representation in American visual culture)

Cécile Whiting, Ph.D. Stanford University, *Associate Dean for Humanities Graduate Study and Research and Professor of Art History* (American art and culture, feminist theory)

Bert Winther-Tamaki, Ph.D. Institute of Fine Arts, New York University, *Associate Professor of Art History* (Modern Japanese art, Asian American art, art and nationalism)

Undergraduate Program

Art History is the study of works of art and other visual artifacts from all regions of the world and all periods of history. Consequently, the undergraduate curriculum in Art History, with its global perspective, is one of the most diverse disciplines in the humanities. Through Art History students learn how to describe and interpret a range of objects including sculpture, painting, photography, architecture, and so-called "new media" such as video or performance art. These skills, along with the program's intense focus on writing and verbal expression, prepare students to think critically and to express themselves clearly at a time when visual communication is becoming ever more important. Because works of art are always created within a larger cultural context, Art History courses are a good way to understand what other places or times were like. Students may explore, for example, ancient Greece, nineteenth-century Japan, or even the twenty-first century United States. Majors in Art History are thus welcome to take related courses in other fields of the humanities. Students are encouraged to pursue the study of language beyond the minimum requirements, and because of its international perspective, Art History is a particularly good major for students interested in studying abroad. There are many study centers throughout the world associated with the University's Education Abroad Program. Special scholarships are available for the Pacific region program.

CAREERS FOR THE ART HISTORY MAJOR

Following their graduation, students with a B.A. in Art History have found employment in art galleries, auction houses, and museums, and they have entered graduate programs with a view to careers in university teaching, curatorial work, and art conservation. Moreover, with its strong emphasis on developing critical skills in writing, speaking, and analysis, Art History also provides an excellent preparation for many other careers. UCI graduates have pursued professional paths ranging from medicine and law, to business and education, to information technologies and architecture. As in the case of arts administration or intellectual property law, some of these professional pursuits have depended on and continue to make use of training in the arts.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Major

One year-long introductory sequence (either Art History 40A, 40B, 40C or 42A, 42B, 42C); eight upper-division courses in art history, with a minimum of one course selected from five of the following six areas: Ancient history (Art History 100–109), Medieval history (110–119), Renaissance/Baroque history (120–129), Modern history (130–149 and 183), Asian history (150–163), and American history (164–165); Art History 190; two quarters of Art History 198.

Students should register for Art History 190 as early as possible in their junior year after completing the University lower-division writing requirement.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

One year-long introductory sequence (either Art History 40A, 40B, 40C or 42A, 42B, 42C); three upper-division courses selected from any three of the following five areas: Ancient history (Art History 100–109), Medieval history (110–119), Renaissance/Baroque history (120–129), Modern history (130–149, 164–165), and Asian history (150–163); and one quarter of Art History 198.

Residence Requirement for the Minor: Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Graduate Study

In conjunction with the Department of Film and Media Studies, the Department of Art History offers a graduate program in Visual Studies. A program description may be found at the end of the School of Humanities section. Graduate courses satisfying the requirements of the program are listed there, as well as below.

Courses in Art History

LOWER-DIVISION

Lower-division courses provide a comprehensive introduction to broad fields of art history, knowledge of some of the most influential monuments of human history, and an acquaintance with basic methods that art historians use to interpret artifacts in many media from many cultures.

40 History of Western Art. A year-long survey of art and culture in the West from prehistory to the present.

40A Ancient (4) F. An overview of prehistoric, Egyptian, Greek, and Roman art. Considers how and why the peoples of antiquity created art and architecture, as well as the significance within its social, religious, and historical contexts. **(IV, VII-B)**

40B Medieval and Renaissance (4) W. Focuses on the art of the Mediterranean area and Europe between ca. A.D. 350 and 1600. By means of movements and artists, examines the cultural identities of the Christian, Islamic, and early modern worlds. **(IV, VII-B)**

40C Baroque and Modern (4) S. The visual arts from the seventeenth to the twentieth centuries. Explores the changing social purposes and meaning of painting, sculpture, and architecture in relation to historical events and to the artists who made them. **(IV, VII-B)**

42A, B, C History of Asian Art (4, 4, 4) F, W, S. A one-year survey of painting, sculpture, architecture and other artifacts in various regions of Asia. Starts with prehistory in 42A (fall quarter) and concludes with modern art in the twentieth century in 42C (spring quarter). Topics include neolithic excavations, pan-Asiatic transmissions of art, developments of art in China and Japan. **(IV, VII-B)**

46 The Nature of Architecture (4). Selected topics determined by individual faculty members dealing with the development of styles and schools in Western architecture and covering all periods.

80 Modern Art and Society. A one-year survey of art and other visual artifacts from the seventeenth century to the present.

80A Art, Class, and Nation in the Seventeenth and Eighteenth Centuries (4) F. Surveys how modern art in Europe emerged alongside new conceptions of class and nation. Investigates the manner in which art, far from simply recording these changes, made them visual form. **(IV, VII-B)**

80B Rationalized Life and Vision in the Nineteenth Century (4) W. Explores how artworks, the built environment, and even vision responded and contributed to industrialization. Attention paid to new visual forms, such as advertisements and photography, that arose from these distinctly modern forces. **(IV, VII-B)**

80C Vision and Self in the Twentieth Century (4) S. Examines how the practices of art, economics, and politics have been closely linked to the development of new accounts of the self within society over the last one hundred years. **(IV, VII-B)**

UPPER-DIVISION

Upper-division courses explore a wide variety of aims and methods —archaeological, historical, and critical—in the study of art. Deeper understanding is obtained by focusing on shorter historical periods, specific cultural contexts, developments in particular media, or certain theoretical problems.

100 Studies in Ancient Art (4). Topics in Egyptian, Prehistoric, and Etruscan art of the Mediterranean area treated with specific reference to relevant cultural and historical settings. Specialized courses in Greek and Roman art are also taught. May be repeated for credit as topics vary. Concurrent with Art History 200.

103 Studies in Greek Art (4) F, W, S. Topics in Greek art, architecture, and topography from the Prehistoric period through the end of the fourth century B.C.E. May be repeated for credit as topics vary.

107 Studies in Roman Art (4) F, W, S. Topics in Hellenistic and Roman art and architecture; stresses historical and political background. May be repeated for credit as topics vary.

110 Studies in Medieval Art (4) F, W, S. Specialized topics in Medieval art and architecture in Europe, the Mediterranean area, and the Near East between the fourth and fifteenth centuries. Examples: the art of the Migration Period, Medieval City. May be repeated for credit as topics vary. Concurrent with Art History 210.

112 Studies in Early Christian and Byzantine Art (4) F, W, S. Selected topics on the development of the art and architecture of the Later Roman and Byzantine Empires between ca. 300 and 1453. Examples: Early Christian architecture, Byzantine painting. May be repeated for credit as topics vary.

114 Studies in Western Medieval Art (4) F, W, S. Selected topics on the development of art and architecture in Western Europe between ca. 700 and 1400. Examples: Romanesque painting, Gothic architecture. Same as Comparative Literature CL 104 or Humanities 110 when topic is appropriate. May be repeated for credit as topics vary.

118 Studies in Medieval Islamic Art (4) F, W, S. Selected topics on the development of art and architecture between the seventh and fifteenth centuries A.D. (first to ninth centuries A.H.) in the Eastern Mediterranean and the Near East after the rise of Islam. May be repeated for credit as topics vary.

120 Studies in Renaissance and Baroque Art (4) F, W, S. Selected topics on the art and architecture of Europe between the fifteenth and eighteenth centuries. Examples: Renaissance and Baroque prints, Bruegel to Rubens. May be repeated for credit as topics vary. Concurrent with Art History 220.

121 Studies in Southern Renaissance Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Italy and Spain. Examples: Renaissance Venice, Age of Michelangelo. May be repeated for credit as topics vary.

123 Studies in Northern Renaissance Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the fifteenth and sixteenth centuries in Northern Europe. Examples: Late Medieval art, painting from Van Eyck to Bosch. May be repeated for credit as topics vary.

125 Studies in Southern Baroque Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Italy and Spain. Example: Rome in the seventeenth century. Same as Comparative Literature CL 104 when topic is appropriate. May be repeated for credit as topics vary.

128 Studies in Northern Baroque Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the seventeenth and eighteenth centuries in Northern Europe. Example: the Age of Rembrandt. May be repeated for credit as topics vary.

130 Studies in Eighteenth-Century Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the eighteenth century. Examples: English art, Neoclassicism. May be repeated for credit as topics vary. Concurrent with Art History 230.

134 Studies in Modern European Art. F, W, S. Varying topics within the period 1643 to 1940. Works of art are studied as cultural, social, and political practices. May be repeated for credit as topics vary. Concurrent with Art History 234A, B, C, D, E.

134A European Art: 1643–1789 (4)

134B European Art: 1789–1851 (4). Formerly Art History 133A.

134C European Art: 1851–1907 (4). Formerly Art History 133B.

134D European Art: 1907–1940 (4). Formerly Art History 133C.

134E Topics in Modern European Art (4). Varies with each offering. Consult with the instructor for specific topic. Formerly Art History 133D.

140 Studies in Contemporary Art. F, W, S. Varying topics within the period 1940 to the present. Works of art are studied as cultural, social, and political practices. May be repeated for credit as topics vary. Concurrent with Art History 240A, B, C.

140A History of Contemporary Art (4)

140B Issues of Contemporary Art (4)

140C Theories of Contemporary Art (4)

145 Studies in the History of Modern and Contemporary Architecture. F, W, S. Varying topics from the late eighteenth century to the present. Architecture and related design practices are studied in relation to social, aesthetic, technological, and political questions. May be repeated for credit as topics vary.

145A Modern Architecture (4)

145B Architecture after 1945 (4)

145C Various Topics (4)

150 Studies in Asian Art (4) F, W, S. Topics include visual studies in China, Japan, Korea, and India. May be repeated for credit as topics vary. Concurrent with Art History 250.

152 Studies in Chinese Art and Religion (4) F, W, S. A study of the rich archaeological finds in mainland China (including tombs and temples) and the development of religious beliefs from the Neolithic through the imperial periods. May be repeated for credit as topics vary.

153 Studies in Early Chinese Painting (4) F, W, S. An examination of the major traditions in painting from the fourth through the thirteenth centuries and the parallel developments in art theory.May be repeated for credit as topics vary.

154 Studies in Later Chinese Painting (4) F, W, S. New developments in Yuan, Ming, and Qing, through modern periods. May be repeated for credit as topics vary.

162 Later Japanese Art and Design. Explores stylistic and technical developments in Japanese visual culture. A cross-section of media such as architecture, crafts, painting, photography, and sculpture are studied in relation to Japanese social and political history. Concurrent with Art History 262A, B, C.

162A Japanese Art: 1615–1868 (4). (VII-B)

162B Japanese Art: 1868–1945 (4). (VII-B)

162C Japanese Art: 1945–Present (4). (VII-B)

163 Asian American Art History (4). F, W, S. Investigation of the Asian American experience expressed by art and visual culture through the twentieth century. Art by Asian Americans of diverse backgrounds as well as the history of visualization of Asian identities in American art/visual culture. May be repeated for credit as topics vary. Concurrent with Art History 263. **(VII-A)**

164 African American Art

164A African American Art: 1650–1900 (4). Explores African American history and identity through the architecture, crafts, decorative arts, graphics, painting, sculpture, and photography produced by North Americans of African descent during the colonial through post-Emancipation eras. **(VII-A)**

164B African American Art: 1900–Present (4). Examines relationships between aesthetic and social struggles in modern architecture, film, graphics, painting, photography, sculpture, video, and new media by African Americans. **(VII-A)**

165 Studies in American Art. F, W, S. Varying topics within the period 1620 to 1950. Works of art are studied in their cultural, social, and political contexts. Concurrent with Art History 265A, B, C, D.

165A American Art: 1620–1800 (4)

165B American Art: 1800–1900 (4)

165C American Art: 1900–1950 (4)

165D Topics in American Art (4). Varies with each offering. Consult with instructor for specific topic. May be repeated for credit as topics vary.

175 Studies in Native and Tribal Art (4) F, W, S. Varying topics on the art and culture of native and tribal societies. For example, North American Indians. May be repeated for credit as topics vary. Concurrent with Art History 275.

180 Criticism of Art (4) F, W, S. Selected topics discussed on the theoretical and/or practical dimensions of art historical criticism. May be repeated for credit as topics vary. Concurrent with Art History 280.

183 Studies in the History of Photography. F, W, S. Varying topics within the history of photography from the early nineteenth century to the present. Photographic practice studied in relation to art history, cultural history, and social history. May be repeated for credit as topics vary. Concurrent with Art History 283A, B, C.

183A Nineteenth-Century Photographic History (4)

183B Twentieth-Century Photographic History (4)

183C Selected Topics in Photographic History (4). Examples: documentary; pictorialism and art photography; photomontage, photographic books.

185 Topics in Visual Studies (4) F, W, S, Summer. Interdisciplinary topics on the cultural analysis of visual artifacts and practices. May be repeated for credit as topics vary.

190 Practicum for Majors (4) W. Theory and practice of art history with emphasis on formal and social models of analyzing and writing about art. Prerequisite: Art History major, junior standing, and completion of the lower-division writing requirement.

198 Proseminar in Art History (4) F, W, S. Discussion and report-oriented seminar with emphasis on reading, writing, and thinking about problems in art history. Topics vary according to the faculty member in charge. Examples: Caravaggio and his followers, Dunhuang painting. Prerequisite: Art History major or consent of instructor. May be repeated for credit as topics vary.

199 Independent Study in Art History (1 to 4) F, W, S. Supervised, but independent reading or research on art historical topics. Prerequisite: consent of supervising instructor. May be taken for credit four times.

GRADUATE

In addition to the courses below, graduate courses satisfying the requirements of the graduate program in Visual Studies are listed in the Visual Studies section of the *Catalogue*. Graduate students may also enroll concurrently in any upper-division lecture class with the approval of the instructor.

200 Studies in Ancient Art (4). Topics in Egyptian, Prehistoric, and Etruscan art of the Mediterranean area treated with specific reference to relevant cultural and historical settings. Specialized courses in Greek and Roman art are also taught. May be repeated for credit as topics vary. Concurrent with Art History 100.

210 Studies in Medieval Art (4) F, W, S. Specialized topics in Medieval art and architecture in Europe, the Mediterranean area, and the Near East between the fourth and fifteenth centuries. Examples: the art of the Migration Period, Medieval City. May be repeated for credit as topics vary. Concurrent with Art History 110.

220 Studies in Renaissance and Baroque Art (4) F, W, S. Selected topics on the art and architecture of Europe between the fifteenth and eighteenth centuries. Examples: Renaissance and Baroque prints, Bruegel to Rubens. May be repeated for credit as topics vary. Concurrent with Art History 120.

230 Studies in Eighteenth-Century Art (4) F, W, S. Selected topics determined by individual faculty members exploring historical developments and individual artists of the eighteenth century. Examples: English art, Neoclassicism. May be repeated for credit as topics vary. Concurrent with Art History 130.

234 Studies in Modern European Art. F, W, S. Varying topics within the period 1643 to 1940. Works of art are studied as cultural, social, and political practices. May be repeated for credit as topics vary. Concurrent with Art History 134A, B, C, D, E.

234A European Art: 1643–1789 (4)

234B European Art: 1789–1851 (4). Formerly Art History 233A.

234C European Art: 1851–1907 (4). Formerly Art History 233B.

234D European Art: 1907–1940 (4). Formerly Art History 233C.

234E Topics in Modern European Art (4). Varies with each offering. Consult with the instructor for specific topic. Formerly Art History 233D.

240 Studies in Contemporary Art. F, W, S. Varying topics within the period 1940 to the present. Works of art are studied as cultural, social, and political practices. May be repeated for credit as topics vary. Concurrent with Art History 140A, B, C.

240A: History of Contemporary Art (4)

240B: Issues of Contemporary Art (4)

240C: Theories of Contemporary Art (4)

250 Studies in Asian Art (4) F, W, S. Topics include visual studies in China, Japan, Korea, and India. May be repeated for credit as topics vary. Concurrent with Art History 150.

262 Later Japanese Art and Design. Explores stylistic and technical developments in Japanese visual culture. A cross-section of media such as architecture, crafts, painting, photography, and sculpture are studied in relation to Japanese social and political history. Concurrent with Art History 162A, B, C.

262A Japanese Art: 1615–1868 (4)

262B Japanese Art: 1868–1945 (4)

262C Japanese Art: 1945–Present (4)

263 Asian American Art History (4) F, W, S. Investigation of the Asian American experience expressed by art and visual culture through the twentieth century. Art by Asian Americans of diverse backgrounds as well as the history of visualization of Asian identities in American art/visual culture. Concurrent with Art History 163.

265 Studies in American Art. F, W, S. Varying topics within the period 1620 to 1950. Works of art are studied in their cultural, social, and political contexts. Concurrent with Art History 165A, B, C, D.

265A American Art: 1620–1800 (4)

265B American Art: 1800–1900 (4)

265C American Art: 1900–1950 (4)

265D Topics in American Art (4). Varies with each offering. Consult with instructor for specific topic. May be repeated for credit as topics vary.

275 Studies in Native and Tribal Art (4) F, W, S. Varying topics on the art and culture of native and tribal societies. For example, North American Indians. May be repeated for credit as topics vary. Concurrent with Art History 175.

280 Criticism of Art (4) F, W, S. Selected topics discussed on the theoretical and/or practical dimensions of art historical criticism. May be repeated for credit as topics vary. Concurrent with Art History 180.

***283 Studies in the History of Photography.* F, W, S.** Varying topics within the history of photography from the early nineteenth century to the present. Photographic practice studied in relation to art history, cultural history, and social history. May be repeated for credit as topics vary. May be repeated for credit as topics vary. Concurrent with Art History 183A, B, C.

283A Nineteenth-Century Photographic History (4)

283B Twentieth-Century Photographic History (4)

283C Selected Topics in Photographic History (4). Examples: documentary; pictorialism and art photography; photomontage, photographic books.

399 University Teaching (4) F, W, S. Limited to teaching assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

DEPARTMENT OF ASIAN AMERICAN STUDIES

300 Murray Krieger Hall; (949) 824-2746
R. Radhakrishnan, **Department Chair**

Core Faculty

Yong Chen, Ph.D. Cornell University, *Associate Professor of History and Asian American Studies* (Asian American history)

Dorothy Fujita-Rony, Ph.D. Yale University, *Associate Professor of Asian American Studies and History* (U.S. history, Asian American studies)

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Asian American Studies and English* (Asian American literature, post-colonial literature)

Claire Jean Kim, Ph.D. Yale University, *Associate Professor of Asian American Studies and Political Science* (racial and ethnic politics, protest and social movements, contemporary political theory)

Karen Leonard, Ph.D. University of Wisconsin, *Professor of Anthropology* (social history of India, caste, ethnicity and gender, Asian Americans in the United States)

John M. Liu, Ph.D. University of California, Los Angeles, *Senior Lecturer with Security of Employment, Asian American Studies* (race/ethnic/minority relations; economy and society)

Glen Mimura, Ph.D. University of California, Santa Cruz, *Assistant Professor of Asian American Studies* (independent film and video, theory and methods, and popular culture)

R. Radhakrishnan, Ph.D. State University of New York, Binghamton, *Department Chair and Professor of Asian American Studies and Professor of English and Comparative Literature* (critical theory, Asian American literature and theory, cultural studies, twentieth-century literature, diasporic and ethnic literatures and theories)

Linda Trinh Võ, Ph.D. University of California, San Diego, *Associate Professor of Asian American Studies* (Southeast Asian American communities, Asian American women, race relations, and ethnography)

Affiliated Faculty

Kei Akagi, B.A. International Christian University, *UCI Chancellor's Professor of Music*

Laura H. Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies and Comparative Literature*

Kyung Hyun Kim, Ph.D. University of Southern California, *Associate Professor of East Asian Languages and Literatures*

Jennifer Lee, Ph.D. Columbia University, *Associate Professor of Sociology*

Daphne Pi-Wei Lei, Ph.D. Tufts University, *Assistant Professor of Drama*

Simon Leung, B.A. University of California, Los Angeles, *Assistant Professor of Studio Art*

Akira Mizuta Lippit, Ph.D. The Johns Hopkins University, *Department Chair and Professor of Film and Media Studies*

Sanjoy Mazumdar, Ph.D. Massachusetts Institute of Technology, *Professor of Social Ecology*

Yong Soon Min, M.F.A. University of California, Berkeley, *Department Chair and Associate Professor of Studio Art*

Kaushik Sunder Rajan, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Anthropology*

Charles J. Wheeler, Ph.D. Yale University, *Assistant Professor of History*
Duncan R. Williams, Ph.D. Harvard University, *Assistant Professor of East Asian Languages and Literatures*
Bert Winther-Tamaki, Ph.D. Institute of Fine Arts, New York University, *Associate Professor of Art History*
Hu Ying, Ph.D. Princeton University, *Associate Professor of East Asian Languages and Literatures*

The Department of Asian American Studies examines the historical and contemporary experiences of Asians after their arrival in the United States. The curriculum seeks to provide an awareness of the history, culture (e.g., literary and creative art accomplishments), psychology, and social organization of Asian American communities. Students are invited to participate and partake in broadening their understanding of multicultural perspectives within U.S. society. The Department offers a B.A. degree program in Asian American Studies, an honors program, a minor, and a graduate emphasis.

In addition to regular UCI faculty, lecturers who teach on a quarterly basis are an integral part of the Department. A current list of participants is available in the office.

Scholarship Opportunities. The Ching-Suei Su Endowed Memorial Scholarship is awarded annually to sophomores or juniors who are majoring in Asian American Studies, East Asian Languages and Literatures, or Linguistics (with an emphasis on an East Asian language) and who demonstrate academic excellence and campus or community service.

CAREER OPPORTUNITIES

Many career opportunities exist for students who graduate with a B.A. degree in Asian American Studies, such as service with national and international organizations which seek knowledge of American multicultural society in general, and of Asian American peoples and cultures in particular; positions as area specialists with state and federal government agencies; careers in the private sector with corporations or private organizations which have a significant portion of their activities in the U.S. and the Pacific Rim; and positions of service and leadership within Asian American communities. Students may also continue their education and pursue professional or graduate degrees.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Humanities Core Course substitution for transfer Asian American Studies majors: Four semester courses or six quarter courses equivalent to the following UCI course work: Writing 39B and 39C; a three-quarter Humanistic Inquiry sequence; and one additional lower-division Humanistic Inquiry course. No Asian American Studies courses may count toward the Core Course substitution.

Departmental Requirements for the Major

A. Five core courses: Asian American Studies 60A, 60B, 60C, 100, 101.

B. Eight upper-division electives (two from each of the following areas): Asian American Studies 110-129 (Humanities/Arts), 130-149 (Social Science/Social Ecology), 151-160 (Asian American Sub-groups), 161-170 (Ethnic/Race/Gender Relations).

C. One course in history, cultural, or political institutions of Asia selected from the following departments: Anthropology, Art History, East Asian Languages and Literatures, History, Political Science, Sociology, Studio Art.

D. One elective course selected from Asian American Studies or from the interdepartmental list available from the Department office. Electives may include Independent Studies/Special Studies courses: Asian American Studies 190-199. Students may request, by petition, one lower-division course to count as an elective.

Students must meet on a quarterly basis with their designated faculty advisor who will review their plan of study.

Residence Requirement for the Major: A minimum of five upper-division courses required for the major must be completed successfully at UCI.

Honors Program in Asian American Studies

The Honors Program in Asian American Studies provides an opportunity for outstanding students to develop their research skills through an intensive study of a topic that is of special interest to them. The program is open to senior Asian American Studies majors who have a 3.3 GPA in Asian American Studies (at least five courses) and a 3.0 GPA overall, and who have successfully completed Asian American Studies 100 (Research Methodologies) before spring quarter of their junior year.

Honors students participate in a three-part sequence, Asian American Studies H190A-B-C, in which they develop research skills, pursue fieldwork, and complete an honors thesis on a topic of their choice under the guidance of a departmental faculty member. During fall quarter, the first part of this sequence introduces students to a range of key methodological issues in Asian American Studies. In the second part, students work closely with their Faculty Advisor to develop research and writing skills; the first draft of their thesis is to be completed at the end of winter quarter. During spring quarter, students revise their thesis and complete it by the end of the quarter. The thesis is evaluated by the Faculty Advisor and must also be approved by the Department Chair of Asian American Studies. Upon successful completion of the sequence, students graduate with Honors in Asian American Studies.

Requirements for the Minor

Asian American Studies 60A, 60B, 60C, 101, and four upper-division courses selected from Asian American Studies 100–169, 190–199.

Residence Requirement for the Minor: Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

GRADUATE EMPHASIS IN ASIAN AMERICAN STUDIES

The Department of Asian American Studies offers a graduate emphasis in Asian American Studies, which is available in conjunction with selected departmental graduate programs. Students in the graduate emphasis complete a minimum of four courses, including Asian American Studies 200A and 200B, and two electives, one of which is selected from the student's own department or area of interest, and the other from a discipline outside that department or area.

Subject to the requirements of participating academic units, Ph.D. students in the emphasis will have at least one Asian American Studies core faculty member on their qualifying examination and dissertation committees. With the approval of the Asian American Studies Graduate Committee, affiliated faculty members can sit in place of the core faculty. (There are no requirements concerning qualifying examinations or theses for master's students.)

Applicants to the emphasis must be admitted to a participating UCI graduate program. For complete information about application policies and procedures, as well as the requirements of the emphasis, see one of the Asian American Studies faculty members.

Courses in Asian American Studies

LOWER-DIVISION

50 Introductory Topics in Asian American Studies (4). Introduction to a broad range of topics in Asian-American studies, exploring history, literature, art, culture, politics, and contemporary social issues. May be repeated for credit as topics vary.

51 Introduction to Asian American Politics (4). Examines the political experiences of Asian immigrants and Asian Americans from the mid-1800s to the present, with a special focus on how an Asian American identity came to be constructed and deployed in the struggle for political equality. Same as Political Science 27A. **(VII-A)**

60A Introduction to Asian American Studies I (4). Examines and compares the diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include: origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Same as History 15C and Social Science 78A. **(III, VII-A)**

60B Introduction to Asian American Studies II (4). Examines the renewal of Asian immigration following World War II. Focuses on domestic and international conditions influencing the liberalization of U.S. immigration laws, and the impact of contemporary Asian immigration on the U.S. political economy and social order. Same as Social Science 78B. **(III, VII-A)**

60C Introduction to Asian American Studies III (4). Analyzes the Asian American experience in comparative perspective, which includes comparisons of different ethnic and racial groups, and across gender and class. Possible topics include labor, economy, politics, migration, nation, popular culture, gender, family, sexuality, and multiraciality. Same as Social Science 78C. **(III, VII-A)**

UPPER-DIVISION

100 Research Methodologies for Asian American Studies (4). Explores various research methodologies for Asian American Studies combining theoretical knowledge with field research. Goals: conduct field research about immigrants and refugees from Asia. Topics vary: migration and labor, assimilation and cultural preservation, cultural expressions in the diaspora. Prerequisites: satisfactory completion of the lower-division writing requirement. Formerly Asian American Studies 100A.

101 Globalization, Diaspora, and Racialization (4). Studies the relationship between globalization and racialization and comparatively examines the racialization of Asians in the U.S. with the experiences of other Asians in the diaspora. Attention paid to the cultural expressions of racialization as creation, representation, adaptation, and resistance. Same as Social Science 177A. Formerly Asian American Studies 100B. **(VII-A)**

110 Asian American Writers (4). Literary analysis of Asian American writers' representations of issues of identity, class, history among others. Variety of literary forms—novel, poem, drama, essay—included in a study of a variety of Asian American ethnic groups. May be repeated for credit as topics vary. **(VII-A)**

111 Asian American History (4). Introduction to important themes in the history of people of Asian ancestry in the United States from the nineteenth century to the present. May be repeated for credit as topics vary. **(VII-A)**

111A Chinatowns in the U.S. (4). Discusses the various communities that Chinese Americans have established in different places and at different times; their significance for Chinese Americans and their prominent place in American racial consciousness. **(VII-A)**

112 Asian American Art History (4). Investigation of Asian American experience expressed by art and visual culture throughout the twentieth century. Art by Asian Americans of diverse backgrounds as well as the history of cultural visualization of Asian identities in American art/visual culture. May be repeated for credit as topics vary.

114 Asian American Film and Video (4). Topics include histories of Asian American film and video, including documentaries, experimental, short subjects, feature-length independent film, and other forms of cinematic expression. Explores issues of identity (national, racial, gendered, among others). May be repeated for credit as topics vary.

115 Asian American Media and Arts (4). Includes the study of Asian American history and society through the analysis of a variety of media forms such as painting, music, cinema, video, and other artistic representations. May be repeated for credit as topics vary.

131 Asian American Politics (4). Provides various overviews of politics within Asian American communities. May compare with African American and/or Latino politics. May be repeated for credit as topics vary.

132 Comparative Minority Politics (4). Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements. Same as African American Studies 151, Chicano/Latino Studies 147, and Political Science 124C. **(VII-A)**

133 Asian American Family (4). Examines the representations and experiences of Asian American families from diverse standpoints. Analyzes the similarities and differences among family structures with particular attention to cultural values, gender roles, and domestic violence. Same as Social Science 177D. **(VII-A)**

135 Special Topics in Asian American Social Sciences and Social Ecology (4). Explores a broad range of issues in Asian American social sciences and social ecology. May be repeated for credit as topics vary. **(VII-A)**

141 Asian American Psychology (4). Examines the social and psychological concerns of Asian Americans; e.g., coping with racial prejudice, maintaining bicultural identities, dealing with cross-cultural conflicts in interracial relationships, and trying to reconcile generational differences between immigrant parents and their American-born children. Same as Psychology 174A. **(VII-A)**

142 Muslim Identities in North America (4). Explores multiple identities of Muslims in North America, including indigenous Muslims (e.g., African American Muslims and Sufis) and immigrants of many national origins. Explores religious, political, cultural, ethnic, class differences among American Muslims, turning to Islamic institutions near UCI to conduct small research projects. Same as Anthropology 125Z. **(VII-A)**

150 Special Topics in Asian American Studies (4). Analyzes a variety of themes in Asian American Studies—identity, history, culture—from various interdisciplinary perspectives in humanities, arts, social sciences. May be repeated for credit as topics vary. **(VII-A)**

151 Asian American Ethnic Groups (4). Topics include study of the history, culture, and social formations of diverse Asian American subgroups such as Pacific Islanders, Hmong, Thai, Indonesian, Indian subcontinental, among others. May be repeated for credit as topics vary. **(VII-A)**

151A Filipina/Filipino American History Pre-1965 (4). Introduces students to major themes and issues of pre-1965 Filipina/Filipino American history: nationalism, migration, labor, region, colonization, social organizations, and education. **(VII-A)**

151B Filipina/Filipino American History Post-1965 (4). Explores the history of Filipina/Filipino Americans in the post-1965 era. Examines migration, colonization, labor; investigates community formation focusing on Los Angeles, Hawai'i, and San Diego. Undertakes issues surrounding politics, education, the arts, and identity. **(VII-A)**

151C The Korean American Experience (4). Explores the factors that have distinctly shaped the Korean American experience, including patterns of racial domination, the profile of immigrant flow, immigrant roles in the urban political economy, politics in Korea, and the role of the church. Same as Social Science 178C. **(VII-A)**

151D The Vietnamese American Experience (4). Studies the resettlement of Vietnamese in the United States following their exodus from Southeast Asia. Topics discussed include the Vietnam War, the 1975 evacuation, boat and land refugees, the shaping of Vietnamese communities, and Vietnamese American literature. Same as Social Science 178D. **(VII-A)**

151E The Japanese American Experience (4). Studies the settlement of Japanese in Hawaii and the continental United States since the late nineteenth century. Topics covered include sugar plantations, development of rural Japanese America, World War II internment, post-War community development, and persistence of Japanese American identity. Same as Social Science 178E. **(VII-A)**

151F South Asian American Experience (4). Examines and compares the experiences of South Asian immigrants in the U.S. over time. Looks at the economic, political, and social positions of the immigrants, with special emphasis on religious changes and the changes in the second and later generations. Same as Anthropology 125Y.

151G Asian Americans and Pacific Islanders (4). Discusses the different histories, cultures, religious practices of Asian Americans and Pacific Islanders. Examines the experiences of indigenous peoples and Asian immigrants in the Pacific and their links to the continental United States. **(VII-A)**

151H Southeast Asian American Experience (4). Analyzes experiences of refugees and immigrants from Cambodia, Laos, and Vietnam. Examines political and economic factors for their exodus and how they reconstruct their identities, families, and communities. Issues include educational experiences, public policies, social services, occupational options, homeland relations. Same as Social Science 178H. **(VII-A)**

151J Chinese American Experience (4). Analyzes the experiences of Chinese in the United States. Immigration, Chinese exclusion, racial and gender identity. Historical overview and contemporary issues covered. Same as Social Science 178J. **(VII-A)**

151K Filipina/Filipino American Experience (4). Explores the experience of Filipina/Filipino Americans from the era of Spanish colonization of the Philippines to present-day community formations in the United States, with special emphasis on the twentieth century. Topics include colonialism, nation, migration, gender, and culture. Same as Social Science 178K. **(VII-A)**

161 Ethnic and Racial Communities (4). Examines various theoretical analyses of race and ethnicity, particularly as they apply to Asian Americans. Also explores the relationship of Asian Americans to other racialized minorities in the U.S. Same as Social Science 175B. **(VII-A)**

162 Asian American Women (4). Examines the representations and experiences of Asian American women from diverse perspectives. Explores the commonalities and differences among various groups of Asian American women, with particular focus on history, culture, values, and family roles. Same as Social Science 177B. **(VII-A)**

163 Asian American Women's Film (4). Explores the social significance of film and video made by Asian American women in relation to issues of race, representation, and social change. These film and video makers use these media to raise complex issues of class, politics, and race interacting with gender. May be repeated for credit as topics vary.

164 Special Topics in Ethnicity, Gender, and Race (4). Topics include analysis and comparison of various themes related to ethnicity, gender, and race within the Asian American communities. May be repeated for credit as topics vary. **(VII-A)**

165 Vietnamese American Women (4). Focuses on sociopolitical forces that have shaped the lives of Vietnamese American women, including colonization, militarization, dislocation, and diaspora. Examines how women negotiate their participation in the labor force, and issues of identity formation and cultural representation. Same as Social Science 177C. **(VII-A)**

171 Topics in Asian Studies (4). Various surveys of topics focusing on Asia/Asian cultures, arts, histories, social and political institutions. May be repeated for credit as topics vary. **(VII-B)**

171A Comparative International Migration (4). Examines the migration patterns to the four largest nations that receive immigrants (i.e., permanent settlers): Australia, Canada, Israel, and the United States. Special attention to increasing importance of Asian migrants in the economic and cultural fabric of *each* nation. **(VII-B)**

173 Topics in East Asian Studies (4). Analysis of East Asian literary works in translation. Taught in English. May be repeated for credit as topics vary. **(VII-B)**

H190A Asian American Studies Honors Seminar I (4). First of a three-quarter honors sequence. Students explore key methodological issues in Asian American Studies and craft their own research project. Methodologies may include library research, historical research, literary review, cultural analysis, ethnographic interviews, participant observation, and data collection. Prerequisites: successful completion of Asian American Studies 100; 3.3 GPA in Asian American Studies courses and 3.0 GPA overall.

H190B Asian American Studies Honors Tutorial II (4). In the second of the three-part honors sequence, students work closely with a Faculty Advisor on their chosen research project. Emphasis is given to the writing process. At the end of the quarter, students are to complete the first draft of their thesis. Prerequisite: Asian American Studies H190A.

H190C Asian American Studies Honors Tutorial III (4). In the last of the honors sequence, students revise their thesis based on constructive comments from their Faculty Advisor. A final draft of the thesis is evaluated by the Faculty Advisor and the Department Chair of Asian American Studies. Prerequisite: Asian American Studies H190B.

197 Field Research: Asian Immigrants and Refugees in Orange County (4). Instruction in field work methodology via research projects involving the local communities of immigrants and refugees from Asia. Open only to School of Social Sciences and Asian American Studies majors. Same as Anthropology 161T. **(VII-A)**

199 Independent Study (1 to 4). Directed reading and research in consultation with a faculty member. Substantial written work required. Prerequisite: consent of sponsoring faculty member. May be repeated for credit.

GRADUATE

200A Theory and Methods in Asian American Studies (4). Introduction to the interdisciplinary intersection of the social sciences, humanities, and other fields that constitute the theory and methodology of Asian American Studies. Focuses on the interventions and contestations within Asian American Studies that have transformed the discipline in recent years. Prerequisite: graduate standing.

200B Contemporary Issues in Asian American Studies (4). Examines the interrelations between history, theory, and race in the aftermath of the twentieth-century decolonial movements, offering an account of race through postcolonial and postnationalist approaches in comparative, multiregional contexts. Considers the interventions made by transnational feminist and racialized queer critiques. Prerequisite: graduate standing.

201 Graduate Topics in Asian American Studies (4). Seminars on various topics in Asian American Studies. Prerequisite: graduate standing. May be repeated for credit as topics vary.

250 Advanced Topics in Asian American Studies (4). Seminar covering various areas of research within Asian American Studies as an interdisciplinary field. Recommended for advanced graduate students.

290 Directed Research (4 to 12). Directed graduate study/research in Asian American Studies. Prerequisite: graduate standing. May be taken for credit for a total of 24 units. Formerly Asian American Studies 299.

291 Directed Reading (4). Readings focused on specialized topics. Prerequisite: graduate standing and consent of instructor. May be taken for credit for a total of 12 units.

399 University Teaching (4). Limited to teaching assistants. Must be admitted to the graduate emphasis in Asian American Studies. Satisfactory/Unsatisfactory only. May be taken for credit six times.

DEPARTMENT OF CLASSICS

120 Humanities Office Building II; (949) 824-6735
Maria C. Pantelia, **Department Chair**

Faculty

Luci Berkowitz, Ph.D. Ohio State University, *Professor Emerita of Classics* (Greek literary history, computer applications to literature)
Theodore F. Brunner, Ph.D. Stanford University, *Professor Emeritus of Classics* (computer application to Classical literature, Augustan literature)
Cynthia L. Claxton, Ph.D. University of Washington, *Lecturer in Classics with Security of Employment, Undergraduate Program Director, and Graduate Teaching Supervisor* (Greek prose, historiography)
Walter Donlan, Ph.D. Northwestern University, *Professor Emeritus of Classics* (early Greek literature and social history)
Richard I. Frank, Ph.D. University of California, Berkeley, *Professor Emeritus of History and Classics* (Roman history, Classical tradition)
Max Goldman, Ph.D. Brown University, *Lecturer in Classics* (Latin poetry, ancient novel, literary criticism)
Susan Lape, Ph.D. Princeton University, *Assistant Professor of Classics* (Athenian law, Hellenistic Greek history, comedy, political theory)
Margaret M. Miles, Ph.D. Princeton University, *Associate Professor of Art History and Classics* (Greek and Roman art, archaeology)
Maria C. Pantelia, Ph.D. Ohio State University, *Department Chair and Professor of Classics and Director, Thesaurus Linguae Graecae®* (Greek epic, Hellenistic poetry, digital technologies in the humanities)
B. P. Reardon, D.U. Université de Nantes, *Professor Emeritus of Classics* (Late Greek literature, Greek novel)
Patrick Sinclair, Ph.D. Northwestern University, *Professor Emeritus of Classics* (rhetoric, Latin prose, lexicography)
Dana F. Sutton, Ph.D. University of Wisconsin, *Professor of Classics* (Greek and Latin drama, Greek poetry, Anglo-Latin literature)
Nicholas White, Ph.D. Harvard University, *Professor of Philosophy and Classics* (Greek philosophy, ethics, epistemology)
Andrew Zissos, Ph.D. Princeton University, *Assistant Professor of Classics and Graduate Advisor* (Latin epic, medieval Latin, Roman culture)

Undergraduate Program

The Department of Classics aims to provide the undergraduate student with a working knowledge of the origins and heritage of Greco-Roman civilization. The Department is committed to a twofold purpose: (1) disseminating interest in and knowledge of Classical Civilization through the teaching of Greek and Latin language and literature; and (2) helping students, through courses in Classical literature, history, civilization, mythology, and religion taught through English translations, to appreciate the achievements of Greek and Roman culture and their pervasive influence on our own civilization.

The Department offers both a major in Classics (with an emphasis on Greek, Latin, or Linguistics) and a major in Classical Civilization in which most of the required courses are in English translation. Students are encouraged to consult with the Classics faculty regarding the appropriate choice of major and design of their programs.

For the Classics major, study of the Classics must be based on competence in both Greek and Latin. The Classics program is designed to provide the student with this competence as rapidly as possible, so that by the end of first-year Greek or Latin the student has already been introduced to some of the major Classical authors in the original language. From then on, courses are devoted to reading and interpreting the literature of ancient Greece and Rome. In addition to their training in the languages, students increase their knowledge of the literature, history, and thought of the ancient world through the close study of some of its finest writers.

The major in Classical Civilization is designed for students who do not plan to concentrate on the Classical languages or pursue graduate study in the Classics, yet wish to obtain an undergraduate degree based on a sound knowledge of the Classical world. This major requires one year of study (or its equivalent) in either Greek or Latin and a minimum of 10 courses taught in English translation concerning such topics as Classical literature, civilization, history, archaeology, art, drama, and philosophy.

Students entering UCI with previous Greek or Latin training can be given advanced standing. Usually, one year of high school work is equated with one quarter of UCI work. Thus, students with one, two, three, or four years of high school Latin (or Greek) will enroll in Latin (or Greek) 1B, 1C, and 100A or 100B, respectively. Placement may vary, depending on the extent of the student's preparation. Students with transfer credit for Greek and/or Latin may *not* repeat those courses for credit. Students with high school training in the Classical languages are encouraged to consult with the Classics faculty before enrolling in Classics courses.

The Department adheres to the policy of giving its students an opportunity to participate in the departmental decision-making process. Student representatives, elected from and by the undergraduate majors, participate in all open departmental meetings. Representatives are responsible for maintaining close liaison with their constituency, for representing the students' interest in curriculum and personnel matters, and for the evaluation of both the academic program and the academic staff.

Inquiries regarding language placement, prerequisites, planning a program of study, or other matters related to the Department's offerings should be directed to the Office of the Chair, 120 Humanities Office Building II, telephone (949) 824-6735.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for Majors

Two separate majors: Classics (with an emphasis in Greek, Latin, or Linguistics) and Classical Civilization.

Classics (Greek emphasis): Classics 36A, B, C; six upper-division courses in Greek 100–104; Greek 110; three upper-division courses in Latin 100–104. Greek 120 may be substituted for Greek 100–104.

Classics (Latin emphasis): Classics 37A, B, C; six upper-division courses in Latin 100–104; Latin 110; three upper-division courses in Greek 100–104.

Classics (Linguistics emphasis): two possible plans of study. *Greek concentration*—six upper-division courses in Greek 100–104; three upper-division courses in Latin 100–104; Linguistics 3, 10, 20, 170 (Greek 120 recommended) or *Latin concentration*—six upper-division courses in Latin 100–104; three upper-division courses in Greek 100–104; Linguistics 3, 10, 20, 170.

Classical Civilization: Latin (or Greek) 1A-B-C, or equivalent; Classics 36A, B, C *or* 37A, B, C *or* 45A-B-C; five upper-division Classics courses; two additional upper-division courses in related fields such as Classical history, Classical philosophy, or Classical art. These two courses may be taken in another UCI department.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for Minors

The Department offers minors in Greek, Latin, and Classical Civilization.

Greek: Greek 1A-B-C; six upper-division courses in Greek 100–104. Greek 120 may be substituted for one course at the 100 level.

Latin: Latin 1A-B-C; six upper-division courses in Latin 100–104.

Classical Civilization: Classics 36A, B, C *or* 37A, B, C *or* 45A-B-C; five upper-division Classics courses, one of which may be in a related field such as history, art history, or philosophy.

Residence Requirement for the Minor: Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

PLANNING A PROGRAM OF STUDY

The Department believes in close consultation with students on academic advising and program planning. Students planning to major (or minor) in Classics or Classical Civilization are strongly urged to consult with the departmental faculty at the earliest possible moment to learn about the various programs.

Single-Subject Waiver Program in Latin. The California Commission on Teacher Credentialing (CCTC)-approved Single-Subject Waiver Program in Latin is designed to provide the prospective teacher with rigorous training in all aspects of the Latin language and culture. First and foremost is language competency: students are required to take four years of college-level Latin or the equivalent. Emphasis is placed upon the acquisition of firm grammatical understanding, as expert mastery of Latin grammar enables a teacher to use inductive approaches to Latin learning as well as more traditional methods. In addition, students are required to complete the historical/cultural survey class, Classics 37A, B, C, in order to gain an understanding of the history and culture of Rome in its Mediterranean context. Students are also asked to take several upper-division Classical Civilization classes on Roman topics in order to deepen their understanding of ancient Rome. Because vocabulary-building skills are now often taught along with Latin, students are required to take Classics 5, an etymology class. Through Linguistics 3, students gain a theoretical understanding of the nature of language. Classics 201 provides students with an introduction to the use of technology in the classroom by focusing upon electronic resources in Classics; it enables students to utilize these resources in teaching, to construct Web pages, and to integrate multimedia tools into the classroom. For students with undergraduate degrees from other institutions, some substitutions for these requirements are permitted. Every effort is made to work with the student's previous undergraduate training. Specific course requirements are available in the Classics Department. Students interested in completing the waiver program in Latin are encouraged to contact the Undergraduate Advisor in the Classics Department or a Department of Education advisor.

The Department of Classics encourages students to take advantage of educational opportunities abroad while making progress toward their UCI degree. Classics and Classical Civilization majors and minors can benefit from a broader perspective of the field by studying for periods ranging from one quarter to one year at any number of universities all over the world through the UC Education Abroad Program. Students can also augment their exposure to Greek, Latin, and Classical civilizations by studying for a summer or during the academic year in Greece or Italy at programs sponsored by other academic institutions through the International Opportunities Program. See the Department of Classics Undergraduate Program Director for additional information.

CAREER OPPORTUNITIES

The study of the ancient world is a valuable possession for modern life. The discipline of Classics is an important part of a well-rounded education. Greek and Latin language and literature, history and philosophy, mythology and religion make an excellent basis for exploring all periods of Western culture down to the present day. Classics is an interdisciplinary study, exploring human culture by a variety of methods from a variety of points of view. For this reason, the student who chooses to major in Classics or Classical Civilization may find many professional opportunities open.

Graduate and professional schools in medicine, law, management, and other fields welcome students with training in Classics. So do many business corporations. Business, industry, and technology are well acquainted with the value of an education in Classics. They are aware that students with a strong background in a respected and challenging major such as Classics are disciplined thinkers who can express themselves in clear, coherent, and cogent language, capabilities that are considered valuable in future physicians, lawyers, and managers.

There are also specific vocational opportunities open to the graduate in Classics or Classical Civilization. A major in this field may lead to a career in high school teaching, or (after appropriate further study) in college or university teaching. It is also an excellent preparation for advanced study in other academic disciplines such as archaeology, history, comparative literature, philosophy, and linguistics, as well as for theological studies and for work in a wide range of the humanities and social sciences.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on résumé preparation, job search, and interview techniques. See the Career Center section for additional information.

The University of California Tri-Campus Graduate Program in Classics

UC IRVINE, UC RIVERSIDE, AND UC SAN DIEGO

Anthony Edwards, **Director**

Faculty

Georgios Anagnostopoulos, Ph.D. Brandeis University, *Professor of Philosophy,* UCSD (Ancient Greek philosophy, ethics, metaphysics)

Luci Berkowitz, Ph.D. Ohio State University, *Professor Emerita of Classics,* UCI (Greek literary history, computer application to literature)

Theodore F. Brunner, Ph.D. Stanford University, *Professor Emeritus of Classics,* UCI (computer application to Classical literature)

Charles Chamberlain, Ph.D. University of California, Berkeley, *Lecturer in Classics and Comparative Literature,* UCSD (Greek and Latin literature, Aristotle, poetics)

Cynthia L. Claxton, Ph.D. University of Washington, *Lecturer in Classics with Security of Employment, Undergraduate Program Director, and Graduate Teaching Supervisor,* UCI (Greek prose, historiography)

Walter Donlan, Ph.D. Northwestern University, *Professor Emeritus of Classics,* UCI (early Greek literature, Greek social history)

Page duBois, Ph.D. University of California, Berkeley, *Professor of Classics and Comparative Literature,* UCSD (Greek literature, rhetoric, critical theory, cultural studies)

Anthony Edwards, Ph.D. Cornell University, *Director of the UC Tri-Campus Graduate Program in Classics and Professor of Classics and Comparative Literature,* UCSD (epic, Greek comedy, critical theory)

Leslie Collins Edwards, Ph.D. Cornell University, *Lecturer in Classics and Comparative Literature,* UCSD (Homer, Greek drama, education in ancient Greece)

Richard I. Frank, Ph.D. University of California, Berkeley, *Professor Emeritus of History and Classics,* UCI (Roman history, Latin elegy and satire, classical tradition)

David Glidden, Ph.D. Princeton University, *Professor of Philosophy,* UCR (Greek and Roman philosophy)

Max Goldman, Ph.D. Brown University, *Lecturer in Classics, UCI* (Latin poetry, ancient novel, literary criticism)

Anna Gonosová, Ph.D. Harvard University, *Associate Professor of Art History,* UCI (Byzantine and Medieval art)

Susan Lape, Ph.D. Princeton University, *Assistant Professor of Classics* (Athenian law, Hellenistic Greek history, comedy, political theory)

Edward N. Lee, Ph.D. Princeton University, *Professor Emeritus of Philosophy,* UCSD (Greek philosophy, Plato)

Marianne McDonald, Ph.D. University of California, Irvine, *Professor of Theatre and Classics,* UCSD (Greek and Roman theatre, ancient drama in modern plays, film, and opera)

Margaret M. Miles, Ph.D. Princeton University, *Associate Professor of Art History and Classics,* UCI (Greek and Roman art and archaeology, ancient Sicily, Greek religion)

Alden A. Mosshammer, Ph.D. Brown University, *Professor Emeritus of History,* UCSD (early Christian thought, Greek chronography, early Greek history)

Sheldon Nodelman, Ph.D. Yale University, *Associate Professor of Visual Arts,* UCSD (Classical art and architecture, Roman portraiture, critical theory)

Maria C. Pantelia, Ph.D. Ohio State University, *Department Chair and Professor of Classics and Director, Thesaurus Linguae Graecae®,* UCI (Greek epic, Hellenistic poetry, digital technologies in the humanities)

Wendy Raschke, Ph.D. State University of New York, Buffalo, *Lecturer in Classics,* UCR (Roman satire, Greek art and archaeology)

B. P. Reardon, D.U. Université de Nantes, *Professor Emeritus of Classics,* UCI (Late Greek literature, ancient novel)

Dylan Sailor, Ph.D. University of California, Berkeley, *Assistant Professor of Classics and Comparative Literature,* UCSD (ancient historiography, Roman literature and culture of the Principate, cultural history)

Michele Salzman, Ph.D. Bryn Mawr College, *Professor of History,* UCR (Late antiquity; Roman history and literature, religion, women's studies)

Gerasimos Santas, Ph.D. Cornell University, *Professor of Philosophy,* UCI (ancient philosophy, history of philosophy, ethics)

Thomas F. Scanlon, Ph.D. Ohio State University, *Professor of Classics,* UCR (Greek and Roman historiography, ancient athletics)

Gary Shiffman, Ph.D. University of Michigan, *Assistant Professor of Political Science,* UCSD (Greek political theory)

Patrick Sinclair, Ph.D. Northwestern University, *Professor Emeritus of Classics,* UCI (Roman historiography, rhetoric)

Dana F. Sutton, Ph.D. University of Wisconsin, *Professor of Classics,* UCI (Greek and Latin drama, Greek poetry, Anglo-Latin literature)

Nicholas White, Ph.D. Harvard University, *Professor of Philosophy and Classics,* UCI (ancient philosophy, ethics, epistemology/metaphysics)

Eliot Wirshbo, Ph.D. University of Pennsylvania, *Lecturer in Classics and Comparative Literature,* UCSD (Greek epic, folklore)

Andrew Zissos, Ph.D. Princeton University, *Assistant Professor of Classics and Graduate Advisor,* UCI (Latin epic, medieval Latin, Roman culture)

The UC Tri-Campus Graduate Program in Classics is a joint venture that combines faculty in Classics and related disciplines from the three southernmost University of California campuses—UC Irvine, UC Riverside, and UC San Diego.

Students accepted into the program may enroll at any of the three campuses, but normally apply for admission through UCI, which is the main location for instruction and administration. Applications are reviewed by an admissions committee composed of faculty members from all three campuses.

The goal of the program is to provide a graduate education that unites the main currents of modern literary, cultural, and social-scientific theory with the traditional skills and methodologies of classical philology. Candidates for degrees are expected to exhibit facility in Greek and Latin, competence in research, including theoretical approaches to texts and objects, technical mastery of computing for research and teaching, and experience in teaching. These goals are realized through the four core courses (Classics 200A-B-C and 201) and seminars (Classics 220).

All entering students are admitted into the Ph.D. program. With the exception of those granted advanced standing because they hold the M.A. degree in Classics from another institution, entering students may be awarded an M.A. along the way, however, the M.A. degree is not requisite for the Ph.D. requirements.

Master of Arts in Classics

The requirements for the M.A. degree are two years (six quarters) of course work, passage of a special set of examinations, and completion of a Master's paper. M.A. students must successfully complete a minimum of 12 approved, seminar-level courses. The normal course load is three 200-level courses each quarter distributed as follows: nine quarters of Classics 220; three quarters of Classics 200A-B-C, and 201; a fourth quarter may be substituted for a Classics 220. Up to one quarter of Classics 290 for research and writing of the Master's paper may be substituted for a Classics 220. If remedial work is required in Greek or Latin, with the Graduate Advisor's approval, one enhanced upper-division Greek or Latin course (enrolled as a Classics 280) may be substituted for a Classics 220. With the Graduate Advisor's approval, M.A. students may substitute one external graduate seminar in a relevant area outside of Classics (at any of the three participating campuses) for a Classics 220. A reading knowledge of either German, French, Italian, or an equivalent language, demonstrated by examination or other means, is also required. At the end of a student's M.A. studies, a positive vote of the program faculty is necessary for continuation in the Ph.D. program. The expected time for completion of the M.A. degree is two years.

Doctor of Philosophy in Classics

The requirements for the Ph.D. degree are three years (nine quarters) of course work. Minimum course requirements are four quarters of Classics 200A-B-C, and 201; 12 quarters of Classics 220; two external graduate seminars, from departments or programs outside of Classics. These may be taken from the offerings of any of the three campuses. Students may take up to two quarters of enhanced upper-division Greek or Latin courses (enrolled as 280s) in place of Classics 220s with permission of the Graduate Advisor if remedial work is required in Greek or Latin. Where appropriate, in the third year of course work, a second Classics 200A, B, or C, may be substituted for a 220. Classics 280, Independent Study (supervised research), may be substituted for Classics 220s *only with the permission of the Graduate Advisor.* Up to 12 equivalent graduate-level courses completed elsewhere may be substituted for Tri-Campus Program courses with approval of the Joint Executive Committee. Classics 280 may be used, normally in the fourth year, to provide time to work on the Greek and Latin reading lists and to prepare for Qualifying Examinations, but these courses do not count toward the required 18 courses. Students are encouraged to take courses and seminars in relevant areas outside the program at any of the three campuses. At this stage, and during the fourth year of study, students are expected to have read extensively in the primary texts, in literary history and theory, and in ancient history. In addition, experience in supervised teaching and/or research activity is normally required. In order to qualify as a candidate for the Ph.D. and enter the dissertation stage, a student must pass a set of seven qualifying examinations, including Greek and Latin translation, Greek and Roman history, history of Greek and Roman literature, a "special area" that can be fulfilled by either an extensive research paper or by a three-hour written examination, and an oral examination administered by the candidacy committee to be taken only after the other examinations have been passed. Ph.D. students must also demonstrate reading proficiency in one modern research language (normally German and French or Italian) by the end of their second year either through appropriate course work or by examination. Proficiency in a second modern research language is expected by the end of the third year. The normal time for advancement to candidacy is four years. The normal time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

The facilities, course offerings, programs, and individual faculty mentorship of all three campuses are available to students in the UC Tri-Campus Graduate Program in Classics. In addition, program resources are enhanced through a cooperative teaching arrangement among the Tri-Campus Program and the Classics graduate program at UC Los Angeles and at the University of Southern California.

Thesaurus Linguae Graecae®

The Thesaurus Linguae Graecae® (TLG®) is a research center at UCI. TLG® has created a digital library of Greek literature, a unique resource for research in Greek literary and linguistic studies. Although administratively separate, TLG® is closely affiliated with the Department of Classics. Information is available in the Research and Graduate Studies section of this *Catalogue.*

Undergraduate Courses

Several of the Department of Classics' upper-division undergraduate courses are offered as variable-topics courses, that is, the topics addressed change from quarter to quarter. Contact the Department office for a list of recently offered topics.

Courses in Greek

1A-B-C Fundamentals of Greek (5-5-5) F, W, S. 1A-B: Elements of Classical Greek grammar, syntax, and vocabulary. **1C:** Introduction to reading texts. Greek 1A-B-C and Greek S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamentals of Greek (7.5-7.5) Summer. First-year Greek in an intensified form. Same as Greek 1A-B-C during academic year. Will be offered if enrollment warrants; those interested should contact the Department. Prerequisite for S1AB: none; for S1BC: S1AB or 1B, or two years of high school Greek. Greek S1AB-BC and Greek 1A-B-C may not both be taken for credit. (S1BC: **VI**)

97 Fundamentals of Greek (with Emphasis on Reading) (4). Designed primarily for students interested in acquiring a solid reading knowledge of Greek, and to facilitate the understanding and translating of Greek texts dealing with a variety of disciplines. Not open to Classics majors or minors or Greek minors. Does not serve as a prerequisite for any higher-level Greek courses or fulfill any undergraduate foreign language requirement.

99 Special Studies in Greek (1 to 4) F, W, S. Consultation with instructor necessary prior to registration. May be repeated for credit as topics vary.

100A Readings in Greek Prose (4) F. Selected readings of Greek prose authors with particular emphasis paid to the fundamentals of Greek prose style, together with grammar review. Possible authors include Xenophon, Herodotus, and Plato. Prerequisite: Greek 1C or equivalent, or consent of the Department. **(VII-B)**

100B Readings in Greek Poetry (4) F. Selected readings from Greek poetry with particular emphasis paid to the peculiarities and difficulties of reading Greek poetry, together with an introduction to metrics. Possible authors include Homer and Euripides. Prerequisite: Greek 1C or equivalent, or consent of the Department. **(VII-B)**

103 Seminar in Greek Prose (4) W, S. Specialized and focused study of a particular Greek prose author or topic. Prerequisite: Greek 100A or equivalent, or consent of the Department. May be repeated for credit as topics vary. **(VII-B)**

104 Seminar in Greek Poetry (4) W, S. Specialized and focused study of a particular topic or author of Greek poetry. Prerequisite: Greek 100B or equivalent, or consent of the Department. May be repeated for credit as topics vary. **(VII-B)**

110 Greek Prose Composition (4). Studies in Greek grammar and syntax through composition of sentences and passages in Greek prose. Prerequisite: Greek 100A or equivalent, or consent of the Department.

120 Reading of Selected Portions of the New Testament (4). Portions read may change each time course is offered. May be repeated for credit provided content varies. Prerequisite: Greek 1C or equivalent.

198 Directed Group Study (4-4-4) F, W, S. Special topics in Greek culture and civilization through directed reading and research. Consultation with instructor necessary prior to registration.

199 Independent Studies in Greek (1 to 4) F, W, S. Consultation with instructor necessary prior to registration. May be repeated for credit as topics vary.

Courses in Latin

1A-B-C Fundamentals of Latin (5-5-5) F, W, S. 1A-B: Elements of Latin grammar, syntax, and vocabulary. **1C:** Introduction to reading texts, including study of the poetry of Catullus and selected readings. Latin 1A-B-C and Latin S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamentals of Latin (7.5-7.5) Summer. First-year Latin in an intensified form. Same as Latin 1A-B-C during academic year. Will be offered if enrollment warrants; those interested should contact the Department. Prerequisite for S1AB: none; for S1BC: S1AB or 1B, or two years of high school Latin. Latin S1AB-BC and Latin 1A-B-C may not both be taken for credit. (S1BC: **VI**)

97 Fundamentals of Latin (with Emphasis on Reading) (4). Designed primarily for students interested in acquiring a solid reading knowledge of Latin, and to facilitate the understanding and translating of Latin texts dealing with a variety of disciplines. Not open to Classics majors or minors or Latin minors. Does not serve as a prerequisite for any higher-level Latin courses or fulfill any undergraduate foreign language requirement.

99 Special Studies in Latin (1 to 4) F, W, S. Consultation with instructor necessary prior to enrollment. May be repeated for credit as topics vary.

100A Readings in Latin Prose (4) F. Selected readings of Latin prose authors with particular emphasis paid to the fundamentals of Latin prose style, together with grammar review. Possible authors include Cicero, Caesar, and others. Prerequisite: Latin 1C or equivalent, or consent of the Department. **(VII-B)**

100B Readings in Latin Poetry (4) F. Selected readings from Latin poetry with particular emphasis paid to the peculiarities and difficulties of reading Latin poetry, together with an introduction to metrics. Possible authors include Vergil and Ovid. Prerequisite: Latin 1C or equivalent, or consent of the Department. **(VII-B)**

103 Seminar in Latin Prose (4) W, S. Specialized and focused study of a particular Latin prose author or topic. Prerequisite: Latin 100A or equivalent, or consent of the Department. May be repeated for credit as topics vary. **(VII-B)**

104 Seminar in Latin Poetry (4) F, W, S. Specialized and focused study of a particular topic or author in Latin poetry. Prerequisite: Latin 100B or equivalent, or consent of the Department. May be repeated for credit as topics vary. **(VII-B)**

110 Latin Prose Composition (4). Studies in Latin grammar and syntax through composition of sentences and passages in Latin prose. Prerequisite: Latin 100A or equivalent, or consent of the Department.

198 Directed Group Study (4-4-4) F, W, S. Special topics in Roman culture and civilization through directed reading and research. Consultation with instructor necessary prior to enrollment.

199 Independent Studies in Latin (1 to 4) F, W, S. Consultation with instructor necessary prior to enrollment. May be repeated for credit as topics vary.

Courses in Classics

LOWER-DIVISION

5 Building English Vocabulary through Greek and Latin Roots (4). Formation and use of English words from Greek and Latin derivatives. Particularly useful for first-year students who wish to augment their vocabulary systematically.

10 Scientific and Specialized Terminology (4). A study of English terms derived from Greek and Latin and important to contemporary medicine, science, and other professions, with emphasis on development of word-building skills. No prior knowledge of Greek or Latin required. For undergraduates, particularly those in the sciences, interested in development of their technical vocabulary.

36A, B, C The Formation of Ancient Greek Society (4, 4, 4). An overview of ancient Greek civilization and its interactions with other cultures of the Mediterranean world. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion. Same as History 36A, B, C.

36A Early Greece (IV)

36B Late Archaic and Classical Greece (IV)

36C Fourth-Century and Hellenistic Greece (IV)

37A, B, C The Formation of Ancient Roman Society (4, 4, 4). A survey of the principal aspects of Roman civilization from its beginnings to the so-called Fall of the Roman Empire in C.E. 476. Focuses on political history and ideology, social history, literature, art and architecture, and religion. Same as History 37A, B, C.

37A Origins to Roman Republic (IV)

37B Roman Empire (IV)

37C The Roman Legacy (IV)

45A-B-C Classical Mythology (4-4-4) F, W, S. An overview of the main myths of the ancient Greeks and Roman and their influence in literature and art throughout time. Includes readings from ancient and modern sources and utilizes modern technology.

45A The Gods (IV)

45B The Heroes (IV)

45C Ancient and Modern Perspectives of Classical Mythology. Topics vary. **(IV)**

75 Introduction to Classical Rhetoric (4). Introduction to the principles of rhetoric among the ancient Greeks and Romans and to the critical analysis of arguments. Students are introduced to the history, law, and politics that provided the context in which ancient rhetoric operated.

99 Special Studies in Classics (1 to 4) F, W, S. Consultation with instructor necessary prior to enrollment.

UPPER-DIVISION

111 The Thesaurus Linguae Graecae (4). Exposes undergraduate students to the history, objectives, and activities of UCI's Thesaurus Linguae Graecae and provides them with basic understanding of the principles and procedures inherent in computer application to literary texts. Prerequisite: one year of ancient Greek, or consent of instructor.

140 Classics and History: The Ancient World (4). Selected topics in society and culture of the Graeco-Roman world. May be repeated for credit provided topic varies. Readings in translation.

150 Classical Mythology (4). Selected myths and legends as used in Classical literature, and their modern interpretations.

151 The Olympians (4). Examination of the origins and development of the Greek Olympian divinities with emphasis upon those who became central figures in pre-Christian religious cults.

160 Topics in Classical Literature in English Translation (4). Subject matter variable. May be repeated for credit provided topic varies.

165 New Testament Literature (4). Analysis of texts and their literary, historical, and religious contexts.

170 Topics in Classical Civilization (4). Subject matter variable. May be repeated for credit provided topic varies.

175 Multicultural Studies and the Classics (4). Treats the literature and culture of one or more minority groups in California and the United States in relation to Classical literatures. May be repeated for credit as topics vary. **(VII-A)**

176 International Studies and the Classics (4). Develops a broader understanding of the formation of different cultures and countries of Classical times and their impact on the modern world. May be repeated for credit as topics vary. **(VII-B)**

198 Directed Group Study (4-4-4) F, W, S. Special topics in Classical studies through directed reading and research. Consultation with instructor necessary prior to registration.

199 Independent Studies in Classics (1 to 4) F, W, S. Consultation with instructor necessary prior to registration.

TRI-CAMPUS GRADUATE COURSES IN CLASSICS

The topics offered in these courses vary from quarter to quarter. Contact the Department of Classics office for a list of recently offered topics.

200A Contemporary Literary Theory and the Classics (4). An introduction to contemporary literary theory focusing on important critical approaches; topics vary from year to year. May be repeated for credit as topics vary.

200B Diachronic Perspectives on Classical Antiquity (4). Examines ways in which Classical texts and ideas have been received and appropriated for the diverse purposes of ancient and subsequent cultures. May be repeated for credit as topics vary.

200C Greece and Rome in Their Contemporary Cultural Contexts (4). An introduction to the methods and perspectives of social scientific theory which can be used to study the material and social dimensions of the ancient cultures of Greece and Rome. May be repeated for credit as topics vary.

201 Computing in Classical Studies (4). An introduction to the latest methods of computing for research and teaching. May be repeated for credit as topics vary.

205 Concurrent Reading (2). Concurrent enrollment with advanced undergraduate courses with enhanced reading and separate examinations. May be repeated for credit as topics vary.

220 Classics Graduate Seminar (4). Subject matter variable; mainly but not exclusively major literary topics. May be repeated for credit as topics vary. Same as Art History 295 when topic is appropriate.

280 Independent Study (4). Supervised independent research. Subject varies.

290 Research in Classics (4-4-4) F, W, S

299 Dissertation Research (4 to 12) F, W, S. May be repeated for credit. Satisfactory/Unsatisfactory only.

399 University Teaching (4) F, W, S. Limited to Teaching Assistants. May be repeated for credit.

DEPARTMENT OF COMPARATIVE LITERATURE

435 Humanities Instructional Building; (949) 824-6712
Rei Terada, **Department Chair**

Faculty

Dina Al-Kassim, Ph.D. University of California, Berkeley, *Assistant Professor of Comparative Literature* (British, American, French, Arabic, Anglophone and Francophone modernism; postcolonial critique)

Etienne Balibar, Docteur en philosophie, Katholieke Universiteit Nijmegen, *Professor of French and of Comparative Literature* (critical theory, political philosophy)

Lindon Barrett, Ph.D. University of Pennsylvania, *Director of African American Studies and Professor of Comparative Literature* (critical theory, African American cultural studies)

Alexander Gelley, Ph.D. Yale University, *Professor of Comparative Literature* (eighteenth- and nineteenth-century European novel, critical theory)

Jonathan M. Hall, Ph.D. University of California, Santa Cruz, *Assistant Professor of Comparative Literature* (Japanese literary, cultural, and cinematic history; critical theories of East Asia; East Asian cinema; psychoanalytic and queer theory)

Renée Riese Hubert, Ph.D. Columbia University, *Professor Emerita of Comparative Literature and French* (literature and fine arts, modern poetry, surrealism, Romanticism)

Wolfgang Iser, Ph.D. University of Heidelberg, *Professor of English* (eighteenth-century English literature, modern novel, critical theory)

Susan Jarratt, Ph.D. University of Texas at Austin, *Campus Writing Coordinator and Professor of Comparative Literature* (histories and theories of rhetoric, composition pedagogy and teacher preparation, feminist theory and pedagogy)

Adriana M. Johnson, Ph.D. Duke University, *Assistant Professor of Comparative Literature* (Latin American literature, nineteenth- and twentieth-century Latin America, cultural and postcolonial studies)

Laura H. Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies, Comparative Literature, and English* (feminist epistemologies and theories, cultural studies, ethnic studies)

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Asian American Studies, Comparative Literature, and English* (Asian American literature, post-colonial literature)

Dragan Kujundzic, Ph.D. University of Southern California, *Director of Russian Studies and Associate Professor of Russian and Comparative Literature* (Russian and Slavic literatures, Russian film, critical theory, modernism)

Karen R. Lawrence, Ph.D. Columbia University, *Dean of the School of Humanities and Professor of English and Comparative Literature* (twentieth-century literature, travel writing, women's writing, the novel)

Julia Reinhard Lupton, Ph.D. Yale University, *Professor of English* (Renaissance literature, literature and psychology)

Juliet Flower MacCannell, Ph.D. Cornell University, *Professor Emerita of Comparative Literature* (eighteenth-century French literature, modern semiotics, comparative literature)

Steven Mailloux, Ph.D. University of Southern California, *UCI Chancellor's Professor of Rhetoric* (rhetoric, critical theory, American literature, law and literature)

J. Hillis Miller, Ph.D. Harvard University, *UCI Distinguished Research Professor of English and Comparative Literature* (Victorian literature, critical theory)

Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature* (sixteenth- and seventeenth-century German literature, contemporary theory and criticism, feminism)
Ngugi wa Thiong'o, *Director of the International Center for Writing and Translation and UCI Distinguished Professor of Comparative Literature and English* (African and Caribbean literatures, theater and film, performance studies, cultural and political theory)
Margot Norris, Ph.D. State University of New York, Buffalo, *Professor of English and Comparative Literature* (modern Irish, British, American and continental modernism; literature and war)
R. Radhakrishnan, Ph.D. State University of New York, Binghamton, *Department Chair and Professor of Asian American Studies and Professor of English and Comparative Literature* (critical theory, Asian American studies, poststructuralism, postcoloniality, globalization, nationalisms, diasporas)
John Carlos Rowe, Ph.D. State University of New York, Buffalo, *Professor Emeritus of Comparative Literature* (American literature, modern literature, critical theory)
Annette Schlichter, Ph.D. Humboldt University of Berlin, *Assistant Professor of Comparative Literature* (feminist theory and criticism, queer theory, contemporary American literature, gender and literature)
Gabriele Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature* (modern literature, critical theory, psychoanalysis)
Martin Schwab, Ph.D. University of Bielefeld, *Director of the Minor in Humanities and Law and Professor of Philosophy and Comparative Literature* (philosophy and aesthetics)
Rei Terada, Ph.D. Boston University, *Department Chair and Professor of Comparative Literature and Professor of English* (critical theory, poststructuralism, nineteenth- and twentieth-century poetry)

Comparative Literature reaches beyond any single national culture to consider relations between various literatures and cultures, methods of study, periods, and media. Because it does not limit study by nation, language, period, or medium, Comparative Literature tends to orient itself by defining and analyzing questions. Hence, Comparative Literature emphasizes theoretical approaches (critical theory, political theory, feminism, psychoanalysis, and more) and produces new theories. Areas in which the Department of Comparative Literature offers courses include post-colonial studies, comparative American studies, critical theory, film studies, rhetoric, and queer theory.

CAREERS FOR THE COMPARATIVE LITERATURE MAJOR

The study of Comparative Literature trains students to do independent research, learn languages, and think and write analytically, always in an international context. This helps qualify majors for careers in education, international relations, law, government, communications, or journalism, and for graduate study in the humanities, education, or law. An undergraduate degree in Comparative Literature is widely taken to indicate intellectual ambition.

Undergraduate Program

Comparative Literature offers a major and a minor. The major focuses on the study of literature and culture from around the globe and across historical periods. While students in Comparative Literature will study novels, plays, films, and poems written in English, emphasis is placed on works originally in other languages. Most of these will be studied in translation; to ensure that students have the experience of encountering another culture from the inside, however, two upper-division courses must be taken in literature in an original language other than English. Another key component of the program is the study of critical theory, or the methods required to think about works analytically and philosophically. Comparative Literature is well suited for students interested in international issues, the history of inter- and cross-cultural contact, and the ways in which literatures and cultures dialogue with one another across time and space. Most Comparative Literature classes are small and intimate and emphasize student discussion.

The Department also sponsors meetings and activities for majors so that students can get to know one another.

The Comparative Literature 50A, B, C series introduces students to a geographically and chronologically broad selection of works not limited to the western tradition. This series studies literatures and cultures in dialogue and in a historically intensive way, and through the lenses of genre and medium. Transfer students may be required to take one or more courses in this sequence, depending on the courses they have taken previously.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Comparative Literature Major

CL 50A, B, C; CR 100A; CL 101; CL 102; CL 106; and four additional upper-division courses, two of which must be Comparative Literature courses and two of which may be drawn from Comparative Literature, English, Creative Writing, or upper-division literature courses in a foreign language (in addition to any such courses used to fulfill the Comparative Literature foreign language requirement).

Competence in a foreign language sufficient for reading and understanding literature and culture in that language, fulfilled by two upper-division courses in literature or culture in that language.

NOTE: One upper-division course in literature or culture in translation may substitute for one upper-division course in a foreign language. If this option is taken, students are usually required to match language and literature (e.g., if the student's foreign language is German, then the student must take a course in German literature or culture in translation).

Some languages, such as Chinese, Japanese, Korean, and Russian, ordinarily require three years of language study for competence. Students who wish to study these languages may take three years of language training and one approved upper-division course in literature or culture of that language in translation in order to fulfill the major's language requirement. Here again, literature and language should be matched. If the student intends to go on to graduate work, the study of a second foreign language is highly recommended.

Study abroad through the UC Education Abroad program is encouraged.

Residence Requirement for the Comparative Literature Major: CR 100A, CL 101, and three upper-division literature courses must be completed successfully at UCI.

Departmental Requirements for the Comparative Literature Minor

CL 50A, B, C; CR 100A; CL 101; one upper-division CL course; and one upper-division foreign language literature course or a third year of language in languages such as Chinese, Japanese, Korean, and Russian.

Residence Requirement for the Comparative Literature Minor: Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved by the appropriate program advisor or chair.

PLANNING A PROGRAM OF STUDY

The Department offers close consultation for academic planning. All students should plan courses of study with faculty advisors. Students who wish to pursue double majors, special programs, or study abroad are urged to seek advising as early as possible.

Graduate Program

Comparative Literature faculty are particularly equipped to guide students with interests in critical theory, postcolonial studies, and comparative American studies. Comparative Literature is engaged with disciplines such as psychoanalysis, rhetoric, political theory, narrative theory, and gender studies, and many small seminars in these fields are offered. The M.A. degree is considered to be a step toward the Ph.D.; only students intending to complete the doctorate are admitted to the program. Applicants must hold a B.A. or equivalent degree and should normally have majored in Comparative Literature, English, or a foreign literature. Majors in other disciplines (e.g., philosophy, history, visual studies, women's studies, ethnic studies) will be considered, provided that a sufficient background in literary and cultural studies and in at least one foreign language is demonstrated.

The Department offers a track in (1) Comparative Literature with an emphasis in a literary tradition, (2) Comparative Literature with an emphasis in Translation Studies, and (3) Comparative Literature with an emphasis in Critical Theory. (See the departmental graduate student handbook for a description of these emphases.) Graduate students in Comparative Literature may also complete a course of study with an emphasis in Translation Studies or an emphasis in Chinese Language and Literature, Classics, East Asian Cultural Studies, French, German, Japanese Language and Literature, or Spanish. Emphases in Asian American Studies, Feminist Studies, and Critical Theory are available through the School of Humanities. Within these emphases, students enroll in sequences of courses that highlight individual interests and expertise. In consultation with advisors, students may also develop individualized curricula that cut across these and other offerings in the Department and School.

A minor field specialization is recommended. This optional component promotes engagement with a field or methodology outside the student's specialization. It may be of a national, historical, disciplinary, or methodological nature, with the student of western post-modern literary theory and forms engaging in a focused study of ancient Greek or Roman philosophy and culture, for example, or the student of East Asian languages and diasporic literatures may work in anthropology or ethnography. This optional component of the student's program may be fulfilled through course work, independent studies, or a Qualifying Examination topic.

For the graduate student in Comparative Literature, proficiency in foreign languages is essential. Ability to study theoretical and literary traditions in their original languages (e.g., Chinese, French, German, Italian, Japanese, Korean, Spanish, or Russian) is usually expected, and a classical language (Arabic, Greek, and Latin) is indispensable. The student's own area of specialization may require the mastery of still other languages. Competence in two foreign languages is required for the Ph.D. and is verified through examination.

The Department recognizes that most of its graduate students intend to become teachers, and believes that graduate departments should be training college teachers as well as scholars—indeed, that teaching and scholarship complement one another. Thus candidates for the Ph.D. are expected to acquire experience in teaching, and all Ph.D. candidates gain supervised training as part of the seminar work required for the degree.

Several substantial fellowships are available to graduate students. The Schaeffer Fellowship provides $20,000 plus fees for up to two years to Ph.D. students in Comparative Literature for whom translation will be a crucial element of their dissertation work. Scholars translating literary or historical texts or archival materials not previously reliably available in English as part of their dissertation research are eligible. Multiple fellowships per year may be awarded. Students interested in the Schaeffer Fellowship should contact the Department prior to applying to the Ph.D. program.

The Murray Krieger Fellowship in Literary Theory is the foremost fellowship in the Humanities and one of the largest at UCI. It is intended for an outstanding entering graduate student who is pursuing the Ph.D. in Comparative Literature or English and who demonstrates a primary interest in theory as theory relates to literary texts. It consists of a five-year support package, including a fellowship during the first year and a teaching assistantship for four years. Also included is a readership in the René Wellek Collection. A range of other fellowships is also available to students in the Department.

Master of Arts in Comparative Literature

Entering students are assigned a faculty advisor who usually serves as the chair of the student's M.A. examination committee (which consists of at least two other members of the faculty). Nine courses and an examination are required to complete the degree. The normal academic load for both M.A. and Ph.D. candidates is three courses a quarter; teaching assistants take two courses in addition to earning credit for University teaching. Only in exceptional circumstances will students be permitted to undertake programs of less than six full courses during the academic year.

The M.A. examination is normally taken during the quarter in which the student completes course work. For the examination, the candidate submits an M.A. paper and a statement of purpose outlining past and future course work and preliminary plans for the Ph.D. qualifying examination. The M.A. examination consists of a discussion of the student's paper and the statement of purpose. In practice, it resembles an extended advising session, but with particularly close attention to the student's paper.

Doctor of Philosophy in Comparative Literature

The doctoral program in Comparative Literature prepares the student for a professional career in the research and teaching of comparative literary and cultural studies. Some students also choose to enter professions (e.g., specialized research, nonprofit organizations, international cultural exchange) in which the specialized work in a specific field indicated by an advanced degree is highly desirable.

Normally, students who have not done graduate work at another university must complete at least 16 courses. Upon completion of the course work, the student takes a qualifying examination on six areas formulated by the student in consultation with the four faculty members who make up the examination committee. The topics should combine historical breadth and some generic variety with specialization. The examination is part written, part oral, according to a formula decided by the student and the committee. The examination as a whole should reflect the student's ability to work in at least two foreign languages.

After passing the qualifying examination, the student forms a dissertation committee of three faculty members, formulates a dissertation topic in consultation with them, and submits a prospectus for the dissertation along with a preliminary bibliography. Study toward the Ph.D. culminates in the writing of a suitable dissertation, often on a comparative topic, although subjects within a single literature or dealing with general literary and theoretical problems not confined to any specific literature are also acceptable. The normal time for advancement to candidacy is four years. The normal time for completion of the Ph.D. is seven years, and the maximum time permitted is nine years.

Courses in Comparative Literature

LOWER-DIVISION

Satisfaction of the UC Entry Level Writing requirement is a prerequisite for all departmental courses except CL 8. Descriptions of the undergraduate courses available during a given year may be obtained in the Department office in the fall.

CL 8 Topics in Comparative Literary Study (4). Lecture, three hours. Comparative studies in different literatures. Readings in English and in English translation on such generic topics as tragedy, epic, short tales, and such thematic topics as love, war, cities, travel writing, politics, violence. May be taken only once in lieu of one quarter of the E 6, E 7, E 8 series. May be repeated for credit as topics vary. **(IV)**

CL 9 Introduction to Multicultural Topics in Literature (4). Introduction to multicultural literature including African American, Asian-American, Chicano/Latino, and Native American. May be repeated for credit as topics vary. **(VII-A)**

CL 40A, B, C Development of Drama (4, 4, 4) F, W, S. Same as Drama 40A, B, C. **(IV, VII-B)**

CL 50 Introduction to Global Comparative Literature: Literary and Textual Traditions. F, W, S. Lecture, three hours. An introduction to the comparative study of literature and culture, Western and non-Western. Offers students the opportunity to study literatures of various cultures, periods, and traditions in depth and in dialogue with one another. Prerequisite: satisfaction of the lower-division writing requirement.

50A Literatures in Dialogue (4). Studies the principles of literary imitation and canon formation, asking, for example, how the study of the Homeric epics can help us understand Caribbean novels and film "epics" such as *Star Wars.* Readings include major works from several historic periods and traditions. **(IV)**

50B Periods and Movements (4). Allows students to study literatures comparatively and in a historically specific and intensive way, for example, the period of the Middle Ages across Europe and in dialogue with various contact cultures, such as Islam, or modernism and post-modernism, East and West. Focus of the lecture varies according to the instructor's field of expertise. **(IV)**

50C Genre and Medium (4). Focuses on understanding the concept of genre and the difference that medium (literature vs. film, novels vs. plays, prayers vs. poetry, for example) makes on the way a text is produced and received. Different media studied each quarter to allow the special qualities of each medium to emerge. **(IV)**

UPPER-DIVISION

CR 100A Literary Theory and Criticism (4) F, W. Required of majors in English, Comparative Literature, and Literary Journalism. A series of lectures and discussions devoted to the theoretical dimensions of literary criticism as reflected in major theorists from Plato to the present. Prerequisite: three courses from CL 50A, 50B, 50C, English 28A or 28D, 28B, 28C or 28E, LJ 20, LJ 21, or equivalent.

CR 100B Undergraduate Seminar in Literary Theory (4) F, W, S. Seminar, three hours. Open to upper-division majors in English and Comparative Literature only, and required of all English majors soon after the completion of CR 100A. Sections limited to 20 students. Each instructor announces a theoretical topic deriving from CR 100A and explores it through a number of theoretical and literary texts. Prerequisite: CR 100A. May be taken for credit twice.

CL 101 Comparative Literature/Theories in Dialogue (4) F, W, S. Students read literary texts in conjunction with two theoretical models. This literary and theoretical dialogue enhances students' grasp of different types of theoretical analysis, emphasizes the interplay of theories, and insists on the interrelation of theory and literary practice. Prerequisite: CR 100A.

CL 102 Undergraduate Seminar in Literary Theory and Practice (4). F, W, S. Seminar, three hours. Sections limited to 20 students. Instructors announce topics that join consideration of comparative literary study with the practical consideration of individual literary texts, such as Autobiography and Travel, Romance and History, Performing Gender, Translation and the Native Tongue, Politics and Literature. Prerequisites: a lower-division series in literature and satisfactory completion of the lower-division writing requirement; limited to upper-division majors in English and Comparative Literature only. May be repeated for credit as topics vary. Formerly CL 100.

CL 103 Undergraduate Lectures in Comparative Literature (4) F, W, S, Summer. Lecture, three hours. A series of lectures on and discussions of announced comparative topics in literary criticism, history, genres, modes, major authors. May be repeated for credit as topics vary. Same as East Asian Languages and Literatures 150 when topic is appropriate.

CR 103 Contemporary Critical Theory (4). Lecture, three hours. Discussion of contemporary critical theory. May be repeated once for credit toward graduation, but not repeated for credit within the major. Prerequisite: English and Comparative Literature CR 100A.

CL 104 The Interdisciplinary Course (4) F, W, S. Lecture and discussion course open to all students, three hours. Treats interdisciplinary topics of various kinds (e.g., literature and politics, literature and religion, literature and science, literature and other arts). Prerequisites: none for most topics; check descriptions of individual course topics. May be taken for credit as topics vary. Same as Art History 114, Art History 125, or Humanities 110 when topic is appropriate.

CL 105 Multicultural Topics in Comparative Literature (4) F, W, S. Treats the literature and culture of one or more minority groups in California and the United States, including African Americans, Asian-Americans, Chicano/Latinos, and Native Americans, in relation to other national literatures. May be repeated for credit as topics vary. **(VII-A)**

CL 106 Advanced Seminar in Comparative Literature and Theory (4) F. Seminar, three hours. Limited to 20 students. Capstone seminar for the Comparative Literature major. Designed to deepen students' understanding of the history and methods of Comparative Literature as a discipline. Joins theoretical analysis with practical criticism of individual literary texts. Prerequisites: satisfactory completion of the lower-division writing requirement; CR 100A and either CR 100B or CL 101.

CL 198 Special Topics (4-4-4). Directed group study of selected topics. By consent, by arrangement.

CL 199 Reading and Conference (1 to 4). To be taken only when the materials to be studied lie outside the normal run of departmental offerings, and when the student will have no formal chance to pursue the subject. Prerequisites: consent of the student's advisor, the instructor, and the Department Chair.

GRADUATE

All graduate courses may be repeated when the topic varies. Descriptions of the topics to be treated in a given academic year are published by the Department in the fall. Enrollment in each graduate course requires the consent of the instructor. The courses are limited to registered graduate students, except for specially qualified fifth-year students seeking teaching credentials, who may enroll if they have received permission from the Director of Graduate Studies and if space permits.

In addition to the following courses, graduate students in the Department of Comparative Literature might find Humanities 200 (The Nature and Theory of History) and Humanities 291 (Interdisciplinary Topics) of special interest.

CL 200 Theories and Methods of Comparativism (4). Addresses the disciplinary, institutional, and theoretical dimensions of Comparative Literature. Course design varies with instructor.

200A History of Comparative Literature and Introduction to Methods and Theories of Comparative Literature (4) F. Seminar designed to introduce graduate students in Comparative Literature to the parameters and practices of the discipline of Comparative Literature. Major issues and theories of comparative literary and cultural study are covered. Strongly recommended for first- and second-year students before the M.A. examination and review.

200B Theories of Translation (4) F, W, S. The reproduction, translation, and transfer of literary and cultural, ideological and political, and symbolic codes and texts have long been the object of study in Comparative Literature. Addresses the diverse ways in which expressive systems interact and intersect.

200C Theories of Globalization, Inter-Nationalism, and Post-Colonialism (4) F, W, S. Addresses both theories and the complex history of literary and cultural expression in a national, trans-, inter-, and post-national, global frame. Topics may include: globalism and nationhood, theories of citizenship and political subjecthood, post-colonial literature and theory.

200D Cultural Rhetoric and Rhetorical Theory (4) F, W, S. Surveys contemporary theories of cultural rhetoric and the cultural rhetoric of contemporary theory, and interrogates the intersection of rhetoric, critical theory, and cultural studies. Both historical and contemporary theories of rhetoric and cultural rhetorics are studied.

CL 210 Comparative Studies (4) F, W, S

CL 220 Translation Workshop (4) F, W, S. May be taken for credit twice.

CR 220A, B Studies in Literary Theory and Its History (4, 4) F, W. Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists. Same as Humanities 220A, B.

CR 240 Advanced Theory Seminar (4) F, W, S

CL 290 Reading and Conference (4) F, W, S

CL 291 Guided Reading Course (4)

CL 299 Dissertation Research (4 to 12) F, W, S

DEPARTMENT OF EAST ASIAN LANGUAGES AND LITERATURES

443 Humanities Instructional Building; (949) 824-2227
Edward Fowler, **Department Chair**

Faculty

Chungmoo Choi, Ph.D. Indiana University, *Associate Professor of Korean Culture* (modern Korea, post-colonial and colonial discourse, popular culture, anthropology)

Edward Fowler, Ph.D. University of California, Berkeley, *Department Chair of East Asian Languages and Literatures and Professor of Japanese* (modern Japanese literature, cultural studies, film)

James Fujii, Ph.D. University of Chicago, *Associate Professor of Japanese* (modern Japanese literature; critical theory and cultural studies)

Michael A. Fuller, Ph.D. Yale University, *Associate Professor of Chinese* (Chinese poetry and poetics, the cultural and intellectual contexts for poetry, aesthetic theory, linguistic issues in classical Chinese)

Hu Ying, Ph.D. Princeton University, *Associate Professor of Chinese* (narrative literature, translation theory, feminist theory)

Martin W. Huang, Ph.D. Washington University, *Professor of Chinese* (narrative theories and traditional Chinese fiction)

Kyung Hyun Kim, Ph.D. University of Southern California, *Associate Professor of Korean Culture* (East Asian cinema, modern Korea, cultural theory)

Susan B. Klein, Ph.D. Cornell University, *Director of Religious Studies and Associate Professor of Japanese* (premodern and modern theater and dance, Japanese religions, feminist critical theory)

Duncan R. Williams, Ph.D. Harvard University, *Assistant Professor of Japanese* (Japanese religion, East Asian Buddhism, culture and history)

Meng Yue, Ph.D. University of California, Los Angeles, *Assistant Professor of Chinese* (Chinese poetry and literatures in pre-modern Chinese)

Affiliated Faculty

Jonathan M. Hall, Ph.D. University of California, Santa Cruz, *Assistant Professor of Comparative Literature* (Japanese literary, cultural, and cinematic history; critical theories of East Asia; East Asian cinema; psychoanalytic and queer theory)

Eugene Y. Park, Ph.D. Harvard University, *Assistant Professor of History* (Korea)

Kenneth L. Pomeranz, Ph.D. Yale University, *UCI Chancellor's Professor of History and of East Asian Languages and Literatures* (modern Chinese)

Anne Walthall, Ph.D. University of Chicago, *Co-Director of the Minor in Asian Studies and Professor of History and of East Asian Languages and Literatures* (early modern and modern Japan)

The curriculum in East Asian Languages and Literatures enables students to understand the extensive and rich literary, historical, social, and aesthetic traditions of East Asia through the intensive study of an East Asian language and of literary texts in translation and in the original language. Students take a total of four years of courses in the modern language, in which comprehension, speaking, reading, and writing are stressed. Studies of texts take place throughout the curriculum: the first three years students read texts in translation and the fourth year they read in the original language. The literature-in-translation courses consist of general introductory overviews as well as more specific topics at the intermediate level for those students whose language proficiency is insufficient to cope with difficult literary texts. At the advanced level, course content focuses on reading texts in the original language and rotates among significant literary and cultural topics. In these courses, the curriculum integrates the study of East Asian literatures with theoretical issues that shape the study of world literature in general. In this way, the student gains the dual perspectives of studying East Asian cultures on their own terms as well as recognizing the affinities these civilizations share with the emerging world culture.

CAREERS FOR THE MAJOR

Studies in East Asian languages and literatures will give the student the intensive linguistic and cultural preparation needed to pursue a career involving these important Pacific Rim nations. In an era in which the United States is seeking to come to grips with the challenges and opportunities presented by this vital area of the world, the training in language and literature offered by the departmental faculty will serve the student well in a variety of endeavors, such as international business, law, government service, journalism, teaching, and other careers involved with public affairs. Undergraduate studies in an East Asian language are also a valuable preparation for those students intent upon pursuing graduate study in any field of East Asian language or culture.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

Undergraduate Program

The Department offers three undergraduate majors: the B.A. degree program in Chinese Language and Literature, the B.A. degree program in Japanese Language and Literature, and the B.A. degree program in East Asian Cultures. In addition, minors are offered in Chinese Language and Literature and Japanese Language and Literature.

PLANNING A PROGRAM OF STUDY

The student and the faculty advisor (assigned upon entering the major) should plan a coherent program that both fulfills the requirements of the major and covers the student's areas of interest in allied fields outside East Asian Languages and Literatures.

Students who plan to enroll in a language course in Chinese, Japanese, Korean, or Vietnamese will be placed on the basis of a written test and oral interview in the respective language, regardless of their language background or proficiency, unless they have taken previous course work in the same language at UCI. (The number of years of high school-level study is taken into account only as a reference.) The written test is typically administered through the Testing Office; the oral interview, by the appropriate faculty, who will evaluate students' oral/aural abilities in the target language and consider results from the written placement test and any prior exposure to the language to determine their proper placement level. In the case of some languages, students in the first-year levels will be placed in either heritage classes (for students who have had exposure to the language in question through family ties) or non-heritage classes (for students with no exposure).

The faculty encourages students who are serious about improving their East Asian language ability in reading, writing, and speaking to take advantage of opportunities to immerse themselves in the relevant language by studying abroad through the University's Education Abroad Program (EAP) or through the International Opportunities Program (IOP). Students can gain substantially from first-hand experience of the culture they have studied academically while still making progress toward their UCI degree. Programs are available for one quarter, one semester, or one year. More information is available from academic counselors; see also the Center for International Education section of the *Catalogue*.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Majors

Three separate majors: Chinese Language and Literature, Japanese Language and Literature, and East Asian Cultures.

Chinese Language and Literature: Completion of Chinese 3C or equivalent; Chinese 100A-B-C, 101A-B-C; East Asian Languages and Literatures 190; one course dealing with the literature or culture of another East Asian country; and at least four additional courses in Chinese literature, history, art history, linguistics, or comparative literature, of which one may be a lower-division East Asian course offered by the Department.

Japanese Language and Literature: Completion of Japanese 3C or equivalent; Japanese 100A-B, 101A-B-C; East Asian Languages and Literatures 190; one course dealing with the literature or culture of another East Asian country; and at least five additional courses in Japanese literature, history, art history, linguistics, or comparative literature, of which one may be a lower-division East Asian course offered by the Department.

East Asian Cultures: Completion of Chinese 3C, Japanese 3C, or Korean 3C; two quarters of East Asian Languages and Literatures 155, with different topics; East Asian Languages and Literatures 190; and nine additional upper-division courses, at least three of which must pertain to a country other than the one of language specialization; up to four of these courses may be taken outside the Department, with the approval of the undergraduate advisor.

Residence Requirement for the Majors: At least five upper-division courses required for the major must be completed successfully at UCI. Students are encouraged, however, to complete up to a year of their language study in approved programs of study abroad.

Requirements for the Minors

Two separate minors: Chinese Language and Literature and Japanese Language and Literature.

Chinese Language and Literature: A three-quarter sequence selected from Chinese 3A-B-C, 100A-B-C, or 101A-B-C; and four courses selected from the East Asian Languages and Literatures offerings on Chinese topics and/or the upper-division courses in Chinese.

Japanese Language and Literature: Either Japanese 3A-B-C, 100A-B, or 101A-B-C; and four courses (or five courses, if the 100A-B sequence has been chosen) selected from the East Asian Languages and Literatures offerings on Japanese topics and/or the upper-division courses in Japanese.

Residence Requirement for the Minors: A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Graduate Program

The Department offers a Ph.D. degree program in East Asian Languages and Literatures, with concentrations in Chinese, Japanese, and East Asian Cultural Studies. The M.A. degree may be awarded to Ph.D. students in progress toward the doctoral degree.

The graduate program emphasizes rigorous training in language and textual analysis, with equal attention given to the historical, social, and cultural dimensions of literary study. In addition to more traditional vocabularies of criticism and theory, the curriculum encourages exploration of recent challenges to established conceptual and methodological frameworks. The program builds on the foundation of a faculty whose research interests engage major issues in Chinese, Japanese, and Korean literature and culture, while developing connections with the larger community of scholarship at UCI.

Because the graduate program is designed to prepare students for both college-level teaching and advanced research, each student will be required to serve, under direct faculty supervision, as a teaching assistant in an appropriate undergraduate course offered through the Department. As noted below, one quarter's worth of this teaching may be counted as part of the required course work toward completion of the degree.

Assuming that a student is enrolled full-time and enters the program with no major deficiencies in background or training, normal time needed to complete the Ph.D. degree is seven years from matriculation. The maximum time permitted is eight years. For students admitted with an M.A. degree or its equivalent from another institution, certain course requirements may be waived upon the approval of a faculty advisory committee, with a consequent reduction in normative time for completion of the Ph.D.

The following graduate emphases are available: Critical Theory (see the Humanities Special Programs section); Feminist Studies (see the Women's Studies section); and Comparative Literature (see below, following the Ph.D. program requirements).

MASTER OF ARTS IN EAST ASIAN LANGUAGES AND LITERATURES

Students are not admitted to an M.A.-only degree program but may be granted an M.A. in recognition of progress toward the Ph.D., normally after six quarters of course work and submission of two approved seminar papers, which will serve as the M.A. examination.

DOCTOR OF PHILOSOPHY IN EAST ASIAN LANGUAGES AND LITERATURES

Requirements for Admission

In addition to meeting the general requirements for admission to graduate study at UCI, specified by the Office of Graduate Studies, all students must present the following for review by an admissions committee composed of members of the faculty in East Asian Languages and Literatures: records of prior scholastic performance, including all college transcripts; three letters of recommendation; samples of written work; and aptitude scores from the Graduate Record Examination. Although the Department does not require entering students to have received an undergraduate degree comparable to its own, it recommends as much preparation in an East Asian language as possible. It also welcomes applications from students whose language training may not be as extensive but who have shown promise in the study of related disciplines. The study of appropriate European languages is encouraged as well.

General Requirements

Upon admission to the program, the student is assigned a graduate advisor, in consultation with whom an advisory committee consisting of two additional faculty members is constituted. The student and committee plan a program of study consisting of 15 graduate courses.

Before advancement to candidacy (normally after three years of graduate study), the student must have: (1) completed required course work as detailed below; (2) prepared one paper of publishable quality; (3) completed language requirements as listed below; (4) prepared five research reports on current scholarly articles to be decided upon in consultation with the faculty advisor; and (5) passed the qualifying examinations on four topics to be selected in consultation with the faculty advisory committee no more than two quarters before the examinations are to be taken. At least one of the topics should be related directly to the student's projected area of specialization in dissertation research.

Students who complete the qualifying examinations successfully are advanced to candidacy for the Ph.D. degree. The normal time for advancement to candidacy is four years. They then write their doctoral dissertation on a topic developed in consultation with the faculty advisory committee. Some period of study abroad, for enhancement of language proficiency and/or dissertation research, is strongly encouraged.

Concentration in Chinese

Course Work. Each student is required to complete: three courses from Chinese 201–204; Chinese 211A-B or 212A-B; Chinese 213A-B; Chinese 214; and seven additional courses (of which one may be in the graduate teaching program) as determined upon consultation with faculty advisors. At least three of these additional courses must be taken outside the Department on a relevant topic in literary or cultural theory. Courses taken to fulfill language requirements may not be counted toward the course work requirement.

Language Requirements. Before advancement to candidacy, all students must have completed four years of modern Chinese, two years of classical Chinese, and three years of modern Japanese, and have demonstrated reading proficiency in another appropriate language. Much of this work may, of course, have been completed prior to admission. In addition, the requirement for a second year of classical Chinese may be fulfilled by taking three reading courses in classical literature.

Concentration in Japanese

Course Work. Each student is required to complete: three courses from Japanese 201–204; Japanese 211A-B or 212A-B; Japanese 213A-B; Japanese 214; and seven additional courses (of which one may be in the graduate teaching program) as determined upon consultation with faculty advisors. At least three of these additional courses must be taken outside the Department on relevant topics in literary or cultural theory. Courses taken to fulfill language requirements may not be counted toward the course work requirement.

Language Requirements. Before advancement to candidacy, all students must have completed four years of modern Japanese and one year of classical Japanese, and have demonstrated reading proficiency in another appropriate language. In addition, students emphasizing classical Japanese are required to take one year of classical Chinese. Much of this work may, of course, have been completed prior to admission.

Concentration in East Asian Cultural Studies

Course Work. Each student is required to complete: four Theory and Cultural Studies graduate courses; four graduate courses in Chinese, Japanese, or Korean; and seven additional courses (of which one may be in the graduate teaching program) as determined upon consultation with faculty advisors. At least three of these additional courses must be taken outside the Department on relevant topics. Courses taken to fulfill language requirements may not be counted toward the course work requirement.

Other Requirements. Before advancement to candidacy, all students must have completed examinations in four areas as determined upon consultation with faculty advisors. These areas will vary according to the interests of the student; examples might be Colonial and Postcolonial Theories; Modernity and East Asia; Critique of Asian Studies as a field; Gender, Class and East Asia; Visual Culture and Japan; and Theorizing Minority Status in East Asia. All students must have completed four years of Chinese, Japanese, or Korean, or the equivalent. Three years or the equivalent in a second East Asian language is recommended. Much of this work may, of course, have been completed prior to admission.

Graduate Emphasis in Comparative Literature

A student must submit an application for the emphasis to the Graduate Advisor in East Asian Languages and Literatures, and the Department tracks the student's progress and fulfillment of requirements. Upon graduation, students receive a letter from the Graduate Advisor certifying completion of the emphasis.

Course Work. Students take at least five graduate courses in the Department of English and Comparative Literature, three of which may be counted toward the seven electives required for the Ph.D. in East Asian Cultural Studies. One of the five courses should be Criticism 220A or 220C, or Comparative Literature 200; at least three of the courses should have a Comparative Literature (CL) designation; and one of the courses could be Humanities 270 (Critical Theory).

Qualifying Examination and Dissertation. One topic on the Ph.D. Qualifying Examination should be on a Comparative Literature topic and should be prepared with a professor from the Comparative Literature program who will serve as a member of the student's examination committee. The student should be able to demonstrate some expertise in comparative critical methodologies as well as knowledge of a literature and tradition other than those in East Asian. One member of the student's dissertation committee will normally be from the Comparative Literature program.

Courses in Chinese

UNDERGRADUATE

1A-B-C Fundamental Mandarin Chinese (5-5-5) F, W, S. Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing. Conducted in Mandarin Chinese using the Pinyin system of Romanization. Chinese 1A-B-C and Chinese S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamentals of Mandarin Chinese (7.5-7.5) Summer. First-year Mandarin Chinese in an intensified form. Same as Chinese 1A-B-C during academic year. Prerequisite for S1AB: none; for S1BC: Chinese S1AB or 1B, or two years of high school Chinese. Chinese S1AB-BC and Chinese 1A-B-C may not both be taken for credit. (S1BC: **VI**)

2A-B-C Intermediate Mandarin Chinese (5-5-5) F, W, S. Conversation, reading, and composition skills; new Chinese characters introduced. Conducted in Mandarin Chinese. Prerequisite for 2A: Chinese 1C or S1BC with a grade of C or better, three years of high school Chinese, or equivalent; for 2B: Chinese 2A with a grade of C or better, or equivalent; for 2C: Chinese 2B with a grade of C or better, or equivalent. Placement test required. **(VII-B)**

3A-B-C Advanced Mandarin Chinese (4-4-4) F, W, S. Emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation. Conducted in Mandarin Chinese. Prerequisite: Chinese 2C or equivalent. **(VII-B)**

100A-B-C Classical Chinese (4-4-4) F, W, S. Introduction to classical Chinese grammar and vocabulary with emphasis on reading basic texts. Prerequisite: Chinese 3C, Japanese 3C, Korean 3C, or the equivalent. **(VII-B)**

101A-B-C Fourth-Year Mandarin Chinese (4-4-4) F ,W, S. Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of specific literary texts. Prerequisite: Chinese 3C or equivalent. **(VII-B)**

115 Chinese Literature: Advanced Texts (4). A reading course designed for students with near-fluency in reading Chinese. Readings may include both literary and philosophical work by important writers, but the emphasis will be on literary texts and writings that interpret those texts. Prerequisite: Chinese 101C or consent of instructor. May be taken for credit three times as topic varies. **(VII-B)**

180 Topics in Chinese Literature (4). Special topics through directed reading in Chinese. Paper required. Prerequisite: consent of instructor. May be taken for credit three times as topic varies. Formerly Chinese 198. **(VII-B)**

199 Independent Study (1 to 4). Investigation of special topics through directed reading in Chinese. Paper required. Prerequisite: consent of instructor. May be taken for credit for a total of 12 units.

GRADUATE

201 Readings in Traditional Chinese Narrative and Prose (4). Close reading of selected premodern prose texts such as historical narratives, novels, short stories, and essays. Prerequisite: Chinese 101C or equivalent. May be repeated for credit as topics vary.

202 Readings in Traditional Chinese Poetry (4). Close readings of selected premodern poetic texts. Prerequisite: Chinese 100C or equivalent. May be repeated for credit as topics vary.

203 Readings in Modern Chinese Literature (4). Close readings of selected modern literary texts. Prerequisite: Chinese 101C or equivalent. May be repeated for credit as topics vary.

204 Readings in Chinese Literary and Cultural Theory (4). Close readings of selected texts in premodern criticism and theory. Prerequisite: Chinese 100C or equivalent. May be repeated for credit as topics vary.

211A-B Studies in Traditional Chinese Narrative and Prose (4-4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Chinese 100C or equivalent. May be repeated for credit as topics vary.

212A-B Studies in Traditional Chinese Poetry (4-4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Chinese 100C or equivalent. May be repeated for credit as topics vary.

213A-B Studies in Modern Chinese Literature (4-4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Chinese 101C or equivalent. May be repeated for credit as topics vary.

214 Studies in Chinese Literature and Cultural Theory (4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Chinese 100C and/or Chinese 101C, as specified. May be repeated for credit as topics vary.

230 Topics in Chinese Literature and Culture (4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Chinese 101 or equivalent. May be repeated for credit as topics vary.

290 Independent Study (4). Directed research on topic determined in consultation with faculty member. A term paper or project is required. May be repeated for credit.

299 Dissertation Research (4 to 12). For students who have been admitted to doctoral candidacy. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

Courses in Japanese

UNDERGRADUATE

1A-B-C Fundamental Japanese (5-5-5) F, W, S. Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing all three Katakana, Hiragana, and Kanji scripts. Conducted in Japanese. Japanese 1A-B-C and Japanese S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamentals of Japanese (7.5-7.5) Summer. First year Japanese in an intensified form. Same as Japanese1A-B-C during academic year. Prerequisite for S1AB: none; for S1BC: Japanese S1AB or 1B, or two years of high school Japanese. Japanese S1AB-BC and Japanese 1A-B-C may not both be taken for credit. (S1BC: **VI**)

2A-B-C Intermediate Japanese (5-5-5) F, W, S. Conversation, reading, and composition skills; approximately 400 Kanji characters are introduced. Conducted in Japanese. Prerequisite for 2A: Japanese 1C or S1BC with a grade of C or better, three to four years of high school Japanese, or equivalent; for 2B: Japanese 2A with a grade of C or better, or equivalent; for 2C: Japanese 2B or S2AB with a grade of C or better, or equivalent. Placement test required. Japanese 2A-B-C and Japanese S2AB-BC may not both be taken for credit. **(VII-B)**

S2AB-BC Intermediate Japanese (7.5-7.5) Summer. Second-year Japanese in a time-intensified form. Equivalent to Japanese 2A-B-C during the academic year. For description, see Japanese 2A-B-C. Prerequisite for S2AB: Japanese S1BC or 1C with a grade of C or better, three to four years of high school Japanese, or equivalent; for S2BC: Japanese S2AB or 2B with a grade of C or better, or equivalent. Japanese S2AB-BC and Japanese 2A-B-C may not both be taken for credit. **(VII-B)**

3A-B-C Advanced Japanese (4-4-4) F, W, S. Emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation. Conducted in Japanese. Prerequisite: Japanese 2C or equivalent. **(VII-B)**

100A-B Classical Japanese (4-4) F, W or W, S. Introduction to classical Japanese grammar and vocabulary with emphasis on reading and analysis of basic texts. Prerequisite: Japanese 3C or equivalent. **(VII-B)**

101A-B-C Fourth-Year Japanese (4-4-4) F, W, S. Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of texts. Prerequisite: Japanese 3C or equivalent. **(VII-B)**

115 Japanese Literature: Advanced Texts (4). A reading course designed for students with near-fluency in written Japanese. Texts will include both fiction and non-fiction by important writers, and may be supplemented and contextualized where needed by literary criticism and cultural-studies texts in English. Prerequisite: Japanese 101C or consent of instructor. May be taken for credit three times as topic varies. **(VII-B)**

180 Topics in Japanese Literature (4). Special topics through directed reading in Japanese. Paper required. Prerequisite: consent of instructor. May be taken for credit three times as topic varies. Formerly Japanese 198. **(VII-B)**

199 Independent Study (1 to 4). Investigation of special topics through directed reading in Japanese. Paper required. May be repeated for credit provided topic varies. Prerequisite: consent of instructor. May be taken for credit for a total of 12 units.

GRADUATE

201 Readings in Traditional Japanese Prose (4). Close reading of selected premodern prose texts, including tales, journals, travel journals, essays. Prerequisite: Japanese 100B or equivalent. May be repeated for credit as topics vary.

202 Readings in Traditional Japanese Poetry or Drama (4). Close reading of selected premodern poetic or dramatic texts. Prerequisite: Japanese 100B or equivalent. May be repeated for credit as topics vary.

203 Readings in Modern Japanese Literature (4). Texts include both fiction and nonfiction by important writers, and may be supplemented where needed by literary criticism and cultural-studies texts in English. Prerequisite: Japanese 101C or equivalent, or consent of instructor. May be repeated for credit as topics vary.

204 Readings in Traditional Japanese Literary and Cultural Theory (4). Close reading of selected texts involving literary criticism and/or aesthetics. Prerequisite: Japanese 100B or equivalent. May be repeated for credit as topics vary.

205 Readings in Japanese Religion (4). Close readings of selected Japanese religious texts. Prerequisite: Japanese 101C or equivalent, or consent of instructor. May be repeated for credit as topics vary.

211A-B Studies in Traditional Japanese Prose (4-4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Japanese 100B or equivalent. May be repeated for credit as topics vary.

212A-B Studies in Traditional Japanese Poetry or Drama (4-4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Japanese 100B or equivalent. May be repeated for credit as topics vary.

213A-B Studies in Modern Japanese Literature (4-4). A two-quarter, in-depth look at a major author and/or issue in modern Japanese literature. Seminar format. The first quarter is devoted to reading of the requisite texts; the second quarter, to the writing of a research paper. Prerequisite: Japanese 203 or consent of instructor. May be repeated for credit as topics vary.

214 Studies in Japanese Literary and Cultural Theory (4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Japanese 100B or equivalent. May be repeated for credit as topics vary.

215 Studies in Japanese Religion (4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: Japanese 101C or equivalent, or consent of instructor. May be repeated for credit as topics vary.

230 Topics in Japanese Literature and Culture (4). A topical study that addresses important issues in Japanese literature and culture. May focus on a specific writer or writers, or on a specific issue or set of related issues. Prerequisite: Japanese 203 or consent of instructor. May be repeated for credit as topics vary.

290 Independent Study (4). Directed research on topic determined in consultation with faculty member. A term paper or project is required. May be repeated for credit.

299 Dissertation Research (4 to 12). For students who have been admitted to doctoral candidacy. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

398 Pedagogy for Teaching Japanese (4). Lecture and training on how to teach Japanese. Provides theoretical knowledge and practical skills necessary for teaching the language. Prerequisite: Japanese 101C or consent of instructor.

Courses in Korean

UNDERGRADUATE

1A-B-C Fundamentals of Korean (5-5-5) F, W, S. Natural approach with emphasis on the four fundamental skills of listening, speaking, reading, and writing. Conducted in Korean. Korean 1A-B-C and Korean S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamentals of Korean (7.5-7.5) Summer. First-year Korean in an intensified form. Same as Korean 1A-B-C during academic year. Prerequisite for S1AB: none; for S1BC: S1AB or Korean 1B, or two years of high school Korean. Korean S1AB-BC and Korean 1A-B-C may not both be taken for credit. (S1BC: **VI**)

2A-B-C Intermediate Korean (5-5-5) F, W, S. Designed to develop writing and reading skills as well as communicative skills in authentic situations. Students also introduced to aspects of Korean culture as related to lesson topics. Prerequisite for 2A: Korean 1C or S1BC with a grade of C or better, or equivalent, or consent of instructor; for 2B: Korean 2A with a grade of C or better, or equivalent, or consent of instructor; for 2C: Korean 2B with a grade of C or better, or equivalent, or consent of instructor. Placement test required. **(VII-B)**

3A-B-C Advanced Korean (4-4-4) F, W, S. Focuses on developing advanced reading, writing, and translation skills with additional instruction in Chinese characters. Prerequisites: Korean 2C or equivalent; consent of instructor. **(VII-B)**

101A-B-C Fourth-Year Korean (4-4-4). Continued emphasis on comprehension, grammar, and proficiency in reading, composition, and conversation through intensive study and analysis of a variety of modern texts. Prerequisite: Korean 3C. **(VII-B)**

115 Korean Literature: Advanced Texts (4). Designed for students with near-fluency in reading Korean. Readings include modern Korean literary works (poetry, prose, and drama) by important writers. Emphasis on the interpretation of the texts and writings that interpret those texts in the original language. Prerequisite: Korean 101C or consent of instructor. May be taken for credit three times as topics vary. **(VII-B)**

180 Topics in Korean Literature (4). Special topics through directed readings in Korean. Paper required. Prerequisite: consent of instructor. May be taken for credit three times as topic varies. **(VII-B)**

199 Independent Study (1 to 4). Investigation of special topics through directed reading in Korean. Paper required. Prerequisite: consent of instructor. May be taken for credit for a total of 12 units.

Courses in Vietnamese

1A-B-C Fundamental Vietnamese (5-5-5) F, W, S. Natural approach with emphasis on four fundamental skills of listening, speaking, reading, and writing. Conducted in Vietnamese. Vietnamese 1A-B-C and Vietnamese S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamental Vietnamese (7.5-7.5) Summer. First-year Vietnamese in intensified form. Intended for students with little or no knowledge of the Vietnamese language. Emphasis is on mastery of the basic language skills of understanding, speaking, reading, and writing. Prerequisite for S1AB: none; for S1BC: S1AB, or two years of high school Vietnamese, or one semester of college-level Vietnamese. Vietnamese S1AB-BC and Vietnamese 1A-B-C may not both be taken for credit. (S1BC: **VI**)

2A-B-C Intermediate Vietnamese (5-5-5) F, W, S. Designed to develop writing and reading skill as well as communicative skills in authentic situations. Students are introduced to aspects of Vietnamese culture as related to lesson topics. Prerequisite for 2A: Vietnamese 1C or S1BC with a grade of C or better, or equivalent; for 2B: Vietnamese 2A with a grade of C or better, or equivalent; for 2C: Vietnamese 2B with a grade of C or better, or equivalent. Placement test required. **(VII-B)**

3A-B-C Advanced Vietnamese (4-4-4). Focuses on the development of effective speaking, reading, and writing with an emphasis on correct syntax and appropriate word usage in spoken language. Prerequisite: Vietnamese 2C or equivalent. **(VII-B)**

115 Vietnamese Literature: Advanced Texts (4). A reading course for students with near-fluency in reading Vietnamese. Readings may include both literary and more broadly culturally significant works by important writers, but emphasis is literary texts and writings that interpret those texts. Prerequisite: Vietnamese 3C or consent of instructor. May be taken for credit three times as topics vary. **(VII-B)**

Courses in East Asian Languages and Literatures

UNDERGRADUATE

20 Asian Religions (4). An introduction to Asian religions (Hinduism, Buddhism, Confucianism, Taoism, Shamanism) including both elite doctrinal aspects and forms of more popular religiosity. May be taken for credit three times as topics vary. **(VII-B)**

55 Introduction to East Asian Cultures (4). Interdisciplinary courses organized each year around a broad theme designed to introduce students to the cultures of East Asia. Topical organization of courses addresses issues that have been of importance historically and are reshaping East Asia today. May be taken three times for credit as topics vary. Formerly East Asian Languages and Literatures 50A, B, C and 60A, B, C. **(IV, VII-B)**

110 Topics in Chinese Literature and Society (4). Studies in Chinese texts in their social and cultural context(s). Conducted in English. May be taken for credit three times as topic varies. **(VII-B)**

113 Linguistic Structure of Chinese (4). Introduction to the phonology and major syntactic patterns of Mandarin Chinese. Prerequisites: Chinese 2C, or Linguistics 10 or 20, or consent of instructor. Same as Linguistics 165A. Concurrent with Linguistics 265A.

116 Topics in East Asian Religions (4). Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Islam, shamanism. May be taken for credit three times as topics vary. **(VII-B)**

117 Topics in East Asian Philosophy (4). Selected topics in the philosophies of East Asia, e.g., Yoga, Buddhism, Vedanta, Confucianism, Taoism, and Shinto. Same as Philosophy 117. May be repeated for credit as topics vary. **(VII-B)**

120 Topics in Japanese Literature and Society (4) F. Studies in Japanese texts in their social and cultural context(s). Conducted in English. May be taken for credit three times as topic varies. **(VII-B)**

123 Linguistic Structure of Japanese (4). Detailed analysis of essential grammatical aspects of Japanese. Comparison with aspects of English grammar. Course not designed to teach Japanese per se, but to study the grammatical characteristics of Japanese from the perspective of theoretical linguistics. Prerequisite: Linguistics 10 or 20. Same as Linguistics 165B.

125 Topics in East Asian Applied Linguistics (4). In-depth examination of selected topics in applied linguistics, with a particular emphasis on language acquisition and language pedagogy. May be taken for credit three times as topics vary. Concurrent with East Asian Languages and Literatures 225.

130 Korean Society and Culture (4). Introductory background to the social and cultural forces that affect the lives of the Koreans, including those in the United States. Considers traditional values and contemporary issues within a historical framework. Same as Anthropology 163K and Sociology 175A. **(VII-B)**

133 Linguistic Structure of Korean (4). Introduction to essential grammatical aspects of the Korean language. Comparisons to other languages. Prerequisite: East Asian 2C or consent of instructor. Same as Linguistics 165C.

143 Linguistic Structure of Vietnamese (4). Detailed analysis of essential grammatical aspects of Vietnamese. Comparison with other languages. Course not designed to teach Vietnamese per se but to study the language from the perspective of theoretical linguistics. Prerequisite: Linguistics 3 or equivalent.

150 Topics in East Asian Literature in Translation (4). East Asian literary works in translation. Taught in English. May be taken for credit three times as topic varies. Same as Comparative Literature 103 when topic is appropriate. **(VII-B)**

155 Cultural Studies in East Asia (4). Interdisciplinary and theoretical introduction to issues in cultural studies that are pertinent to the study of East Asia. All readings in English. May be taken for credit three times as topics vary. **(VII-B)**

160 East Asian Cinema (4). Study of Chinese or Japanese cinema from historical, theoretical, and comparative perspectives. Taught in English. May be repeated for credit when topic changes. Same as Film and Media Studies 160 when topic is appropriate. **(VII-B)**

170 Gender in East Asia (4). Explores the construction of gender in East Asian cultures and literatures. Pays close attention to the specificity of historical, cultural, and literary contexts of East Asia as it investigates various theoretical and critical perspectives on gender and sexuality. May be taken for credit three times as topics vary. **(VII-B)**

190 Junior-Senior Colloquium (4) W. Specialized courses dealing with primary sources; required reports and papers. Each colloquium reflects the instructor's intellectual interest and is conducted as a discussion group. Limited to 15 students. Prerequisite: consent of instructor. May be taken for credit three times as topics vary. **(VII-B)**

192 Junior-Senior Seminar (4). Specialized courses that require analysis of a literary or cultural topic or problem through research and writing of two short and one long original research papers for a total of 4,000 words minimum. Each seminar is offered in a quarter following East Asian Languages and Literatures 190 and is related to the colloquium's subject. Prerequisite: East Asian Languages and Literatures 190 in preceding quarter or consent of instructor; satisfactory completion of the lower-division writing requirement. May be taken for credit three times as topics vary. **(VII-B)**

198 Directed Group Study (1 to 4). Directed group study on special topics. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

199 Independent Study (1 to 4). Investigation of special topics through directed reading in translation. Paper required. Prerequisite: consent of instructor. May be taken for credit for a total of 12 units as topics vary.

GRADUATE

216 Topics in East Asian Religions (4). Selected topics in the religions of East Asia, e.g., Buddhism, Daoism, Shintô, Islam, shamanism. May be taken for credit three times as topics vary.

220 Topics in East Asian Cultural Studies (4). Seminar, with topics varying from year to year. Research paper required. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

225 Topics in East Asian Applied Linguistics (4). In-depth examination of selected topics in applied linguistics, with a particular emphasis on language acquisition and language pedagogy. May be taken for credit three times as topics vary. Concurrent with East Asian Languages and Literatures 125.

260 Topics in East Asian Cinema (4). An examination of the possibilities of East Asian cinematic narrative. Possible topics: cinematic history; cinema in popular culture; comparisons with literary texts; major auteurs. Emphasis on technical as well as on thematic aspects. Includes readings in film theory. Prerequisite: East Asian Languages and Literatures 160 or consent of instructor. May be repeated for credit as topics vary.

290 Independent Study (2 to 4). Directed research on topic determined in consultation with faculty member. A term paper or project is required. May be counted toward course requirements for the Ph.D. May be repeated for credit.

299 Dissertation Research (4 to 12). For students who have been admitted to doctoral candidacy. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

399 University Teaching (4). Limited to Teaching Assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

DEPARTMENT OF ENGLISH

435 Humanities Instructional Building; (949) 824-6712
Jerome Christensen, **Department Chair**

Faculty

Elizabeth Allen, Ph.D. University of Michigan, *Assistant Professor of English* (medieval literature, narrative and poetic form, literary history, theories of reception and hermeneutics)

Stephen A. Barney, Ph.D. Harvard University, *Professor Emeritus of English* (medieval literature and culture, allegory)

Carol Burke, Ph.D. University of Maryland, *Associate Professor of English* (folklore, cultural studies, creative nonfiction)

James L. Calderwood, Ph.D. University of Washington, *Professor Emeritus of English* (drama, Shakespeare)

Jerome Christensen, Ph.D. Cornell University, *Department Chair and Professor of English* (British Romanticism, film studies)

Michael P. Clark, Ph.D. University of California, Irvine, *Associate Executive Vice Chancellor for Academic Planning and Professor of English* (Colonial American literature, critical theory)

Robert Folkenflik, Ph.D. Cornell University, *Professor of English* (eighteenth-century, novel, biography, and autobiography)

Natalka Freeland, Ph.D. Yale University, *Assistant Professor of English* (Victorian literature, the novel, cultural studies and criticism)

Linda Georgianna, Ph.D. Columbia University, *Professor of English* (medieval literature and culture)

Mark Goble, Ph.D. Stanford University, *Assistant Professor of English* (twentieth-century U.S. literature, film and media studies)

Oakley Hall, M.F.A. University of Iowa, *Professor Emeritus of English* (fiction writing, contemporary fiction)

Rebeca Helfer, Ph.D. Columbia University, *Assistant Professor of English* (early modern literature and culture, Spenser, rhetoric)

Andrea K. Henderson, Ph.D. University of Pennsylvania, *Associate Professor of English* (romantic literature, poetics)

John Hollowell, Ph.D. University of Michigan, *Director of Composition and Senior Lecturer with Security of Employment* (rhetorical theory, teaching of composition, American literature)

Renée Riese Hubert, Ph.D. Columbia University, *Professor Emerita of Comparative Literature and French* (literature and fine arts, modern poetry, surrealism, Romanticism)

Laura H. Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies, English, and Comparative Literature* (feminist epistemologies and theories, cultural studies, ethnic studies)

Ketu H. Katrak, Ph.D. Bryn Mawr College, *Department Chair and Professor of Asian American Studies and Professor of English and Comparative Literature* (Asian American literature, post-colonial literature)

Wolfgang Iser, Ph.D. University of Heidelberg, *Professor of English* (eighteenth-century English literature, modern novel, critical theory)

Richard W. F. Kroll, Ph.D. University of California, Los Angeles, *Professor of English* (rhetoric, Restoration and eighteenth-century British literature, literary theory, history of science)

Michelle Latiolais, M.F.A. University of California, Irvine, *Associate Professor of English and Creative Writing* (creative writing, fiction)

Karen R. Lawrence, Ph.D. Columbia University, *Dean of the School of Humanities and Professor of English and Comparative Literature* (twentieth-century literature, travel writing, women's writing, the novel)

José Rodrigo Lazo, Ph.D. University of Maryland, Assistant Professor of English (Latino studies, American ethnic and minority literature, Cuba and Cuban American studies)

Jayne E. Lewis, Ph.D. Princeton University, *Professor of English* (Restoration and eighteenth-century British literature)

Julia Reinhard Lupton, Ph.D. Yale University, *Professor of English* (Renaissance literature, literature and psychology)

Juliet Flower MacCannell, Ph.D. Cornell University, *Professor Emerita of Comparative Literature* (eighteenth-century French literature, modern semiotics, comparative literature)

Steven Mailloux, Ph.D. University of Southern California, *UCI Chancellor's Professor of Rhetoric* (rhetoric, critical theory, American literature, law and literature)

James McMichael, Ph.D. Stanford University, *Director of Poetry, Programs in Writing, and Professor of English and Creative Writing* (contemporary poetry, poetry writing, prosody, Joyce)

J. Hillis Miller, Ph.D. Harvard University, *UCI Distinguished Research Professor of English and Comparative Literature* (Victorian literature, critical theory)
Robert L. Montgomery, Ph.D. Harvard University, *Professor Emeritus of English* (Renaissance literature, critical theory, comparative literature)
Robert Newsom, Ph.D. Columbia University, *Professor Emeritus of English* (Victorian literature, theory of fictions)
Ngugi wa Thiong'o, *Director of the International Center for Writing and Translation and UCI Distinguished Professor of English and Comparative Literature* (African and Caribbean literatures, theater and film, performance studies, cultural and political theory)
Margot Norris, Ph.D. State University of New York, Buffalo, *Professor of English and Comparative Literature* (modern Irish, British, American and continental modernism; literature and war)
Laura O'Connor, Ph.D. Columbia University, *Assistant Professor of English* (British and American modernism, Irish literary studies, postcolonial theory)
Robert L. Peters, Ph.D. University of Wisconsin, *Professor Emeritus of English* (Victorian literature, contemporary poetry)
Douglas Pfeiffer, Ph.D. Columbia, *Assistant Professor of English* (Renaissance literature, humanism)
R. Radhakrishnan, Ph.D. State University of New York, Binghamton, *Department Chair and Professor of Asian American Studies and Professor of English and Comparative Literature* (critical theory, Asian American studies, poststructuralism, postcoloniality, globalization, nationalisms, diasporas)
Barbara L. Reed, Ph.D. Indiana University, *Senior Lecturer with Security of Employment Emerita, English* (American literature, children's literature)
Hugh Roberts, Ph.D. McGill University, *Associate Professor of English* (Romantic literature, eighteenth-century literature, Victorian poetry, literary theory, New Zealand literature)
Michael Ryan, Ph.D. University of Iowa, *Professor of English and Creative Writing* (American literature, creative writing, poetry, poetics)
Edgar T. Schell, Ph.D. University of California, Berkeley, *Professor Emeritus of English* (medieval and Renaissance literature)
Barry Siegel, M.S. Columbia University Graduate School of Journalism, *Director of Literary Journalism and Professor of English* (literary journalism and creative nonfiction)
Victoria Silver, Ph.D. University of California, Los Angeles, *Associate Professor of English* (Renaissance literature, Milton)
Myron Simon, Ed.D. University of Michigan, *Professor Emeritus of English* (American and Canadian literature, early twentieth-century English poetry, ethnic literature, rhetoric)
James Steintrager, Ph.D. Columbia University, *Associate Professor of English* (comparative literature, eighteenth-century French, German, and English literature and aesthetics)
Michael Szalay, Ph.D. The Johns Hopkins University, *Associate Professor of English* (twentieth-century American literature, film and media studies, corporate culture)
Elisa Tamarkin, Ph.D. Stanford University, *Assistant Professor of English* (pre-1900 American literature and culture)
Rei Terada, Ph.D. Boston University, *Department Chair and Professor of Comparative Literature and Professor of English* (critical theory, nineteenth- and twentieth-century poetry)
Brook Thomas, Ph.D. University of California, Santa Barbara, *UCI Chancellor's Professor of English* (American literature, literature and law)
Harold Toliver, Ph.D. University of Washington, *Professor Emeritus of English* (Renaissance and seventeenth-century literature, theory of genre)
Ann J. Van Sant, Ph.D. University of California, Berkeley, *Associate Professor of English* (seventeenth- and eighteenth-century literature, eighteenth-century novel, women and fiction, satire)
Andrzej Warminski, Ph.D. Yale University, *Professor of English* (Romanticism, critical theory)
Geoffrey Wolff, Novelist and Biographer, *Director of Fiction, Programs in Writing, and Professor of English and Creative Writing* (creative writing, fiction, biography)

The Department of English is concerned with the nature and value of literature, the variety of approaches to literary works, and the relation of literary criticism to the intellectual issues of the day. Its main literary concerns are critical, theoretical, and historical. The Department recognizes its continuing obligation to help all students write English with clarity and grace.

Students are given the opportunity to participate in departmental affairs through elected representatives to departmental committees. Each quarter both undergraduate and graduate students taking classes within the Department have the opportunity to evaluate their courses and teachers.

CAREERS FOR THE ENGLISH OR LITERARY JOURNALISM MAJOR

The study of literature helps students express their ideas clearly, do independent research, and think analytically and imaginatively. These capabilities will help qualify majors for careers in education, law, technical writing, communications, journalism, public relations, business, and management. Departmental advisors encourage their students to investigate various career options before completing their undergraduate educations.

For those students interested in going on for a credential in secondary school teaching, UCI has a CCTC-approved single-subject-matter preparation program in English.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

Undergraduate Program

All of the Department's areas of study emphasize a variety of critical approaches in the reading and criticism of literature. Two majors, as well as an emphasis in Creative Writing, are offered:

English. This major seeks to introduce students to the entire range of literatures written in English, from British and American to African, Asian, and Australasian literatures. The major emphasizes the differences among historical periods and various genres, and encourages exploration of a broad range of literary theories. It also offers students the opportunity to do significant work in Creative Writing.

Creative Writing is an emphasis within the English major focusing on the writing of poetry and fiction. The emphasis aims to encourage the creative powers of students while introducing them to the disciplines of reading and practical criticism, often in a workshop setting. Under certain circumstances, creative writing courses may partly satisfy the writing portion of the UCI breadth requirement (Category I).

Literary Journalism. This major was created to meet the needs of a growing number of students who wish to read, study, and write nonfiction prose that has transcended the limits of daily journalism. This is prose that has evolved into a distinct branch of literature, prose that adopts the aims and techniques of the finest fiction. The program provides majors with a solid foundation in nonfiction writing and an equally solid background in areas such as literary history, which together will help make students more informed writers.

Literary journalism is an emerging field of study that is known by varying names, including creative nonfiction, the literature of fact, and literary nonfiction. The Nieman Foundation at Harvard University holds an annual national conference on narrative journalism; there are anthologies devoted to it; many colleges offer courses in it, or feature it as an option within their majors. UCI's program builds on existing departmental strengths: its nationally ranked programs in creative writing, literature, and literary theory. Literary Journalism majors take three intensive writing seminars, and are expected to develop a portfolio of work by graduation which they can present as evidence of their skill for purposes of employment or future education. At the same time, majors are asked to take a comprehensive look at the theory, history, and context of literary journalism. Among other forms, they study and write narratives, memoirs, profiles, histories, and personal essays, in subject areas as varied as science, politics, justice, travel, sports, food, and popular culture. They use as models a multitude of writers, ranging from Daniel Defoe, James Boswell, and Stephen Crane to George Orwell, John Hersey, Lillian Ross, Joseph Mitchell, Gay Talese, John McPhee, Joan Didion, Tom Wolfe, Tracy Kidder, Calvin Trillin, Hunter Thompson, Truman Capote, and Norman Mailer.

While it differs from an applied journalism major that focuses primarily on newspaper writing, the major in Literary Journalism is excellent preparation for students planning to enter graduate programs in journalism, as well as for those interested in the many careers requiring sophisticated writing skills.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the English Major

E 28A (or E 28D), E 28B, and E 28C (or E 28E) (in some cases, students who change their majors to English after taking E 6, E 7, E 8 may petition to substitute one of those courses for a course from the E 28 series; and students who take any one Comparative Literature CL 50 course can substitute it for any one E 28 course); CR 100A; CR 100B; E 102A, E 102B, E 102C, E 102D; E 105; E 106; and at least three more Departmental courses numbered 102 or above (excluding E 140, E 150, WR 139, or WR 179), for one of which may be substituted an upper-division foreign literature-in-translation course offered in the School of Humanities (that is, requisite courses in Classics, Comparative Literature, East Asian Languages and Literatures, French and Italian, German, Spanish and Portuguese).

Competence in a foreign language, either classical or modern, equivalent to six quarters of work at UCI (in classical languages, 1A-B-C, and *either* 100A and two 103s, *or* 100B and two 104s) plus *either* (in modern languages) one upper-division course in a foreign literature in which texts are read in the original language, *or* two courses in the School of Humanities in foreign literatures in translation.

Emphasis in Creative Writing: Students interested in poetry must complete WR 30, WR 90, E 28D, CR 100A, and WR 100B; and they may additionally take WR 111 after submitting work in advance. Students interested in fiction must complete WR 31, WR 91, E 28E, CR 100A, and WR 100B; and they may additionally take WR 110 and WR 113 after submitting work in advance. An additional optional course, WR 115, permits students to develop their individual skills in a tutorial.

Residence Requirement for the English Major: CR 100A, CR 100B, two E 102s and E 106 must be completed successfully at UCI.

Departmental Requirements for the English Minor

Three courses selected from E 28A (or E 28D), E 28B, E 28C (or E 28E), E 6, E 7, E 8, including at least one quarter of E 28 (students can substitute any one Comparative Literature CL 50 course for any one E 28 course); and at least five English or writing courses numbered 102 or higher (excluding WR 139), although two courses from the following may be substituted: CR 100A, CR 100B, WR 100B.

Residence Requirement for the English Minor: Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the department undergraduate chair.

Departmental Requirements for the Literary Journalism Major

LJ 20; LJ 21; one course from the E 28 series (in some cases, students who change their majors to Literary Journalism after taking E 6, E 7, E 8 may petition to substitute one of those courses for a course from the E 28 series; and students can substitute any one Comparative Literature CL 50 course for any one E 28 course); CR 100A; LJ 101A, LJ 101B (three times, on various genres); at least three more Departmental courses numbered 102 or above (excluding E 140, E 150, WR 139, or WR 179), for one of which may be substituted an upper-division foreign literature-in-translation course offered in the School of Humanities (that is, requisite courses in Classics, Comparative Literature, East Asian Languages and Literatures, French and Italian, German, Spanish and Portuguese); E 105; and two upper-division History courses in a single regional or thematic focus area.

Residence Requirement for the Literary Journalism Major: LJ 20, CR 100A, LJ 101A, and two LJ 101B courses must be completed successfully at UCI.

PLANNING A PROGRAM OF STUDY

Students should plan coherent programs of study with their faculty advisors, including undergraduate seminars, workshops and seminars in writing (for students choosing a Literary Journalism major or Creative Writing emphasis), and courses in allied areas outside the Department. It is possible to combine a cluster of courses in literature with other majors in the sciences and social sciences, and to use an English or Literary Journalism major as preprofessional training in government, law, or medicine. Students who wish advice in planning such programs should consult both the Department and people in their prospective professional areas.

A student who intends to continue with graduate work is urged to study a second foreign language before graduation.

Students are also encouraged to take advantage of the opportunity to study abroad through the Education Abroad Program. See the Center for International Education section of the *Catalogue* or an academic counselor for additional information.

Subject-Matter Program in English. English majors wishing to obtain a single-subject credential in English may complete a California Commission on Teaching Credentialing (CCTC)-approved subject-matter program in English. The program can be easily satisfied in tandem with major requirements, especially with early and careful planning. Program requirements include specific courses in English and Comparative Literature, course work in linguistics and education, in-class K-12 experience, and a portfolio. Interested students should contact the Department of English for further information. Students who intend to pursue a single-subject or multiple-subject teaching credential should consult the UCI Department of Education as early as possible to ensure that they understand the departmental and State requirements.

Graduate Program

The Department's three principal undergraduate offerings—English and American Literature, the English major with a Creative Writing emphasis, and Literary Journalism—are reflected in the graduate programs, which, at this level, also involve collaboration with the Department of Comparative Literature: M.A. and Ph.D. in English, M.A. and Ph.D. in Comparative Literature, M.F.A. in English

(Creative Writing), and an emphasis in Creative Nonfiction within the Ph.D. degrees in English and in Comparative Literature. A student's courses for the M.A. and Ph.D. in English may include a specialization in American literature as well. The faculty is particularly equipped to guide students with special interests in criticism and theory, an area which candidates for the Ph.D. in English or in Comparative Literature may stress by adding the Schoolwide Critical Theory emphasis. Applicants for graduate degrees in English must submit scores for the Graduate Record Examination (GRE) including the Subject Test in Literature in English. Ordinarily students are not admitted to the English program unless they plan to continue, and are qualified to continue, to the degree of Ph.D. Students are admitted to the M.F.A. program chiefly on the basis of submitted creative work.

Specific requirements for the graduate degrees will be established by consultation between members of the faculty and the candidate. First-year graduate students or candidates for the Master of Fine Arts in English (Creative Writing) plan a program with an assigned advisor; candidates for the Ph.D. plan with an advisor and three-person committee. At the time of the M.A. examination, the Graduate Committee evaluates the student's graduate career up to that point and offers advice about future prospects. Candidates for literary degrees are encouraged to study philosophy, history, foreign languages and literatures, and the fine arts.

Only in exceptional circumstances will students be permitted to undertake programs of less than six full courses during the academic year. The normal expectation is enrollment in three courses each quarter; Teaching Assistants take two courses in addition to earning credit for University Teaching. Students who are not teaching should be able to complete course work in two years. The Ph.D. qualifying examination should be taken within a couple of quarters after courses are finished. The Ph.D. in English normally should be completed in seven years or less.

The Department recognizes that many of its graduate students intend to become teachers, and it believes that graduate departments should be training college teachers as well as scholars—indeed, that teaching and most literary scholarship complement one another. Thus the Department has initiated a program by which all its Ph.D. candidates may gain supervised training as part of the formal seminar work required for the degree. M.F.A. candidates also have the opportunity to participate in this program. Candidates for the Ph.D. are expected to acquire experience in teaching.

The Murray Krieger Fellowship in Literary Theory is the foremost fellowship in the Humanities and one of the largest at UCI. It is intended for an outstanding entering graduate student who is pursuing the Ph.D. in English or Comparative Literature and who demonstrates a primary interest in theory as theory relates to literary texts. It consists of a five-year support package, including a fellowship during the first year and a teaching assistantship for four years. Also included is a readership in the René Wellek Collection. A range of other fellowships is also available to students in the Department.

Emphasis in Creative Nonfiction

Students admitted to the emphasis in Creative Nonfiction must meet all course, language, and examination requirements for the Ph.D. in English. Their course work must include: (a) three writing workshops in nonfiction; (b) three courses in nonfictional literature or rhetoric; and (c) if needed for the projected dissertation, one course outside the Department. Students must also conduct a dissertation defense.

School Emphases

Schoolwide graduate emphases are available in Asian American Studies, Critical Theory, and Feminist Studies. Refer to the appropriate sections of the *Catalogue* for information.

ENGLISH

Master of Arts in English

Each candidate for the M.A. will be assigned to a graduate advisor who will supervise the student's program. The M.A. plan of study includes (1) the completion of course work, as advised, for three quarters or the equivalent; (2) demonstrated proficiency in reading a designated foreign language, modern or classical; and (3) the submission of materials (including a statement about work accomplished and plans for future study, and a sample essay) to the Graduate Committee, who will review and assess the student's progress, recommend whether further study toward the Ph.D. is advisable, and, if so, give advice about areas for further study.

The Department of English sponsors a Summer M.A. Program in English designed for teachers. The M.A. degree in English is awarded to candidates who complete 32 units of graduate course work through two consecutive summers in the program and submit an acceptable Master's essay. Applicants from outside the State of California may apply for the program.

Master of Fine Arts in English

The Master of Fine Arts (M.F.A.) is a degree in creative writing. The M.F.A. degree is normally conferred upon the completion of a two- to three-year residence. Each quarter the candidate will be enrolled in either the poetry or fiction section of the Graduate Writers' Workshop, which will constitute two-thirds of a course load, the other course to be selected in consultation with the student's advisor. It is expected that M.F.A. candidates will complete at least one supervised teaching seminar.

In addition to course work, the candidate is required to present as a thesis an acceptable book-length manuscript of poetry or short stories or a novel.

Doctor of Philosophy in English

The program for the Ph.D. in English requires about two years of full-time enrollment in regular courses beyond the B.A.; proficiency in the reading of two acceptable foreign languages, modern or classical; satisfactory performance on designated examinations; and the dissertation.

The languages acceptable depend upon the nature of the student's program as determined by the student's advisors. Reading competence in one of these languages must be established in the first year of residence, and competence in the second before the Qualifying Examination. Competence in the two languages required for the Ph.D. is verified through examination.

Upon completion of course work the student is examined in three areas: (1) a primary field; (2) a secondary field; and (3) theory and/or criticism.

Upon satisfactorily completing this Qualifying Examination, the student is admitted to candidacy for the degree. As soon after completion of the Qualifying Examination as is practical, the student presents a dissertation prospectus for the approval of the doctoral committee. The dissertation itself must also be approved by the committee, which may or may not require an oral examination on it. All work for the Ph.D. degree must be in courses limited to graduate students. The normal time for advancement to candidacy is four years. The normal time for completion of the Ph.D. is seven years, and the maximum time permitted is nine years.

Courses in English and Literary Journalism

LOWER-DIVISION

Satisfaction of the UC Entry Level Writing requirement is a prerequisite for all departmental courses except E 6, E 7, and E 8. See the Requirements for a Bachelor's Degree section for information on fulfilling this requirement.

Descriptions of the topics to be offered in the undergraduate literary courses during a given year are available in the Department office in the fall.

E 6 British Literature to the Renaissance (4) F. Lecture, three hours. Various topics in literature of the Middle Ages and Renaissance in English, such as the heroic, the rise of tragedy, women in literature, literature and nature. Primarily designed for nonmajors. **(IV)**

E 7 Literature in English from the Eighteenth to the Twentieth Centuries (4) W. Lecture, three hours. Various topics in literature in English outside the U.S., such as Romanticism, the development of the novel, revolution and industrialism in literature, the literary representation of war. Primarily designed for nonmajors. **(IV)**

E 8 American Literature (4) S. Lecture, three hours. Various topics in American literature, such as the literature of colonialism, U.S. literature and popular culture, the New England tradition, the English literature of the Pacific Rim. Primarily designed for nonmajors. **(IV)**

LJ 20 Introduction to Literary Journalism (4). Lecture, three hours. Reading of selected texts to explore the ways in which literary journalism and related nonfiction modes formulate experience. Students write several short papers and one final project. Prerequisite: satisfactory completion of the lower-division writing requirement.

LJ 21 Reporting for Literary Journalism (4). Seminar, three hours. Instruction and hands-on training in how to interview, report, research, and collect the types of information needed to write literary journalism. Prerequisite: LJ 20. Open to Literary Journalism majors only.

E 28 The Nature of Literature F, W, S, Summer. Discussion, three hours. Reading of selected texts to explore the ways in which these modes formulate experience. Students write several short analytic papers in each course. E 28D and E 28E also require creative writing. Prerequisite: satisfaction of the lower-division writing requirement. E 28A and E 28D may not both be taken for credit; E 28C and E 28E may not both be taken for credit.

E 28A The Poetic Imagination (4). (IV)

E 28B Comic and Tragic Vision (4). (IV)

E 28C Realism and Romance (4). (IV)

E 28D The Craft of Poetry (4). (IV)

E 28E The Craft of Fiction (4). (IV)

WR 30 The Art of Writing: Poetry (4) F, W, S. Beginners' workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings. May be repeated once for credit with a different instructor. **(I)**

WR 31 The Art of Writing: Prose Fiction (4) F, W, S. Beginners' workshop in fiction writing, evaluation of student manuscripts, and parallel readings. May be repeated once for credit with a different instructor. **(I)**

WR 37 Intensive Writing (6). Discussion, three hours; tutorial, two hours. Deals with review of grammar and usage, the process of writing, rhetorical principles, and guided practice in writing. Readings selected from current fiction and nonfiction; writing assignments require analysis of readings and demonstration of rhetorical principles. Successful completion of WR 37 with letter grade of C or above fulfills the UC Entry Level Writing requirement and one quarter of the UCI lower-division writing requirement. Students who achieve a C- or below must repeat the course or enroll in the equivalent. Students held for the UC Entry Level Writing requirement must satisfy the requirement before the beginning of their fourth quarter of residency. Prerequisite: students must have taken the UC Analytical Writing Placement Examination. Enrollment open to recommended students only. **(I)**

WR 38 The Art of Writing: Nonfiction and Journalism (4). Beginners' workshop in the writing of nonfiction and news articles, evaluation of student manuscripts, projects. **(I)**

WR 39A Fundamentals of Composition (4) F, W, S, Summer. Discussion, three hours. Deals with the fundamentals of grammar, usage, paragraph development, principles of rhetoric, and the writing of expository essays. Some exercises; frequent papers. A student seeking to satisfy the UC Entry Level Writing requirement who receives a grade below C must repeat the course, normally in the next quarter of residency. Students held for the UC Entry Level Writing requirement must satisfy the requirement before the beginning of their fourth quarter of residency.

WR 39B Critical Reading and Rhetoric (4) F, W, S, Summer. Discussion, three hours. Guided practice in the critical reading and written analysis of both popular and academic prose. Readings selected from literary, academic, journalistic, and fictional genres; writing topics require rhetorical analysis of readings and demonstration of rhetorical principles in student writing. Prerequisite: WR 39A or the equivalent. **(I)**

WR 39C Argument and Research (4) F, W, S, Summer. Discussion, three hours. Guided writing practice in argumentation, logic, and inquiry. Readings are selected from current nonfiction and from materials students select from the University library. Research strategies emphasized. Prerequisite: WR 37 or WR 39B. **(I)**

WR 90 Intermediate Poetry Writing (4). Intermediate workshop in the writing of poetry, evaluation of student manuscripts, and parallel readings. Prerequisite: WR 30 or equivalent. May be repeated once for credit with a different instructor.

WR 91 Intermediate Fiction Writing (4). Intermediate workshop in the writing of fiction, evaluation of student manuscripts, and parallel readings. Prerequisite: WR 31 or equivalent. May be repeated once for credit with a different instructor.

UPPER-DIVISION

CR 100A Literary Theory and Criticism (4) F, W. Required of majors in English, Comparative Literature, and Literary Journalism. A series of lectures and discussions devoted to the theoretical dimensions of literary criticism as reflected in major theorists from Plato to the present. Prerequisite: three courses from CL 50A, 50B, 50C, English 28A or 28D, 28B, 28C or 28E, LJ 20, LJ 21, or equivalent.

CR 100B Undergraduate Seminar in Literary Theory (4) F, W, S. Seminar, three hours. Open to upper-division majors in English and Comparative Literature only, and required of all English majors soon after the completion of CR 100A. Sections limited to 20 students. Each instructor announces a theoretical topic deriving from CR 100A and explores it through a number of theoretical and literary texts. Prerequisite: CR 100A. May be taken for credit twice.

WR 100B Undergraduate Seminar in Literary Theory (4). Seminar, three hours. Substitute for CR 100B for Creative Writing emphasis students. Prerequisite: CR 100A.

LJ 101A Lectures in the History and Theory of Literary Journalism (4). Lecture, three hours. Required of beginning majors in Literary Journalism. Lectures on topics that explore the historical and theoretical dimensions of literary journalism. Prerequisites: LJ 21 and one course from the E 28 or CL 50 series or equivalent.

LJ 101B Literary Journalism Core Writing Seminar (4). Seminar, three hours. Limited to 20 students. Writing seminars in announced specialized genres that students will both study and practice. Examples: "The Memoir"; "Review Writing"; "The Editorial"; "Writing Biography"; "The Profile"; "Political Writing." Prerequisites: satisfactory completion of the lower-division writing requirement; LJ 20 plus two other courses from the E 28 or CL 50 series; and LJ 101A. May be taken for credit three times as topics vary.

E 102 English and American Literary History F, W, S, Summer. Lecture, three hours. Studies of works representative of historical periods of literature in English, with attention to literary history, treating at a minimum more than one author and more than one genre. Prerequisites: upper-division standing; majors only. May be repeated for credit as topics vary.

102A Medieval and Renaissance Literature (4)

102B Restoration and Eighteenth-Century Literature (4)

102C Romantic and Nineteenth-Century Literature (4)

102D Twentieth-Century Literature (4)

E 103 Topics in Literature, Theory, and Criticism (4) F, W, S, Summer. Lecture, three hours. A series of lectures on and discussions of announced topics in literary criticism, history, genres, modes, major authors. May be repeated for credit as topics vary.

CR 103 Contemporary Critical Theory (4). Lecture, three hours. Discussion of contemporary critical theory. May be repeated once for credit toward graduation, but not repeated for credit within the major. Prerequisite: CR 100A.

LJ 103 Lectures on Topics in Literary Journalism (4). A series of lectures on, and discussions of, announced topics in literary journalism and the literature of fact. Examples: "Writing the Palate"; "Early Modern Women in the Public Sphere"; "Victorian Cultural Critics"; "Writing about War." May be repeated for credit as topics vary.

E 105 Multicultural Topics in English-Language Literature (4) F, W, S. Treats the literary consequences of relations and conflicts between races, genders, classes, ethnic groups, and other forms of cultural identity prevalent at different moments in history. May be repeated for credit as topics vary. **(VII-A)**

E 106 Advanced Seminar (4). Seminar, three hours. Required of all English majors. Limited to 25 students. Focuses on a topic within the area of literatures in English. Seeks to provide majors intensive work on a single topic in the field of English in a discussion setting. Prerequisites: two upper-division English (E) courses. May be repeated for credit as topics vary.

WR 109 Nonfiction and Journalism (4). Three hours. The course develops out of WR 38 for students with special competence for advanced work in journalism. Prerequisite: consent of instructor.

WR 110 Short Story Writing (4) F, W, S. Three-hour workshop in short fiction; discussion of student writing and of relevant literary texts. May be repeated once for credit toward graduation, but not repeated for credit within the major. Prerequisite: consent of instructor.

WR 111 Poetry Writing (4) F, W, S. Three-hour advanced poetry writing workshop; discussion of student writing and of relevant literary texts. May be repeated once for credit toward graduation, but not repeated for credit within the major. Prerequisite: consent of instructor.

WR 113 Novel Writing (4). Three-hour advanced workshop in fiction writing; discussion of student writing and of relevant literary texts. Prerequisite: consent of instructor.

WR 115 Conference in Writing (4). Primarily for writing emphasis seniors. May be repeated for credit toward graduation but not repeated for credit within the major. Prerequisite: consent of instructor.

WR 139 Advanced Expository Writing (4) F, W, S, Summer. Discussion, three hours. Study of rhetorical techniques; practice in writing clear and effective prose. Several essays of varying lengths, totaling at least 4,000 words. Prerequisites: satisfaction of the lower-division writing requirement of the breadth requirement and junior standing. May not be counted toward the upper-division requirements for majors or minors. **(I)**

E 140 Children's Literature (4). Lecture course open to all students. Explores the nature of children's literature and the special critical problems raised by it. Primarily for nonmajors. May not be counted toward the upper-division requirements for majors.

E 150 Topics in Literature for Nonmajors (4). Lecture, three hours. Major texts in English, American, and Comparative Literature explored for basic humanistic issues and themes, on announced topics. Primarily for upper-division students, but not requiring previous training in literature. May be repeated as topics change. May not be counted toward the upper-division requirements for majors.

WR 179 Advanced Composition for Teachers (4). Principles of formal composition and teaching composition. Selected handbooks and ancillary reading, marking papers, making assignments, and conducting workshops and tutorials. May not be counted toward the upper-division requirements for majors. Same as Education 179.

E 181 The Structure of English (4). An examination of American English phonology, morphology, and syntax. Useful for prospective teachers of English in elementary and secondary schools and for teachers of English as a second language. Prerequisite: Linguistics 3 or consent of instructor. Same as Linguistics 163B.

E 184 History of English (4). External (historical and social) and internal (linguistic) changes which have affected the English language from its Germanic roots to the present day. Prerequisite: Linguistics 3. Same as Linguistics 172.

E 187 Selected Topics in English Linguistics (4)

E 198 Special Topics (4-4-4). Directed group study of selected topics. By consent, by arrangement.

LJ 198 Special Topics (4-4-4). Directed group study of selected topics. By consent, by arrangement.

E 199 Reading and Conference (1 to 4). To be taken only when the materials to be studied lie outside the normal run of departmental offerings, and when the student will have no formal chance to pursue the subject. Prerequisites: consent of the student's advisor, the instructor, and the Department Chair.

LJ 199 Reading and Conference (1 to 4). To be taken only when the materials to be studied lie outside the normal run of departmental offerings, or when students have obtained internships at local publications. Prerequisites: consent of the student's advisor, the instructor, and the Literary Journalism Program Director.

GRADUATE

All graduate courses may be repeated when the topic varies. Descriptions of the topics to be treated in a given academic year are published by the Department in the fall. Enrollment in each graduate course requires the consent of the instructor. The courses are limited to registered graduate students, except for specially qualified fifth-year students seeking teaching credentials, who may enroll if they have first received permission from the Department's Graduate Committee and if space permits.

In addition to the following courses, graduate students in the Department of English might find Humanities 200 (The Nature and Theory of History) and Humanities 291 (Interdisciplinary Topics) of special interest.

E 210 Studies in Literary History (4) F, W, S

E 215 Prospectus Workshop (2) F. Workshop for the writing of the graduate student prospectus for those who have completed their qualifying examinations. Topics covered and assignments completed culminate in a presentation of a draft of the prospectus in class. Biweekly discussions.

CR 220 A, B Studies in Literary Theory and Its History (4, 4) F, W. Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English and American theorists. Same as Humanities 220 A, B.

E 225 Studies in Literary Genres (4) F, W, S

E 230 Studies in Major Writers (4) F, W, S

E 235 Methods of Literary Scholarship (4)

CR 240 Advanced Theory Seminar (4) F, W, S

WR 250A-B Graduate Writers' Workshop (Fiction) (4-4) F, W, S. Satisfactory/Unsatisfactory only.

WR 250C Graduate Writers' Workshop (Poetry) (8) F, W, S. Satisfactory/Unsatisfactory only.

WR 251A-B Writing in Conference (Fiction) (4-4) F, W, S. Satisfactory/Unsatisfactory only.

WR 251C Writing in Conference (Poetry) (8) F, W, S. Satisfactory/Unsatisfactory only.

WR 252 Graduate Workshop in Nonfiction (4) F, W, S. Reading and critique of student-manuscripts in creative nonfiction. The instructor leads discussions and meets with students on an individual basis. Satisfactory/Unsatisfactory only. May be taken for credit three times.

E 290 Reading and Conference (4) F, W, S

E 291 Guided Reading Course (4)

E 299 Dissertation Research (4 to 12) F, W, S. Satisfactory/Unsatisfactory only.

E 398 Rhetoric/Teaching of Composition (4) F, W. Readings, lectures, and internship designed to prepare graduate students to teach composition. Formal instruction in rhetoric and practical work in teaching methods and grading. Consent of instructor required.

E 399 University Teaching (4) F, W, S. Limited to Teaching Assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

UNDERGRADUATE PROGRAM IN EUROPEAN STUDIES

168 Humanities Instructional Building; (949) 824-8119
David Carroll, **Director**

Advisory Committee

Luis F. Avilés, *Department of Spanish and Portuguese*
Carolyn P. Boyd, *Department of History*
David Carroll, *Department of French and Italian*
Russell Dalton, *Department of Political Science*
Jane O. Newman, *Department of Comparative Literature*

Core Faculty

Luis F. Avilés, Ph.D. Brown University, *Department Chair of Spanish and Portuguese and Associate Professor of Spanish*
Philippe A. Barbé, Ph.D. Northwestern University; Doctorate, University of Paris, *Assistant Professor of French*
George Bauer, Ph.D. Princeton University, *Professor of Art History*
Linda Freeman Bauer, Ph.D. Institute of Fine Arts, New York University, *Professor of Art History*
Carolyn P. Boyd, Ph.D. University of Washington, *Department Chair and Professor of History*
Ellen S. Burt, Ph.D. Yale University, *Department Chair of French and Italian and Associate Professor of French*
David Carroll, Ph.D. The Johns Hopkins University, *Director of European Studies and Professor of French*
Russell Dalton, Ph.D. University of Michigan, *Professor of Political Science*
Sarah Farmer, Ph.D. University of California, Berkeley, *Associate Professor of History*
Ana Paula Ferreira, Ph.D. New York University, *Professor of Portuguese*
Linda Georgianna, Ph.D. Columbia University, *Professor of English*
Michelle M. Hamilton, Ph.D. University of California, Berkeley, *Assistant Professor of Spanish*
Douglas M. Haynes, Ph.D. University of California, Berkeley, *Associate Professor of History*
James D. Herbert, Ph.D. Yale University, *Department Chair and Professor of Art History*
Gail K. Hart, Ph.D. University of Virginia, *Director, Humanities Core Course and Professor of German*
Karen R. Lawrence, Ph.D. Columbia University, *Dean of the School of Humanities and Professor of English and Comparative Literature*
Meredith Lee, Ph.D. Yale University, *Professor Emerita of German*
Lynn Mally, Ph.D. University of California, Berkeley, *Professor of History*
Anthony McGann, Ph.D. Duke University, *Assistant Professor of Political Science*
Robert G. Moeller, Ph.D. University of California, Berkeley, *Professor of History*
Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Professor of Spanish*
Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature*
Gary Richardson, Ph.D. University of California, Berkeley, *Assistant Professor of Economics*
Jill Robbins, Ph.D. University of Kansas, *Associate Dean of the School of Humanities and Associate Professor of Spanish*
Thomas P. Saine, Ph.D. Yale University, *Professor Emeritus of German*
Gabriele Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature*
Martin Schwab, Ph.D. University of Bielefeld, *Director of the Minor in Humanities and Law and Professor of Philosophy and Comparative Literature*
Victoria Silver, Ph.D. University of California, Los Angeles, *Associate Professor of English*
James Steintrager, Ph.D. Columbia University, *Associate Professor of English*

The program in European Studies provides undergraduates with an opportunity to study Europe from the vantage points of several disciplines in the humanities and social sciences. Because Europe is both a geographical place and an idea which changes throughout history, it has had different meanings at different times and in different places. The study of Europe thus requires an open, pluralistic, and interdisciplinary curriculum that takes a critical approach to the idea (or ideas) of Europe. The program provides a multidisciplinary view of Europe as a whole and of its historical, political, and cultural formation and global implications. It also provides a focus on a specific area of European experience that cuts across traditional disciplinary and national boundaries. Participation in an Education Abroad Program in a European country is strongly recommended for all European Studies majors.

Students may elect to emphasize one of the following areas: Medieval Studies, Early Modern Europe (1450–1789), Modern Europe (1789–present), Encounters with the Non-European World, British Studies, French Studies, German Studies, Italian Studies, The Mediterranean World: Past and Present, Russian Studies, or Spanish-Portuguese Studies. As an alternative, students may define their own emphasis in consultation with a program advisor and with the approval of the European Studies Advisory Board.

Because there are so many emphasis options within the major, students are assigned for academic advising to members of the European Studies Advisory Board and are required to consult with their advisor on a quarterly basis.

CAREER OPPORTUNITIES

A degree in European Studies prepares its graduates to enter advanced degree programs in international business, history, law, and political science. The strong academic skills and professional orientation acquired by European Studies majors are necessary to pursue successful careers in such fields as international banking, law, journalism, management, public relations, publishing, and government service. Humanities graduates in general learn to express ideas clearly, do independent research, and think analytically and imaginatively—the required tools for success beyond the undergraduate career.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 235–236.

Requirements for the Major

Completion of two years of language (through the 2C level) in French, German, classical Greek, Italian, Latin, Portuguese, Russian, or Spanish.

Thirteen courses, of which four may be lower-division: (a) Humanities 101A-B; (b) six courses from an approved emphasis list (see sample below), four of which must be upper-division; (c) four multidisciplinary electives: two courses in European History or Political Science or Social Science outside the student's emphasis, and two courses in European Literature or Arts outside the student's emphasis; and (d) Humanities 190. NOTE: One course from either the approved emphasis list or the multidisciplinary elective category must be from the Encounters with the Non-European World emphasis. In addition, annual consultation with a faculty advisor is required.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Emphases and Approved Courses: The following list includes a few examples of courses that have been approved for each emphasis. The complete list is extensive and varies from quarter to quarter, depending upon course scheduling. For complete up-to-date information about approved courses, students are advised to consult the School of Humanities Web site at http://www.humanities.uci.edu/.

Medieval Studies: Gothic Architecture (Art History 114A), Women and Gender in Late Medieval Literature (English 102A), Jewish History from Ancient to Early Modern (History 130A).

Early Modern Europe (1450–1789): Art of Venice (Art History 121), Milton (English 103), Tudor England (History 117A).

Modern Europe (1789–present): Modern European Art (Art History 134), German Literature and Culture in Translation (German 150), World War, Cold War, and Reunification: 1939– (History 122C).

Encounters with the Non-European World: New World Slave Societies and Their Legacies (African American Studies 140), Topics in East Asian Philosophy (East Asian Languages and Literatures 117), Indian and Colonial Societies in Mexico (History 161A).

British Studies: Elizabethan and Jacobean Drama (Drama 103), Medieval and Renaissance Literature (English 102A), Stuart England (History 117B).

French Studies: Problems in French Culture (French 110), French Cinema (French 160), Early Modern France: 1500–1774 (History 120A).

German Studies: Literature and Society 1918–1945 (German 102B), Emergence of the German Nation: 1815–1890 (History 122A), Hegel to Nietzsche (History 127B).

Italian Studies: Studies in Southern Renaissance Art (Art History 121), Renaissance Europe (History 112A), Introduction to Italian Literature (Italian 101).

The Mediterranean World: Past and Present: Studies in Greek Art (Art History 103), Classical Mythology (Classics 150), Later Roman Empire (History 105B).

Russian Studies: Twentieth-Century Russia (History 124B), Peoples and Cultures of Post-Soviet Eurasia (Political Science 154F), Topics in Russian Literature (Russian 150).

Spanish/Portuguese Studies: Introduction to Portuguese and Brazilian Literature (Portuguese 120), Latin American Literature of the Twentieth Century (Spanish 130C), Literature in Translation (Spanish 150).

Requirements for the Minor

Nine courses are required: (a) Humanities 101A-B; (b) three courses selected from a single emphasis (see sample list above and at http://www.humanities.uci.edu/); and (c) four multidisciplinary electives: two courses in European History or Political Science or Social Science outside the student's emphasis, and two courses in European Literature or Arts outside the student's emphasis, approved by petition to the European Studies Committee.

Residence Requirement for the Minor: At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

DEPARTMENT OF FILM AND MEDIA STUDIES

235 Humanities Instructional Building; (949) 824-5386
Akira M. Lippit, **Department Chair**

Core Faculty

Edward Dimendberg, Ph.D. University of California, Santa Cruz, *Associate Professor of Film and Media Studies and Graduate Advisor to the Visual Studies Ph.D. Program* (film history, audio-visual media and the built environment, contemporary architecture and urbanism, avant-garde cinema, modernism and modernity)

Nanette Fornabai, Ph.D. Brown University, *Assistant Professor of French and of Film and Media Studies* (early French film, detective film, film noir, science and cinema)

Victoria E. Johnson, Ph.D. University of Southern California, *Assistant Professor of Film and Media Studies and of African American Studies* (history and critical theory of U.S. television, popular film, and media; politics of geography, race, gender, and sexuality in popular culture; cultural studies)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Assistant Professor of Film and Media Studies* (digital culture, media theory, cultural memory, history and politics of the Internet, hypertexts)

Bliss (Felicidad) Cua Lim, Ph.D. New York University, *Assistant Professor of Film and Media Studies* (Filipino and Hong Kong cinema, Third World and postcolonial studies, Fantastic cinema and the philosophy of history, politics of genre)

Akira Mizuta Lippit, Ph.D. The Johns Hopkins University, *Department Chair and Professor of Film and Media Studies* (film history and theory, critical theory, experimental film and media, Japanese cinema)

Mark S. Poster, Ph.D. New York University, *Professor of History and of Film and Media Studies* (theory and history of the media, theory of technology and culture, and Internet studies)

Fatimah Tobing Rony, Ph.D. Yale University, *Associate Professor of Film and Media Studies* (documentary film, race and representation, film history and criticism, film production)

Jared Sexton, Ph.D. University of California, Berkeley, *Assistant Professor of African American Studies and of Film and Media Studies* (race and sexuality, policing and imprisonment, contemporary U.S. cinema and political culture, multiracial coalition, critical theory)

Affiliated Faculty

Philippe A. Barbé, Ph.D. Northwestern University; Doctorate, University of Paris, *Assistant Professor of French* (Francophone studies, twentieth-century French literature)

Juan Bruce-Novoa, Ph.D. University of Colorado, *Professor of Spanish* (Latin American and Chicano studies)

David Carroll, Ph.D. The Johns Hopkins University, *Director of European Studies and Professor of French* (film history and criticism, French cinema, film and society)

Edward Fowler, Ph.D. University of California, Berkeley, *Department Chair of East Asian Languages and Literatures and Professor of Japanese* (modern Japanese literature, film, and cultural studies)

Jonathan M. Hall, Ph.D. University of California, Santa Cruz, *Assistant Professor of Comparative Literature* (Japanese film, East Asian Cinemas, queer and psychoanalytic theory, experimental and avant-garde film)

James D. Herbert, Ph.D. Yale University, *Professor and Department Chair of Art History* (modern European art, critical theory, and visual culture)

Kyung Hyun Kim, Ph.D. University of Southern California, *Associate Professor of Korean Culture and Director of the Film and Video Center* (history of film, Asian films, critical theory)

Glen Mimura, Ph.D. University of California, Santa Cruz, *Assistant Professor of Asian American Studies* (independent ethnic media; cultural studies of ethnicity, space, and globalization; queer theory and racialized sexuality; popular culture studies)

Sally A. Stein, Ph.D. Yale University, *Associate Professor of Art History* (American art, history of photography, photography and media)

Undergraduate Program

We live in a world in which we are surrounded by electronic media in the form of images and sounds. Whether printed on roadside billboards or broadcast into our homes via television, the media greatly influence our sense of who we are and how we live. Yet so much of our exposure to the sights and sounds of film, TV, video, advertising, and new technologies is taken for granted. Those sights and sounds are so pervasive, and in many cases so enjoyable, that we rarely pause to consider how they act upon us and how we interact with them. An undergraduate education in Film and Media Studies provides students with an opportunity to explore the appeal and to begin to understand the operation of these complex meaning-producing machines we call cinema, television, and new digital technologies.

The course work for the B.A. degree program in Film and Media Studies trains students to read and understand the audio-visual languages of modern media and new technologies and to analyze images from socioeconomic, political, aesthetic, and historical perspectives. Learning these critical viewing skills involves learning new ways of seeing. The Film and Media Studies curriculum is systematic and comprehensive; upper-division courses have between 20 and 50 students and are typically taught by regular faculty. During the 2004–05 academic year, there were more than 235 Film and Media Studies majors enrolled at UCI.

The Department of Film and Media Studies familiarizes students with the history, theory, and art of cinema and other media. Courses focus on a range of topics, including individual directors, period styles, genres, national cinemas, the history and criticism of television, and developments in new technologies. Additional courses offer students hands-on experience in video production and screenwriting. The program provides its majors with a thorough appreciation of the modern media's roles in contemporary society. Regular course offerings are complemented by film and video screenings and series at the School of Humanities Film and Video Center. Film and Media Studies, in cooperation with other units at UCI, regularly invites scholars, digital artists, directors, producers, and screenwriters to campus to share their work and perspectives with students.

Film and Media Studies at UCI is unique in its concentration on the history, theory, and criticism of cinema, television, and new technologies. The faculty has published books and articles on topics that include images of the Vietnam war, avant-garde directors, ethnographic film, film and postmodernism, horror cinema, women filmmakers, television performance, and new technologies.

In order to cover the extra costs generated by the purchase and rental of media and production equipment demanded by the specialized Film and Media Studies curriculum, the School of Humanities charges a laboratory fee of $20 per course to all students taking Film and Media Studies courses.

Film and Media Studies students can complete professional internships in the fields of film, television, or digital media production, distribution, writing, and related areas for elective course credit.

Film and Media Studies students also have the opportunity to spend their junior year in France studying at the Inter-University Center for Film and Critical Studies in Paris, through the University's Education Abroad Program. Information is available both in the Film and Media Studies Office and the Education Abroad Program Office.

CAREER OPPORTUNITIES

A degree in Film and Media Studies will provide students with a variety of opportunities leading to a career choice or to further education at the graduate or professional level. Graduates from the program have gone on to a host of different careers. Some have pursued graduate work in critical film studies at leading institutions such as the University of California, Los Angeles, and the University of Iowa. Others have entered M.F.A. programs in production at places like the University of Southern California, UCLA, or San Francisco State University. Many are now at work in various sectors of the entertainment industry as feature film editors, executives in film and video distribution companies, network television producers, and independent filmmakers.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resumé preparation, job search, and interview techniques. See the Career Center section for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Major

Film and Media Studies 85A-B-C, 101A-B-C, either 110 or 111, either 117A or 120A, 139, and four of the following: 112, 113, 114, 115, 117B*, 117C*, 120B*, 120C*, 130, 141, 142, 143, 144, 160, 161, 185, 190. (*Students may apply only two of the courses marked with an asterisk toward this requirement.)

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

Film and Media Studies 85A, 101A-B-C, and three of the following: 85B, 85C, 110, 111, 112, 113, 114, 115, 130, 141, 142, 143, 144, 160, 161, 185, 190.

Residence Requirement for the Minor: Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Graduate Study

In conjunction with the Department of Art History, the Department of Film and Media Studies offers a graduate program in Visual Studies. A program description may be found at the end of the School of Humanities section. Graduate courses satisfying the requirements of the program are listed there and in the Art History section.

Courses in Film and Media Studies

LOWER-DIVISION

85A-B-C Image Culture

85A Visual Media and Contemporary Culture (4) F. An introduction to the study of visual media—such as advertising, movies, television, and video—and analysis of their role in contemporary culture. Introduces students to the critical vocabulary of film and television studies. Formerly Film Studies 85A. **(IV)**

85B History of Broadcasting (4) W. A history of broadcast media. Social, political, economic, legal, institutional, and cultural perspectives guide analysis. United States commercial TV serves as the primary case study. Prerequisite: Film and Media Studies 85A or consent of instructor. Formerly Film Studies 85B. **(IV)**

85C New Technologies and Visuality (4) S. The study of electronic communication technologies, such as virtual reality and the Internet, from social, cultural, psychological, and political perspectives. Prerequisites: Film and Media Studies 85A-B or consent of instructor. Formerly Film Studies 85C. **(IV)**

UPPER-DIVISION

101A-B-C History of Film

101A The Silent Era I (4) W. An investigation of the technological, economic, social, and aesthetic determinants of the cinema in its first 30 years. The formal strategies and historical importance of films by Méliès, the Lumières, Porter, Griffith, Murnau, Lang, Eisenstein, Pudovkin, and others. Prerequisite: Film and Media Studies 85A. Formerly Film Studies 101A.

101B The Sound Era I (4) S. Explores the formal strategies and sociohistorical dynamics of films made between 1930 and 1960, concentrating on representative cinemas and works by Lang, Riefenstahl, Renoir, Welles, De Sica, Ophüls, Kurosawa, and others. Prerequisite: Film and Media Studies 101A. Formerly Film Studies 101B.

101C The Sound Era II (4) F. Studies narrative strategies and formal possibilities in films made since 1960, framing aesthetic questions in political, social, and economic terms, using selected features from Western and non-Western countries. Prerequisite: Film and Media Studies 101B. Formerly Film Studies 101C.

110 Film and Media Theory (4) F, W, S, Summer. Survey of major directions in film and media theory. Various theories of mass culture, realism, auteurism, semiotics, feminism, cultural studies, and theories of other media. Offered as a seminar, with an emphasis on developing the student's ability to analyze and articulate a theoretical argument. Prerequisites: Film and Media Studies 85A-B-C and 101A-B-C. Formerly Film Studies 110.

111 Media Theory and Practice (4) F, W, S. Seminar on theory and practice focusing on issues in film and media production and editing. Reading and exercises to understand aspects of film and media production (montage, sound, film movement, directing, and mise en scène), and how ideology works in tandem with style. Prerequisite: Film and Media Studies 101C, 120A, and consent of instructor. Open only to Film and Media Studies majors.

112 Genre Study (4) F, W, S. Critical approaches to the serial productions we call "genre" films, the patterns of recognition known as westerns, weepies, musicals, horror films, and others; televisual genres, such as sitcoms, drama, comedy, news, docudrama, police; Internet categories, such as chat-rooms, listservs, Web pages. Prerequisite: Film and Media Studies 85A or consent of instructor. May be repeated for credit as topics vary. Formerly Film Studies 112.

113 Narrative/Image (4) F, W, S. What relations do sound, image, and story assume in film, television, video, and Internet narratives? In what ways do these media interact with and borrow from each other and traditional storytelling media, like print and orality? How have the new media explored non-narrative strategies and to what end? Prerequisite: Film and Media Studies 85A or consent of instructor. May be repeated for credit as topics vary. Formerly Film Studies 113.

114 Film, Media, and the Arts (4) F, W, S. A synthetic entity, film draws on both established and popular arts. Looks at visual media's exchanges with "high" and "low" culture, exploring its relation to areas such as photography, music, painting, and architecture. Prerequisite: Film and Media Studies 85A or consent of instructor. May be repeated for credit as topics vary. Formerly Film Studies 114.

115 Authorship (4) F, W, S. Theoretical and analytical discussions of visual media authorship, focusing on case studies of directors, producers, scriptwriters, and film, video, and digital artists. Prerequisite: Film and Media Studies 85A or consent of instructor. May be repeated for credit as topics vary. Formerly Film Studies 115.

117A Introduction to Screenwriting (4) F, W, S, Summer. Introduction to the history and technique of the screenplay, with a particular focus on its different aesthetic forms as well as on the various roles it has assumed within the evolution of the film industry. Formerly Film Studies 117A.

117B Basic Scriptwriting (4) F, W, S. Exercises in the development of screenplays with emphasis on formal and structural considerations as well as on film industry praxis. Conducted in an intimate workshop setting with frequent group discussions of student scripts-in-progress. Prerequisite: Film and Media Studies 117A. Formerly Film Studies 117B.

117C Scriptwriting Workshop (4) F, W, S. Continuation and intensification of work initiated in 117B. Students complete a full-length screenplay. Concentrates on both practical and technical concerns, addressing pragmatic and aesthetic questions in intensive small-group discussions. Prerequisite: Film and Media Studies 117B. Formerly Film Studies 117C.

120A Basic Production (4) F, W, S, Summer. Introduction to the basic apparatus of video/film production. The elementary essentials of production, including the use of camera and lenses, lighting, editing, and sound. Prerequisite: Film and Media Studies 85A or consent of instructor. Formerly Film Studies 120A.

120B Intermediate Production (4) W. Students work on individual and group projects, utilizing skills and insights introduced in Film and Media Studies 120A. Prerequisite: Film and Media Studies 120A or consent of instructor. Formerly Film Studies 120B.

120C Production Workshop (4) S. As film and video are collaborative media, students form production groups and ultimately produce final 10–15 minute film/video projects. Prerequisite: Film and Media Studies 120B or consent of instructor. Formerly Film Studies 120C.

130 Multicultural Topics in the Media (4) F, W, S. An investigation of media representations of gender, race, and sexuality in the United States. Topics include media images of and by one or more minority groups in the United States, including African Americans, Asian Americans, Chicano/Latinos, Native Americans, and gays and lesbians. Prerequisite: Film and Media Studies 85A or consent of instructor. May be repeated for credit as topics vary. Formerly Film Studies 130. **(VII-A)**

139 Writing on Film and Media (4) F, W, S. Practical exercises in film, TV, and other media criticism as a form of cultural analysis. Requires at least 4,000 words of assigned composition. Prerequisites: Film and Media Studies 85A and 101A; satisfactory completion of the lower-division writing requirement; junior standing. Formerly Film Studies 139.

141 Studies in Television: 1930–1970 (4) F, W, S. Part one of an in-depth sequence in the critical history of television. Focuses thematically on different concerns of the period (the Anthology Drama, Live Television, TV and the Hollywood Studios, and others). Prerequisites: Film and Media Studies 85A-B-C or consent of instructor.

142 Studies in Television: 1971–Present (4) F, W, S. Part two of an in-depth sequence in the critical history of television. Expands on knowledge of broadcast history from 85B and 141. Focuses thematically on different concerns of the period ("Quality Television and the Producer's Medium," TV and Censorship, The Emergence of Cable and Narrowcasting). Prerequisites: Film Studies 85A-B-C or consent of instructor.

143 Critical Theory of Television (4) F, W, S. Introduction to critical, theoretical, scholarly understandings and analyses of television, which offer in-depth analyses of television programming, audience reception practices, and industry strategies of address. Prerequisites: Film and Media Studies 85A-B or consent of instructor.

144 Studies in New Media (4) F, W, S. Analyzes interpretations of the Internet and looks at empirical studies of various features of it. Asks students to explore the Internet and present their own conclusions about it. Prerequisites: Film and Media Studies 85A-B-C or consent of instructor.

160 National Cinemas (4) F, W, S. Period styles, national schools, oppositional movements, e.g., Classical Japanese Cinema, Italian Neorealism, Nouvelle Vague, Weimar Film, Cinema Nôvo. Same as East Asian Languages and Literatures 160, French 160, German 160, or Spanish 160 when topics are appropriate. May be repeated for credit when topics vary. Formerly Film Studies 160. **(VII-B)**

161 Global Media (4) F, W, S. Comparative analysis of global media systems focusing on case studies in the development, embrace of, and resistance to media forms and practices from the 1850s to the present. Prerequisites: Film and Media Studies 85A-B-C or consent of instructor. May be repeated for credit as topics vary. **(VII-B)**

185 Television and New Media (4) F, W, S. An advanced seminar focusing on special issues pertaining to broadcasting and/or new technologies. Topics include, but are not limited to: television criticism; space and new technologies; and broadcast advertising. Prerequisites: Film and Media Studies 85A-B-C or consent of instructor. Formerly Film Studies 185.

190 Special Topics in Film and Modern Media (4) F, W, S. Special issues concerned with film and media history, theory, and criticism. Examples include Gone Primitive (Anglo-American romance with the "primitive" in literature, film, other media); television criticism (review and analysis of models and modes of criticism applied to television since the 1940s). Prerequisite: Film and Media Studies 85A or consent of instructor. May be repeated for credit as topics vary. Formerly Film Studies 190.

197 Professional Internship (2 to 4) F, W, S. Professional internship in the broadcast, film, video, or Internet industries designed to provide students with closely supervised professional experience to enhance their understanding of media from industrial, historical, and critical perspectives. Journal and final report required. Prerequisites: Film and Media Studies 117A-B-C or 120A-B-C or consent of instructor. Open only to Film and Media Studies majors and minors with a B average or better in Film and Media Studies course work. May be taken for credit for a total of four units. Formerly Film Studies 197.

198 Creative Project (2 to 4) F, W, S. Creative project in screenwriting, filmmaking, videomaking, or Web or Internet design intended to provide advanced production and creative writing training beyond the Film and Media Studies 117A-B-C or 120A-B-C series. Final project required. Prerequisites: Film and Media Studies 85A and 117A-B-C or 120A-B-C or consent of instructor; 101A recommended. May be taken twice for a credit total of eight units. Formerly Film Studies 198.

199 Directed Research (4) F, W, S. Directed reading and research under supervision of a faculty member in topic areas not covered by regular course offerings. Final research paper required. Prerequisites: upper-division standing and consent of instructor. Formerly Film Studies 199.

GRADUATE

In addition to the course below, graduate courses satisfying the requirements of the program in Visual Studies are listed in the Visual Studies and Art History sections of the *Catalogue.*

399 University Teaching (4) F, W, S. Limited to teaching assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit. Formerly Film Studies 399.

DEPARTMENT OF FRENCH AND ITALIAN

312 Humanities Hall; (949) 824-6407
Ellen Burt, **Department Chair**

Faculty

Etienne Balibar, Docteur en philosophie, Katholieke Universiteit Nijmegen, *Professor of French and Comparative Literature* (critical theory, political philosophy), *Winter Quarter*

Philippe A. Barbé, Ph.D. Northwestern University; Doctorate, University of Paris, *Assistant Professor of French* (Francophone studies, twentieth-century French literature)

Ellen S. Burt, Ph.D. Yale University, *Department Chair of French and Italian and Associate Professor of French* (eighteenth-century French literature and nineteenth-century poetry)

David Carroll, Ph.D. The Johns Hopkins University, *Director of European Studies and Professor of French* (critical theory and twentieth-century French literature)

James Chiampi, Ph.D. Yale University, *Professor of Italian* (Italian Renaissance)

Nanette Fornabai, Ph.D. Brown University, *Assistant Professor of French and of Film and Media Studies* (nineteenth- and twentieth-century French literature, film, popular culture)

Suzanne Gearhart, Ph.D. The Johns Hopkins University, *Professor of French* (seventeenth- and eighteenth-century French literature, philosophy and literature)

Elizabeth Guthrie, Ph.D. University of Illinois, *Director of the French Language Program and Senior Lecturer with Security of Employment* (second-language acquisition and teaching)

Sonja Hamilton, Ph.D. The Johns Hopkins University, *Assistant Professor of French* (nineteenth-century literature, politics, and women writers)

Judd D. Hubert, Ph.D. Columbia University, *Professor Emeritus of French* (seventeenth- and nineteenth-century French literature)

Renée Riese Hubert, Ph.D. Columbia University, *Professor Emerita of French and Comparative Literature* (literature and fine arts, modern poetry, surrealism, Romanticism, comparative literature)

Alice M. Laborde, Ph.D. University of California, Los Angeles, *Professor Emerita of French* (eighteenth-century French literature)

Carrie J. Noland, Ph.D. Harvard University, *Co-Director of the Major in Humanities and Arts and Associate Professor of French* (twentieth-century poetry; World War II and literature of the avant-garde)

Richard L. Regosin, Ph.D. The Johns Hopkins University, *Professor of French* (sixteenth-century French literature)

Undergraduate Program in French

The Undergraduate Program in French offers a broad humanistic course of study designed for students in the liberal arts. The orientation of the program is multidisciplinary, where the study of literature is linked to critical, cultural, and historical concerns. Courses reflect the faculty's interest in the related disciplines of history, philosophy, anthropology, women's studies, cultural studies, and comparative literature, and express its conviction that the study of French literature and culture is enriched by pursuing its relations with other disciplines, fields, and cultures.

Lower-division language courses encourage students to participate in the creative process of language, to think in French as they learn to understand, speak, read, and write. These courses are taught entirely in French, and the approach to teaching stresses the interdependence of the four basic language skills and makes them mutually reinforcing. The Language Laboratory is used to complement classroom activity.

At the intermediate lower-division level, texts of contemporary literary and social interest provide the focus for advanced conversation, reading, and composition. After the second year, advanced courses in conversation and writing enable students to attain a greater degree of proficiency, preparing them for further study in the multidisciplinary upper-division program.

All upper-division offerings are taught in the seminar mode. Because classes are limited in size, they promote and encourage participation and discussion and facilitate direct contact with professors. In the introductory courses in literature, texts are studied in their historical context. The student learns to analyze and interpret different types of creative literature and is introduced to various critical concepts and vocabularies. At the more advanced level, the multidisciplinary courses bring together material and methodologies from the various disciplines in order to address interpretive problems of French literature, culture, and history. In recent years, courses have been offered in literature and political opposition, monsters and madness in Renaissance literature, cubism in painting and poetry, ethnography and literature, autobiography, Francophone literature, and Albert Camus and Algeria. The content of courses changes yearly according to the interests of both faculty and students.

Placement examinations will no longer be required for students who have successfully completed French language classes in high school. Students will now be placed in French language courses according to their years of previous study. In general, one year of high school French will be considered equal to one quarter of a UCI French course. Thus, for example, students with two years of high school French language will be placed in 1C, while students who have completed three years in high school will be placed in 2A. Students in 2A will, however, be informed of their level of competency in French by taking a diagnostic test the first day of class. Students who place in 2A but who have scored below what is expected for successful performance in 2A will be informed that they may either remain in 2A or choose to enroll in 1C instead.

Student representatives serve on departmental committees. These representatives also participate in Department meetings and are responsible for student evaluation procedures.

CAREERS FOR THE FRENCH MAJOR

The great majority of students who major in French pursue careers in business and commerce, where they can take advantage not only of their proficiency in French language but also of their knowledge of French literature and culture. Many students also go on to law school, to medical school, and to careers in the diplomatic service. In recent years, graduates have entered the field of education in increasing numbers. The Department's multidisciplinary approach to the study of literature teaches students to think critically and develops analytical skills that can be applied to a wide range of problems. It also helps students to develop the interpretive and writing skills necessary to express their own ideas clearly and persuasively. Whether they enter business or professions such as law, education, or government, French majors acquire the intellectual and communicative skills requisite for success.

The UCI Career Center provides service to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Major

French 100A-B, 101A-B-C, and nine other upper-division courses taught in the Department. Students may take up to two courses from the Department offerings taught in English.

Residence Requirement for the Major: At least five upper-division courses (above 101A-B-C) required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

French 100A-B plus five other French courses, four of which must be upper-division and four of which must be taught in French. Prerequisite: French 2C or equivalent.

Residence Requirement for the Minor: Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

PLANNING A PROGRAM OF STUDY

Students should consult with the faculty to plan a coherent program of courses to fulfill the major requirements.

The Department encourages students to study in France, either through the University's Education Abroad Program or independently. Information is available in the Department Office.

Students should consult with faculty members concerning career plans in areas such as teaching, industry, journalism, law, and civil service.

Undergraduate Minor in Italian Studies

The minor in Italian Studies is an interdisciplinary curriculum that allows students to go beyond second-year Italian and engage in various aspects of Italian culture by taking courses in Italian literature in the Department of French and Italian and other courses related to Italian history and culture in the Departments of Art History, Comparative Literature, English, Film and Media Studies, History, and Philosophy.

Departmental Requirements for the Minor

Italian 1A-B-C, 2A-B-C; and seven upper-division courses selected from the following two lists, when topics are appropriate. At least five of the seven courses must be from list A.

A. Art History 120, 121, 125, 198; Comparative Literature CL 103; Film Studies 160; History 112A; Italian 101A, 101B, 101C; Philosophy 132. (No more than *two* courses may be taken from the same department.)

B. Art History 107, 198; Classics 140, 150, 170; Comparative Literature CL 104; History 105A, 105B, 105C, 110C, 112D.

Residence Requirement for the Minor: At least four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken at an Italian university through the UC Education Abroad Program, provided they are approved in advance by the Director of the Minor.

Students who complete significant course work on Italian topics while participating in the Education Abroad Program in Italy are encouraged to pursue their interest in Italian studies through the special Humanities interdisciplinary major, leading to a B.A. degree in Humanities. Interested students should consult the Senior Academic Counselor in the School's Office of Undergraduate Study.

Graduate Program in French

The Department of French and Italian offers a graduate program in French with a strong theoretical, cultural, and multidisciplinary orientation. In addition to their specialties in the traditionally constituted fields of French literature, the faculty is actively involved in related disciplines such as philosophy, psychoanalysis, anthropology, history, women's studies, cultural studies, and comparative literature. A theoretical and multidisciplinary approach to literature is a demanding one requiring, among other things, a restless critique of its own evaluations and concepts.

In small seminars designed to stimulate intellectual exchange, students and faculty explore literature written in French within the context of relevant historical, cultural, or theoretical issues. They raise questions engaged by literary discourse and study critically the theories formulated to account for it. Courses tend to cross lines between disciplines and to emphasize both the close reading of texts and modern theories of history, culture, literature, and criticism. Students are encouraged to pursue their work in related fields outside the Department. They are also strongly encouraged to study abroad at some point during their graduate career.

MASTER OF ARTS IN FRENCH

The Master of Arts degree is considered to be a step toward the Ph.D. degree; only students intending to pursue studies for the doctorate are admitted to the program. Performance on the Master's examination, usually given in the second year of graduate study, determines entrance into the doctoral program. Most candidates take a minimum of 11 graduate courses. All entering graduate students are counseled by the graduate advisor. During the winter quarter of each year, the teaching performance and academic record of each student who is a Teaching Assistant are evaluated. All graduate students are also given a written evaluation of their work on a course-by-course basis. Proficiency in a foreign language in addition to French is required for the M.A. degree (proficiency is defined as the equivalent of the level attained at the end of course 2C).

All M.A. candidates are required to pass the Master's examination. Plan I allows particularly well-prepared students to receive special permission to take nine courses and to write a short thesis, for which two course credits are given. Under Plan II candidates take a minimum of 11 courses and have the option of taking a written examination or of writing a research paper. The written examination consists of essays that demonstrate skills of literary analysis and an understanding of theoretical concepts and their application to the study of specific literary texts. The research paper involves a carefully developed and well-documented analysis that reflects extensive critical reading. In all cases students also take an oral examination that focuses on the written essays or the research paper and that seeks as well to test the student's broader knowledge.

The Master's examination is normally given at the end of the winter quarter of the second year of studies. Students who are

Teaching Assistants normally take the examination in the fifth quarter of their studies.

Students transferring to the program from other graduate institutions may receive credit for up to two courses, subject to the approval of the Department. A maximum of five courses may be transferable from other UC graduate programs, with departmental approval.

DOCTOR OF PHILOSOPHY IN FRENCH

Upon successful completion of the Master's examination and admission to the Ph.D. program, or upon admission with a Master's degree from an accredited institution, a Guidance Committee is appointed in consultation with the student. The Guidance Committee advises the student in the choice of courses to help prepare for the written and oral Qualifying Examinations leading to advancement to candidacy for the Ph.D. degree. The Committee is comprised of five faculty members: three from the Department, one from outside the Department who represents the student's outside area of specialization, and, for the qualifying examination, another faculty member not affiliated with the Department who represents the faculty-at-large. One member of the Committee is expected to direct the dissertation.

Language Requirements: A reading knowledge of two foreign languages relevant to the student's area of specialization and subject to the approval of the Guidance Committee.

Course Requirements: A minimum of 15 graduate courses or seminars in French beyond the B.A. and three graduate courses outside the Department in areas related to the field of specialization are required.

A student may pursue the Ph.D. with particular emphasis in literary theory by taking additional course work in the Department and in the Critical Theory Program beyond the minimum number required.

A student may pursue the Ph.D. with an emphasis in Comparative Literature by taking a minimum of five courses in the Comparative Literature program.

A graduate emphasis in Feminist Studies also is available. Refer to the Women's Studies section of the *Catalogue* for information.

Teaching: Since the overwhelming majority of Ph.D. candidates plan to teach, the Department recognizes its responsibility to train them as teachers. Therefore, as far as it is possible, all candidates without previous teaching experience are required to participate in a program of supervised teaching for at least one year.

Qualifying Examination—Written and Oral: Upon completion of course work, the student takes a series of examinations involving problems of a critical and interpretive nature. The Ph.D. Examination encourages focus and depth at a time when the student's area of specialization and eventual dissertation topic should be taking an increasingly clearer shape. In consultation with the Guidance Committee, the student defines the precise nature and scope of four topics for the examination, which consists of written and oral parts. Upon successful completion of the written and oral Qualifying Examinations, the student is advanced to candidacy for the Ph.D. degree. The normal time for advancement to candidacy is four years.

Dissertation: The dissertation topic chosen by the candidate will normally, but not necessarily, fall within one of the major fields covered by the Qualifying Examination. The dissertation must be defended in an oral examination and approved by the Doctoral Committee before the candidate is recommended for the degree.

Three faculty members, chosen by the candidate, proposed by the Department, and appointed on behalf of the Dean of Graduate Studies and the Graduate Council, constitute the Doctoral Committee which directs the preparation and completion of the doctoral dissertation. The Doctoral Committee supervises an oral defense, the focus of which is the content of the doctoral dissertation, and certifies that a completed dissertation is satisfactory. The normal time for advancement to candidacy is four years. The normal time for completion of the Ph.D. is seven years, and the maximum time permitted is eight years.

Courses in French

LOWER-DIVISION

1A-B-C Fundamentals of French (5-5-5) 1A (F), 1B (F, W), 1C (W, S). Students are taught to conceptualize in French as they learn to understand, read, write, and speak. Classes are conducted entirely in French and meet daily. Language Laboratory attendance is required. French 1A-B-C and S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamentals of French (7.5-7.5) Summer. First-year French in an intensified form. Same as French 1A-B-C during academic year. Prerequisite for S1AB:none; for S1BC: French S1AB or 1B, or two years of high school French. Formerly French S1A-B. French S1AB-BC and 1A-B-C may not both be taken for credit. (S1BC: **VI**)

2A-B-C Intermediate French (4-4-4) 2A (F, S), 2B (F, W), 2C (W, S). Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in French. Prerequisite: normally three years of high school French or one year of college French. French 2A-B-C and S2AB-BC may not both be taken for credit. **(VII-B)**

S2AB-BC Intermediate French (6-6) Summer. Second-year French in an intensified form. Same as French 2A-B-C during academic year. For description, see French 2A-B-C. Prerequisite for S2AB: French S1BC or 1C with a grade of C or better, or three to four years of high school French, or the equivalent; for S2BC: French S2AB or 2B with a grade of C or better, or the equivalent. French S2AB-BC and 2A-B-C may not both be taken for credit. **(VII-B)**

13 Conversation (4) F, W, S. Helps students increase their fluency and enrich their vocabulary. Prerequisite: French 2C or equivalent.

50 French Culture and the Modern World (4) F, W, S. Introductory course for non-majors. Focuses on France's role in the modern world and its cultural connections to Asia, the Middle East, Africa, Europe, and the Americas. Taught in English. May be taken for credit three times as topics vary. **(IV, VII-B)**

97 Fundamentals of French (with Emphasis on Reading) (4). Designed primarily for students interested in acquiring a solid reading knowledge of French, and to facilitate the understanding and translating of French texts dealing with a variety of disciplines. Not open to French majors or minors. Does not serve as a prerequisite for any higher-level French courses or fulfill any undergraduate foreign language requirement.

UPPER-DIVISION

100 Composition and Grammar Review

100A Advanced Grammar and Composition (4) F, W. Systematic review of grammar with written compositions on various topics. Students study and practice forms of descriptive and imitative writing, techniques of translation, and textual analysis including *explication de texte* of prose and poetry passages. Prerequisite: French 2C or equivalent.

100B Essay Writing (4) W, S. Trains students to write about literature in French, and introduces them to specific critical approaches and strategies for utilizing library resources, organizing arguments, and developing a coherent essay. Topics for weekly compositions drawn from texts of literary, historical, and social interest. Prerequisite: French 100A or equivalent.

101A-B-C Introduction to French Literature (4-4-4) F, W, S. Introduction to all of the genres of a narrowly defined period in relationship to a specific literary problem. In French. French 100A and 100B are recommended as prerequisites but may be taken concurrently with French 101A-B-C. **(VII-B)**

105 Advanced Composition and Style (4). Helps the student attain greater proficiency and elegance in the written language. Prerequisites: French 100B.

NOTE: The prerequisite for the following upper-division courses is French 101A-B-C or the equivalent. The content of these upper-division courses changes yearly. Courses numbered 110 through 198, except 139 and 180, may be repeated for credit when topics change.

110 Problems in French Culture (4). (VII-B)

116 Sixteenth-Century French Literature (4). (VII-B)

117 Seventeenth-Century French Literature (4). (VII-B)

118 Eighteenth-Century French Literature (4). (VII-B)

119 Nineteenth-Century French Literature (4). (VII-B)

120 Twentieth-Century French Literature (4). (VII-B)

125 African Literature of French Expression (4). Introduction to the principal African and Caribbean works written in French. Offers opportunity to study literature and culture in French in a non-European context. Lectures and papers in French. **(VII-B)**

127 Francophone Literature and Culture (4). Literature and cultures of the francophone world. **(VII-B)**

130 Junior-Senior Seminar in French Literature (4). Provides advanced students in French literature an opportunity to explore in-depth selected topics in French literature and culture in a seminar environment. Class discussion and independent research projects are emphasized. Prerequisite: two upper-division French literature courses beyond French 101A-B-C. May be repeated for credit as topics vary.

139 Literature and Society (4). In English. Readings of masterpieces of French literature in their social, political, and historical contexts. Course requires at least 4,000 words of assigned composition based on French works. Several essays required. Topics vary. French majors have admission priority. *Prerequisites: satisfaction of lower-division writing requirement;* junior standing or consent of instructor. May be repeated for credit as topics vary. **(VII-B)**

140 Studies in French Literary Genre (4)

150 Topics in French Literature and Culture (4). In English. **(VII-B)**

160 French Cinema (4) F, W, S, Summer. In English. May have discussion sections in French. May be repeated when topic varies, but can be taken only twice for credit toward the major. Same as Film and Media Studies 160. **(VII-B)**

170 History and Literature (4)

171 Politics and Literature (4)

180 Junior/Senior Seminar in Theory and Criticism (4). May be repeated for credit once when topics vary.

199 Special Studies in French (1 to 4) F, W, S. Open only to outstanding students. Research paper required. Prerequisites: consent of instructor and of Department Chair; student must submit a written description of the proposed course to the instructor and the Chair prior to the beginning of classes. May be repeated for credit as topics vary.

GRADUATE

The content of these courses changes yearly, and courses numbered 200 and 216–399 (except 280) may be repeated for credit as topics vary. Students should also consult the offerings of the Department of Linguistics.

In addition to the following courses, graduate students in French might find these Humanities courses of special interest: Humanities 200 (History and Theory); Humanities 220 (Literary Theory and Its History); and Humanities 270 (Advanced Critical Theory).

200 Selected Topics in French Linguistics (4)

216 Studies in Renaissance Literature (4)

217 Studies in Seventeenth-Century Literature (4)

218 Studies in Eighteenth-Century Literature (4)

219 Studies in Nineteenth-Century Literature (4)

220 Studies in Twentieth-Century Literature (4)

225 Francophone Literature and Culture (4). Studies in different francophone literatures and cultures (of Canada, the Caribbean, West and North Africa, and Southeast Asia).

231 Studies in Fiction (4)

232 Studies in Nonfictional Prose (4)

233 Studies in Poetry and Poetics (4)

240 Studies on a Major Writer (4)

250 Studies in Theory and Criticism (4)

254 History and Literature (4)

272 Cultural Studies (4)

280 Directed Study in French Literature (4) F, W. Restricted to graduate students taking the Master's examination the same quarter.

290 Research in French Language and Literature (4-4-4) F, W, S. A project proposal must be prepared by the student and approved by the faculty member who will direct the project. This proposal, with the faculty member's signature, must be given to the Chair for approval and will be put in the student's file. This procedure can be completed before or after registration or at the very latest must be completed by the end of the first week of classes. After the end of the first week no 290s can be approved. M.A. candidates may take this course once; Ph.D. candidates may take it twice.

299 Dissertation Research (4 to 12) F, W, S

399 University Teaching (4) F, W, S. Limited to Teaching Assistants. May be repeated for credit.

Courses in Italian

LOWER-DIVISION

1A-B-C Fundamentals of Italian (5-5-5) F, W, S. Students are taught to conceptualize in Italian as they learn to understand, read, write, and speak. Classes are conducted entirely in Italian and meet daily. Language Laboratory attendance is required. (1C: **VI)**

2A-B-C Intermediate Italian (4-4-4) F, W, S. Texts of contemporary literary or social interest provide the focus for more advanced conversation, reading, and composition. Classes are conducted entirely in Italian. Prerequisite: *Italian 1C, three years of high school Italian, or one year of college Italian.* **(VII-B)**

97 Fundamentals of Italian (with Emphasis on Reading) (4). Designed primarily for students interested in acquiring a solid reading knowledge of Italian, and to facilitate the understanding and translating of Italian texts dealing with a variety of disciplines. Not open to Italian Studies minors. Does not serve as a prerequisite for any higher-level Italian courses or fulfill any undergraduate foreign language requirement.

99 Special Studies in Italian (4) F, W, S. Both student and instructor arrive at the theme of the course and the critical approach to be followed in consultation. Intended to offer courses in Italian otherwise unavailable. Prerequisites: consent of instructor and Department Chair; student must submit a written description of the course to the Chair prior to the first week of classes to obtain consent. May be repeated for credit when topic changes.

UPPER-DIVISION

100A-B Italian Language and Civilization (4-4). Systematic review of grammar with written and oral composition on topics chosen from readings on Italian culture and civilization. Prerequisite: completion of Italian 2C or equivalent. **(VII-B)**

101A, B, C Introduction to Italian Literature (4, 4, 4). Introduction to all of the genres of a narrowly defined period in relationship to a specific literary problem. In Italian. Prerequisite: Italian 2C or equivalent; Italian 100A-B recommended. **(VII-B)**

140A-B-C Readings in Medieval and Renaissance Literature (4-4-4). In English.

199 Tutorial in Italian Literature and Culture (4-4-4) F, W, S. The student must submit a written description of the proposed course to the instructor and the Chair prior to the beginning of the course. Prerequisites: consent of instructor and approval of the Department Chair.

DEPARTMENT OF GERMAN

400 Murray Krieger Hall; (949) 824-6406
E-mail: german@uci.edu
John H. Smith, **Department Chair**

Faculty

Kai Evers, Ph.D. Duke University, *Assistant Professor of German* (twentieth-century German literature and film)

Gail K. Hart, Ph.D. University of Virginia, *Director, Humanities Core Course and Professor of German* (eighteenth- and nineteenth-century German literature, drama, fictional prose)

Ruth Kluger, Ph.D. University of California, Berkeley, *Professor Emerita of German* (Kleist, nineteenth-century literature, Stifter, Holocaust literature)

Meredith Lee, Ph.D. Yale University, *Professor Emerita of German* (lyric poetry, eighteenth-century literature, Goethe, music and literature)

Herbert Lehnert, Ph.D. University of Kiel, *Research Professor of German* (modern German literature)

Glenn S. Levine, Ph.D. University of Texas, Austin, *German Language Program Director and Assistant Professor of German* (applied linguistics, pedagogy, German-Jewish culture and literature)

William J. Lillyman, Ph.D. Stanford University, *Research Professor of German* (Romanticism, Goethe, Tieck)

Jens Rieckmann, Ph.D. Harvard University, *Professor Emeritus of German* (twentieth-century literature, fin-de-siècle Austria, Hofmannsthal, Thomas Mann)

Thomas P. Saine, Ph.D. Yale University, *Professor Emertius of German* (eighteenth-century German literature, Enlightenment, French Revolution, Goethe)

John H. Smith, Ph.D. Princeton University, *Director of the Critical Theory Institute, Department Chair and Professor of German* (eighteenth- and nineteenth-century literature and intellectual history, literary theory)

The Department of German pursues a program of German studies as part of the humanistic endeavor to understand and evaluate culture. Departmental courses are focused on language, literature, and film *in context,* that is, within the historical, social, intellectual, and political circumstances of their production and continuing reception. Clearly, we come to understand ourselves and our immediate culture much better through the study of different languages and cultural systems. Therefore, university language study is not merely a matter of memorizing vocabulary and practicing pronunciation. It is the serious investigation of a foreign linguistic system and the cultures which are defined by it. It is difficult—in fact, nearly impossible—for us to scrutinize and analyze something we know as intimately as our native language, and yet this is the order by which we formulate our thoughts and the order which may sometimes formulate our thoughts for us. The "foreignness" of a foreign language allows us to objectify an entire linguistic system, to observe its structure and its usage, and then to make comparisons with our own linguistic situation. This kind of knowledge of one's *native* language is the foundation of critical reflection on texts of any nature—historical, philosophical, literary, political, legal, journalistic, and others. Thus, serious study of a foreign language is absolutely crucial to a university education. The Department teaches its language courses with this principle in mind and seeks to provide its students with a framework for these linguistic and cultural comparisons.

Department literature and film courses offer a variety of critical perspectives from historical, social, or politically engaged readings to feminist and post-structuralist analysis. Topics range from studies of individual authors, periods, and genres to the history of German-language literature and film, the theory of criticism, and the relations of German-language literature to other literatures.

Undergraduate Program

The Department offers a major and a minor in German Studies. The major can be combined as a double major with any other UCI course of study; see an academic counselor for information.

All courses in the Department are taught in German to the extent compatible with the aim of the course. In the lower-division language courses students develop skills in speaking, listening, reading, and writing through an engaging, collaborative, task-based curriculum. The courses place a great deal of emphasis on meaningful cultural literacy in German, employing a diverse range of authentic texts and materials from the beginning, including avid use of Internet resources. During the second year (intermediate), students benefit from a curriculum based on authentic literary and cultural content (theater, media) and simulation of "real world" situations. These courses have the additional goal of contributing to students' education in the humanities and developing their skills in critical thinking.

After completion of the intermediate level, students enroll in the German 100 series (Advanced Reading, Writing, Oral Communication) and in Introduction to German Literature and Culture (German 101), which provides an introduction to genre, periodization, and the German terminology used in critical analysis. This course is taken in preparation for the upper-division literature and film courses (German 102, 117, 118, 119, 120), which range historically from the Reformation to the present and cover a variety of topics and approaches. A further series of courses (German 130, 140, 150, 160) is taught in English for both German Studies students and those who do not speak the language, and covers topics in German literature and culture, literary theory, and criticism as well as German-language cinema.

Students are encouraged to participate in work- and study-abroad programs in German-speaking countries. The Department recommends the University's Education Abroad Program (EAP) in Göttingen, Germany. Göttingen is an old university city in central Germany, where EAP students complete an advanced language program and enroll in university courses with great success, usually achieving native or near-native fluency during this exciting year abroad. EAP also offers semester- and year-long programs in Berlin and Bayreuth. All EAP courses are accepted for UCI graduation credit and many contribute to fulfillment of the German Studies major and minor requirements. More information is available from the academic counselors.

German placement tests are recommended but not required for students who have successfully completed foreign language classes in high school or elsewhere. To obtain information about the German placement test, please contact the UCI Testing Office at (949) 824-6207. Students with college-level course work should present their transcript to an academic counselor in the Humanities Undergraduate Study Office, 143 Humanities Instructional Building, or call (949) 824-5132 for assistance in determining which UCI course to take.

Apart from the optional placement test, students are placed in German language courses according to the number of years of previous study. In general, one year of high school German is considered equal to one quarter of a UCI German language course.

CAREERS FOR THE GERMAN STUDIES MAJOR

The ability to speak and write German can open up opportunities in communications, foreign trade and banking, transportation, government, science and technology, tourism, library services, and teaching. Because German plays such an important role in modern technology, employers in international law, business, the foreign service, the airline industry, journalism, professional translating, and all levels of education increasingly seek students with a knowledge of German. German is excellent preparation for professional schools. It can be combined successfully with work in the natural sciences, business and management, and the computer sciences, and it is invaluable for advanced work in the humanities and the arts.

Recent graduates of the German Department have begun careers in international law, business, the foreign service, the airline industry, journalism, and all levels of education, including university teaching.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Major

German 100A, B, C; German 101; eight upper-division courses in German literature and culture; and two courses selected from German 140, 150, 160, Linguistics 3, Comparative Literature CL 50A, B, C, courses in German history, German philosophy, or German political science, as approved by the advisor for the major. The upper-division writing requirement must be met by additional course work either within or outside the Department.

Residence Requirements for the Major: At least five of the upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

Seven upper-division courses, which must include German 100A, B, C and German 101. Not more than one course from German 140, 150, or 160 may be counted for the minor. German 139 may not be used to satisfy minor requirements.

Residence Requirement for the Minor: Four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Distinguished Visiting Professors

The Department's Distinguished Visiting Professors program brings students into direct contact with some of the outstanding scholars in the field of German Studies. Distinguished Visiting Professors typically visit for one quarter, during which they teach a graduate course and an undergraduate course and present a lecture to which students, faculty, and other members of the University community are invited. Program participants include Bengt Algot Sørenson (Odense), Uwe Ketelsen (Bochum), Peter Pütz (Bonn), Leslie Adelson (Ohio State), Hans Wysling (Zürich), Hans-Wolf Jäger (Bremen), Norbert Oellers (Bonn), Hans Rudolf Vaget (Smith College), Heinrich Detering (Göttingen), Wolfgang Martens (Munich), Anna Kuhn (UC Davis), Renate Möhrmann (Köln), Ülker Gökberk (Reed College), Stephanie Hammer (UC Riverside), Helmut Schneider (Bonn), Richard Gray (University of Washington), Ursula Mahlendorf (UC Santa Barbara), Sander Gilman (Emory University), and Irmela von der Lühe (Freie Universität, Berlin).

Graduate Program

In its graduate courses the Department stresses theoretical understanding of the nature of literature and culture. Seminars focus on German literary and cultural development after 1700. An emphasis in Critical Theory is available to graduate students in all departments of the School of Humanities. A graduate emphasis in Feminist Studies also is available. Refer to the Women's Studies section of the *Catalogue* for information. In addition, graduate students in German may choose to complete an emphasis in Comparative Literature.

The graduate program in German is essentially a Ph.D. program. The M.A. requires a minimum of one year in academic residence and must be completed in no more than two years of full-time graduate study. The Department will decide after completion of the M.A., at the latest, whether or not to permit the student to continue in the Ph.D. program. The M.A. thus may be in some cases a terminal degree. In those cases where the student enters the UCI graduate program in German with an M.A. from another institution, the Department will evaluate the student's progress during the first year of study before deciding to allow continuation toward the Ph.D.

Students who enter with normal academic preparation and pursue a full-time program of study ordinarily should be able to earn the Ph.D. degree within six years or less.

MASTER OF ARTS IN GERMAN

Before entering the program, a candidate is expected to have the equivalent of our undergraduate major. Students with a bachelor's degree in another subject may be considered for admission. Normally their course of studies will have to be extended in order to make up for the deficiency. However, each case is considered individually by the faculty. The minimum course requirement for the M.A. degree is nine courses, eight of which must be taken within the Department of German. Reading knowledge of a foreign language other than German also is required for the M.A. degree. Whenever possible, a candidate is urged to complete this requirement before entering the program. Further requirements follow.

The Preparation of a Reading List. All candidates should prepare as early as possible a list of works read in the field of German literature, both primary texts and critical works. This list should preferably be augmented by critical texts and by works from other literatures which, in the candidate's opinion, relate to the German works on the list. Since it should ultimately contain representative selections from various eras of German literature and some works of criticism, a tentative list must be discussed with the graduate advisor before the end of the fall quarter of the year in which the candidate expects to receive the M.A. Candidates should indicate on the list a number of works with which they are especially familiar. In its final form (including works read during the course of study both in and out of class) the list will be submitted together with the essay two weeks before the oral examination. It is the student's responsibility to keep the reading list current.

The Master's Essay. The purpose of the written part of the M.A. comprehensive examination is to show the candidate's methodological progress in interpreting German literature. It consists of an essay in which a text is elucidated and related to: (a) pertinent works by the same author, (b) its social and historical context, and (c) other works of German or other literatures with which the candidate is familiar. The level of the discussion will normally be enhanced by the candidate's knowledge of the relevant secondary literature. The topic of the essay should be tentatively formulated and reported to the graduate advisor before the end of the second quarter of the student's residence.

The Oral Examination. During the oral examination the following items will be discussed: (a) the essay, (b) the reading list. The discussion based on the reading list will focus on works which the student knows well, but may broaden into other areas.

One Year of Residence.

DOCTOR OF PHILOSOPHY IN GERMAN

The Department requires a minimum of 22 approved courses from students entering with a bachelor's degree. These may include courses in philosophy, history, comparative literature, and others suitable for the individual student's program of study. The student also will participate in each of the German Department's colloquia.

The student will augment the reading list and keep it current during the whole course of study. At least two years of residence are required.

Students entering with the master's degree will be advised individually as to remaining course requirements.

Since the majority of Ph.D. candidates choose careers as teachers, the German Department recognizes its obligation to offer them preparatory experience. Therefore, all candidates for the Ph.D. are required to teach under the supervision of a faculty member at least one course in each of three quarters (for which they will receive credit as German 399). Three of these courses may be counted toward the 22 courses required for the Ph.D.

Comprehensive Examination. There are two parts to the examination. In order to fulfill the written examination requirement the student will choose either (1) to present a lecture to the faculty and to the other graduate students, or (2) to write a three-part examination (one part on a significant author, one on a major genre, and one on an historical period) within a period of two weeks. The examination essays or the lecture will be on a text or texts selected by the faculty from a reading list submitted by the student for the comprehensive examination. The second part of the comprehensive examination is the formal oral qualifying examination of up to three hours duration ranging over the whole field of the student's studies, to be taken within two weeks after completion of the written examination. The student will submit the reading list at least two weeks before the written examination after consultation with the members of the examination committee.

Language Requirements. The candidate must demonstrate reading knowledge of two languages or extensive competence in one language other than German or English. Choice of language(s) depends on the student's area of specialization. French and Latin are recommended. For the various ways in which these requirements may be fulfilled, the student should see the graduate advisor.

Dissertation. Toward the end of the second year of study, the student should formulate a tentative dissertation topic. Three faculty members proposed by the Department and appointed on behalf of the Dean of Graduate Studies and the Graduate Council constitute the Doctoral Committee which directs the preparation and completion of the dissertation. The Doctoral Committee certifies that a completed dissertation is satisfactory through the signature of the Committee members on the signature page of the dissertation.

Time to degree. The normal time for advancement to candidacy is four years. The normal time for completion of the Ph.D. is six years, and the maximum time permitted is eight years.

Courses in German

LOWER-DIVISION

1A-B-C Fundamentals of German (5-5-5) F, W, S. Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and beginning study of German. With a learner-centered approach the courses help students develop speaking, listening, reading, writing, and cultural skills and knowledge. Prerequisite for 1A: none; for 1B: German 1A with a grade of C or better, one to two years of high school German, or equivalent; for 1C: German 1B or S1AB with a grade of C or better, two to three years of high school German, or equivalent. German 1A-B-C and S1AB-BC may not both be taken for credit. (1C: **VI**)

S1AB-BC Fundamentals of German (7.5-7.5) Summer. First-year German in a time-intensive form. Equivalent to German 1A-B-C during the academic year. For description, see German 1A-B-C. Prerequisite for S1AB: none; for S1BC: German S1AB or 1B with a grade of C or better, or equivalent. German S1AB-BC and 1A-B-C may not both be taken for credit. (S1BC: **VI**)

2A-B-C Intermediate German (4-4-4) F, W, S. Emphasizes the development of meaningful communicative skills in German for the purposes of interaction with German speakers and intermediate study of German. With a learner-centered approach, the courses help students develop reading, writing, speaking, listening, grammatical, and cultural skills and knowledge. First-year grammar is reviewed and expanded. Prerequisite for 2A: German 1C or S1BC with a grade of C or better, three to four years of high school German, or equivalent; for 2B: German 2A with a grade of C or better, or equivalent; for 2C: German 2B or S2AB with a grade of C or better, or equivalent. German 2A-B-C and S2AB-BC may not both be taken for credit. **(VII-B)**

S2AB-BC Intermediate German (6-6) Summer. Second-year German in a time-intensive form. Equivalent to German 2A-B-C during the academic year. For description see German 2A-B-C. Prerequisite for S2AB: German S1BC or 1C, three to four years of high school German, or equivalent; for S2BC: German 2B or S2AB with a grade of C or better, or equivalent. German S2AB-BC and German 2A-B-C may not both be taken for credit. **(VII-B)**

50 Science, Society, and Mind (4) F, W, S. Historical, philosophical, and literary reflections by German writers on the rise of the modern sciences. In English. Designed primarily for nonmajors. May be taken three times for credit as topics vary. **(IV, VII-B)**

53 Advanced Conversation (2) S. Includes reading of political and cultural material. Conducted in German. May be repeated for credit. Prerequisite or corequisite: German 2C or consent of instructor.

97 Fundamentals of German (with Emphasis on Reading) (4) F, W, S. Designed primarily for students interested in acquiring a solid reading knowledge of German, and to facilitate the understanding and translating of German texts dealing with a variety of disciplines. Not open to German majors or minors. Does not serve as prerequisite for any higher-level German courses or fulfill any undergraduate foreign language requirement.

99 Special Studies German (1 to 5) F, W, S. Consultation with instructor necessary prior to enrollment. Prerequisite: consent of instructor.

UPPER-DIVISION

NOTE: Upper-division courses normally are taught in German. Exceptions are German 103, 139, 140, 150, and 160.

100 Advanced German. Competence in reading, writing, and speaking German. Prerequisite: German 2C or equivalent or consent of instructor.

100A Advanced Reading (4). Competence in reading expository German with emphasis on vocabulary expansion, comprehension of complex syntactical structures, and cultural literacy. Topics such as women in the Nazi period, reading the German news. **(VII-B)**

100B Advanced Writing (4). Competence in writing German including selected specialized skills and vocabulary. Topics such as business German, the art of letter writing. **(VII-B)**

100C Advanced Oral Communication (4). Oral proficiency with emphasis on active listening, communication skills, discussion strategies, and pronunciation. Topics such as the art of conversation, media and mass communication. **(VII-B)**

101 Introduction to German Literature and Culture (4) F. Sample interpretations of texts in their cultural and historical contexts. Introduction to critical language in German. Prerequisite: German 2C. **(VII-B)**

102A Literature and Society Since World War II (4). Interdisciplinary introduction to recent German literature not only as an aesthetic phenomenon but also as a social and political force. Methodological problems arising from an analysis of literature in its historical context. Prerequisite: German 2C or consent of instructor. **(VII-B)**

102B Literature and Society 1918–1945 (4). See above description. Prerequisite: German 2C or consent of instructor. **(VII-B)**

104 Topics in German Linguistics (4). Explores linguistic, sociolinguistic, or ethnography-of-communication topics of German or other Germanic languages (Swedish, Icelandic, Yiddish, and others). Taught in English. Intermediate knowledge of a Germanic language assumed. May be repeated for credit as topics vary.

117 Topics in German Literature and Culture 750–1750 (4). Specific course content determined by individual faculty members. Example: Luther and the European Renaissance. Prerequisite: German 101 or consent of instructor. May be repeated for credit as topics vary. **(VII-B)**

118 Studies in the Age of Goethe (4). Individual authors such as Lessing, Goethe, Schiller, Kleist, and Hölderlin, or the drama of the "angry young men" of the German 1770s. Prerequisite: German 101 or consent of instructor. May be repeated for credit as topics vary. **(VII-B)**

119 Studies in Nineteenth-Century German Literature and Culture (4). Individual authors such as Büchner, Grillparzer, Keller, and Nietzsche, or broader social-literary phenomena. Prerequisite: German 101 or consent of instructor. May be repeated for credit as topics vary. **(VII-B)**

120 Studies in Twentieth-Century German Literature and Culture (4). Individual authors such as Thomas Mann, Brecht, and Kafka, or topics addressing questions of genre and/or social-literary problems. Prerequisite: German 101 or consent of instructor. May be repeated for credit as topics vary. **(VII-B)**

130 Topics in German Literature and Culture (4). Literary and cultural topics not fully contained within the periods listed above, such as "German Comedy" and "Turn-of-the-Century Vienna." Prerequisite: German 101. May be repeated for credit as topics vary.

139 Writing about Literature and Culture (4). In English. Requires at least 4,000 words of assigned composition based upon readings in Germanic literatures and cultures. Several essays required. Topics vary. German majors given admission priority. Prerequisites: satisfactory completion of the lower-division writing requirement; junior standing or consent of instructor.

140 Topics in Literary Theory and Criticism (4). In English. Theoretical dimensions of literary criticism and the German philosophical tradition. Topics such as Marxism, Freudian thought, the German Idealistic tradition of aesthetics, Historicism, twentieth-century hermeneutics, Frankfurt School, and *Rezeptionsaesthetik* are explored in a selection of theoretical, critical, and literary texts. May be repeated for credit as topics vary.

150 German Literature and Culture in Translation (4). In English. Major works in Germanic literature and culture in context. Prerequisite applicable only when offered as an upper-division writing course: upper-division standing and satisfactory completion of the lower-division writing requirement. May be repeated for credit as topics vary.

160 German Cinema (4). Historical, theoretical, and comparative perspectives on German cinema. Same as Film and Media Studies 160 when topic is appropriate. May be repeated for credit as topics vary. **(VII-B)**

199 Individual Study (1 to 4) F, W, S. May be repeated for credit as topics vary.

GRADUATE

All graduate courses offered in the Department fall under the generic titles German 200, 210, 220, and 230. Course titles and contents change according to the instructor teaching them; courses offered under these numbers may be repeated for credit provided the content has changed. Complete course descriptions are available quarterly from the Department at http://www.humanities.uci.edu/german/courses.php. Course offerings for the entire School of Humanities are available at http://www.humanities.uci.edu/SOH/students/graduate.html.

200 Literary Criticism (4)

210 Literary Theory (4)

220 Selected Topics in German Linguistics (4)

230 Literary and Cultural History (4)

290 Independent Study (4). Counted toward course requirements for the M.A. or Ph.D. A term paper or project is required. Letter grade only. May be repeated for credit.

298 Independent Directed Reading (4 to 12). For students preparing for doctoral examination. Satisfactory/Unsatisfactory only.

299 Dissertation Research (4 to 12). For students who have been admitted to doctoral candidacy. Satisfactory/Unsatisfactory only.

398A-B The Teaching of German (2-2) F, W. Required of all Teaching Assistants in the German Department. Also open to present and prospective teachers of German who are not Teaching Assistants.

399 University Teaching (4) F, W, S. Limited to Teaching Assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

UNDERGRADUATE PROGRAM IN GLOBAL CULTURES

168 Humanities Instructional Building; (949) 824-8119
Douglas M. Haynes, **Director**

Core Faculty

Sharon B. Block, Ph.D. Princeton University, *Assistant Professor of History*
Ana Paula Ferreira, Ph.D. New York University, *Professor of Portuguese*
James Fujii, Ph.D. University of Chicago, *Associate Professor of Japanese*
David Theo Goldberg, Ph.D. City University of New York Graduate School and Center, *Director of the UC Humanities Research Institute and Professor of African American Studies and of Criminology, Law and Society*
Douglas M. Haynes, Ph.D. University of California, Berkeley, *Associate Professor of History*
Laura H. Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies and Comparative Literature*
Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Asian American Studies and English*
Keith L. Nelson, Ph.D. University of California, Berkeley, *Professor Emeritus of History*
Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature*
Mark S. Poster, Ph.D. New York University, *Professor of History and of Film and Media Studies*
Brook Thomas, Ph.D. University of California, Santa Barbara, *UCI Chancellor's Professor of English*
Armin Schwegler, Ph.D. University of California, Berkeley, *Professor of Spanish*
Jacobo Sefamí, Ph.D. University of Texas at Austin, *Professor of Spanish*
Bert Winther-Tamaki, Ph.D. Institute of Fine Arts, New York University, *Associate Professor of Art History*

The major in Global Cultures provides UCI students with an opportunity to explore the stimulating ways in which local and global processes are intertwined. In recent decades, the intensified processes of globalization have meant that cultural practices, symbolic systems, and the intersectional formations of gender, sexuality, race, ethnicity, and class have increasingly spanned national boundaries. But, on the other hand, this feature of the world today was shaped by and is as much a feature of the past. The aim of the Global Cultures major is to provide students with a humanistic framework for understanding the problem and processes of globalization in relationship to change across time and space, the formation and contestation of identity, and theoretical and discursive practices that shape philosophical speculation and belief. Students may choose one of the following approved emphases or may define their own emphasis in consultation with a program advisor and with the approval of the Global Cultures Committee.

Atlantic Rim: Explores the movement of people and cultures in relationship to the historical and contemporary experience of societies that are adjacent to the Atlantic Ocean, including, among others, west Africa, the Americas, the Caribbean, and western and northern Europe, as well as the British archipelago.

Hispanic, U.S. Latino/Latina, and Luso-Brazilian Cultures: Examines the historical, political, and cultural formations of regions where Spanish and Portuguese are spoken, including Spain, Portugal, Spanish- and Portuguese-speaking countries in the Western Hemisphere, and the Latino/Latina population in the United States.

Locating Africas (Nation, Culture, and Diaspora): Examines Africa as a diverse geographical and political expression, including its historical, political, and cultural formation locally, regionally, and globally.

Locating Asias (Nation, Culture, and Diaspora): Examines Asia as a diverse geographical and political expression, including its historical and cultural formation locally, regionally, and globally.

Locating Europes and European Colonies: Examines Europe as a diverse geographical and political expression, including its historical and cultural formation locally, regionally, and globally.

Pacific Rim: Explores the movement of people and cultures in relationship to the historical and contemporary experience of societies that are adjacent to the Pacific Ocean, including, among others, India, China, Japan, Korea, Vietnam, the United States, Central and South America, and Malayasia.

Inter-Area Studies: Includes comparative studies of the geographical regions outlined in the above six emphases, for instance, the analysis of Africans in Asia, or the cultural, historical, and political connections between the Atlantic and the Pacific Rim.

Because there are so many emphasis options within the major, students will be assigned for academic advising to a member of the Global Cultures Committee or a Core faculty member and are required to consult with their advisor on a quarterly basis.

CAREER OPPORTUNITIES

Students in this major will be well prepared to do what other Humanities majors do after graduation: work in business, law, education, politics, public policy, academia, and print and television media. Global Cultures majors will be especially qualified for careers in the foreign service and international business. Students majoring in Humanities are particularly well prepared for careers in all fields in which analysis, judgment, and argument are important. The Global Cultures major will equip students with a knowledge and understanding of the complexities of the diverse world in which they live. Perhaps nowhere more than in the State of California, the contemporary workforce is constituted by people who have crossed geographic and cultural boundaries and who are embodiments of the forces of globalization that this major will help students to understand better. Global Cultures majors will thus be particularly sensitive to the challenges and opportunities presented by the multicultural society of which they are a part.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Requirements for the Major

Fourteen courses are required: History 21A-B-C; Humanities 103A-B; eight upper-division courses from an approved emphasis list (see sample below), six of which must be selected from one emphasis and two from a second emphasis (three of the eight courses must focus on representation, i.e., Art History, Film, Media, Literature, History, French, Italian, Spanish, Russian); and Humanities 191. Quarterly consultation with a faculty advisor is also required.

Students are encouraged to augment their foreign language competence beyond the School minimum. Participation in the UC Education Abroad Program is strongly recommended for all Global Cultures majors.

Residence Requirement for the Major: At least five five upper-division courses required for the major must be completed successfully at UCI.

Requirements for the Minor

History 21A-B-C, Humanities 103A-B, four courses selected from one emphasis; and one course selected from a second emphasis.

Residence Requirement for the Minor: A minimum of four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Emphases and Approved Courses: The following list includes a few examples of courses that have been approved for each emphasis. The complete list is extensive and varies from quarter to quarter, depending upon course scheduling. For complete up-to-date information about approved courses, students should consult the School of Humanities Web site at http://www.humanities.uci.edu/.

Atlantic Rim: The Black Protest Tradition (African American Studies 141), American Art: 1800-1900 (Art History 165B), Black Britain (History 190).

Hispanic, U.S. Latino/Latina, and Luso-Brazilian Cultures: Women, Race, and Social Movements in Latin America (Anthropology 121E), Chicana/Chicano History: Twentieth Century (History 151B), Introduction to Portuguese and Brazilian Literature (Portuguese 120B).

Locating Africas (Nation, Culture, and Diaspora): Race and Medicine in the United States: 1870-1990 (African American Studies 110), African American Art: 1900–Present (Art History 164B), The African American Civil Rights Movement (History 142B).

Locating Asias (Nation, Culture, and Diaspora): Japanese Art: 1868-1945 (Art History 162B), Asian Americans and Education in a Multicultural Society (Asian American Studies 150), Asian American Writers: Ethnicity and the Politics of Location (Comparative Literature 105).

Locating Europes and European Colonies: European Art: 1851-1907 (Art History 134C), Classics and History: The Ancient World (Classics 140), The Holocaust (History 190).

Pacific Rim: Asian American Labor (Asian American Studies 111), Japan as Spectacle at the End of the Century (East Asian Languages and Literatures 155), America and the Third World (History 158C).

Inter-Area Studies: Nationalism and Ethnicity in the Contemporary World (Anthropology 136A), Film and Media Theory (Film Studies 110), Cross-Cultural Studies of Gender (Women's Studies 180).

DEPARTMENT OF HISTORY

200 Murray Krieger Hall; (949) 824-6521
Carolyn P. Boyd, **Department Chair**

Faculty

Marc Baer, Ph.D. University of Chicago, *Assistant Professor of History* (Ottoman and Islamic history, Middle East history, and history of religion)

Sharon B. Block, Ph.D. Princeton University, *Assistant Professor of History* (early American, feminist theory and gender studies)

Carolyn P. Boyd, Ph.D. University of Washington, *Department Chair and Professor of History* (Europe, Spain)

Dickson D. Bruce, Jr., Ph.D. University of Pennsylvania, *Professor of History* (American culture, African American history)

Vinayak Chaturvedi, Ph.D. University of Cambridge, *Assistant Professor of History* (South Asia, postcolonial studies)

Yong Chen, Ph.D. Cornell University, *Associate Professor of History and Asian American Studies* (Asian American history)

Mike Davis, C.Phil. University of California, Los Angeles, *Professor of History* (U.S., urban, cultural history)

Alice Fahs, Ph.D. New York University, *UCI Chancellor's Fellow and Associate Professor of History* (U.S. intellectual/cultural history)

Sarah Farmer, Ph.D. University of California, Berkeley, *Associate Professor of History* (twentieth-century European cultural)

Thelma Foote, Ph.D. Harvard University, *Associate Professor of History and African American Studies* (early America, African American history)

Richard I. Frank, Ph.D. University of California, Berkeley, *Professor Emeritus of History and Classics* (Roman empire, Classics)

Dorothy Fujita-Rony, Ph.D. Yale University, *Associate Professor of Asian American Studies and History* (U.S. history, Asian American studies)

James B. Given, Ph.D. Stanford University, *Professor of History* (medieval Europe)

Douglas M. Haynes, Ph.D. University of California, Berkeley, *Associate Professor of History* (social and cultural history of modern Britain, social history of modern medicine)

Lamar M. Hill, Ph.D. University of London, *Professor of History* (Tudor-Stuart Britain)

Robert V. Hine, Ph.D. Yale University, *Professor Emeritus of History* (intellectual history of the American West)

Karl G. Hufbauer, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (social history of science)

David Igler, Ph.D. University of California, Berkeley, *Assistant Professor of History* (U.S. environmental, American West, Pacific)

Jon S. Jacobson, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (European international)

Michael P. Johnson, Ph.D. Stanford University, *Professor Emeritus of History* (American social and political)

Mark A. LeVine, Ph.D. New York University, *Associate Professor of History* (modern Middle Eastern history, Islamic studies, histories of empire and globalization)

Lynn Mally, Ph.D. University of California, Berkeley, *Professor of History* (modern Russian and Soviet)

Samuel C. McCulloch, Ph.D. University of California, Los Angeles, *Professor Emeritus of History* (British empire and commonwealth)

Laura Mitchell, Ph.D. University of California, Los Angeles, *Assistant Professor of History* (sub-saharan Africa, colonial southern Africa, environmental history, transregional networks of exchange)

Robert G. Moeller, Ph.D. University of California, Berkeley, *Professor of History* (modern Germany, European women)

J. Michelle Molina, Ph.D. University of Chicago, *Assistant Professor of History* (trans-regional religious history, seventeenth-century European women and Jesuits, Latin American history)

Keith L. Nelson, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (American foreign relations)

Spencer C. Olin, Ph.D. Claremont Graduate School, *Edward A. Dickson Professor Emeritus of History* (American social and political)

Eugene Y. Park, Ph.D. Harvard University, *Assistant Professor of History (Korea)*

Kenneth L. Pomeranz, Ph.D. Yale University, *UCI Chancellor's Professor of History and of East Asian Languages and Literatures* (modern Chinese)

Mark S. Poster, Ph.D. New York University, *Professor of History and of Film and Media Studies* (modern European intellectual)

Jaime E. Rodríguez, Ph.D. University of Texas, *Director of Latin American Studies and Professor of History* (Latin America, Mexico)

Vicki L. Ruiz, Ph.D. Stanford University, *Professor of Chicano/Latino Studies and History* (women, Chicano/Chicana labor)

Daniel Schroeter, Ph.D. University of Manchester, *Professor of History and Teller Family Chair in Jewish History* (Jewish history, Middle East and North Africa)

Ulrike Strasser, Ph.D. University of Minnesota, *Associate Professor of History* (early modern continental Europe)

Timothy Tackett, Ph.D. Stanford University, *Professor of History* (Old Regime Europe, French Revolution)

Heidi Tinsman, Ph.D. Yale University, *UCI Chancellor's Fellow and Associate Professor of History* (Latin America)

Steven C. Topik, Ph.D. University of Texas, *Professor of History* (Latin America)

Anne Walthall, Ph.D. University of Chicago, *Co-Director of the Minor in Asian Studies and Professor of History and of East Asian Languages and Literatures* (early modern and modern Japan)

Charles J. Wheeler, Ph.D. Yale University, *Assistant Professor of History* (Southeast Asia, Vietnam, Chinese overseas, cross-cultural trade)

Jonathan M. Wiener, Ph.D. Harvard University, *Professor of History* (recent American, theory and history)

Undergraduate Program

The undergraduate program in History is designed to develop critical intelligence and to foster an awareness of ourselves and our world through the study of the past. The Department presents a variety of approaches to history, and each emphasizes basic disciplinary skills: weighing evidence, constructing logical arguments, and exploring the role of theory in historical analysis and human action.

The Department offers a number of lower-division courses open to nonmajors as well as majors, most of which fulfill part of the UCI breadth requirement. The Department requires all majors to take an introductory course in three of four regional histories—United States history, European history, Latin American history, or East Asian history. These courses are also open to nonmajors.

Students who are interested in the study of history but are majoring in other disciplines may minor in History. The minor incorporates elements of the Department's program for majors but allows students enough flexibility to pursue programs in other departments and schools.

Upper-division courses range from the examination of individual nation-states (e.g., Chinese history), to studies of the relations among nation-states (e.g., European International History), to historical analyses of political, socio-economic, and cultural factors (e.g., Women in the United States). Students are also provided the opportunity for small-group learning experiences in a series of colloquia in social history, political history, international history, intellectual history, social thought, and comparative history. The colloquia are conducted as discussion groups and involve close reading and analysis of secondary texts. The research seminar is a one-quarter seminar in primary materials that culminates in the writing of a research paper.

The faculty strongly encourages History majors and minors to take advantage of the University's study abroad programs and to experience a different culture for a quarter or longer while making progress toward their UCI degree. Moreover, students who are interested in the history of a particular country or region should seriously consider participation in University of California programs within that country or area. UCI's Center for International Education, which includes both the Education Abroad Program (EAP) and the International Opportunities Program (IOP), assists students in taking advantage of the many worldwide opportunities. See the Center for International Education section of the *Catalogue* or an academic counselor for additional information.

CAREERS FOR THE HISTORY MAJOR

The training and discipline derived from historical studies provide a valuable experience for all educated persons seeking to understand themselves and their world. Many students who complete undergraduate degrees in the Department of History go on to graduate school in a variety of fields, including history, law, business, international relations, and teacher education. Students interested in teaching history at the intermediate and high school levels should consult with an academic advisor in the Department of History, School of Humanities Undergraduate Counseling Office, or Department of Education about course work and enrollment requirements for the state-approved history/social science subject matter preparation program.

The study of history is valuable preparation for many other careers as well. The strong academic and professional orientation acquired by History majors is necessary to pursue successful careers in such diverse fields as advertising, banking, journalism, management, public relations, publishing, and government service.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Major

Fourteen courses are required: three courses from the History 70 series, Problems in History (History 70A Asia, 70B Europe, 70C United States, 70D Latin America, 70E Middle East and Africa); three upper-division History courses with a regional or thematic focus decided upon in consultation with a faculty advisor, at least one of which is devoted to the period prior to 1800; two colloquia (History 190), one of which is followed by a research seminar (History 192); two additional upper-division History courses outside the regional or thematic focus area; and three additional lower- or upper-division History courses.

Residence Requirement for the Major: Three History courses, a colloquium, and a research seminar must be completed successfully at UCI.

Departmental Requirements for the Minor

Seven courses are required: a year-long survey in world history (History 21A, 21B, 21C), United States history (History 40A, 40B, 40C), or three courses in problems of history (History 70A Asia, 70B Europe, 70C United States, 70D Latin America, 70E Middle East and Africa); and four upper-division History courses.

Residence Requirement for the Minor: At least four upper-division History courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Graduate Program

The M.A. and Ph.D. degree programs in History are designed to provide students with both advanced historical skills and a rigorous grounding in historical theory. This combination of theoretical study with training in historical method reflects the Department's conviction that scholars should be encouraged to deal with significant questions about the past and to approach these questions in a methodologically sophisticated way. This approach requires that the student develop the critical abilities necessary to deal with primary sources, secondary syntheses, and the interrelationship of history and theory. Candidates for a Ph.D. in History are expected to gain teaching experience as an integral part of their graduate training. Ordinarily this is accomplished through service as a teaching assistant.

Basic to the curriculum is the Department's course in History and Theory which deals with both theoretical texts and historical studies that have utilized theoretical concepts and models. The course directs attention to the diverse implications of modernity, to the groups who dominated and were dominated by it, and to the costs and benefits of the process. These matters can be studied most satisfactorily by the historian whose theoretical self-consciousness and methodological facility have been systematically and carefully developed.

The colloquium, a reading course that examines a field's chief historical works, enriches the student's knowledge of the main areas of historical research and develops critical reading skills. A colloquium series is offered annually in American history; biannually (depending on demand) in modern European history, early modern European history, Latin American history, South and Southeast Asian history, East Asian history, world history, Middle Eastern and North African history, and ancient history; and occasionally in medieval history. A student may prepare a dissertation in any of these fields.

In addition to the History and Theory sequence and the major field colloquia, students also take a proseminar/research seminar sequence during their first year. The proseminar provides an orientation to the literature on a broad historical subject, and the associated seminar offers guidance in research and writing on problems within this broad area. Students awarded M.A. degrees at other institutions before entering the graduate program at UCI may be exempted from this requirement, subject to evaluation of their M.A. theses.

During the second year of study, Ph.D. students normally take a colloquium series in their second field. They also take a two-quarter research seminar where they have an opportunity to work on problems of their own choosing; students who entered the program with an M.A. degree must also take this seminar. In addition, independent reading and research courses are provided for advanced, specialized study in tutorial form.

The immediate objective for the doctoral student is to develop two fields of competence in addition to History and Theory. Competence in the two fields is demonstrated by the satisfactory completion of three courses in each of these areas. A comprehensive oral examination on the student's major field follows fulfillment of all degree requirements. However, those students who elect a second field administered by another program or department (e.g., Critical Theory, Asian American Studies, Feminist Studies) must complete requirements, which sometimes include a written examination, for that field. Competence in History and Theory is demonstrated by satisfactory completion of History 200A and 200B. History 200C may be taken as an elective.

The subsequent objective, to write a distinctive dissertation, is of crucial importance. To assist in accomplishing both objectives, the Department offers intensive consultation with the faculty as well as a lively intellectual atmosphere. Students have long shared in the decision-making processes of the Department, which engages the entire historical community at UCI in the collective pursuit of excellence. Students profit also from a vigorous visiting speakers program that brings scholars from other campuses and other nations to meet and interact with UCI students and faculty.

Requirements for Admission. Although it is desirable that an applicant have the equivalent of an undergraduate major in History, the Department also considers students who have previously specialized in other subject areas and who show promise of sustained and self-disciplined work in history. Typically, a minimum undergraduate grade point average of 3.3 (B+) is required for admission, with evidence of better work in history. In addition, all applicants are asked to submit three letters of recommendation and scores from the Graduate Record Examination. An example of written work in history from undergraduate courses is also required. A departmental interview may also be required. Students are accepted for admission for fall quarter only, and the deadline for application for fall admission is January 2.

MASTER OF ARTS IN HISTORY

Program of Study. The M.A. program emphasizes the theoretical and historiographical dimensions of history. Each candidate for the M.A. will choose a graduate advisor who will supervise the student's program. Nine courses are required for the degree: three in a colloquium series, a proseminar and related first-year research seminar, a secondary emphasis of two related courses (History and Theory 200A and 200B, or other), a thesis course or preparation class for the written examination in the major field (taken as 291), and another elective course. Students who decide to pursue the Ph.D. after completion of the M.A. program need to consider Ph.D. course requirements when selecting courses.

Language Requirement. Students in the M.A. program whose major field requires use of foreign language sources demonstrate competence in a foreign language in the process of writing the first-year research paper and thesis. Other M.A. students do not have to meet a foreign language or alternative skills requirement.

Plan I: Thesis. The master's thesis represents a revision of the first-year research paper, equivalent to a scholarly article of 40-50 typescript pages, under the supervision of a professor in the student's major field and reviewed and approved by a three-member thesis committee, at least two of which must be History faculty members.

Plan II: Comprehensive Examination. At the end of the final quarter the M.A. candidate must pass a comprehensive written examination administered by three faculty members covering the student's major field (e.g., America, Early Modern Europe) and focused upon material assigned in the three-quarter colloquium series.

Time Limits. The M.A. requires a minimum of one year in academic residence and can be completed during that term if full-time study is undertaken. However, it is expected that many M.A. students are employed and need to enroll on a part-time basis. Therefore, students are allowed up to three years of graduate study to complete the degree.

DOCTOR OF PHILOSOPHY IN HISTORY

Ph.D. students are advised to begin their graduate work at UCI, since those who have taken the M.A. elsewhere will be expected to enroll in the same courses that are required of all incoming students, with the exception of the First-Year Research Seminar. Subject to evaluation of their M.A. theses, these students will be exempted from this requirement. In the second and third years, the greater experience of those who enter with an M.A. may work to their advantage in speeding them to the qualifying examination.

First-Year Review. To be admitted formally into the doctoral program, students must satisfactorily pass a departmental evaluation at the end of their first year of study; this includes students who entered with an M.A. from another institution.

Emphasis in Creative Nonfiction. In addition to meeting admission requirements, applicants must submit an additional writing sample that demonstrates aptitude for the program. During their program of study, students take three of the writing workshops or their equivalents that are offered through the International Center for Writing and Translation. They also write a dissertation that meets traditional intellectual standards for academic rigor and is accessible to an audience beyond the academy.

Emphasis in the History of Gender and Sexuality. To complete this emphasis, students take three courses emphasizing feminist studies and/or queer theory in three different fields. At least two of these courses must be taken in the History Department; the third course may be either a History Department course or one of the three core graduate seminars offered through the Program in Women's Studies.

Program of Study. The Department requires doctoral students to prepare themselves in three different areas:

1. History and Theory.
2. The first field (such as Modern Europe), which is designed as a teaching field as well as the focus of the student's dissertation.
3. The second field (such as American History or Critical Theory), which is designed as a second teaching field.

The courses required in this preparation include the History and Theory sequence, colloquium series in both fields, First-Year Proseminar/Research Seminar sequence, and the Second-Year Research Seminar. The normal academic load is three courses per quarter. However, students may be eligible for approved part-time status, which allows them to take a lighter course load at reduced fees for a maximum of two academic years.

Every doctoral student will be assisted by a departmental advisor in the student's general area of study who will be responsible for approving defined fields, guiding the student to consultant faculty, and supervising the examination.

Ph.D. students can be awarded an M.A. after fulfilling requirements for residence and one language and successfully completing 36 units, including 28 in required courses. They also take a two-hour oral examination with an advisor.

Language Requirements. All students, except as specified below, must demonstrate a reading knowledge of two foreign languages prior to taking the Ph.D. candidacy qualifying examination. Competency in a language may be established either by passing a departmental examination (proctored in the department office) or through extensive language use in one of the research seminars. The specific languages that may be used to satisfy this requirement depend on the students' first fields, subject to their advisors' approval.

Students may substitute for one of their language requirements one or a sequence of two graduate courses in an allied discipline or relevant methodology (e.g., critical theory, political theory, cultural anthropology, Asian American studies, feminist theory, art history, linguistics, statistics, quantitative methods), at the discretion of their major field advisors. Students choosing this option are normally expected to write a substantial paper and must demonstrate that the allied discipline or methodology used to fulfill the requirement is of value to historical inquiry. The course(s) taken to satisfy a language requirement may not count toward fulfilling the requirement for the second field.

Qualifying Examination and Dissertation. In preparation for the oral Qualifying Examination, the student will present to the Ph.D. Candidacy Committee a portfolio of three papers totaling at least 45 pages on subjects related to the major field (but not from required colloquia courses). Successful completion of this examination results in the student's advancement to Ph.D. candidacy. The normal time for advancement to candidacy is four years for students who need two foreign languages and three years for those who opt for courses in an allied discipline to fulfill their second language requirement. Within one academic quarter of the oral examination, new candidates must meet in a colloquy with their Doctoral Committee to present their dissertation proposal. Once the Doctoral Committee approves the proposal, the student begins intensive work on the dissertation. The research and writing involved in this effort may require from one to four years. At the end of this period an oral defense of the dissertation, focusing on the adequacy of the student's research and thesis, is normally held.

Students who enter with normal academic preparation and pursue a full-time program of study should be able to earn the Ph.D. degree within seven years. The maximum time permitted is nine years. For students who substitute courses in an allied discipline for their second language requirement, the normal time to the degree is six years, and the maximum permitted is eight years.

Courses in History

LOWER-DIVISION

INTRODUCTORY COURSES

Courses of general interest for all students. No prerequisites. Designed to survey particular fields or themes and to introduce methods and premises of historical study. Many of these courses fulfill part of the UCI breadth requirement.

11 Introduction to Peace and Conflict (4). Examines the causes and effects of international violence, focusing on World War I, World War II, and the Cold War. Relates what is known about the dynamics of war to what is understood by conditions of peace. Required for the minor in Conflict Resolution. **(VII-B)**

12 Introductory Topics in History (4). Introduces methods and premises of historical study. Topics include introductions to cultural, political, economic, social, and religious history. May be repeated for credit as topics vary.

15 American Ethnic History

15A Native American History (4). Introduction to multiple topics: indigenous religious beliefs and sociopolitical organization, stereotypic "images," intermarriage, the fur trade, Native leaders, warfare, and contemporary issues. **(VII-A)**

15B African American Studies I (4). Introduction to the main contours of the African American experience from the importation of Africans into the Americas to the present. Focuses on the unique expressions of African American society and culture. Same as African American Studies 40A. **(IV, VII-A)**

15C Introduction to Asian American Studies I (4). Examines and compares the diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include: origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Same as Asian American Studies 60A and Social Sciences 78A. **(III, VII-A)**

21 World History

21A World History: Beginnings to 1650 (4). Treats major themes of world historical development through the mid-seventeenth century, focusing on the Eurasian world, but with secondary emphasis on Africa and the Americas. **(IV, VII-B)**

21B World History: 1650–1870 (4). Examines three major transformations that made the world of 1870 dramatically different from that of 1650: e.g., the scientific revolution, industrialization, and the formation of modern states and nations. **(IV, VII-B)**

21C World History Since 1870 (4). Considers several major currents of modern history: technological change and its social effects; changes in gender relations; totalitarianism; peasant revolutions and the crisis of colonization; international migration; and ecological problems. **(IV, VII-B)**

36 The Formation of Ancient Greek Society. An overview of ancient Greek civilization and its interactions with other cultures of the Mediterranean world. Focuses on major institutions and cultural phenomena as seen through the study of ancient Greek literature, history, archaeology, and religion. Same as Classics 36A, B, C.

36A Early Greece (4). (IV)

36B Late Archaic and Classical Greece (4). (IV)

36C Fourth-Century and Hellenistic Greece (4). (IV)

37 The Formation of Ancient Roman Society. A survey of the principal aspects of Roman civilization from its beginnings to the so-called Fall of the Roman Empire in C.E. 476. Focuses on political history and ideology, social history, literature, art and architecture, and religion. Same as Classics 37A, B, C.

37A Origins to Roman Republic (4). (IV)

37B Roman Empire (4). (IV)

37C The Roman Legacy (4). (IV)

40 The Formation of American Society. An introduction to the social, economic, political, and cultural development of the United States from the fifteenth century to the present. Any one quarter of history 40A, 40B, or 40C satisfies the American History portion of the UC American History and Institutions requirement.

40A The Formation of American Society: 1492–1790 (4). (IV)

40B The Formation of American Society: The Nineteenth Century (4). (IV)

40C The Formation of American Society: The Twentieth Century (4). (IV)

50 Crises and Revolutions (4). Study of turning points in world history, illustrating themes and methods of historical analysis. May be taken for credit three times as topics vary. **(VII-B)**

60 Revolting Ideas: An Introduction to the History of Science (4). The emergence of modern science since 1500. Case studies to illuminate revolutionary change in science and the impact of science-based technology on society. History 60 and Education 130 may not both be taken for credit.

70 Problems in History. An introduction to the historical problems, the issues of interpretation, the primary sources, and the historical scholarship of the history of Asia, Europe, the U.S., Latin America, the Middle East, and Africa, with an emphasis on developing skills in historical essay-writing.

70A Problems in History: Asia (4). (IV, VII-B)

70B Problems in History: Europe (4). (IV, VII-B)

70C Problems in History: United States (4). (IV)

70D Problems in History: Latin America (4). (IV, VII-B)

70E Problems in History: Middle East and Africa (IV, VII-B)

UPPER-DIVISION

HISTORICAL STUDIES

Courses in which students gain experience in analysis, interpretation, and writing. No prerequisites.

100C War and Society in the Twentieth Century (4). Examination of war, military systems, and technology and their interaction with politics, economies, societies, and cultures in the twentieth century. **(VII-B)**

101 History of the World Economy (4). Beginning with a discussion of different economic "worlds" of the 1400s, traces the complex processes by which these worlds began to influence each other, ending with the twentieth-century world economy. Topics include imperialism, industrial revolution, migration, slave trade. **(VII-B)**

102A Environmental History of the Victorian Age (4). Explores the "secret" environmental history of world agriculture, from the famous "year without summer" (1816) to the droughts that devastated Indian and Chinese peasantries at century's end. **(VII-B)**

102B Topics in Environmental History (4). Explores the many historical interfaces between climate change, modes of production, and culture. Topics include the environmental history of warfare, imperialism, and famine in the nineteenth century and the history of environmental thought. **(VII-B)**

103A Gender and Politics in the Early Modern World (4). Explores the relationship between politics and gender in a variety of societies and historical moments between 1400 and 1800. Topics include: definitions of male and female throughout the world, state formation, empire-building and marriage; religion and women's enclosure. **(VII-B)**

ANCIENT HISTORY

105 The Roman Empire. Creation of a bureaucratic empire; rule by gentry and officers; official culture and rise of Christianity; social conflict and political disintegration.

105A Early Roman Empire (4)

105B Later Roman Empire (4)

105C The Classical Tradition (4)

EUROPEAN HISTORY

110 Medieval Europe

110A Europe in the Early Middle Ages (4). Survey of Europe between 300 A.D. and 900 A.D. Topics include the breakup of the Roman Empire, barbarian invasions, spread of Christianity, rise of Islam, the Carolingian Empire, and the Vikings. **(VII-B)**

110B Europe in the Central Middle Ages (4). Survey of European history from ca. 900 to ca. 1300. Topics discussed include the growth of the economy, feudalism, the crusades, the rise of towns, the development of the church, popular heresy, and the rise of large-scale polities. **(VII-B)**

110C Europe in the Later Middle Ages (4). Survey of European history from ca. 1300 to ca. 1500. Topics include the Black Death, the crisis of the economy, the Hundred Years' War, peasant and urban uprisings, and the Great Schism. **(VII-B)**

110D Topics in Medieval Europe (4). May be repeated for credit as topics vary.

112 Early Modern Europe

112A Renaissance Europe (4). Survey of the Renaissance in Italy and northern Europe.

112B Reformation Europe (4). Survey of the Protestant and Catholic Reformations in sixteenth- and seventeenth-century Europe.

112C Europe of the Old Regime (4). Survey of the social, cultural, and political history of Europe from the middle of the seventeenth century to the French Revolution. **(VII-B)**

112D Topics in Early Modern Europe (4). Theme-based approach to the main social, political, and cultural developments in Europe between the fifteenth and eighteenth centuries. Topics include Renaissance humanism, Reformation and Counter-Reformation, scientific revolution, court culture and nation building, interactions with non-European peoples, and cities and commerce. May be repeated for credit as topics vary. **(VII-B)**

114 Topics in Modern European History (4). Course content changes with instructor. Topics include the Inquisition; science and religion in modern Europe; sex and society in modern Europe; French revolutions; culture in interwar Europe; the Holocaust; the fall of communism in Eastern Europe. May be repeated for credit as topics vary. **(VII-B)**

115 Survey of European History

115A Europe: 1350–1750 (4). The period 1350–1750 begins with the devastation of the Great Plague and ends with a renewed "enlightened" Europe invested in global colonial ventures. In short, an exploration of the emergence of the modern world. **(VII-B)**

115B Europe: 1750–1870 (4). A study of Europe from the end of the Old Regime to the beginning of World War I, with emphasis on the origins of the "modern age": the political, economic, and cultural patterns characteristic of our own society. **(VII-B)**

115C Europe: Twentieth Century (4). Europe from World War I to the collapse of the U.S.S.R. World War I and its impact on the modern world; rise of an international Communist movement; regimes created by Mussolini, Hitler, Stalin; World War II; the killing of Europe's Jews; Cold War and collapse of communism. **(VII-B)**

116 Medieval England

116A England in the Early Middle Ages (4). Survey of English history from ca. 400 to ca. 1200. Topics include the Anglo-Saxons, the Viking settlement, the Norman Conquest, the Angevin Empire, and the development of royal, legal, and administrative mechanisms. **(VII-B)**

116B Later Medieval England (4). Survey of English history between ca. 1200 and ca. 1500. Topics include the Magna Carta, the Barons' War, the Welsh and Scottish wars, the development of Parliament, the Hundred Years' War, and the Wars of the Roses. **(VII-B)**

117 Early Modern England

117A Tudor England (4). Survey of English history from the fifteenth century until the early seventeenth century. Concentrates on the formation of Tudor political, social, and economic institutions. **(VII-B)**

117B Stuart England (4). Survey of English history from the early-seventeenth century until the early-eighteenth century. Concentrates on the causes of the English Revolution and the Revolution itself, the Restoration, and the Protestant ascendancy. **(VII-B)**

118 Great Britain

118A Modern Britain: 1700 to 1850 (4). Examines the major developments in British politics, socioeconomic structure, and culture from 1700–1850. The development of the British nation-state and the fashioning of a national identity. Explores basic questions about British national identity. **(VII-B)**

118B Modern Britain: 1850 to 1930 (4). Examines the social, economic, and political history of Britain from 1850–1930. Post-industrialism, urbanization, population and economic change, increased political participation by working classes and women, consolidation of the empire and the breakup of the United Kingdom. **(VII-B)**

118C Modern Britain: 1930 to Present (4). Explores Britain from the Second World War to the resignation of Margaret Thatcher. Examines Britain's devolution from world power to member of the European Community; transition from a manufacturing to service-based economy; changing demographic and racial composition in light of decolonization. **(VII-B)**

120 France. Emphasis on social, economic, and cultural history of France since the Great Revolution.

120A Early Modern France: 1500–1774 (4). Formerly History 124. **(VII-B)**

120B The French Revolution and Napoleon: 1774–1815 (4). (VII-B)

120C France in the Nineteenth Century (4). (VII-B)

120D France in the Twentieth Century: 1914 to Present (4). (VII-B)

120E History of Paris (4). The development of Paris from the beginnings through the present, with emphasis on the last three centuries. The city is examined from the political, social, ecological, and architectural points of view as well as through the perspective of urban planning. **(VII-B)**

122 Germany. Political, social, and economic history from 1815 to the present.

122A Emergence of the German Nation: 1815–1890 (4). (VII-B)

122B Hitler and the Germans (4). Focuses on Hitler's rise to power and Nazi society. Examines Germany's defeat in World War I; the political and cultural experimentation of the 1920s; the causes of Hitler's success; and life in Germany under the Nazis. **(VII-B)**

122C World War, Cold War, and Reunification: 1939– (4). (VII-B)

123 Spain

123A Medieval Spain: 711–1469 (4). Examines the history of the Iberian Peninsula after the Arab invasion of 711, with emphasis on the gradual territorial and political unification of the Christian monarchies and the social and cultural interaction of Christians, Muslims, and Jews. **(VII-B)**

123B Imperial Spain: 1469–1808 (4). Overview of Spanish political, social, economic, and cultural history from the reign of Ferdinand and Isabel, to the invasion of Napoleon in 1808. **(VII-B)**

123C Twentieth-Century Spain: 1898–Present (4). Examination of political, social, and cultural conflict under the parliamentary monarchy and the II Republic; the Spanish Civil War and the popular revolution of 1936; Spanish fascism and the Franquist dictatorship; and the transition to constitutional democracy after 1975. **(VII-B)**

123D Topics in Spanish History (4). Topics include Spain in the nineteenth century, the Spanish Civil War, and dictatorship and democracy in modern Spain. May be repeated for credit as topics vary. **(VII-B)**

124 Russia. Political and social developments from traditional Russia to the present Soviet society.

124A Imperial Russia: 1689–1905 (4). (VII-B)

124B Twentieth-Century Russia (4). (VII-B)

126 The World Wars

126A The Era of World War I: 1900–1939 (4). (VII-B)

126B The Era of World War II: 1933–45 (4). (VII-B)

126C The Cold War and After: Europe and the World, 1945–91 (4). (VII-B)

127 European Cultural and Intellectual History. Main currents of Western thought, emphasizing English, French, and German thinkers.

127A Enlightenment Europe (4). (VII-B)

127B Hegel to Nietzsche (4). (VII-B)

127C Freud to Sartre (4). (VII-B)

127D Contemporary European Thought (4)

128 European Women and Gender History

128A Women and Gender in Early Modern Europe: 1400–1700 (4). Explores what it meant to be a woman in early modern Europe. Students examine women's lives in early modern Europe while developing skills of historical interpretation. Topics include: notions of masculinity and femininity; "proto-feminism"; marriage and sexuality; female piety and witchcraft. **(VII-B)**

128B Sex and Society in Early Modern Europe (4). Examines the role of sexuality in early modern European society. Explores the emergence of modern notions of sexuality and their connection to European imperialism. Topics include: biological notions of sexual difference and human reproduction; marriage and family; prostitution, lesbian and transvestitism. **(VII-B)**

128C Topics in the History of Women in Europe (4). May be repeated for credit as topics vary. Formerly History 128. **(VII-B)**

JEWISH, MUSLIM, MIDDLE EAST, AND AFRICAN HISTORY

130 Jewish History

130A Jewish History, Ancient to Early Modern Times (4). The history of the Jewish people from their origins in the ancient world to the 1700s. Social, religious, and intellectual life of Jewish communities in the Middle East, North Africa, and Europe. **(VII-B)**

130B Modern Jewish History (4). History of the Jews in Europe, the Middle East, North Africa, and the United States from the early-eighteenth century to recent times. Emancipation, assimilation, religious reform, antisemitism, Zionism, socialism, the Holocaust, and modern Israel are the major themes. **(VII-B)**

130C Topics in Jewish History (4). May be repeated for credit as topics vary. **(VII-B)**

131 Topics in Islamic History (4). Examines the evolution of Islam as a religion within the social, political, and economic histories of various Muslim societies throughout its 14 centuries. Introduction to major concepts, practices, and texts of Islam, and key historical events associated with them. **(VII-B)**

132 Israel and Palestine (4). Origins of Zionism in the nineteenth century, Arab-Jewish conflicts in Palestine, emergence of Palestinian nationalism, the formation of the Israeli nation after 1948, and the development of the Palestinian movement. Focus on Palestinian and Israeli society and culture. Formerly History 177. **(VII-B)**

133A The Emergence of the Modern Middle East (4). Offers a survey of the history of the Middle East from the nineteenth century to the present time. **(VII-B)**

133B North Africa Since 1500: Islam and Colonialism (4). Examines the history of the Maghrib (Morocco, Algeria, Tunisia, and Libya) from the time of Ottoman expansion and the Sa'dian and Alawid dynasties in Morocco in the sixteenth and seventeenth centuries. **(VII-B)**

134 Africa

134A Africa: Societies and Cultures (4). Introduction to the variety of cultures, political organizations, social structures, and artistic expressions created by Africans over a broad time span. The indigenous development of African societies in distinct regions of the continent. Issues, themes, processes for understanding history of Africa. **(VII-B)**

134B Modern Africa (4). Explores the last 200 years of history in Africa, from the end of the Atlantic slave trade through colonization to independence. **(VII-B)**

134C Topics in the History of Africa (4). May be repeated for credit as topics vary. **(VII-B)**

134D Topics in South African History (4). Introduction to important historical events and processes in Southern Africa. Focuses on particular themes and explores how those themes change over time. Topics include: changing ideas about race, the development of class structures, identity formation, the role of gender. **(VII-B)**

HISTORY OF SCIENCE AND TECHNOLOGY

135 History of Science and Medicine

135A The Scientific Revolution (4). An examination of early modern European science from 1500 to 1700. Includes readings from central figures (Copernicus, Harvey, Bacon, Descartes, et al.); themes include the impact of printing, humanism, patronage, technology, and discussion of the term "revolution" in this context.

135B Science and Religion (4). Historical analysis of two episodes in the interaction between science and religion in the West: Galileo's defense of heliocentrism and Darwin's theory of evolution. Emphasizes historical context for each case and changes in definitions of science, religion, and their relationship.

135C Exploring the Cosmos (4). After briefly considering the invention of astronomy in antiquity and the Copernican revolution, examines the development of solar science; the triumph of the view of the expanding universe; and a medley of themes in post-1945 astrophysics and cosmology.

135D Science and the Environment (4). Science and ideas about ecology, the exploitation of natural resources, and the protection of nature since the Enlightenment.

135E Topics in the History of Science and Technology (4). May be repeated for credit as topics vary.

HISTORY OF MEDICINE AND HEALTH CARE

136 History of Medicine and Health Care

136A The Making of Modern Medicine (4). Examination of medical care in Britain from the 1660 plague to establishment of the National Health Service Act in 1946. Structured around meanings of health and disease, the organization of medicine, and the politics of health care.

136B Race and Medicine (4). Examines racial politics in the development of American medicine from 1870 to 1990s. Racial subordination and the American Medical Association, discrimination in medical education and black medical schools, the National Medical Association, black doctors and war, health care inequities and AIDS.

136C Health Care in the United States Since 1900 (4). Explores the rise of health care since 1900. Themes include the politics of professional authority, the political economy of health care, and the cultural meaning of disease and illness in society.

136D Topics in the History of Medicine and Health Care (4). May be repeated for credit as topics vary.

139 History and Prose Composition (4). Requires at least 4,000 words of assigned composition based upon historical works. History majors are given admission priority. Prerequisites: satisfaction of the lower-division writing requirement; junior standing or consent of instructor. May be repeated for credit as topics vary.

AMERICAN HISTORY

140 The Development of the American Nation. Growth of a distinctively American society out of the colonial heritage, with emphasis on social and economic bases of culture and politics, sectionalism, industrialization, and the United States as a world power.

140A Early America: 1492–1740 (4). Examines the history of the land that became the first 13 states of the United States, from early attempts at exploration and discovery to the economic growth and demographic heterogeneity that marked the white settlements of the early 1700s.

140B Revolutionary America: 1740–1790 (4). An exploration of why 13 continental colonies, whose commercial and cultural connections with Britain far exceed their interaction with one another, resisted imperial reform after 1763 to the point of war in 1775 and independence the following year.

140C Coming of the Civil War (4). Investigates the social, political, economic, cultural, and constitutional changes that transformed antebellum America and culminated in civil war.

140D Civil War and Reconstruction (4). Focuses upon the social, economic, political, cultural, and constitutional changes that transformed the United States during the Civil War era.

140F The United States in the 1890s (4). A social, cultural, political history of U.S. in 1890s. Topics include racial politics of Jim Crow; Spanish-American War and conquest of the Philippines; "New Women" and gendering of modern culture; rise of cities, urban reform, labor resistance to new capitalist order.

140G The Cold War and After (4). Explores topics in gender, race, and class in American history since 1945, considering politics and popular culture, domestic issues, and foreign policy. Topics include McCarthyism and the civil rights, anti-war, and feminist movements. Formerly History 140E.

142 American Social and Economic History

142A California in Modern America (4). California as a case study of national trends and as a unique setting: its specific problems and culture. Major themes include: colonization, immigration, race relations, agricultural development, industrialization, urbanization, working class movements, social conflict, and political reform.

142B Topics in American Social and Economic History (4). May be repeated for credit as topics vary.

144 American Intellectual and Cultural History

***144A Early American Cultural and Intellectual History* (4).** Examination of ideas and culture during the early American period, with emphasis on the relationship of ideas to their social, political contexts. From contact to Puritanism to the Revolutionary era, with attention to constructions of class, race, gender.

144B Nineteenth-Century American Cultural and Intellectual History (4). Topics include religious revivals; antislavery thought; theories of the body; Transcendentalism; feminism and suffrage; the meanings of the Civil War; corporatism; realism; forms of racism and nativism.

144C Twentieth-Century American Cultural and Intellectual History (4). Topics include modernism and anti-modernism; Pragmatism; the Harlem Renaissance; theories of sexuality; mass culture and consumer culture; the rise of social science; Marxism; McCarthyism; the civil rights movement; the New Left; feminism, postmodernism.

144D Religion and Society in the United States (4). An examination of major issues in the study of relationships between religion and society in American history, focusing on the ways in which religious institutions and ideas have influenced, and been influenced by, significant developments in American life.

144E Racial Thought in America (4). An examination of the development, significance, and persistence of racism in American society. Looking mainly at white racial ideas, considers some of the major historical approaches to understanding their origin, character, and role in American life.

144F Utopian Experiments in American History (4). Focus on the cooperative dimension of the American experience; the large number of intentional experiments in community living and alternative lifestyles in the nineteenth and twentieth centuries. Examination of both the ideological foundations of communitarianism and specific historical case studies. Formerly History 142B.

144G Topics in American Cultural and Intellectual History (4). May be repeated for credit as topics vary.

145 American Working-Class History (4). Traces formation of the American working-class and examines its response to the changing structures of economic/political power determined by nineteenth-century industrial capitalism and twentieth-century imperialism. Issues/intersections of race, culture, and gender are examined.

146 Women and Gender Relations in the United States. An examination of changes in gender relations and in the conditions of women's lives from the 1700s on. Emphasis on race and class, cultural images of women and men, sexuality, economic power, and political and legal status.

146D Sex in the U.S. to 1860 (4). Perspectives on sexual behavior in colonial and U.S. history to c. 1860. Mainstream and non-mainstream sexual practices, beliefs, identities. Asks why various ideas of sexual behavior developed and how they related to religious, racial, ethnic, political, cultural belief systems. **(VII-A)**

146E Gender in Nineteenth-Century America (4). A social and cultural history of women's lives in nineteenth-century America, examining how racial, sexual, class identities were constructed by women themselves and by their surrounding culture. Topics include slavery, anti-slavery movement, domesticity, experience of the Civil War. **(VII-A)**

146F American Women to 1820 (4). Formerly History 146A. **(VII-A)**

146G United States Women: 1820–1980 (4). Formerly History 146B. **(VII-A)**

146H Topics in Women and Gender Relations in the United States (4). May be repeated for credit as topics vary. Formerly History 146C. **(VII-A)**

148 Multicultural United States History

148A Law and Minorities in the United States (4). An analysis of American law as it has affected major minority groups throughout United States history. Readings focus on legal cases and documents, and class sessions are conducted in the socratic method. **(VII-A)**

148B Topics in Multicultural U.S. History (4). Examines the variety of cultural expressions through which the people who came to inhabit the United States historically signify their collective identities. May be repeated for credit as topics vary. **(VII-A)**

150 Topics in African American History (4). May be repeated for credit as topics vary. **(VII-A)**

151 Chicana/Chicano History

***151A Chicana/Chicano History: Pre-Colonial to 1900* (4).** Examines social history of the southwest region from antiquity to 1900. Discusses major questions, theory and research methods pertinent to Chicanas/Chicanos. Themes include: indigenous empires, conquest, colonialism, social stratification, ideology, marriage, sexuality, industrial capitalism, accommodation and resistance. Same as Chicano/Latino Studies 132A. **(VII-A)**

151B Chicana/Chicano History: Twentieth Century (4). Examines social history of the Southwest with emphasis on Mexican-origin people. Discusses major questions, theory and research methods pertinent to Chicana/Chicano history. Themes explored include: immigration, xenophobia, class struggle, leadership, generational cohorts, unionization, education, barrioization, ethnicity, patriarchy, sexuality. Same as Chicano/Latino Studies 132B. **(VII-A)**

151C Latinas in the Twentieth Century U.S. (4). Latinas in the U.S. from 1900 to present, offering a diversity of their cultures, regional histories, sexualities, generations, and classes. Same as Chicano/Latino Studies 135. **(VII-A)**

***152 Topics in Asian-American History* (4).** *Introduction to important* themes in the history of people of Asian ancestry in the United States from the nineteenth century to the present. May be repeated for credit as topics vary. **(VII-A)**

153 American Legal History (4). Introduction to American legal case materials, to legal categories and ways of thinking, and to selected topics in U.S. legal history. Does *not* offer a chronological survey of the development of law in the United States.

154 American Urban History (4). A study of urban communities in the United States, from colonial times to the present. Traces the impact of industrialization and urbanization on social and cultural life and investigates the significance of urban life for U.S. democratic culture.

155 Street Gangs in American History (4). Surveys the history of the street gang (1830–2000) in its three classic urban settings—New York, Chicago, and Los Angeles. Looks at the gang's popular culture, social science, and state policy. **(VII-A)**

158 History of American Foreign Relations

158A U.S. Foreign Relations Since World War II (4). An examination of relations between the United States and the world since the early twentieth century, with special attention to America's role in successive wars, its growing economic and cultural involvement abroad, and its connection with global problems of justice and development. **(VII-B)**

158B Imperialism in American History (4). To what extent has the United States (either consciously or unconsciously) dominated, used, and/or exploited other countries and nations in the years since its founding? Examines the causes and effects of American behavior toward less powerful peoples, from seventeenth century encounters to contemporary interventions. **(VII-B)**

158C America and the Third World (4). Introduction to the mounting problems of the underdeveloped, or "Third" World: population pressure, hunger, exploitation, ethnic struggle, political instability. Attention to the ways in which the industrialized "North" and, particularly, the United States affect and are affected by these difficulties. **(VII-B)**

LATIN AMERICAN HISTORY

161 Mexico

161A Indian and Colonial Societies in Mexico (4). Examines the history of Colonial Mexico from prehistoric times to the eighteenth century. Focuses on the social, economic, and political evolution of the new Mexican society which resulted from the "meeting" of two cultures. **(VII-B)**

161B Nineteenth-Century Mexico (4). Examines the history of Mexico in the nineteenth century. Focuses on the social, economic, political, and cultural transformation of Mexico in the 1800s. Same as Chicano/Latino Studies 133A. **(VII-B)**

161C Twentieth-Century Mexico (4). Examines the history of contemporary Mexico beginning with the Mexican Revolution and concluding with the present administration. Social, economic, and political effects of the Revolution; formation of a "one-party democracy"; economic transformation of the nation; the present crisis. Same as Chicano/Latino Studies 133B. **(VII-B)**

162 Brazil (4). Overview of social, economic, and political developments since 1500.

163 The World of Coffee (4). History of consumption and production of coffee over the centuries and coffee's cultural, economic, social, political consequences. Coffee's social life as a drug, symbol of hospitality, religious rite, sociability and bourgeois lifestyle, commodity, and source of livelihoods, imperial revenues, corporate profits. **(VII-B)**

166 United States–Latin America Relations (4). U.S. relations with Latin America with emphasis on the twentieth century. Topics include the Monroe Doctrine, Mexican-American and Spanish-American Wars, the Big Stick and Good Neighbor policies, and recent events in Central America and the Caribbean.

168 Overview of Latin American History (formerly History 42 Latin America)

168A Precolumbian Civilizations and European Colonialism (4). An overview of Native American peoples such as the Aztecs, Inca, Maya, and Spanish and Portuguese Conquest and Colonialism (1400–1700). Topics include: new religion, disease, African slavery, exports, gender, gender relations, and how colonial regimes shaped a new world. **(VII-B)**

168B Nineteenth-Century Iberian America (4). Examines the history of Iberian America in the nineteenth century. Focuses on Chile, Mexico, and Brazil as areas representative of the trends occurring in the region. Considers the social, economic, political, and cultural transformation of Iberian America in the last century. **(VII-B)**

168C History of Modern Latin America (4). Explores modern Latin American social, political, and cultural history. The Mexican Revolution; Eva Peron and populism; U.S. foreign policy; women and the Cuban Revolution; liberation theology and civil war in Guatemala; student radicalism; socialism and dictatorship in Chile; the Zapatista rebellion in Chiapas. **(VII-B)**

169 Topics in Latin American History (4). May be repeated for credit as topics vary. **(VII-B)**

ASIAN HISTORY

170 East Asia: Traditions and Transformations

170D Premodern East Asia (4). Introduction to the histories of China, Korea, and Japan from the earliest states to about 1600. Topics include: state formation and dissolution; the role of ideology and how it changes; religious beliefs and values; agriculture, commerce, and industry; changing family relations. Formerly History 178A. **(VII-B)**

170E East Asia: 1600–1895 (4). Introduction to China, Korea, and Japan from about 1600 to 1895. Establishment of Qing Chinese, late Choson Korean, and Tokugawa Japanese sociopolitical orders and their characteristics, plus major cultural developments. Responses to Western impact and the rise of Meiji Japan. Formerly History 178B. **(VII-B)**

170F East Asia Since 1895 (4). Introduction to the turbulent modern histories of China, Korea, and Japan since 1895. An overarching concern is to understand the evolution of modern East Asia and its place for humankind's future. Formerly History 178C. **(VII-B)**

170G Topics in the History of Asia (4). Topics include the cultural, political, economic, social, intellectual, and religious history of Asia. May be repeated for credit as topics vary. **(VII-B)**

171 China

171D Chinese History to 1800 (4). A survey of the history of China to 1800. Formerly History 170A. **(VII-B)**

171E Chinese History: 1800–1949 (4). An examination of Chinese society and thought from the late-eighteenth century to the 1949 revolution. Focuses on the role of intellectuals; popular culture; women in Chinese society; developments in commerce and urban life; rebellion; foreign imperialism. Formerly History 170B. **(VII-B)**

171F Chinese History: 1949–Present (4). A discussion of major themes in the social, cultural, political, economic and intellectual history of China since the founding of the People's Republic in 1949. Emphases will vary from year to year. Formerly History 170C. **(VII-B)**

171G Topics in the History of China (4). Topics include the cultural, political, economic, social, intellectual, and religious history of China. May be repeated for credit as topics vary. **(VII-B)**

172 Japan

172D Age of the Samurai (4). Topics include the simultaneous elaboration of a civilian aristocratic tradition and the military ethos, the conflict between martial and economic values in the context of an expanding economy, and the development of Japan's indigenous religions, art, and literature. Formerly History 171A. **(VII-B)**

172E Imperial Japan (4). Topics in the rise of modern Japan include the relationship between centralization and imperialism, democracy and fascism, industrialization and feminism in the context of the complex and competing forces that shaped Japan's experience in the modern world. Formerly History 171B. **(VII-B)**

172F Postwar Japan (4). From the ashes of defeat to economic superpower, from poverty to material consumerism, from the ethic of diligence and fortitude to hedonism. Addresses what these changes have meant for ordinary people, as well as government policy and Japan's international position. Formerly History 171C. **(VII-B)**

172G Topics in the History of Japan (4). Topics include the cultural, political, economic, social, intellectual, and religious history of Japan. May be repeated for credit as topics vary. **(VII-B)**

173 Korea

173D Korean History to 1800 (4). A general survey of the history of Korea to 1800. Focuses on internal sociopolitical development, major cultural trends, and foreign relations. Students are introduced to various interpretive approaches in the historiography. Formerly History 172A. **(VII-B)**

173E Korean History: 1800–1945 (4). An examination of Korean society and culture in tumultuous transition, focusing on some new challenges for the Choson Dynasty and its abortive reform effort, external imperialist pressures, and the Japanese colonial rule. Formerly History 172B. **(VII-B)**

173F Korean History Since 1945 (4). Topics include the national liberation, origins of conflict between two rival regimes, South Korea's emergence as a major player in the international political economy, some salient characteristics of the North Korean Marxist state, triumph of democracy, and prospect for reunification. Formerly History 172C. **(VII-B)**

173G Topics in the History of Korea (4). Topics include the cultural, political, economic, social, intellectual, and religious history of Korea. May be repeated for credit as topics vary. **(VII-B)**

SOUTH AND SOUTHEAST ASIA

174 South Asia

174E Nations and Nationalities of India (4). Examines multiple definitions of nation, nationality, and nationalism. Assesses the seeming "successes" of anti-colonial nationalism, while addressing the seeming "failures" of the "freedom movement" in making of the modern nation-states. **(VII-B)**

174G Topics in the History of South Asia (4). Topics include the cultural, political, economic, social, intellectual, and religious history of South Asia. May be repeated for credit as topics vary. **(VII-B)**

175 Southeast Asia

175D Southeast Asia to 1900 (4). Describes the development of indigenous states and societies from earliest times, to the crises they face with growth of European power. Topics include migrations, trading and raiding, religious '"crossroads," temple states, the growth of commercial economies, state growth, changing cultural definitions. **(VII-B)**

175E Twentieth-Century Southeast Asia (4). Issues include legacies of colonialism, rise of nationalism and communism, role of religion in politics, creation of nation-states, development and its dislocations, globalization, changing cultural definitions, genocide and war crimes, human rights, ethnic conflicts, continuing impact of U.S. on region. **(VII-B)**

175F War in Vietnam (4). A comprehensive view of Vietnamese and American perspectives on the U.S. war in Vietnam, offering an in-depth historical background to Vietnam's internal dynamics, American perceptions of Vietnam, military and political strategies, and the experiences of Vietnamese and Americans directly involved. **(VII-B)**

175G Topics in the History of Southeast Asia (4). Topics include the cultural, political, economic, social, intellectual, and religious history of Southeast Asia. May be repeated for credit as topics vary. **(VII-B)**

SPECIAL STUDIES

Topics with particular methodological foci. Content varies; departmental office has quarterly list of topics. May be repeated for credit as topics vary.

180 Special Studies in Social History (4)

181 Special Studies in Economic History (4)

182 Special Studies in Intellectual-Cultural History (4)

183 Special Studies in International History (4)

184 Special Studies in Comparative History (4)

185 Special Studies in Social Theory (4)

188 Teaching of History as an Academic Discipline

188A History: A Way of Knowing the World (2). Provides a grounding in the history of the discipline, exploring such topics as history's authors, kinds of history, historical debates, and roles of historians in the processes of making determinations of legitimacy. Same as Education 188A.

188B Historical Argument: Making Your Case (2). Explores the construction of historical argument, grounded in the California history standards, by analyzing historical sources, categories of analysis, evidence, and a range of arguments that pertain to and uncover major issues in U.S. and World History. Prerequisite: History 188A. Same as Education 188B.

188C Teaching the Past: History-Specific Pedagogy (2). Explores the important link between authentic historical inquiry and critical pedagogies that can be used to teach history effectively in the K–12 setting. Class discussions focus on attempting to link historical scholarship and research techniques to history pedagogy. Prerequisite: History 188B. Same as Education 188C.

HISTORICAL RESEARCH FOR HISTORY MAJORS

190 Colloquium (4). Specialized courses dealing primarily with close reading and analysis of secondary works; required reports and papers (critical essays). Each colloquium reflects the instructor's intellectual interests and is conducted as a discussion group. Limited to 15 students. Prerequisites: junior/senior standing and history major, or consent of instructor. May be repeated for credit as topics vary.

192 Research Seminar (4). Specialized courses that require analysis of a historical problem through research in primary sources and the preparation of an original research paper. Each research seminar is offered in a quarter following a History 190 colloquium and is related to the colloquium's subject. Prerequisites: History 190 in the preceding quarter; junior or senior standing; and History major or consent of instructor. May be taken for credit six times as topic varies.

198 Directed Group Study (4). Special topics through directed reading. Paper required. Prerequisites: consent of instructor; a minimum of two students must enroll.

199 Independent Reading (1 to 4). Investigation of special topics through directed reading. Paper required. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

GRADUATE COURSES

In addition to the following courses, graduate students in History might find Humanities 220 (Literary Theory and Its History) and Humanities 270 (Advanced Critical Theory) to be of interest.

HISTORY AND THEORY

200A, B, C History and Theory (4, 4, 4) F, W, S. Introduction to role of theory in historical writing, focusing on several major theorists, their relation to their setting, the structure of their thought, and its application to significant historical issues. Completion of History 200A and 200B is required for all History Ph.D. students. History 200C is optional. Same as Humanities 200A, B, C.

202 Proseminar (4). Topical courses devoted to the literature of a broad historical subject, e.g., the absolutist state, the French Revolution, comparative industrialization, women's history. May be repeated for credit as topics vary.

203 First-Year Research Seminar (4). *Course devoted to research and writ*ing on questions connected with proseminar topics. Normally required of all entering graduate students. Includes review of the current state of the literature and practical experience in conducting research and writing a research paper. Prerequisite: History 202.

204A-B Second-Year Research Seminar (4-4). Two-quarter sequence required of all Ph.D. students. Normally taken during the second year of the Ph.D. program; not required for M.A. students. Includes review of the current state of the literature and practical experience in conducting research and writing a research paper.

COLLOQUIA

220 The Literature and Interpretations of Early-Modern Europe. *Not offered every year.*

220A Society and Economy (4)

220B Political History (4)

220C Intellectual and Cultural History (4)

230 The Literature and Interpretations of Modern European History. *Not offered every year.*

230A Europe: 1789-1848 (4)

230B Europe: 1850-1914 (4)

230C Europe: 1914-1989 (4)

240 The Literature and Interpretations of World History. *Not offered every year.*

240A Approaches to World History (4)

240B Topics in World History (4)

240C Advanced Research in World History (4)

250 The Literature and Interpretations of Latin American History. *Not offered every year.*

250A Colonial Period (4)

250B Nineteenth Century (4)

250C Twentieth Century (4)

260 The Literature and Interpretations of American History

260A Seventeenth and Eighteenth Centuries (4)

260B Nineteenth Century (4)

260C Twentieth Century (4)

265 The Literatures and Interpretations of South and Southeast Asian History. *Not offered every year.*

265A Globalization in South and Southeast Asia (4)

265B Colonialism in South and Southeast Asia (4)

265C Nationalism in South and Southeast Asia (4)

270 The Literature and Interpretations of East Asian History. *Not offered every year.*

270A Early East Asia (4)

270B China Since 1600 (4)

270C Japan Since 1600 (4)

270D Korea (4)

275 The Literature and Interpretations of Middle Eastern and North African History. *Not offered every year.*

275A Approaches to Islam in the Middle East/Maghrib (4)

275B Ottoman and Modern Middle East (4)

275C The Maghrib Since 1500 (4)

282 Seminar in Medieval and Early Modern British History. (4) F, W, S. An intercampus seminar in Medieval and Early Modern British history that is taught both at the Huntington Library in San Marino and at UCI. Focuses on the development of thesis statements, thesis chapters, and/or publishable articles. May be repeated for credit.

284A, B, C Seminar in French History (4, 4, 4) F, W, S. The development of French society and culture from the Old Regime to the present. May be used to fulfill the First-Year Research Seminar requirement. Prerequisite for 284C: 284A and 284B. *Not offered every year.*

SPECIAL STUDIES

290 Special Topics (4) F, W, S. Lectures, readings, and discussion on subjects more limited in scope than those included in the year-long colloquium series. May be repeated for credit as topics vary.

291 Directed Reading (4 to 12) F, W, S. Reading courses focused on specialized topics. Prerequisite: consent of instructor.

295 Special Methods (4). Development of particular research skills.

298 Experimental Group Study (4). Open to four or more students. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

299 Dissertation Research (4 to 12) F, W, S. Specifically designed for students researching and writing their dissertations. Prerequisite: consent of instructor; advancement to Ph.D. candidacy.

399 University Teaching (4) F, W, S. Limited to Teaching Assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

UNDERGRADUATE PROGRAM IN HUMANITIES AND ARTS

150 Humanities Instructional Building: (949) 824-8119
Carrie J. Noland, **Co-Director (Humanities)**
Mary Corey, **Co-Director (Arts)**

Faculty

Kei Akagi, B.A. International Christian University, Tokyo, *UCI Chancellor's Professor of Music* (history of jazz)
Luis F. Avilés, Ph.D. Brown University, *Department Chair and Associate Professor of Spanish* (Golden Age literature and literary theory)
Stephen Barker, Ph.D. University of Arizona, *Professor of Drama* (post-modern theatre, Beckett, critical theory)
David Brodbeck, Ph.D. University of Pennsylvania, *Department Chair and Professor of Music, and The Robert and Marjorie Rawlins Chair in Music* (history, criticism)
Rae Linda Brown, Ph.D. Yale University, *Associate Professor of Music* (history, American musics)
Juan Bruce-Novoa, Ph.D. University of Colorado, *Professor of Spanish* (Latin American and Chicano literatures)
James Chiampi, Ph.D. Yale University, *Professor of Italian* (Italian Renaissance)
Michael P. Clark, Ph.D. University of California, Irvine, *Associate Executive Vice Chancellor for Academic Programs and Professor of English* (Colonial American literature, critical theory)
Robert Cohen, D.F.A. Yale University, *Claire Trevor Professor of Drama* (acting, directing, dramatic literature)
Mary Corey, M.A. University of California, Riverside, Certified Professional Labanotator, *Associate Dean of the Claire Trevor School of the Arts, Co-Director of the Arts and Humanities Major, and Professor of Dance* (dance history, modern dance, notation and reconstruction, dance and digital technology)
Christopher Dobrian, Ph.D. University of California, San Diego, *Associate Professor of Music and Informatics* (electronic music)
Alice Fahs, Ph.D. New York University, *UCI Chancellor's Fellow and Associate Professor of History* (U.S. intellectual/cultural history)
Nohema Fernández, D.M.A. Stanford University, *Dean of the Claire Trevor School of the Arts, Professor of Music, and Claire Trevor Dean's Endowed Chair* (Latin American musics, piano)
Jennifer Fisher, Ph.D. University of California, Riverside, *Assistant Professor of Dance* (dance history, philosophy, and criticism)
Natalka Freeland, Ph.D. Yale University, *Assistant Professor of English* (Victorian literature, the novel, cultural studies and criticism)
Edward Fowler, Ph.D. University of California, Berkeley, *Department Chair of East Asian Languages and Literatures and Professor of Japanese* (modern Japanese literature, cultural studies, film)
Alexander Gelley, Ph.D. Yale University, *Professor of Comparative Literature* (eighteenth- and nineteenth-century European novel, critical theory, comparative literature)
Bernard Gilmore, D.M.A. Stanford University, *Professor of Music* (composition, theory)
Inderpal Grewal, Ph.D. University of California, Berkeley, *Director of the Program in Women's Studies and Professor of Women's Studies* (feminist theories of internationalism and transnationalism, cultural studies, British nineteenth-century studies, South Asia and its diasporas)
Gail K. Hart, Ph.D. University of Virginia, *Director, Humanities Core Course and Professor of German* (eighteenth- and nineteenth-century German literature, drama, fictional prose)
James D. Herbert, Ph.D. Yale University, *Department Chair and Professor of Art History* (modern European art, critical theory)
Lamar M. Hill, University of London, *Professor of History* (Tudor-Stuart Britain)
Branden W. Joseph, Ph.D. Harvard University, *Assistant Professor of Art History* (modern and contemporary American art and visual studies)
Laura H.-Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies and Comparative Literature* (feminist visual cultures)
Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Asian American Studies and English* (Asian American literature, post-colonial literature)
Susan B. Klein, Ph.D. Cornell University, *Director of Religious Studies and Associate Professor of Japanese* (premodern and modern theatre and dance, Japanese religions, feminist critical theory)
Richard W. F. Kroll, Ph.D. University of California, Los Angeles, *Professor of English* (rhetoric, Restoration and eighteenth-century British literature, literary theory)
Anthony Kubiak, Ph.D University of Wisconsin, Milwaukee, *Professor of Drama* (American and modern drama, modern poetry, critical theory, philosophy)
Meredith Lee, Ph.D. Yale University, *Professor Emerita of German* (lyric poetry, eighteenth-century literature, Goethe, music and literature)
Daphne Lei, Ph.D. Tufts University, *Assistant Professor of Drama* (Asian theatre, Asian American theatre, intercultural theatre, gender theory, performance theory)
Simon Leung, B.A. University of California, Los Angeles, *Assistant Professor of Studio Art* (queer theories, modernism and post-modern theories)
Akira Mizuta Lippit, Ph.D. The Johns Hopkins University, *Department Chair and Professor of Film and Media Studies* (film history and theory, critical theory, experimental film and media, Japanese cinema)
Catherine Lord, M.F.A. State University of New York, Buffalo, *Professor of Studio Art* (critical theory, feminism)
Julia Reinhard Lupton, Ph.D. Yale University, *Professor of English* (Renaissance literature, literature and psychology)
Lynn Mally, Ph.D. University of California, Berkeley, *Professor of History* (modern Russian and Soviet history)
Daniel Martinez, B.F.A. California Institute of the Arts, *Professor of Studio Art* (public art, installation, performance)
David McDonald, Ph.D. Stanford University, *Professor Emeritus of Drama* (dramatic theory, Irish drama, theatre history, and playwriting)
Glen Mimura, Ph.D. University of California, Santa Cruz, *Assistant Professor of Asian American Studies* (independent film and video, theory and methods, and popular culture)
Yong Soon Min, M.F.A. University of California, Berkeley, *Department Chair and Associate Professor of Studio Art* (diaspora and post-colonial theories, race and representation)
Ian Munro, Ph.D. Harvard University, *Associate Professor of Drama* (European drama and performance, early modern popular culture, theatrical performance of wit)
Margaret Murata, Ph.D. University of Chicago, *Professor of Music* (history, analysis, criticism)
Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Professor of Spanish* (eighteenth- through twentieth-century Spanish literature, film and visual arts, aesthetics and contemporary cultures)
Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature* (sixteenth- and seventeenth-century German literature, contemporary theory and criticism, feminism)
Robert Nideffer, Ph.D. University of California, Santa Barbara, *Associate Professor of Studio Art and Informatics* (interface theory and design, technology and culture, contemporary social theory)
Carrie J. Noland, Ph.D. Harvard University, *Co-Director of the Major in Humanities and Arts and Associate Professor of French* (twentieth-century poetry, World War II and literature of the avant-garde)
Margot Norris, Ph.D. State University of New York, Buffalo, *Professor of English and Comparative Literature* (modern British literature)
Simon Penny, Graduate Diploma in Sculpture, Sydney College of the Arts, New South Wales (Australia), *Professor of Electrical Engineering and Computer Science, Studio Art, and Informatics* (robotic sculpture, interactive environments, electronic media, art practice history, and critical theory)
James Penrod, M.F.A. University of California, Irvine; C.M.A. Laban Institute of Movement Studies, *Professor Emeritus of Dance* (ballet, modern, dance notation, choreography, movement analysis)
Janelle Reinelt, Ph.D. Stanford University, *Associate Dean of Graduate Studies and Professor of Drama* (political theory and performance)
Bryan Reynolds, Ph.D. Harvard University, *Associate Professor of Drama and Head of Doctoral Studies in Drama* (Shakespeare, Renaissance drama, critical theory, feminist theory, performance theory, cultural studies)
Jens Rieckmann, Ph.D. Harvard University, *Professor Emeritus of German* (twentieth-century literature, fin-de-siècle Austria, Hofmannsthal, Thomas Mann)
Nancy Lee Ruyter, Ph.D. Claremont Graduate School, *Professor of Dance* (dance history, research methods)
Connie Samaras, M.F.A. Eastern Michigan University, *Professor of Studio Art* (photography, media and film criticism, gender studies, culture and technology)
Martin Schwab, Ph.D. University of Bielefeld, *Professor of Philosophy and Comparative Literature* (philosophy, aesthetics, comparative literature)

Sally A. Stein, Ph.D. Yale University, *Associate Professor of Art History* (American art, history of photography, feminist theory)

James Steintrager, Ph.D. Columbia University, *Associate Professor of English* (eighteenth-century Associate, German, and English literature and aesthetics)

Dana F. Sutton, Ph.D. University of Wisconsin, *Professor of Classics* (Greek and Latin drama, Greek poetry, Anglo-Latin literature)

Alan Terriciano, M.A. Eastman School of Music, *Department Chair and Associate Professor of Dance* (musical resources)

David Trend, Ph.D. School of Education, Miami University, *Professor of Studio Art* (visual studies)

Hu Ying, Ph.D. Princeton University, *Associate Professor of Chinese* (narrative literature, translation theory, feminist theory)

Bruce Yonemoto, M.F.A. Otis Art Institute, *Professor of Studio Art* (video, multimedia, film theory)

The major in Humanities and Arts provides students with a broad exposure to a range of disciplinary and methodological opportunities in the Humanities and Arts. It insists on the productive intersection of these two fields as the focus of each student's program. Students improve their critical and historical sophistication while learning about the process of performance and creative work, a combination that equips them to participate more effectively in a society that increasingly joins critique and creation just as closely as it fuses image and information.

Humanities and Arts students investigate the symbolic dimension of human behavior and identity, an interest shared by many critics and artists alike. Often, this interest is expressed in the context of interdisciplinary programs designed to facilitate contact among faculty and students from a wide range of different academic disciplines. This major's focus on the connection between practice and analysis distinguishes it from the broader and more diverse scope of more general interdisciplinary programs. The scholarly work of many UCI faculty in the Humanities and Arts lies at an intersection between the two academic units, and the major translates this intellectual and creative activity into a coherent curriculum and projects current forms of scholarship and artistic practice into the classroom.

CAREER OPPORTUNITIES

Graduates of this program will be very attractive to teacher-training programs. There is also a steadily growing market in private industry for students whose training combines skills sharpened by both the Humanities and Arts. Business demands graduates with strong writing and analytic skills, talents stressed in the Humanities. They also desire people with creativity and visual skills who have experience putting their original ideas into practice, something emphasized in the Arts. Graduates will have special skills that will enable them to work in professional fields directly allied with the Arts, including museum work, art foundations, art criticism, journalism, theatre, and the entertainment industry.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

Application Process for the Humanities and Arts Major

New students are not admitted directly to the Humanities and Arts major. Continuing students apply to change their major to Humanities and Arts no earlier than the fall quarter of their sophomore year. Complete information about changing majors to Humanities and Arts is available at http://www.due.uci.edu/Change_of_Major.html. Students must submit a transcript and meet the change-of-major criteria for each of the two departments they propose to combine. In addition, a program of study, approved by the designated faculty member in the Claire Trevor School of the Arts and in the School of Humanities, is required for admission to Humanities and Arts. Students are strongly encouraged to consult with the Humanities Student Affairs Office early in their decision to apply to Humanities and Arts.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Requirements for the Major

Humanities 1A-B-C; one lower-division survey in a specialization in the Arts, chosen from Dance 90A-B-C, Drama 40A,B,C, Music 14A-B-C, Studio Art 10A,B,C; six units of "studio courses" in Dance, Drama, or Studio Art *or* six units of "ensemble courses" in Music; Humanities and Arts 100, 101; 16 additional units of upper-division Humanities courses and 16 additional units of upper-division Arts courses focusing on a specific theme, region, or period, chosen with the approval of a Humanities and Arts faculty advisor. (Students must have their proposed program of study approved by their advisor each year.)

It is expected that students will choose their courses from one major in the Humanities and one major in the Arts. Students with well-developed interests can shape their curriculum more precisely to their needs.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Courses in Humanities and Arts

100 The Arts in Theory and Practice (4). Writing seminar explores writings on art from different times and cultures. How have artists and critics in different cultural contexts tried to explain the principles and theories that guide their work? How can students use their concepts to assess art works? Prerequisite: satisfactory completion of the lower-division writing requirement. Same as Arts and Humanities 100.

101 Topics in Arts and Humanities (4). This interdisciplinary course examines themes relevant to both the Arts and the Humanities. May be repeated for credit as topics vary. Same as Arts and Humanities 100.

SPECIAL PROGRAMS

Undergraduate Major in Humanities

The interdisciplinary major in Humanities is one of the many options available to a student who wants to select a major in the School of Humanities. As such, the major in Humanities is on a par with the major in Spanish, the major in Classics, the major in Philosophy, and other majors in the School. The major in Humanities accommodates students who want to organize their undergraduate education around a humanistic perspective on a topic, a field, or a problem which is interdisciplinary in scope (e.g., Literature and Politics in Twentieth-Century America; The Problem of Community; Social and Religious Thought in the Age of the Reformation; Italian Society and Culture). The student enters the program at the end of the sophomore year and, in consultation with the Humanities Major Committee, devises an individually tailored set of "major requirements," not all of which need be offered in the School of Humanities. The Committee will assign an advisor on the basis of the student's own preference, if possible. At the end of the senior year the student will prepare, under the advisor's supervision, a long paper (40–50 pages) in the area of the special major. This requirement is satisfied by taking Humanities 199. A student majoring in Humanities must also meet the regular School, UCI, and University requirements for graduation. Inquiries by third-quarter sophomores should be addressed to the Senior Academic Counselor in the School's Office of Undergraduate Study.

Residence Requirement: At least five upper-division courses in Humanities required for the major must be completed successfully at UCI.

Minor in Humanities and Law

150 Humanities Instructional Building; (949) 824-8119
Martin Schwab, **Director**

Participating Faculty

Ermanno Bencivenga, *Professor of Philosophy*
Yong Chen, *Associate Professor of History and Asian American Studies*
James B. Given, *Professor of History*
Gail K. Hart, Ph.D. University of Virginia, *Director, Humanities Core Course and Professor of German*
Lamar M. Hill, *Professor of History*
Bonnie Kent, *Associate Professor of Philosophy*
Richard W. F. Kroll, *Professor of English*
Steven Mailloux, *UCI Chancellor's Professor of Rhetoric*
Alejandro Morales, *Professor of Spanish*
Martin Schwab, *Director of the Minor in Humanities and Law and Professor of Philosophy and Comparative Literature*
Victoria Silver, *Associate Professor of English*
Preston Kyle Stanford, *Associate Professor of Logic and Philosophy of Science*
Brook Thomas, *UCI Chancellor's Professor of English*

The minor in Humanities and Law is based on courses in the humanities that UCI graduates have found to be useful in developing skills that prepare them for law-related careers. One set of courses develops skills in critical reading, writing, and analysis that are necessary in dealing with legal issues. Another set presents theoretical and analytical perspectives on ethical, political, and social issues relevant to the law. A final set focuses on specific legal issues from a humanistic perspective. Lower-division requirements primarily develop foundational skills in the first set, whereas upper-division requirements build on these skills by addressing the concerns from the other sets. The minor does not include how-to courses on particular legal practices.

Requirements for the Minor

Lower-Division: Philosophy 29 or Classics 75; either one of the following four-course combinations: Humanities 1A-B-C and one course from Philosophy 4, 5, or 9 *or* Philosophy 1, 4, and either 5 or 9, plus one course from Philosophy 10, 11, 12, 13, or 9 (if not taken above).

Upper-Division: Six courses from among a list of quarterly approved courses, at least one each from philosophy, history, and literature or classics. Consult the School of Humanities Web site (http://www.humanities.uci.edu) or an academic counselor for currently approved courses.

Students considering a career in law are strongly encouraged to take advantage of other law-related courses offered across the campus and of extracurricular activities such as the Pre-Law Society.

Residence Requirement for the Minor: Four upper-division courses required for the minor must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

Interdisciplinary Minor in Asian Studies

5285 Social Science Plaza B; (949) 824-7521
Dorothy J. Solinger, **Co-Director**

259 Murray F. Krieger Hall; (949) 824-3111
Anne Walthall, **Co-Director**

Participating Faculty

Tom Boellstorff, Ph.D. Stanford University, *Assistant Professor of Anthropology* (sexuality, postcoloniality, HIV/AIDS, mass media and popular culture, language and culture, Indonesia, Southeast Asia)
Vinayak Chaturvedi, Ph.D. University of Cambridge, *Assistant Professor of History* (South Asia, postcolonial studies)
Chuansheng Chen, Ph.D. University of Michigan, *Associate Professor of Social Ecology* (cross-cultural psychology, socialization of achievement, adolescent development)
Chungmoo Choi, Ph.D. Indiana University, *Associate Professor of Korean Culture* (modern Korea, post-colonial and colonial discourse, popular culture, anthropology)
Edward Fowler, Ph.D. University of California, Berkeley, *Department Chair of East Asian Languages and Literatures and Professor of Japanese* (modern Japanese literature, cultural studies, film)
James Fujii, Ph.D. University of Chicago, *Associate Professor of Japanese* (modern Japanese literature; critical theory and cultural studies)
Michael A. Fuller, Ph.D. Yale University, *Associate Professor of Chinese* (Chinese poetry and poetics, the cultural and intellectual contexts for poetry, aesthetic theory, linguistic issues in classical Chinese)
Susan Greenhalgh, Ph.D. Columbia University, *Professor of Anthropology* (political economy, transnational studies, feminism/gender, politics of reproduction, critical demography, disciplinarity, China, Taiwan, Pacific Rim)
Judy C. Ho, Ph.D. Yale University, *Associate Professor of Art History* (Chinese art, archaeology, common religion, Buddhist art)
Hu Ying, Ph.D. Princeton University, *Associate Professor of Chinese* (narrative literature, translation theory, feminist theory)
Martin W. Huang, Ph.D. Washington University, *Professor of Chinese* (narrative theories and traditional Chinese fiction)
Kyung Hyun Kim, Ph.D. University of Southern California, *Associate Professor of Korean Culture* (East Asian China, modern Korea, cultural theory)
Susan B. Klein, Ph.D. Cornell University, *Director of Religious Studies and Associate Professor of Japanese* (premodern and modern theater and dance, Japanese religions, feminist critical theory)
Karen Leonard, Ph.D. University of Wisconsin, *Co-Director of the Center for Asian Studies and Professor of Anthropology* (social history of India, caste, ethnicity and gender, Asian-Americans in the United States)
Eugene Y. Park, Ph.D. Harvard University, *Assistant Professor of History (Korea)*
Kenneth L. Pomeranz, Ph.D. Yale University, *UCI Chancellor's Professor of History and of East Asian Languages and Literatures* (modern Chinese)
Kamal Sadiq, Ph.D. University of Chicago, *Assistant Professor of Political Science* (comparative politics, immigration in developing countries, India and South East Asia, Asian security)
David A. Smith, Ph.D. University of North Carolina, Chapel Hill, *Professor of Sociology and Social Ecology* (urbanization, comparative historical sociology, political sociology, world-system analysis)
Dorothy J. Solinger, Ph.D. Stanford University, *Co-Director of the Center for Asian Studies, Co-Director of the Minor in Asian Studies, and Professor of Political Science* (Chinese domestic politics and political economy, comparative politics)
Yang Su, M.A. The Catholic University of America, *Assistant Professor of Sociology* (social movements and collective action, political sociology, China's political transition)
Robert Uriu, Ph.D. Columbia University, *Assistant Professor of Political Science* (international relations, international political economy, Japanese political economy)
Anne Walthall, Ph.D. University of Chicago, *Co-Director of the Minor in Asian Studies and Professor of History and of East Asian Languages and Literatures* (early modern and modern Japan)
Wang Feng, Ph.D. University of Michigan, *Associate Professor of Sociology* (demography, social change, economy and society)
Charles J. Wheeler, Ph.D. Yale University, *Assistant Professor of History* (Southeast Asia, Vietnam, Chinese overseas, cross-cultural trade)
Duncan R. Williams, Ph.D. Harvard University, *Assistant Professor of Japanese* (Japanese religion, East Asian Buddhism, culture and history)
Bert Winther-Tamaki, Ph.D. Institute of Fine Arts, New York University, *Associate Professor of Art History* (Modern Japanese art, Asian American art, East/West discourses in modern visual culture)
Meng Yue, Ph.D. University of California, Los Angeles, *Assistant Professor of Chinese* (Chinese poetry and literatures in pre-modern Chinese)
Mei Zhan, Ph.D. Stanford University, *Assistant Professor of Anthropology* (medical anthropology, cultural and social studies of science, globalization, transnationalism, gender, China, the United States)

The countries and cultures of Asia are significant participants in the world community. They present compellingly different models for social organization, historical development, and cultural commitments. The many countries of this large and complex region provide challenges and opportunities whether one plans to be a scholar, a business person, or a diplomat. The minor in Asian Studies draws upon the expertise of faculty throughout UCI to create opportunities for students to explore Asian topics in a variety of fields, to develop advanced language skills, and to acquire a broader perspective as they apply the disciplinary training of their major field to effective and informed studies of Asian subjects. The minor is open to all UCI students.

Requirements for the Minor

Students choose one country and language of specialization. At the present, due to language limitations at UCI, the Asian Studies minor can focus only on China, Japan, or Korea.

Requirements for the minor are met by taking eight courses (of which no more than four may be lower-division) as specified below:

A. One course selected from History 170D, 170E, 170F (Premodern East Asia, East Asia 1600–1895, East Asia Since 1895). Substitutions are possible when approved by a Co-Director of the minor by petition.

B. Three quarters of course work in one Asian language of specialization beyond the first-year level. Approved courses are:

1. Second-, third- or fourth-year language: Chinese 2A-B-C, 3A-B-C, 101A-B-C; Japanese 2A-B-C, 3A-B-C, 101A-B-C; Korean 2A-B-C, 3A-B-C, 101A-B-C. NOTE: These courses require placement examinations given by the Department of East Asian Languages and Literatures. Students who, for example, place out of Chinese 2B would then take Chinese 2C, 3A-B to meet the requirement.
2. Classical Chinese (Chinese 100A-B-C), *or* Classical Japanese (100A-B) plus a third quarter of Japanese language study.
3. Literature courses taught in the original language: Chinese 115, Japanese 115, Korean 115, or graduate seminars. NOTE: These courses have a prerequisite of completion of the fourth-year language sequence or its equivalent.

C. Four additional courses selected from an approved list available in the Center for Asian Studies and on the World Wide Web at http://www.humanities.uci/edu/cas/minor.htm#2.

1. At least two of these courses must be taken in one (or more) department(s) other than the student's major department.
2. The courses must cover at least two different Asian countries, one of which is the country of language specialization.
3. No more than two of the courses may be lower-division.

NOTE: A maximum overlap of two courses is permitted between this minor and a student's major.

Residence Requirement for the Minor: Four upper-division (or graduate) courses must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

Representative Courses. The following courses are representative of those appearing on the approved list: Anthropology 135H (Religion in South Asia), 138P (Music of Asia), 163K (Korean Society and Culture); Art History 42A, B, C (History of Asian Art), 150 (Studies in Asian Art), 152 (Studies in Chinese Art and Religion), 153 (Studies in Early Chinese Painting), 154 (Studies in Later Chinese Painting), 159 (Japanese Buddhist Art), 161 (Studies in Early Japanese Painting), 162A, B, C (Later Japanese Art and Design); Chinese 100A-B-C (Classical Chinese), 115 (Chinese Literature: Advanced Texts), 180 (Topics in Chinese Literature); East Asian Languages and Literatures 55 (Introduction to East Asian Cultures), 110 (Topics in Chinese Literature and Society), 113 (Linguistic Structure of Chinese), 117 (Topics in East Asian Philosophy), 120 (Topics in Japanese Literature and Society), 123 (Linguistic Structure of Japanese), 130 (Korean Society and Culture), 133 (Linguistic Structure of Korean), 150 (Topics in East Asian Literature in Translation), 160 (East Asian Cinema); History 170A, B, C (Chinese History), 171A, B, C (Japanese History), 172A, B, C (Korean History); Japanese 100A-B-C (Classical Japanese), 115 (Japanese Literature: Advanced Texts), 180 (Topics in Japanese Literature); Korean 115 (Korean Literature: Advanced Texts), 180 (Topics in Korean Literature); Linguistics 165A (Linguistic Structure of Chinese), 165B (Linguistic Structure of Japanese), 165C (Linguistic Structure of Korean); Political Science 142C (International Relations of Japan), 151A (East Asian Politics), 151B (Introduction to Chinese Politics), 151C (Chinese Politics: Policy, Leadership, and Change), 151D (Japanese Politics: State and Economy in Modern Japan), 151F (Korean Politics and Society); Psychology and Social Behavior P124D (Human Development in Cross-Cultural Perspective); Sociology 77 (Social Change in East Asia), 175A (Korean Society and Culture), 175B (Comparative Societies: China), 175C (Japanese Society).

Interdisciplinary Minor in Latin American Studies

300 Murray Krieger Hall; (949) 824-4767
Jaime E. Rodríguez, **Director**

Faculty

Ana María Amár Sánchez, *Associate Professor of Spanish*
Frank D. Bean, *Professor of Sociology*
Carolyn P. Boyd, *Department Chair and Professor of History*
Susan K. Brown, *Assistant Professor of Sociology*
Juan Bruce-Novoa, *Professor of Spanish*
Alison Brysk, *Professor of Political Science*
Teresa Caldeira, *Associate Professor of Anthropology*
Frank Cancian, *Professor Emeritus of Anthropology*
Leo Chávez, *Director of Chicano/Latino Studies and Professor of Anthropology*
Raúl Fernández, *Professor of Social Sciences*
Ana Paula Ferreira, *Professor of Portuguese*
Robert Garfias, *Professor of Anthropology*
Lucía Guerra-Cunningham, *Professor of Spanish*
Ivette N. Hernández-Torres, *Associate Professor of Spanish*
Helen Ingram, *Professor of Social Ecology and Political Science, and Drew, Chace, and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation*
Adriana M. Johnson, *Assistant Professor of Comparative Literature*
William M. Maurer, *Associate Professor of Anthropology*
Seymour Menton, *Research Professor of Spanish and Portuguese*
Alejandro Morales, *Professor of Spanish*
Jaime E. Rodríguez, *Director of Latin American Studies and Professor of History*
John Carlos Rowe, *Professor Emeritus of Comparative Literature*
Vicki L. Ruiz, *Professor of Chicano/Latino Studies and History*
Nancy Lee Ruyter, *Professor of Dance*
Armin Schwegler, *Professor of Spanish*
Jacobo Sefamí, *Professor of Spanish*
Caesar D. Sereseres, *Associate Dean for Undergraduate Studies, School of Social Sciences, and Associate Professor of Political Science*
Etel Solingen, *Professor of Political Science*
Luis Suárez-Villa, *Professor of Social Ecology*
Heidi Tinsman, *UCI Chancellor's Fellow and Associate Professor of History*
Steven C. Topik, *Professor of History*
Luis P. Villarreal, *Director of the Center for Virus Research and Professor of Molecular Biology and Biochemistry and of Virology*
Roberto Villaverde, *Professor Emeritus of Civil and Environmental Engineering*
Juan Villegas, *Research Professor of Spanish*
Douglas R. White, *Professor of Anthropology*

The minor in Latin American Studies is an interdisciplinary curriculum designed to provide for an awareness, knowledge, and appreciation of Latin American issues in the areas of language, history, culture, literary studies, sociology, anthropology, political science, social ecology, health, folk medicine, and creative (art, dance, drama, music) accomplishments. The minor is open to all UCI students.

Requirements for the Minor

Spanish 2A-B-C (Intermediate Spanish) or Portuguese 120A, B, C (may not overlap with other minor requirements), or demonstrated equivalent knowledge of Spanish or Portuguese.

Humanities 100 (Latin America and the Caribbean).

One course in Latin American literature (Spanish-American or Luso-Brazilian) selected from: Comparative Literature CL 103 (when topic is on Latin American literature and history); Spanish 100C (Introduction to Latin American Literature: Pre-Hispanic to Nineteenth Century), 100D (Introduction to Latin American Literature: Nineteenth and Twentieth Centuries), 130A (Latin American Colonial Literature), 130B (Latin American Literature of the Nineteenth Century), 130C (Latin American Literature of the Twentieth Century), 150 (Literature in Translation), 160 (Topics in Luso-Hispanic Film Studies, when topic is on Latin America), 186 (Selected Topics in Latin American Literature and Culture); Portuguese 120A, B, C (Introduction to Portuguese and Brazilian Literature), 121 (Topics in Luso-Brazilian Literature), 190 (Individual Studies).

One course in Latin American history selected from: History 161A (Indian and Colonial Societies in Mexico), 161B (Nineteenth-Century Mexico), 161C (Twentieth-Century Mexico), 162 (Brazil), 166 (United States–Latin America Relations), 168A (Precolumbian Civilizations and European Colonialism), 168B (Nineteenth-Century Iberian America), 168C (History of Modern Latin America), 169 (Topics in Latin American History), 190 (Colloquium, when topic is on Latin America).

One course in Latin American social sciences selected from: Anthropology 125A (Economic Anthropology), 125X (Immigration in Comparative Perspective), 162A (Peoples and Cultures of Latin America); Political Science 145A (Central America and U.S. Policy), 153A (Latin American Politics), 153D (Mexican Politics); Social Science 172F (Latin American Culture I).

One course in Chicano studies selected from: Chicano/Latino Studies 111A (Critical Issues in Chicano Studies); Environmental Analysis and Design E143U (Social Ecology of the Borderlands); Political Science 126A (Mexican-Americans and Politics); Spanish 100E (Introduction to Chicano and U.S. Latino Literature), 110C (U.S. Latino Cultures), 140A, B (Chicano Literature), 142 (Chicano Culture), 186 (Selected Topics in Latin American Literature and Culture, when topic is on Chicano literature).

Four courses in Latin American studies selected from: any of the courses listed above in the literature, history, and social sciences requirements; Spanish 110A (Peninsular Cultures, when topic is on Latin America), 110B (Latin American Cultures); Portuguese 122 (Topics in Luso-Afro-Brazilian Culture); Anthropology 121J (Urban Anthropology, when the topic is on Latin American countries); Biological Sciences 199A-B-C (Independent Study in Biological Sciences Research, when topic is medicinal biology and herbs in Mexico).

With the approval of the director, other relevant courses also may satisfy the requirements for the minor.

Residence Requirement for the Minor: Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

Interdisciplinary Minor in Religious Studies

168 Humanities Instructional Building: (949) 824-8119
Susan B. Klein, **Director**

Participating Faculty

Elizabeth Allen, Ph.D. University of Michigan, *Assistant Professor of English* (medieval literature; theories of reception; exemplary and didactic literature; literature and ethics; literature and affect; history of English language; Old English)

Marc Baer, Ph.D. University of Chicago, *Assistant Professor of History* (Islamic and Middle Eastern history; Ottoman Empire and Turkey; religious conversion; crypto-religion)

Linda Freeman Bauer, Ph.D. Institute of Fine Arts, New York University, *Professor of Art History* (Renaissance and Baroque art)

Victoria Bernal, Ph.D. Northwestern University, *Associate Professor of Anthropology* (feminist theory and gender; civil society, globalization, cyberspace, transnationalism; the Islamic revival; peasants, labor migration; Africa, Muslim societies)

William Bristow, Ph.D. Harvard University, *Assistant Professor of Philosophy* (Kant; nineteenth-century idealist tradition)

Dickson D. Bruce, Jr., Ph.D. University of Pennsylvania, *Professor of History* (American culture; African American history of the South)

Carol Burke, Ph.D. Maryland University, *Associate Professor of English* (folk belief, folklore; creative non-fiction)

Yong Chen, Ph.D. Cornell University, *Associate Professor of History and Asian American Studies* (Asian-American history; late-nineteenth and twentieth-century American social and cultural history; immigration history)

James Chiampi, Ph.D. Yale University, *Professor of Italian* (Italian Renaissance)

Chungmoo Choi, Ph.D. Indiana University, *Associate Professor of Korean Culture* (Modern Korea; post-colonial and colonial discourse; Marxism and Christianity; popular cultures and anthropology)

Susan Bibler Coutin, Ph.D. Stanford University, *Associate Professor of Criminology, Law and Society* (immigration and border issues; law; Central America; political and religious activism; human rights)

Lara Deeb, Ph.D. Emory University, *Assistant Professor of Women's Studies* (Islam, gender, and notions of modernity; religious social movements; gender and the social sphere)

Edward Fowler, Ph.D. University of California, Berkeley, *Department Chair of East Asian Languages and Literatures and Professor of Japanese* (Modern literature; cultural studies; film)

Michael A. Fuller, Ph.D. Yale University, *Associate Professor of Chinese* (Classical Chinese poetry and poetics; the cultural and intellectual contexts for poetry; aesthetic theory; linguistic issues in classical Chinese)

Alexander Gelley, Ph.D. Yale University, *Professor of Comparative Literature* (eighteenth-century English and comparative literature; nineteenth-century English and comparative literature and philosophy; German-Jewish literature and culture)

Linda Georgianna, Ph.D. Columbia University, *Professor of English* (medieval literature and culture; nineteenth-century medievalism)

James B. Given, Ph.D. Stanford University, *Professor of History* (medieval Europe; social and political history)

Anna Gonosová, Ph.D. Harvard University, *Associate Professor of Art History* (Byzantine and Medieval art and architecture)

Michelle Hamilton, Ph.D. University of California, Berkeley, *Assistant Professor of Spanish* (medieval Spanish literature)

Lamar M. Hill, Ph.D. University of London, *Professor of History* (Tudor-Stuart England; early modern Europe)

Judy C. Ho, Ph.D. Yale University, *Associate Professor of Art History* (Chinese art and archaeology; Buddhist art and popular religions)

S. Nicholas Jolley, Ph.D Cambridge University, *Department Chair and Professor of Philosophy* (seventeenth and eighteenth-century philosophy; political philosophy)

Bonnie Kent, Ph.D. Columbia University, *Associate Professor of Philosophy* (ethics; medieval philosophy)

Susan B. Klein, Ph.D. Cornell University, *Director of Religious Studies and Associate Professor of Japanese* (premodern and modern theater and dance; medieval commentaries; Japanese religions; new historicism and feminist critical theory)

Richard W. F. Kroll, Ph.D. University of California, Los Angeles, *Professor of English* (eighteenth-century English and comparative literature; history of literary theory; literature and philosophy; cultural studies and criticism; history and theories of rhetoric)

Karen Leonard, Ph.D. University of Wisconsin, *Professor of Anthropology* (social history of India; caste ethnicity and gender; Asian-Americans in the United States)

Mark LeVine, Ph.D. New York University, *Associate Professor of History* (modern Middle East and Islam; globalization; popular culture)
Julia Reinhard Lupton, Ph.D. Yale University, *Director of Humanities Out There (H.O.T.) and Professor of English* (Shakespeare; Renaissance literature; religious studies; Jewish studies; humanities and the public sphere)
Cecilia Lynch, Ph.D. Columbia University, *Director of the Center for Global Peace and Conflict Studies and Associate Professor of Political Science* (international relations theory; international organization and law; international ethics and political philosophy; social movements in world politics; peace and security)
Steven Mailloux, Ph.D., University of Southern California, *UCI Chancellor's Professor of Rhetoric* (American literature; contemporary theory; cultural studies and criticism; history and theories of rhetoric)
Sanjoy Mazumdar, Ph.D. Massachusetts Institute of Technology, *Professor of Social Ecology* (environmental design research: cultural aspects, environmental psychology; architecture, planning, organizational studies; work environments, home environments, ethnic neighborhoods)
Margaret M. Miles, Ph.D. Princeton University, *Associate Professor of Art History and Classics* (Greek and Roman art, architecture and archaeology)
J. Michelle Molina, Ph.D. University of Chicago, *Assistant Professor of History* (Colonial Latin America, global religious networks, Jesuits, comparative colonialism)
Alan Nelson, Ph.D. University of Illinois at Chicago, *Professor of Philosophy* (early modern rationalism and empiricism; philosophy and history of science; history of analytic philosophy)
Keith L. Nelson, Ph.D. University of California, Berkeley, *Professor Emeritus of History* (American foreign relations; Soviet-American relations; war and society)
Maria C. Pantelia, Ph.D. Ohio State University, *Department Chair and Professor of Classics and Director, Thesaurus Linguae Graecae®* (Greek epic poetry, Hellenistic poetry, computer applications to Classics)
Kenneth L. Pomeranz, Ph.D. Yale University, *UCI Chancellor's Professor of History and of East Asian Languages and Literatures* (Modern China; origins of world economy; global context of environmental change; peasant protest and collective violence; popular religions)
Michael Ryan, Ph.D. University of Iowa, *Professor of English and Creative Writing* (American literature; creative writing; poetry, poetics; autobiography)
Thomas P. Saine, Ph.D Yale University, *Professor Emeritus of German* (eighteenth-century German literature; Goethe; Germany and the French Revolution; eighteenth-century popular philosophy and theology)
Daniel J. Schroeter, Ph.D. University of Manchester, *Professor of History and Teller Family Chair in Jewish History* (Jewish history; North Africa and the Middle East)
Martin Schwab, Ph.D. University of Bielefeld, *Director of the Minor in Humanities and Law and Professor of Philosophy and Comparative Literature* (nineteenth and twentieth-century continental philosophy; literature and other arts, literature and philosophy)
Victoria Silver, Ph.D. University of California, Los Angeles, *Associate Professor of English* (Renaissance studies; feminist and gender studies; cultural studies and criticism; history of literary theory; histories and theories of rhetoric)
John H. Smith, Ph.D. Princeton University, *Director of the Critical Theory Institute and Department Chair and Professor of German* (eighteenth and nineteenth-century literature and intellectual history; literary theory)
Daniel Stokols, Ph.D. University of North Carolina, Chapel Hill, *Professor of Planning, Policy, and Design* (theory development in environmental psychology and social ecology; environmental design research; community and worksite health promotion; effects of environmental stressors on behavior and health; environmental psychology of the Internet)
Ulrike Strasser, Ph.D. University of Minnesota, *Associate Professor of History* (Early Modern Europe and Germany; comparative women's history; social and cultural history)
Timothy Tackett, Ph.D. Stanford University, *Professor of History* (The Old Regime and the French Revolution; social, religious, and cultural history; violence and terror)
Roger N. Walsh, M.B.B.S., Ph.D. University of Queensland (Australia), *Professor of Psychiatry and Human Behavior* (Asian psychologies, philosophies, and religions; ecology; meditation; exceptional psychological well-being; post-conventional development; transpersonal psychology)
Duncan R. Williams, Ph.D. Harvard University, *Assistant Professor of Japanese* (Buddhist studies; Japanese religions; Japanese American Buddhism)

Religious Studies is an interdisciplinary minor that focuses on the comparative study of religions in various cultural settings around the world. The curriculum seeks to provide a wide-ranging academic understanding and knowledge of the religious experience in society through study in the Schools of Humanities, Social Sciences, Social Ecology, and the Arts.

The minor is open to all UCI students. Course descriptions are available in the academic department sections of the *Catalogue.*

Requirements for the Minor

Three Core courses: Humanities 5A, 5B, 5C (World Religions I, II, III). The first quarter is an introduction to the history, doctrine, culture, and writing of Judaism, Christianity, and Islam. The second quarter is an introduction to various religious traditions in selected areas of the world, including India, East Asia, Africa, the Americas, or elsewhere. The third quarter examines aspects of religious expression, including symbolization of the sacred, collective religious behavior, and religious dissent.

Four upper-division courses, two of which must be outside of the student's major. At least one of these course should focus on a primarily Asian religion, and at least one should focus on Judaism, Christianity, or Islam. Students select their courses, in consultation with the Religious Studies faculty, from a quarterly list which is available at http://www.hnet.uci.edu/religious_studies/.

The following courses are representative of those available: Anthropology 135H (Religion in South Asia); Art History 112 (Studies in Early Christian and Byzantine Art), 152 (Studies in Chinese Art and Religion); Classics 165 (New Testament Literature); East Asian 120 (when topic is Religion in Japanese Literature); Comparative Literature CL 103 (when topics are Jews and Muslims in Renaissance, Bible and Interpretation); History 110D (Topics in Medieval Europe: Heresy), 130B (Modern Jewish History), 135B (Science and Religion); Philosophy 123 (Topics in Philosophy of Religion); Women's Studies 150 (Feminist Cultural Studies: Feminism and Religion).

One relevant lower-division course may be substituted for an upper-division course. The following are courses that could apply: Dance 90A (Dance History); Philosophy 11 (History of Medieval Philosophy); Sociology 56 (Society and Religion), 59 (when topic is Religion, Women, Society). A list of acceptable lower-division substitutions is available on the Religious Studies Web site at http://www.hnet.uci.edu/religious_studies/.

A two-quarter Senior Seminar in Religious Studies (Humanities 105A-B), or a two-quarter Humanities 199 on a relevant Religious Studies topic, either of which must include the completion of a senior paper.

Residence Requirement for the Minor: Four upper-division courses required for the minor must be completed successfully at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

Additional Interdisciplinary Minors

Information about the **minor in Conflict Resolution** is available in the School of Social Sciences section. This minor provides skills in conflict analysis and resolution and a useful understanding of integrative institutions at the local, regional, and international levels.

Information about the minors noted below is available in the Interdisciplinary Studies section of the *Catalogue.*

The minor in Chicano/Latino Studies is designed to provide an awareness, knowledge, and appreciation of the language, history, culture, literature, sociology, anthropology, politics, social ecology, health, medicine, and creative (art, dance, film, drama, music) accomplishments in the Chicano/Latino communities.

The minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet.

The minor in the History and Philosophy of Science explores how science is actually done and how it has influenced history, and is concerned with determining what science and mathematics are, accounting for their apparent successes, and resolving problems of philosophical interest that arise in the sciences.

The minor in Native American Studies focuses on history, culture, religion, and the environment. The three core courses serve as an introduction to the Native American experience from the perspective of different historical periods and frameworks of analysis.

Concentration in Medieval Studies

174 Murray Krieger Hall; (949) 824-5441
Linda M. Georgianna, **Coordinator**

The concentration in Medieval Studies allows undergraduate students in the Schools of Humanities and the Arts to augment their major by completing a coherent program of courses in the area of medieval studies. The concentration is available to students in any major offered by the Schools and is particularly well-suited to majors in English and Comparative Literature, History, Philosophy, and the Arts.

Students in the concentration must complete at least two quarters of Humanities 110, the Core Course in Medieval Studies. These courses are interdisciplinary, examinations of such topics as Medieval Cities, The Dark Ages, Medieval Liturgy and Theater, Medieval Women, and The Plague. In addition, students must complete at least four additional courses in medieval studies selected from an approved quarterly list. One of these four courses may be satisfied by completing a senior essay in some area of medieval studies.

3-2 Program with The Paul Merage School of Business

Outstanding students who are interested in a career in management may wish to apply for entry into The Paul Merage School of Business' 3-2 Program. Students normally apply for this program early in their junior year. See The Paul Merage School of Business section for additional information.

Academic English/English as a Second Language Program

200 Humanities Instructional Building; (949) 824-6781

Robin Scarcella, Ph.D. University of Southern California, *Director of the Academic English/English as a Second Language Program and Professor of Humanities* (linguistics, language development emphasis)

Humanities 20A-B-C-D through 29 are for students who have been admitted to UCI and whose scores on the Academic English/ESL Placement Test indicate the need for additional work in Academic English/English as a second language. Students may receive up to 12 baccalaureate credits for AE/ESL course work. Students may receive workload credit for courses taken beyond this 12-unit limit but will not receive additional credits applicable to the bachelor's degree.

Humanities 20A-B-C-D Essentials of Academic Writing (4-4-4-4). Grammar, sentence structure, paragraph and essay organization of formal written English. Pass/Not Pass only. Corequisite: Humanities 22A, if indicated by results of the AE/ESL Placement Test. Prerequisite: AE/ESL Placement Test.

Humanities 21A ESL Speaking and Listening (2). Basic listening and speaking skills in five fundamental areas: pronunciation, lecture comprehension and discussion, academic oral reporting, informal interviewing, and nonverbal communication. Pass/Not Pass only. Primarily for graduate students.

Humanities 21B ESL Speaking and Listening (2). Further development of listening and speaking skills: oral reporting, panel presentation, functional/situational dialogue, and public argumentation and debate. Primarily for graduate students. Pass/Not Pass only. Prerequisite: Humanities 21A or consent of instructor.

Humanities 22A Essentials of Academic English Reading and Vocabulary (2). Intensive reading exercises with occasional practice in extensive reading, focusing on comprehension, development of vocabulary, syntax, rhetorical features, reading strategies, and study skills. Pass/Not Pass only. Corequisite: concurrent enrollment with Humanities 20A-B-C-D if indicated by results of AE/ESL Placement Test. Prerequisite: AE/ESL Placement Test.

Humanities 22B ESL Reading and Vocabulary (2). Extensive reading and discussion with emphasis on journal articles, textbook chapters, notetaking, and the interpretation of charts, diagrams, tables, and figures. Primarily for graduate students. Pass/Not Pass only. Prerequisite: consent of instructor.

Humanities 29 Special Topics in ESL (1 to 2). Directed and individualized work in English as a second language not covered in the Humanities 20, 21, 22 sequence. Pass/Not Pass only. Prerequisite: consent of AE/ESL Director.

Humanities 139 Advanced Academic Writing Across the Curriculum (4). Designed for transfer students who speak English and another or other languages at home and who experienced English language difficulties in a college composition course. Focuses on developing academic reading and writing skills including essay content and organization, vocabulary, grammar instruction. Academic content also covered. Prerequisite: satisfactory completion of the lower-division writing requirement.

Courses in Humanities

LOWER-DIVISION

The following set of courses has no necessary relation to the undergraduate interdisciplinary major in Humanities. Most of the courses are open to any UCI student. Humanities 1A-B-C is required for the major in Humanities, as it is a requirement of any student majoring in the School of Humanities. Also, Humanities 199 is required of any undergraduate in the School who is approved to complete an interdisciplinary major in Humanities.

1A-B-C The Humanities Core Course (8-8-8) F, W, S. This course is restricted to students who are beginning their first year of college-level work. Each year it deals with problems of concern to the humanistic disciplines including interdisciplinary perspectives on major themes in history, literature, and philosophy. Focuses on major texts and works of art from a range of different cultural traditions. A writing program is integral to the course and counts for half the grade each quarter. Students are taught to think, speak, and write clearly about the issues raised in the texts and addressed in lectures. Students held for the UC Entry Level Writing requirement will earn an additional two units of workload credit, and *must* take the course for a letter grade. 1A is prerequisite to 1B, and 1B is prerequisite to 1C. (1A-B-C: **I, IV;** 1C: **VII-A)**

3A, B, C Humanities Interdisciplinary Course. Designed for non-Humanities majors who wish to learn about the nature of humanistic inquiry from a variety of disciplinary perspectives. Offered in year-long series united by a theme (e.g., "Inventing the Americas," "Truth and Skepticism"). Each quarter of each series takes a different disciplinary approach (listed below) to the theme. The order of the disciplinary rubrics (A, B, and C) may vary according to the specific theme. Students must take one each of A, B, and C to complete the series. Additionally, they are strongly encouraged to complete the series within one thematic offering, and ideally in the order in which the rubrics are offered for that theme. Humanities 3A, 3B, 3C and Humanities H3A, H3B, H3C may not both be taken for credit. *Not offered 2005–06.*

3A Representation, Verbal and Visual (4). Explores the various devices that texts and images employ manipulating their own internal structures and making reference to things outside themselves to form or reshape meaning in the world. **(IV)**

3B Confronting the Past (4). Concerns itself with the various techniques that scholars have developed to retrieve events and ways of life from the past, as well as the problems encountered evaluating those reconstructions and their implications for the present. **(IV)**

3C Philosophy, Rhetoric, Belief (4). Examines the social and cultural processes, such as rhetorical persuasion and religious faith, through which ideas transmogrify from mere thought to firm conviction. It asks the question: what is required to make something "true" or at least to make it appear as such? **(IV)**

H3A, B, C Honors Humanities Interdisciplinary Course (4, 4, 4). For non-Humanities majors in the Campuswide Honors Program. Same description as Humanities 3A, B, C. Humanities 3A, 3B, 3C and Humanities H3A, H3B, H3C may not both be taken for credit. **(IV)**

5A World Religions I (4). An introduction to the history, doctrine, culture, and writing of the three "religions of Abraham": Judaism, Christianity, and Islam. **(IV, VII-B)**

5B World Religions II (4). An introduction to various religious traditions in selected areas of the world—including India, East Asia, Africa, the Americas, or elsewhere. Attention to the expressions, teachings, culture, and history of selected religious groups. **(IV, VII-B)**

5C World Religions III (4). An examination of various aspects of religious expression, including symbolization of the sacred, collective religious behavior, and religious dissent. **(IV, VII-B)**

31 Aspects of Religion (4). A presentation of selected issues in the study of religion. May be taken for credit three times as topics vary.

75 Library Research Methods (2) F, W, S. Search strategy techniques relevant for library research at UCI and other academic institutions, with emphasis on application of these techniques to individual research interests. Recommended for, but not limited to, students with assigned papers for other classes. *Not offered every year.*

UPPER-DIVISION

100 Latin America and the Caribbean (4). This foundational course in Latin American and Caribbean studies begins with discussions of the social, cultural, economic, and political process tracing the events from Pre-Conquest to present which have circumscribed the insertion of this region into the world economy. **(VII-B)**

101A-B European Studies Core I, II (4-4). Introduces students to multidisciplinary approaches to important themes in European society, culture, literature, art, and politics, encouraging students to see points of intersection among disciplines. Possible themes: Subjects, Citizens, and Representation; Europe in the World; European Revolutions in Art and Society. **101A:** Early modern Europe (about 1500–1750); **101B:** Modern Europe (1750–present). Prerequisite: satisfactory completion of the lower-division writing requirement.

103A-B Global Cultures I, II (4-4). Introduction to the processes by which economies, cultural practices, national entities, groups, individuals, and personal identities have undergone globalization. **103A:** General background and methodological tools for understanding problems and processes of globalization. **103B:** Explores how globalization has manifested itself in specific topics, periods, or societies. **(VII-B)**

105A-B Senior Seminar in Religious Studies (2-2). A seminar for students completing the Religious Studies minor. **105A:** Research techniques and preparation for the senior paper; discussion of topics. In-progress grading. **105B:** Independent study with the advice of a faculty member and the instructor of Humanities 105A, leading to a research paper to be submitted to the Religious Studies Committee in the School of Humanities.

110 Core Course in Medieval Studies (4). A seminar in selected topics in medieval studies. Interdisciplinary, ordinarily team-taught. Open to all students, and designed especially for those electing the concentration in Medieval Studies. May be taken for credit four times as topic varies. Same as Comparative Literature CL 104 and Art History 114 when topic is appropriate.

116 Topics in the Study of Religion (4). In-depth examination of selected topics in the study of religion. Prerequisites: Humanities 5A, B, C or consent of instructor. May be taken for credit three times as topics vary.

H120 Honors Proseminar (4) F, W, S. Interdisciplinary Honors courses organized each year around a single topic or problem designed to compare and contrast modes of analysis in history, literary studies, and philosophy. Required of participants in the Humanities Honors Program. Prerequisites: consent of instructor and the Humanities Honors Program Committee. May be taken three times for credit as topics vary.

H140 Senior Honors Seminar (4) F. Directed by the Humanities Honors Thesis Advisor and required of students in the Humanities Honors program and Humanities majors in the Campuswide Honors Program. Designed to facilitate the exchange of ideas and research strategies among Honors students and to begin the process of writing the senior honors thesis. Prerequisites: senior standing and consent of the Honors Program Committee.

H141 Senior Honors Thesis (4) W. Directed independent research required of participants in the Humanities Honors Program and Humanities majors in the Campuswide Honors Program. Prerequisites: Humanities H140; consent of Honors Program Committee.

H142 Senior Honors Colloquium (4) S. Completion, presentation, and discussion of Senior Honors Theses. Satisfies upper-division writing requirement. Prerequisites: Humanities H141 and consent of Humanities Honors Program Committee.

183A International Studies Forum (2). A faculty-student forum featuring lecturers from a variety of institutions with discussion issues related to international studies. Pass/Not Pass only. May be taken for credit four times. Same as Social Ecology 183A and Social Science 183A.

183B Senior Seminar in Conflict Resolution (4). Designed for seniors (juniors may also enroll) who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas. Same as Social Ecology 183B and Social Science 183B. **(VII-B)**

183C Senior Seminar in Conflict Resolution (4). Continuation of Humanities 183B. Students write a senior research paper. Prerequisite: Humanities 183B and satisfaction of the lower-division writing requirement. Same as Social Ecology 183C and Social Science 183C.

190 Senior Seminar in European Studies (4). Capstone research seminar. Students engage in rigorous, in-depth, interdisciplinary exploration of specific topics, periods, or themes, investigating and analyzing the intersection of material and discursive culture in different historical periods and geographical locations. Topics vary. Prerequisites: Humanities 101A-B and consent of instructor; satisfactory completion of the lower-division writing requirement.

191 Global Cultures Senior Seminar (4). Students explore a topic(s) concerning the processes and/or problems of globalization from an interdisciplinary perspective and build on their critical and analytical skills when investigating cultural and other phenomena that cut across national borders. Research assignments, class presentations, final seminar paper. Prerequisites: Humanities 103A-B and upper-division standing.

195 Humanities Out There (H.O.T) Practicum (0 to 2) F, W, S. H.O.T. sponsors five-week workshops on selected topics in the humanities. Each workshop sends out a team of undergraduates to a K–12 classroom to develop college skills for Santa Ana students. Requirements: five training sessions; five tutoring sessions; two electronic journals; short paper. Pass/Not Pass only. May be taken for credit for a total of eight units.

197 Individual Field Study (varying credit) F, W, S. Individually arranged field study. Prerequisite: consent of instructor.

198 Directed Group Study (1 to 4) F, W, S. Directed group study on special topics. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

199 Directed Research (1 to 4) F, W, S. Directed research for senior Humanities students. Prerequisite: senior standing and consent of instructor. May be repeated for credit as topics vary.

Additional Language Courses

Arabic 1A-B-C Fundamentals of Arabic (5-5-5) F, W, S, Summer. Using the latest pedagogical materials as well as real world texts (newspapers, poetry, literatures), provides students with a firm foundation in the orthography, grammar, syntax, and vocabulary of written and spoken Modern Standard Arabic. Prerequisites: for 1B, Arabic 1A; for 1C, Arabic 1B. (1C: **VI**)

Hebrew 1A-B-C Fundamentals of Hebrew (5-5-5) F, W, S, Summer. Speaking, understanding, reading, and writing modern Israeli Hebrew with an introduction to Biblical Hebrew. Topics in Israeli culture. Conducted in Hebrew. Prerequisites: for 1B, Hebrew 1A; for 1C, Hebrew 1B. (1C: **VI**)

Tagalog 1A-B-C Elementary Tagalog (5-5-5) F, W, S, Summer. Coverage of basic Tagalog grammar, with equal emphasis on reading, writing, conversation, and comprehension. Prerequisites: for 1B, Tagalog 1A; for 1C, Tagalog 1B. (1C: **VI**)

Ph.D. with Interdisciplinary Emphasis in Humanities

The School of Humanities offers no degree called the Ph.D. in Humanities. However, some Ph.D. students in regular programs in the School may elect an interdisciplinary modification of their degree with the permission of the departments or programs concerned. Such students will do about 60 percent of their graduate work in a major field and about 40 percent in one or more minor fields. Those interested in an interdisciplinary degree should contact the Associate Dean for Graduate Study or the graduate advisor in their major department.

Emphasis in Critical Theory

435 Humanities Instructional Building; (949) 824-6718
World Wide Web: http://www.hnet.uci.edu/cte/

Participating Faculty

Dina Al-Kassim, *Department of Comparative Literature*
Etienne Balibar, *Department of French and Italian*
Stephen Barker, *Department of Drama*
Lindon Barrett, *Program in African American Studies and Department of Comparative Literature*
Ermanno Bencivenga, *Department of Philosophy*
Juan Bruce-Novoa, *Department of Spanish and Portuguese*
Ellen S. Burt, *Department of French and Italian*
David Carroll, *Department of French and Italian*
Vinayak Chaturvedi, *Department of History*
Chungmoo Choi, *Department of East Asian Languages and Literatures*
Michael P. Clark, *Department of English*
Ana Paula Ferreira, *Department of Spanish and Portuguese*
Nanette Fornabai, *Department of French and Italian*
Suzanne Gearhart, *Department of French and Italian*
Alexander Gelley, *Department of Comparative Literature*
David Theo Goldberg, *Program in African American Studies and Department of Criminology, Law and Society*
Inderpal Grewal, *Program in Women's Studies*
Lucía Guerra-Cunningham, *Department of Spanish and Portuguese*
Jonathan M. Hall, *Department of Comparative Literature*
James D. Herbert, *Department of Art History*
Wolfgang Iser, *Department of English*
Laura H. Y. Kang, *Program in Women's Studies*
Kyung Hyun Kim, *Department of East Asian Languages and Literatures*
Bliss (Felicidad) Cua Lim, *Department of Film and Media Studies*
Akira Mizuta Lippit, *Department of Film and Media Studies*
Julia Reinhard Lupton, *Department of English*
Steven Mailloux, *Department of Comparative Literature*
William M. Maurer, *Department of Anthropology*
J. Hillis Miller, *Departments of English and Comparative Literature*
Yong Soon Min, *Department of Studio Art*
Carrie J. Noland, *Department of French and Italian*
Margot Norris, *Departments of English and Comparative Literature*
Laura O'Connor, *Department of English*
Mark S. Poster, *Department of History and of Film and Media Studies*
R. Radhakrishnan, *Departments of Asian American Studies, English, and Comparative Literature*
Fatimah Tobing Rony, *Department of Film and Media Studies*
Annette Schlichter, *Department of Comparative Literature*
Gabriele Schwab, *Department of Comparative Literature*
Martin Schwab, *Department of Philosophy*
David W. Smith, *Department of Philosophy*
John H. Smith, *Department of German*
Sally A. Stein, *Department of Art History*
James Steintrager, *Department of English*
Brook Thomas, *Department of English*
Andrzej Warminski, *Department of English*

Affiliated Faculty

Philippe A. Barbé, *Department of French and Italian*
Stephen A. Barney, *Department of English (Emeritus)*
William Bristow, *Department of Philosophy*
James Fujii, *Department of East Asian Languages and Literatures*
Susan Jarratt, *Department of Comparative Literature*
Dragan Kujundzic, *Department of Comparative Literature*
Karen R. Lawrence, *Departments of English and Comparative Literature and Dean of the School of Humanities*
Juliet Flower MacCannell, *Department of Comparative Literature (Emerita)*
Glen Mimura, *Asian American Studies*
Jane O. Newman, *Department of Comparative Literature*
Janelle Reinelt, *Department of Drama*
John Carlos Rowe, *Department of Comparative Literature*
Shawn Rosenberg, *Department of Political Science*
Heidi Tinsman, *Department of History*
Judith A. Wilson, *Program in African American Studies*
Meng Yue, *Department of East Asian Languages and Literatures*
Andrew Zissos, *Department of Classics*

An emphasis in Critical Theory, under the supervision of the Committee on Critical Theory, is available for doctoral students in all departments at UCI upon approval of the student's faculty advisor or associate dean in accordance with departmental policy. Ph.D. students may, with Committee approval, complete the emphasis in addition to the degree requirements of their graduate program. Although there is no change in the existing Ph.D. program requirements or procedures, if the student wishes to have a letter (signed by the Dean and by the Director of Critical Theory) testifying that the student has satisfactorily added this theoretical dimension to the graduate program, then additional requirements must be met. Critical theory at UCI is understood in the broad sense as the study of the shared assumptions, problems, and commitments of the various discourses in the humanities. The faculty regards critical theory not as an adjunct to the study of one of the traditional humanistic disciplines but as a necessary context for the study of any humanistic discipline.

Admission to the emphasis may be granted by the Critical Theory Committee in response to the student's petition. The petition normally is submitted by the middle of the second year of graduate study, after completion of the Critical Theory Workshop, and upon the recommendation of the Workshop's instructor or a faculty representative of the student's department.

Requirements: (1) a three-quarter Critical Theory Workshop, conducted preferably by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class. No term papers are required, and the course is graded Satisfactory/Unsatisfactory only. Students receive credit for this course only in the spring quarter. For the first two quarters, the course is 0 units with IP grading; (2) three Humanities 270 courses offered under the supervision of the Committee. At least three such courses will be offered each year; (3) participation in two mini-seminars (six–eight hours) offered by visiting scholars (and sponsored by the Committee) on the visiting scholar's ongoing research; and (4) a research paper written under the guidance of a three-member committee (selected by each individual student in consultation with the Director of the Emphasis), with at least one member from outside the student's own department. The paper may (but need not) be part of the student's dissertation.

Graduate Courses in Humanities

Graduate courses in Humanities are under the direction of the School's Associate Dean for Graduate Study and are designed for all graduate students in the School of Humanities.

Humanities 200 and 220 introduce study in various disciplinary areas, either to students planning a degree in history or one of the literature departments or to those seeking familiarity with disciplines other than their own.

200A, B, C History and Theory (4, 4, 4) F, W, S. Introduction to role of theory in historical writing, focusing on several major theorists, their relation to their setting, the structure of their thought, and its application to significant historical issues. Same as History 200A, B, C.

220A, B, C Studies in Literary Theory and Its History (4, 4, 4) F, W, S. Introduction to criticism and aesthetics for beginning graduate students. Readings from continental, English, and American theorists. Restricted to graduate students only. Same as English CR 220A, B.

260A-B-C Critical Theory Workshop (4) F, W, S. A year-long Critical Theory Workshop, conducted by a team of instructors, conceived as a reading group, and developed with the input of all participants, where significant texts are discussed and analyzed in class.

270 Advanced Critical Theory (4) F, W, S. Seminars on various topics in critical theory. Students should have taken introductory courses before enrolling in these seminars. May be repeated for credit as topics vary.

298 Group Study (4) F, W, S. Open to four or more students. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

399 University Teaching (4) F, W, S. Limited to Teaching Associates in the Humanities Core Course. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

DEPARTMENT OF PHILOSOPHY

220 Humanities Office Building II; (949) 824-6525
E-mail: philos@uci.edu
S. Nicholas Jolley, **Department Chair**

Faculty

Ermanno Bencivenga, Ph.D. University of Toronto, *Professor of Philosophy* (logic, history of philosophy, philosophy of language)
William Bristow, Ph.D. Harvard University, *Assistant Professor of Philosophy* (Kant, nineteenth-century European philosophy)
Aaron James, Ph.D. Harvard University, *Assistant Professor of Philosophy* (ethics, political philosophy)
S. Nicholas Jolley, Ph.D. Cambridge University, *Department Chair and Professor of Philosophy* (early modern philosophy, political philosophy)
Bonnie Kent, Ph.D. Columbia University, *Associate Professor of Philosophy* (ethics, medieval philosophy)
J. Karel Lambert, Ph.D. Michigan State University, *Professor Emeritus of Philosophy* (logic, philosophy of science, metaphysics)
Michelle Montague, Ph.D. University of Colorado, Boulder, *Assistant Professor of Philosophy* (philosophy of mind, philosophy of language, metaphysics)
Alan Nelson, Ph.D. University of Illinois at Chicago, *Professor of Philosophy* (history of philosophy, philosophy of science)
Philip Nickel, Ph.D. University of California, Los Angeles, *Assistant Professor of Philosophy* (moral psychology, applied ethics, epistemology)
Nelson C. Pike, Ph.D. Harvard University, *Professor Emeritus of Philosophy* (philosophy of religion, history of philosophy)
Gerasimos Santas, Ph.D. Cornell University, *Professor of Philosophy* (ancient philosophy, history of philosophy, ethics)
Martin Schwab, Ph.D. University of Bielefeld (Germany), *Director of the Minor in Humanities and Law and Professor of Philosophy and Comparative Literature* (nineteenth- and twentieth-century continental philosophy)
David W. Smith, Ph.D. Stanford University, *Professor of Philosophy* (phenomenology, Husserl, ontology, philosophy of mind)
Nicholas White, Ph.D. Harvard University, *Professor of Philosophy and Classics* (Greek philosophy, ethics, epistemology)
Peter Woodruff, Ph.D. University of Pittsburgh, *Professor Emeritus of Philosophy* (philosophy of logic, metaphysics)

Affiliated Faculty

Francisco J. Ayala, Ph.D. Columbia University, *University Professor and Donald Bren Professor of Biological Sciences*
Matthew D. Foreman, Ph.D. University of California, Berkeley, *Professor of Mathematics and Philosophy*
Donald Hoffman, Ph.D. Massachusetts Institute of Technology, *Professor of Cognitive Sciences*
Paul Hoffman, Ph.D. University of California, Los Angeles, *Associate Professor of Philosophy, UCR* (history of early modern philosophy, moral psychology, philosophy of mind)
Kristen R. Monroe, Ph.D. University of Chicago, *Professor of Political Science*
Terence Parsons, Ph.D. Stanford University, *Professor of Philosophy, UCLA* (philosophy of language, Medieval philosophy)
Roger N. Walsh, M.B.B.S., Ph.D. University of Queensland, *Professor of Psychiatry and Human Behavior*

Philosophy addresses itself to questions that arise insistently in every area of human experience and in every discipline within the university. Each discipline inevitably poses problems concerning the nature of the standards appropriate to it and the place of its subject matter within the total framework of human knowledge. If we are to understand science or art or literature, or such human practices as religion and moral thought, we are bound to address ourselves to philosophical issues relating to their nature, the uses of reason appropriate to them, and the contributions they make to our understanding and appreciation of ourselves and the world in which we live.

CAREERS FOR THE PHILOSOPHY MAJOR

The study of argument and the precision and clarity of thought and writing required of Philosophy majors are excellent preparation for a variety of careers. Many undergraduates trained in Philosophy go on to professional schools in medicine, business, or law. The analytical skills developed in Philosophy courses are especially useful in legal education; indeed, many UCI Philosophy graduates have been successful at top law schools. Former Philosophy students have also used their skills to advantage in careers in government, business, teaching, law enforcement, and computer programming. Many Philosophy majors also continue their education at the graduate level, either in philosophy or a related discipline.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

Undergraduate Program

Instruction in philosophy relies essentially upon discussion in which students are active participants. Wherever possible, therefore, classes are severely limited in size in order to permit sustained interchanges between students and instructor.

Some of the courses offered are of general interest to all students. Others are designed to explore issues that arise in selected and special disciplines such as art or science. The undergraduate advisor should be consulted for advice about courses best suited to the specialized needs of particular students.

The program of course offerings is also designed for those Philosophy majors whose intention may be either to enter some professional school upon graduation (e.g., law) or to engage in graduate work in philosophy.

The faculty encourages Philosophy majors and minors to seriously consider expanding their perspective through an experience of study abroad. The Center for International Education, which includes the Education Abroad Program (EAP) and the International Opportunities Program (IOP), assists students in taking advantage of many worldwide opportunities for study and research. Specifically, those interested in analytic philosophy could consider the EAP programs in the United Kingdom, Canada, Sweden, Australia, and New Zealand, and those interested in Continental philosophy could consider the EAP programs in France, Germany, and Italy. See the Center for International Education section of the *Catalogue* or an academic counselor for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Major

Philosophy 30 or 104; 10, 12, and either 11 or 13; Philosophy 101, 102, 103, and five additional quarter courses from Philosophy 100, 105-199. Students planning to go on to graduate school are strongly advised to take Philosophy 105A and 105B.

Residence Requirement: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Minor

Three courses selected from Philosophy 1, 4, 5, 30 or three courses selected from Philosophy 1, 6, 7, 30 or three courses selected from Philosophy 10, 11, 12, 13, 30; four additional upper-division courses selected from Philosophy 100–157.

Residence Requirement for the Minor: Four upper-division courses must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Graduate Program

The Ph.D. program in Philosophy is jointly and cooperatively administered by the Department of Philosophy in the School of Humanities and the Department of Logic and Philosophy of Science (LPS) in the School of Social Sciences. The graduate program has two distinct tracks—the Philosophy track and the LPS track—both of which begin from a common core of shared requirements in history of philosophy, logic, ethics, and metaphysics/epistemology. Students are advised to apply to the track whose faculty, areas of specialization, and curriculum most closely correspond to their interests. The Philosophy track is described here. See the Department of Logic and Philosophy of Science for a description of the LPS track.

Students in the Philosophy track are encouraged to seek the counsel of any and all members of the Philosophy Department and the Logic and Philosophy of Science Department whose recommendations the student would deem helpful. It is hoped that there will be a close intellectual relationship between graduate students and professors in order to provide the students with optimum conditions for philosophical development and to expedite their progress toward the advanced degree. In addition, the Philosophy Department sponsors a series of colloquia each year. Participation in these colloquia is an important part of the graduate student's training. The Logic and Philosophy of Science Department also sponsors colloquia that might be of interest to Philosophy track students.

Every new graduate student is assigned a faculty member whose purpose is to oversee the student's progress through the major requirements for the advanced degree. The student consults with this faculty member each quarter about progress and any administrative or academic difficulties. Each student's overall record is evaluated by the Philosophy Department each year, customarily during the first two weeks of April. When the student has satisfied the residency requirement and the history, logic, field, tools of research, and portfolio requirements, the Candidacy Committee supervises the qualifying examination and the development of a dissertation project, and the subsequent writing of the dissertation itself. The Chair of this committee is the principal person with whom the graduate student will consult on the dissertation.

MASTER OF ARTS IN PHILOSOPHY

There is no list of courses required for the M.A. degree. The M.A. program in Philosophy takes one year at a minimum. The student may elect to follow either of the following routes to the degree: write a thesis on a subject to be chosen in consultation with an advisor and defend the thesis in an oral examination, or satisfy the logic and portfolio requirements for the Philosophy track. Refer to the Research and Graduate Studies section for information on the minimum number of courses required for the M.A. degree.

Advancement to candidacy for the M.A. degree is not automatic, but requires formal application to the Dean of Graduate Studies via the Philosophy Department Office. Application must be made with the recommendation of the Philosophy Department and must take place before the beginning of the quarter in which the student expects to receive the degree.

DOCTOR OF PHILOSOPHY IN PHILOSOPHY

There is no set number of courses required for the Philosophy track, so that work can be tailored to the individual student's needs and interests. However, as a prerequisite for the Ph.D. degree, every student is required to have some experience in teaching.

The Philosophy track is designed to take six years for the normally qualified student, and the maximum time permitted is nine years. A master's degree is not a prerequisite for the Ph.D. The following items are requirements for the Ph.D. degree.

Distribution Requirements. Students are required to take a range of courses designed to expose them to the various historical periods and fields of philosophy. No particular courses are required; when course offerings are announced, students are notified about which courses can be used to satisfy which requirements. In some cases, the requirement satisfied will ultimately depend on the content of the student's term paper(s).

The Distribution Requirements are:

1. History. To satisfy this requirement, students must receive a grade of B or better in at least four courses covering at least three of the following areas: Ancient, Medieval, Modern Empiricism, Modern Rationalism, Kant, Nineteenth Century, and Twentieth Century.
2. Field. To satisfy this requirement, students must receive a grade of B or better in two courses in value theory, one course in logic, and one course in metaphysics/epistemology.

These requirements must be completed by the end of the seventh quarter in residence.

Tools of Research. This requirement allows students to pursue the tool which they and their advisors deem most useful for their area of concentration, either a foreign language or some course of study outside philosophy. To satisfy this requirement, a student must pass an examination in a single appropriate foreign language or receive a grade of B or better in each of three appropriate graduate-level courses in a discipline other than philosophy.

The two-hour foreign language examination (administered by the Philosophy Department) requires students to translate, with the aid of a dictionary, passages from one or two philosophical authors. For the second option, courses of study outside philosophy will be approved (by the Philosophy Department Director of Graduate Studies) when they bear on a student's area of philosophical concentration. Though the courses must be in a discipline other than philosophy, they may in fact be taught in the Philosophy Department or the LPS Program (e.g., a course in mathematical logic taught by an LPS faculty member).

This requirement must be completed by the end of the ninth quarter in residence.

The Portfolio. A portfolio is an extended writing sample designed to demonstrate a student's ability (a) to understand, analyze, and evaluate positions and arguments in classical and contemporary philosophical literature, and (b) to formulate and defend an original philosophical thesis. These virtues must be displayed at a level of sophistication that indicates the student's ability to write a Ph.D. dissertation.

The portfolio must be submitted to the Graduate Coordinator at the end of the fourth week of the student's seventh quarter in residence. Portfolios will be evaluated by the entire faculty of the Philosophy

Department. (Philosophy track students may request that relevant LPS faculty also be present at the evaluation meeting.)

Candidacy Examination. In preparation for the candidacy examination, students consult with their thesis advisor and other appropriate faculty to prepare a reading list on their area of concentration and a brief dissertation proposal. Students apply for candidacy by filing appropriate forms, including a list (devised in consultation with their advisor) of appropriate members for their Candidacy Committee; one of these, the External Examiner, must come from outside the School of Humanities. The Committee is then appointed by the Philosophy Department, on behalf of the Dean of Graduate Studies and the Graduate Council, to administer the oral candidacy examination on the reading list and proposal to determine whether or not the student is prepared to begin work on the dissertation.

This requirement must be completed by the end of the tenth quarter in residence (3.5 years). The Philosophy Department Chair, on behalf of the Dean of Graduate Studies and the Graduate Council, then appoints a Doctoral Committee (typically taken from the Candidacy Committee and naturally including the dissertation advisor) to supervise the writing of the dissertation.

Dissertation Defense. Students must defend their dissertation during an oral examination administered by their Doctoral Committee.

THE SALZBURG EXCHANGE PROGRAM

The Department of Philosophy and the Department of Logic and Philosophy of Science jointly administer an Exchange Program with the University of Salzburg. The program has two parts. The Scholarly Exchange provides opportunities for faculty and graduate students in Philosophy and LPS to visit Salzburg and for faculty and graduate students from Salzburg to visit one or the other of the UCI units. The Program also sponsors joint conferences, held alternately in Irvine and in Salzburg; these are co-sponsored by Salzburg and the UCI Interdisciplinary Program in the History and Philosophy of Science.

To be eligible for the Salzburg Exchange, a graduate student must have advanced to candidacy. The selected student spends one semester in Salzburg, usually teaching one course in the general area of the thesis topic. An upper-division course may be taught in English, but lower-division courses must be taught in German. (Some previous visitors have learned serviceable German by attending a Goethe institute during the preceding summer.) Typically, a Salzburg visitor will receive a Salzburg Fellowship intended to cover travel expenses, and a stipend; those who teach while in Salzburg will also receive a salary intended to cover living expenses (including health and dental insurance).

Application should be made to the Philosophy Department's Salzburg Exchange Director by November 1 and should include a curriculum vita and syllabi for possible courses to be taught. The Director and/or the Philosophy Department Graduate Coordinator should be consulted for further information.

EMPHASIS IN CRITICAL THEORY

The School of Humanities offers an emphasis in Critical Theory that can be appended to the Philosophy track. A student interested in the emphasis begins by taking the three-quarter Critical Theory Workshop. With the recommendation of a workshop instructor or a Critical Theory faculty member in the Philosophy Department, the student may then apply to the Critical Theory Committee for admission to the emphasis. Emphasis students must complete the following requirements in addition to the usual Philosophy track requirements.

The Critical Theory Workshop. Students must successfully complete the three-quarter Critical Theory Workshop. This sequence is conceived as a reading group, normally conducted by a team of instructors, and developed with the input of all participants. Significant texts are discussed and analyzed in class; no term papers are required. (Students receive 0 units and In-progress grades for the fall and winter quarters; passing students receive 4 units and a Satisfactory grade for the spring quarter.

Advanced Critical Theory Requirement. Students must receive a grade of B or better in three Humanities 270 courses offered under the supervision of the Critical Theory Committee. At least three such courses will be offered each year. With the approval of the Philosophy Department, these courses can be used to satisfy the tools of research requirement.

Mini-Seminar Requirement. Students must participate in two committee-sponsored mini-seminars (six–eight hours each) offered by visiting scholars on their ongoing research.

Research Paper Requirement. Students must complete a research paper under the guidance of a three-member committee, selected in consultation with the Director; at least one member must be from outside of the Philosophy Department. This paper may (but need not) be part of the portfolio or dissertation.

Upon completion of the emphasis requirements, a letter certifying that fact, signed by the Dean of Humanities and the Director of the Critical Theory Emphasis, will be added to the student's dossier.

EMPHASIS IN FEMINIST STUDIES

A graduate emphasis in Feminist Studies also is available. Refer to the Women's Studies section of the *Catalogue* for information.

Courses in Philosophy

LOWER-DIVISION

1 Introduction to Philosophy (4). A selection of philosophical problems, concepts, and methods, e.g., free will and cause and substance, personal identity, the nature of philosophy itself. **(IV)**

4 Introduction to Ethics (4). Selected topics from the history of ethics, e.g., the nature of the good life and the moral justification of conduct. **(IV)**

5 Contemporary Moral Problems (4). Selected moral issues of current interest, e.g., abortion, sexual morality, euthanasia, capital punishment, reverse discrimination, civil disobedience, or violence. **(IV)**

6 Philosophy and Psychoanalysis (4). An analysis of Freudian psychoanalytic theory and therapy, and its significance for such classical philosophical problems such as the mind-body problem, self-identity and self-deception, psyche and consciousness, innatism, and the origins of moral behavior. **(IV)**

7 Introduction to Existentialism (4). An analysis of themes in phenomenology and existentialism and their philosophical origins, e.g., consciousness, self and other, freedom and individuality. **(IV)**

9 Feminist Moral and Political Philosophy (4). Selected topics in moral and political philosophy analyzed from feminist perspectives, e.g., gender-based differences in moral attitudes and virtues, hidden in traditional accounts of political obligation, and feminism and sexual orientation. Prerequisite: Philosophy 4 recommended. **(IV)**

10 History of Ancient Philosophy (4). Examination of the central philosophical themes developed by the pre-Socratics, Socrates, Plato, Aristotle, the Stoics, the Epicureans, and the Skeptics. **(IV)**

11 History of Medieval Philosophy (4). A study of some of the major theological and philosophical texts from the Medieval period. Philosophy 10 recommended as background. **(IV)**

12 History of Modern Philosophy (4). A study of major developments in western philosophy from Descartes to Kant with readings from Descartes, Leibniz, Locke, Berkeley, Hume, and Kant. Philosophy 10 or 11 recommended as background. **(IV)**

13 History of Contemporary Philosophy (4). A study of recent philosophical developments in Anglo-American and Continental philosophy with readings from such figures as Russell, Moore, Wittgenstein, Quine, Heidegger, and Sartre. Philosophy 12 recommended as background. **(IV)**

20 Introduction to Human Nature (4). Is our nature determined by how we are created or by what we want to be? Attempts to answer these questions by looking at stories of human origins and scientific accounts of human nature. **(IV)**

21 Introduction to Philosophy and Religion (4). What is religion? What is its relation to philosophy? Must one be religious in order to be a moral or good person? In examining these issues, attends to both Eastern and Western traditions and perspectives. **(IV)**

22 Introduction to Law and Society (4). What constitutes a legal system? What does it mean for a society to have a system as a part of the social fabric. Examines the social status of law and its use as a tool for fashioning society. **(IV)**

23 Introduction to the Problems of Philosophy (4). Are our minds made up of different stuff than our bodies? Are our decisions about what to do just another part of the chain of cause and effects studied by physics? An introduction to the methods of contemporary philosophy. **(IV)**

29 Critical Reasoning (4). Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies. Same as Logic and Philosophy of Science 29. **(V)**

30 Introduction to Symbolic Logic (4). An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction and semantic tableaux. Same as Logic and Philosophy of Science 30. **(V)**

31 Introduction to Inductive Logic (4). Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning. Prerequisite: Philosophy 30 or 104. Same as Logic and Philosophy of Science 31. **(V)**

40 Special Topics in Philosophy (4). Lectures on selected topics at the lower-division level. May be repeated for credit as topics vary.

UPPER-DIVISION

100 Writing Philosophy (4). Discussion of those aspects of writing of special importance in philosophy, e.g., philosophical terminology, techniques for evaluating arguments, philosophical definitions and theories. At least 4,000 words of assigned composition based on philosophical readings. Prerequisites: satisfaction of lower-division writing requirement; junior standing or consent of instructor. Philosophy majors given admission priority.

101 Introduction to Metaphysics (4). A study of one or more of the problems of "first philosophy," e.g., substance, free will, causation, abstract entities, identity.

102 Introduction to the Theory of Knowledge (4). A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty. Same as Logic and Philosophy of Science 102.

103 Introduction to Moral Philosophy (4). A study of one or more of the problems of contemporary moral philosophy, e.g., the nature of justice, liberalism versus conservatism, happiness and its relation to virtue and right conduct, the objectivity of moral standards.

104 Introduction to Logic (4). Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction. Same as Logic and Philosophy of Science 104.

105A Elementary Set Theory (4). An introduction to the basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers. Prerequisite: Logic and Philosophy of Science 104, Mathematics 6B, an upper-division course in Mathematics, or consent of instructor. Philosophy 105A and Mathematics 151 may not both be taken for credit. Same as Logic and Philosophy of Science 105A.

105B Metalogic (4). Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löewenheim-Skolem theorems. Prerequisites: Philosophy 105A or consent of instructor. Philosophy 105B and Mathematics 150 may not both be taken for credit. Same as Logic and Philosophy of Science 105B.

105C Undecidability and Incompleteness (4). Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Göedel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic. Prerequisite: Philosophy 105B or consent of instructor. Philosophy 105C and Mathematics 152 may not both be taken for credit. Same as Logic and Philosophy of Science 105C.

106 Topics in Logic (4). Selected topics in mathematical or philosophical logic. Prerequisite: Philosophy 105B or consent of instructor. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 106.

107 Computability Theory (4). Aims to provide an introduction to recursive function theory, with special emphasis on the theory of the recursively enumerable sets of natural numbers and their "fine structure" under various notions of reducibility. Same as Logic and Philosophy of Science 107.

108 Topics in Induction, Probability, and Decision Theory (4). Selected topics in induction, probability, and decision theory. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 108.

109 Legal Reasoning, Argument, and Evidence (4). A comparison of philosophical investigations of reasoning, argument, and evidence, with the theory and practice of similar notions in the law. Prerequisite: Philosophy 30.

110 Topics in Ancient Philosophy (4). Selected topics from the writings of Plato and Aristotle, e.g., Aristotle's criticisms of Plato's metaphysics, ethics, or politics. May be taken for credit twice as topics vary.

111 Topics in Medieval Philosophy (4). Studies of some of the major issues of concern to Medieval philosophers, e.g., universals, the nature and existence of God, faith, and reason. May be taken for credit twice as topics vary.

112 Topics in Renaissance Philosophy (4). Studies of such authors as Bruno and Montaigne. May be taken for credit twice as topics vary.

113 Topics in Modern Philosophy (4). Focuses on the works of one or more of the central philosophical figures of the modern period (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or on the treatment of one or more central philosophical problems by a number of these figures. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 113.

114 Topics in Nineteenth-Century Philosophy (4). Studies of some of the major figures after Kant (e.g., Hegel, Nietzsche, Marx, Kierkegaard), especially in German idealism and social thought. May be repeated for credit as topics vary.

115 Topics in History of Analytic Philosophy(4). Review of one or more central theories or figures in the history of analytic philosophy. Emphasis is on the study of original sources, especially writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 115.

116 Topics in Continental Philosophy. Studies of some of the major figures (e.g., Husserl), movements (e.g., phenomenology, existentialism) in early twentieth-century continental European thought. May be repeated for credit as topics vary.

117 Topics in East Asian Philosophy (4). Selected topics in the philosophies of East Asia, e.g., Yoga, Buddhism, Vedanta, Confucianism, Taoism, and Shinto. Same as East Asian Languages and Literatures 117. May be repeated for credit as topics vary. **(VII-B)**

120 Topics in Metaphysics (4). Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 120.

121 Topics in the Theory of Knowledge (4). One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of a priori knowledge. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 121.

122 Topics in Philosophy of Mind (4). Selected topics involving the concept of mind, e.g., the relation between mind and body, the self, personal identity, consciousness, the unconscious. May be repeated for credit as topics vary.

123 Topics in Philosophy of Religion (4). Critical examination of concepts involved in the theological literature, e.g., the nature and existence of God, miracles, the problem of evil, divine command theories in ethics. May be repeated for credit as topics vary.

130 Topics in Moral Philosophy (4). Selected topics in ethics. May be repeated for credit as topics vary.

131 Applied Ethics. Application of moral theories and arguments to important problems facing contemporary society.

131A Applied Ethics (4). Topics may include capital punishment, world hunger, obligations to future generations, environmental ethics, animal rights, economic justice, sexual morality, affirmative action, racism and sexism, or legalization of drugs.

131C Medical Ethics (4). Analysis of moral issues concerning health care. Topics may include: just allocation of scarce medical resources, the doctor/patient relationship, genetic engineering, surrogate motherhood, abortion, euthanasia, or social policy concerning AIDS.

131D Ethical Issues in Engineering (4). Application of ethical theory to moral problems confronted by engineers, scientists, managers, e.g., conscience and free expression within corporations; professional obligations to the public; the role of values in safety decisions; ethics codes; whistle-blowing. Examination of case studies. Prerequisite: satisfactory completion of the lower-division writing requirement. Prerequisite: completion of the lower-division writing requirement. Same as Engineering ENGR192.

131E Race and Gender (4). Investigation of philosophical issues concerning race and gender, e.g., the grounding of these concepts (is it scientific or social?); race, gender, and individual self-conception; race and ethnicity; "color-blind" society; group solidarity versus racism; affirmative action; multiculturalism. **(VII-A)**

132 Topics in Political and Social Philosophy (4). Selected topics in social and political philosophy, e.g., the functions of government, the justification of political authority, the nature of democracy, the varieties of liberty, and social justice. Readings from classical and contemporary sources. May be repeated for credit as topics vary.

133 Topics in Philosophy of Law (4). Selected topics concerning legal systems and the concept of law, e.g., the nature and purpose of law, the nature of authority, the relationship between law and morality, law and political-economic systems. May be repeated for credit as topics vary.

140 Topics in Philosophy of Science (4). Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 140.

141A Topics in Philosophy of Physics (4). Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 141A.

141B Geometry and Spacetime (4). An examination of issues concerning the mathematical and philosophical foundations of the special theory of relativity. Among topics discussed is the alleged conventionality of simultaneity. Same as Logic and Philosophy of Science 141B.

141C Philosophy of Quantum Mechanics (4). An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory. Same as Logic and Philosophy of Science 141C.

141D Probability and Determinism (4). An examination of a number of interrelated issues concerning determinism and probability in physics. Includes the senses in which Newtonian mechanics is and is not deterministic and a discussion of the probabilistic structure of quantum mechanics. Same as Logic and Philosophy of Science 141D.

142 Writing/Philosophy of Biology (4). Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers. Prerequisite: satisfactory completion of the lower-division writing requirement; Philosophy 40 recommended as background. Same as Biological Sciences E142 and Logic and Philosophy of Science 142.

143 Topics in Philosophy of Psychology (4). Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 143.

144 Topics in Philosophy of Social Science (4). Selected topics in the philosophy of the social sciences, e.g., is their goal to understand behavior or to predict and control it?; are they normative and the natural sciences not?; do they incorporate philosophical doctrines about language and mind? May be repeated for credit as topics vary.

145 Topics in Philosophy of Language (4). Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts. May be repeated for credit as topics vary. Same as Linguistics 141 and Logic and Philosophy of Science 145. May be repeated for credit as topics vary.

146 Topics in Philosophy of Logic (4). Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 146.

147A Introduction to Philosophy of Mathematics (4). Historical background (e.g., Kant), the three great schools at the turn of the century (logicism, formalism, intuitionism), the positivists and their critics (Carnap, Quine), contemporary views and problems (e.g., Quine, Benacerraf). Same as Logic and Philosophy of Science 147A.

147B Topics in Philosophy of Mathematics (4). Further historical or contemporary issues in the philosophy of mathematics. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 147B.

150 Phenomenology (4). A study of the foundations of phenomenology in Husserl and its background in Bolzano, Frege, Brentano, Meinong, Kant, and Descartes. Topics include phenomenological method, theory of intentionality, meaning, perception, evidence, ego, other minds, intersubjectivity, and life-world. May be repeated for credit as topics vary.

151 Existentialism (4). A study of such central existentialist thinkers as Heidegger and Sartre. Philosophy 7 or 150 recommended as background. Formerly Philosophy 128.

152 Topics in Feminism (4). A study of selected topics in feminist theory and/or gender studies. May be repeated for credit as topics vary.

190 Special Topics in Philosophy (4). Lectures on selected topics to be given by regular faculty and visiting faculty. May be repeated for credit as topics vary.

199 Directed Special Studies (2 to 4). Independent study on a research topic supervised by a faculty member. May be repeated for credit as topics vary.

GRADUATE COURSES

200 Special Topics in Philosophy (4). Seminars on selected topics to be given by regular faculty and visiting faculty. May be repeated for credit as topics vary.

201 First-Year Seminar (4). Examination of some standard works in history of philosophy, value theory, metaphysics, or epistemology. Open to and strongly recommended for all first-year Philosophy graduate students.

205A Set Theory (4). The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers. Same as Logic and Philosophy of Science 205A.

205B Metalogic (4). Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems. Prerequisite: Philosophy 205A. Same as Logic and Philosophy of Science 205B.

205C Undecidability and Incompleteness (4). Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, and proofs of Goedel's incompleteness theorem for arithmetics, and Church's undecidability for first-order logic. Prerequisite: Philosophy 205B. Same as Logic and Philosophy of Science 205C.

206 Topics in Logic (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 206.

210 Topics in Ancient Philosophy (4). May be repeated for credit as topics vary.

211 Topics in Medieval Philosophy (4). May be repeated for credit as topics vary.

212 Topics in Renaissance Philosophy (4). May be repeated for credit as topics vary.

213 Topics in Modern Philosophy (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 213.

214 Topics in Nineteenth-Century Philosophy (4). May be repeated for credit as topics vary.

215 Topics in Analytic Philosophy (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 215.

216 Topics in Continental Philosophy (4). May be repeated for credit as topics vary.

218 Topics in Contemporary Philosophy (4). May be repeated for credit as topics vary.

220 Topics in Metaphysics (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 220.

221 Topics in Epistemology (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 221.

222 Topics in Mind and Action (4). May be repeated for credit as topics vary.

230 Topics in Ethics (4). May be repeated for credit as topics vary.

232 Topics in Political and Social Philosophy (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 232.

234 Topics in Aesthetics (4). May be repeated for credit as topics vary.

240 Topics in Philosophy of Science (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 240.

241 Topics in Philosophy of Physics (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 241.

242 Topics in Philosophy of Biology (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 242.

243 Topics in Philosophy of Psychology (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 243.

244 Topics in Philosophy of Social Science (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 244.

245 Topics in Philosophy of Language (4). May be repeated for credit as topics vary. Same as Linguistics 241 and Logic and Science of Philosophy 245.

246 Topics in Philosophy of Logic (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 246.

247 Topics in Philosophy of Mathematics (4). May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 247.

248A-B-C Continental Philosophy Workshop (0-0-4). A three-quarter long workshop, conceived as a reading group and developed with the input of all participants, where significant texts are discussed and analyzed in class. 248A-B: In-progress grading. 248C: Satisfactory/Unsatisfactory only.

249 Logic and Philosophy of Science Workshop (1 to 4). A two- or three-quarter long workshop on selected topics in logic and philosophy of science. In-progress grading, Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 289.

250 Topics in Existentialism and Phenomenology (4). May be repeated for credit as topics vary.

298 Independent Study (4 to 12). May be repeated for credit.

299 Directed Research (4 to 12). May be repeated for credit.

399 University Teaching (4). Limited to Teaching Assistants. May be repeated for credit.

PROGRAM IN RUSSIAN STUDIES

120 Humanities Office Building II; (949) 824-5433
Dragan Kujundzic, **Director**

Faculty

Guy de Mallac, Ph.D. Cornell University, *Professor Emeritus of Russian* (modern Russian literature, peace studies, philosophy of nonviolence, Tolstoy's thought, Gandhi's thought, religious studies, Russian intellectual thought, Pasternak's life and work)

Michael A. Green, Ph.D. University of California, Los Angeles, *Professor Emeritus of Russian* (eighteenth-century Russian theatre and literary theory, Pushkin, Chekhov, Kuzmin, Russian Symbolist theater, cabaret theatre, Russian literature and theater of the 1920s)

Dragan Kujundzic, Ph.D. University of Southern California, *Director of Russian Studies and Associate Professor of Russian and Comparative Literature* (Russian and Slavic literatures; Russian film; formalism and Bakhtin studies; French, German, and American philosophy and critical theory; modernism)

Victorina Lefebvre, Ph.D. Lomonosov Moscow State University, *Lecturer* (methods of teaching, comparative study of Soviet and American culture, Russian language and literature)

Lynn Mally, Ph.D. University of California, Berkeley, *Professor of History* (modern Russian and Soviet history)

Spanning both Europe and Asia, Russia is one of the world's dominant political entities. Its rich cultural traditions have enhanced world literature, theater, art, and dance. As the world's first socialist state, it became a major political rival of the United States after the Second World War. In the past decade, Russians have abandoned their socialist system and are now in the process of making a rocky transition to capitalism. Although Russia lost sizeable amounts of territory in this transition, the Russian language now serves as the *lingua franca* throughout many areas formerly controlled by the Soviet Union.

While the demand for specialists in various sectors of government has eased, relationships between our countries at other levels of society are growing more active and business opportunities are exciting and rewarding. Other areas in which the need for Russian language competence is evident right now include trade, environmental protection, social services, law, medicine, and technology.

All students in Russian language courses are encouraged to take part in the UC Education Abroad Program and spend a portion of their junior or senior year studying in Russia. Additional information is available in the Center for International Education section of this *Catalogue.*

The Russian Studies minor is a multidisciplinary curriculum combining the Humanities, Social Sciences, and Social Ecology. It is designed to introduce students to the rich history and culture of Russia and provide them with the intellectual and linguistic tools necessary for sustained engagement with this area of the world.

Requirements for the Minor

Russian 1A-B-C, 2A-B-C, 50 (three different topics); 16 units of upper-division courses selected from the following: Russian 140, 150, 199, appropriate Comparative Literature courses, History 124A, 124B, 190 (when topics are related to Russia), Anthropology 136D, and Political Science 152D-E. (A maximum of four units may be chosen from the following courses devoted in part to Russian themes: History 126A, 126B, 126C, 158A, and Social Ecology E113.)

Residence Requirement for the Minor: At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

Courses in Russian

LOWER-DIVISION

1A-B-C Fundamentals of the Russian Language (5-5-5) F, W, S. Focuses on reading, comprehension, basic composition, and conversation skills, and gives the student an initial exposure to the Russian cultural scene. (1C: **VI)**

2A-B-C Intermediate Russian (5-5-5) F, W, S. Students read simple passages from contemporary Russian literary texts and newspapers. Development of oral skills and exposure to Russian culture continue. Prerequisite for 2A: Russian 1C with a grade of C or better, or three years of high school Russian, or equivalent; for 2B: Russian 2A with a grade of C or better, or equivalent; for 2C: Russian 2B with a grade of C or better, or equivalent. **(VII-B)**

50 Russian Culture (4) F, W, S. Study of varied topics in Russian culture, area studies, and society, both in the present and in historical perspective. Topics are not normally repeated for a two-year period. May be taken four times for credit as topics vary. **(IV, VII-B)**

97 Fundamentals of Russian (with Emphasis on Reading) (4). Designed primarily for students interested in acquiring a solid reading knowledge of Russian, and to facilitate the understanding and translating of Russian texts dealing with a variety of disciplines. Not open to Russian Studies minors. Does not serve as prerequisite for any higher-level Russian courses or fulfill any undergraduate foreign language requirement.

99 Special Studies Russian (1 to 5). Prerequisite: consultation with instructor necessary prior to enrollment.

UPPER-DIVISION

140 Topics in Russian Literary Theory (4). Examines the work of individual theorists and schools of literary theory in the nineteenth and twentieth centuries. May be repeated for credit as topics vary. **(VII-B)**

150 Topics in Russian Literature (4) F, W, S. Examines major themes in Russian literature, film, and other media from the eighteenth to twenty-first centuries. Taught in English. May be repeated for credit as topics vary. **(VII-B)**

198 Directed Group Study (4) F, W, S. Group independent study under direct faculty supervision. Prerequisite: consent of instructor. May be taken two times for credit.

199 Independent Study (1 to 4) F, W, S. Independent study under direct faculty supervision. Prerequisite: consent of instructor. May be taken two times for credit.

DEPARTMENT OF SPANISH AND PORTUGUESE

322 Humanities Hall; (949) 824-6901
Luis F. Avilés, **Department Chair**

Faculty

Ana María Amár Sánchez, Ph.D. Universidad de Buenos Aires (Argentina), *Associate Professor of Spanish* (Latin American literature, mass culture studies and critical theory)

Luis F. Avilés, Ph.D. Brown University, *Department Chair of Spanish and Portuguese and Associate Professor of Spanish* (Golden Age literature and critical theory)

Juan Bruce-Novoa, Ph.D. University of Colorado, *Professor of Spanish* (Latin American and Chicano literatures)

Anne J. Cruz, Ph.D. Stanford University, *Professor Emerita of Spanish* (Golden Age Spanish and comparative literature)

Ana Paula Ferreira, Ph.D. New York University, *Professor of Portuguese* (Portuguese and Brazilian literatures, women's studies, and critical theory)

Lucía Guerra-Cunningham, Ph.D. University of Kansas, *Professor of Spanish* (Latin American literature, literary theory, and women's studies)

Michelle M. Hamilton, Ph.D. University of California, Berkeley, *Assistant Professor of Spanish* (medieval Spain, including Hebrew and Arabic literature of al-Andalus)

Ivette N. Hernández-Torres, Ph.D. Brown University, *Associate Professor of Spanish* (colonial literature and Caribbean literature)

Juergen Kempff, Ph.D. University of California, Santa Barbara, *Lecturer with Security of Employment and Language Curriculum Director* (theoretical and applied linguistics, Spanish as a foreign language, technology and instruction)

Seymour Menton, Ph.D. New York University, *Research Professor of Spanish and Portuguese* (Latin American novel and short story)

Alejandro Morales, Ph.D. Rutgers University, *Professor of Spanish* (Latin American and Chicano literature, film studies, creative writing)

Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Professor of Spanish* (eighteenth- through twentieth-century Spanish literature; film and visual arts; aesthetics and contemporary cultures)

Héctor Orjuela, Ph.D. University of Kansas, *Professor Emeritus of Spanish* (Latin American literature, poetry and essay)

Julian Palley, Ph.D. University of New Mexico, *Professor Emeritus of Spanish* (modern Spanish literature)

Jill Robbins, Ph.D. University of Kansas, *Associate Dean of the School of Humanities and Associate Professor of Spanish* (contemporary Spanish literature, gender theory, and cultural studies)

Armin Schwegler, Ph.D. University of California, Berkeley, *Professor of Spanish* (history of Spanish, dialectology, historical linguistics, typology, Creoles)

Jacobo Sefamí, Ph.D. University of Texas at Austin, *Professor of Spanish* (Latin American literature, contemporary poetry)

Dayle Seidenspinner-Núñez, Ph.D. Stanford University, *Professor Emerita of Spanish* (medieval Spanish and comparative literature)

Juan Villegas, Ph.D. Universidad de Chile, *Research Professor of Spanish* (literary theory, modern Spanish literature, Latin American theatre and poetry)

Zidia Webb, M.A. Michigan State University, *Lecturer with Security of Employment Emerita, Spanish and Portuguese*

Undergraduate Program

The main objectives of the program in Spanish and Portuguese are to develop competence in the ability to understand, speak, read, and write Spanish and Portuguese, and to provide through the knowledge of these two languages an understanding and appreciation of their literatures and cultures.

Spanish Placement

To enroll in Spanish 1A or any Spanish course through the 2C (or 5) level: Students without previous background in Spanish must take a copy of their high school transcript to the Humanities Undergraduate Counseling Office, 143 Humanities Instructional Building (open daily from 9 a.m. to noon and from 1 p.m. to 4 p.m.), to activate their eligibility to enroll in Spanish 1A.

Placement examinations will no longer be required for students who have successfully completed Spanish language classes in high school. Students will now be placed in Spanish language courses according to their years of previous study. In general, one year of high school Spanish will be considered equal to one quarter of a UCI Spanish course. Thus, for example, students with two years of high school Spanish language will be placed in 1C, while students who have completed three years in high school will be placed in 2A. Students in 2A will, however, be informed of their level of competency in Spanish by taking a diagnostic test the first day of class. Students who place in 2A but who have scored below what is expected for successful performance in 2A will be informed that they may either remain in 2A or choose to enroll in 1C instead.

Transfer students who have had a previous course (or courses) in Spanish from another college or university who want to enroll in any Spanish 1A through 5 course at UCI must take a copy of their transcript to the Humanities Undergraduate Counseling Office in order to receive authorization to enroll in the appropriate course.

Native or near-native speakers who place into Spanish 2C and whose home language is Spanish are encouraged to enroll in Spanish 5, Spanish for Native Speakers, instead.

To enroll in Spanish 10A, 10B, or beyond: An active prerequisite check system is in place for Spanish 10A and 10B. In order to enroll in Spanish 10A a student must have passed Spanish 2C or 5. The prerequisite for Spanish 10B is 10A.

Students who have satisfied the required prerequisite at another college or university, or who graduated from a high school in a

Spanish-speaking country, or who graduated from a Spanish Academy must take a copy of their transcript to the Humanities Undergraduate Counseling Office in order to receive authorization to enroll in the appropriate course.

All courses in Spanish and Portuguese, unless specifically stated, are taught in the foreign language. By the end of the first year, students attain mastery of the basic structure of the language and ability to converse on everyday topics, as well as to read and write at an elementary level.

In the second year, emphasis is put on gradually raising the level of the student's ability to read and write. A third-year two-quarter sequential course stresses composition and introduces literary analysis. Further, a course in phonetics aims to perfect pronunciation and presents historical and dialect variants of Spanish. In addition to giving students a sense of literary history, the introductory courses in literature, also to be taken in the third year, introduce students to elements of literary research and writing. The courses in Hispanic culture combine a panoramic overview with a close look at a specific country or topic, and require a final research project. Upper-division literature and film courses offer a more detailed analysis of specific texts and require a final research paper.

Although a major in Portuguese is not offered, advanced literature courses are available. In addition, an undergraduate minor is offered.

The faculty encourages Spanish majors or minors who are serious about improving their Spanish language ability in reading, writing, and speaking to take advantage of opportunities to immerse themselves in the Spanish language by studying in Chile, Costa Rica, Mexico, Spain, or other Spanish-speaking countries through the Education Abroad Program (EAP) or through the International Opportunities Program (IOP). Programs are available for the summer, one quarter, one semester, or one year. While studying abroad, students can continue to make progress toward their UCI degree. See the Center for International Education section of the *Catalogue* or an academic counselor for additional information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Departmental Requirements for the Major

Spanish 2C (or Spanish 5, for native speakers) or the equivalent is a prerequisite to Spanish 10A. Spanish 10A is a prerequisite to Spanish 10B and to major requirements. Students may take 10B concurrently with 100-level Spanish grammar or linguistics courses. Students must, however, complete 10B before taking upper-division literature courses.

Students must choose one or both of the following emphases:

Language and Culture: Spanish 10A-B; 15*; 100A or 100B; 100C or 100D; 100E; 107; 110A or 110B or 110C; 113A; 113B; and five additional upper-division courses, three of which must be taught in Spanish.

* For non-native speakers only; semi-native and native speakers must substitute another upper-division course in either literature or culture for Spanish 15.

Literature and Culture: Spanish 10A-B; 100A, 100B, 100C, 100D, 100E; 110A or 110B or 110C; 113A; 119; and five upper-division Spanish courses in literature, two of which may be substituted by culture, film, and/or creative writing courses. NOTE: The Spanish 100A–E series must be completed before enrolling in upper-division literature courses numbered above 100.

Residence Requirement for the Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Departmental Requirements for the Spanish Minor

Spanish 2C or 5 (or equivalent) is a prerequisite to minor requirements.

Seven courses in Spanish, including Spanish 10A and 10B and at least four upper-division courses.

Residence Requirement for the Minor: At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

Departmental Requirements for the Portuguese Minor

Prerequisite: Portuguese 1C or the equivalent. Requirements: Portuguese 120A, B, C and four courses from Portuguese 121 and 122.

Residence Requirement for the Minor: At least four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, providing course content is approved in advance by the appropriate department chair.

CAREER OPPORTUNITIES

Spanish is particularly useful in international business or trade, community or social service, and in foreign service. Spanish majors interested in writing may look to publishing, writing, or editing positions. For a listing of possible professions, visit http://www.humanities.uci.edu/spanish.

Majoring in Spanish is excellent preparation for graduate and professional study in law, medicine, social welfare, library science, business or public administration, education, international relations, journalism, or advanced study in Spanish. An option available to Spanish majors is UCI's 3-2 Program offered by The Paul Merage School of Business, in which students may earn a Bachelor's degree in Spanish and a Master's degree in Management in five years rather than the usual six.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. Visit http://www.career.uci.edu for additional information.

Distinguished Visiting Professors

The Department's Distinguished Visiting Professors program brings students in direct contact with some of the outstanding intellectuals in the field of Spanish, Latin American, and Chicano/United States Latino literatures and cultures. Distinguished visiting professors teach both graduate and undergraduate courses during one or two quarters and give one public lecture. Past program participants have included: Elias J. Rivers (1990–91), State University of New York at Stonybrook, Spanish Golden Age literature; Alfonso Sastre (1991–92), Spanish playwright and intellectual; Hernán Vidal (1992–93), University of Minnesota, Latin American literature and culture; John Kronik (1993–94), Cornell University, modern Spanish literature; José Agustín (1994–96), leading Mexican novelist and cultural critic; Alan D. Deyermond (1997–98), Queen Mary and Westfield College, London, medieval Spanish literature; Noé Jitrik (1999), leading critic in Latin American literature; José Miguel Oviedo (2000), University of Pennsylvania, Latin American literature; Wolfgang Binder (2001), University of Erlangen, Germany, Caribbean and Chicano/U.S. Latino literatures; Paul Julian Smith (2002), University of Cambridge, Spanish and Latin American film and Spanish cultural studies; and Homero Aridjis (2002), Universidad Nacional Autónoma de México, author, poet, environmental activist.

Graduate Program

All graduate courses in the Department are taught in either Spanish or Portuguese, unless otherwise indicated in the course description.

MASTER OF ARTS IN SPANISH

The Master of Arts degree in Spanish is a two-year program of study designed to expose the beginning graduate student to all periods of peninsular, Latin American, and Chicano/Latino literature and culture. The degree is awarded upon the successful completion of course work and written and oral comprehensive examinations. A minimum of 10 courses must be completed with a letter grade; at least eight of these must be graduate seminars. Required course work includes one course in Theory (239A or B), and one course in Chicano/Latino literatures. Proficiency (defined as the equivalent of completing 2C) in a foreign language other than Spanish is required; it is recommended that master's students take Portuguese as their foreign language, although other languages are accepted. Students may choose a focus in literature, linguistics, or creative writing. Master's candidates must complete a minimum of three quarters of course work in the Department; the maximum time to complete the master's program is two years. Students entering with a bachelor's degree must satisfy the requirements for a master's degree before they proceed toward a Ph.D. This includes the master's level examinations and course work. Normally only students intending to work toward the Ph.D. are admitted to the graduate program.

DOCTOR OF PHILOSOPHY IN SPANISH

The Department of Spanish and Portuguese offers a Ph.D. degree in Spanish with a specialization in Spanish, Spanish-American, or Chicano/Latino literatures and cultures. The program integrates period and genre studies with work in literary and critical theory, linguistics, sociohistorical studies, and cultural studies. The Department seeks to professionalize its Ph.D. candidates not as narrow specialists but rather as scholars and critics acquainted with a range of fields that relate to and enhance their discipline. Graduate emphases in Comparative Literature, Critical Theory, and Feminist Studies are available; other areas of study (for example, film, history) may be designed with approval from the student's Ph.D. guidance committee. The Department has been traditionally committed to excellence in teaching, both in its own practice and in the formation of its graduates.

Language Requirements

In addition to Spanish and English, all doctoral candidates should have the necessary command of Portuguese to successfully complete a graduate course in Portuguese. An additional foreign language (with proficiency equivalent to the 2C level) is also required; this requirement may be satisfied by examination or course work. The selection of a second foreign language must be approved by the student's guidance committee and is based on the specific research interests and field of study of the candidate.

Course Requirements

A minimum of 20 courses beyond the B.A. or 10 beyond the M.A. are required. One course in linguistics (diachronic or synchronic), and one graduate course in Luso-Brazilian literature are required at the Ph.D. level. Note that these requirements may include course work completed in the master's program; the remaining elective courses are selected with the approval of the student's guidance committee to prepare for the doctoral examination and the dissertation. Students are encouraged to take more than the minimum number of required courses.

A student who transfers into the doctoral program from elsewhere must take a minimum of 10 graduate courses at UCI, of which seven must be in the Department of Spanish and Portuguese. With regard to students who enter the Ph.D. program with their master's degree from another institution, the Ph.D. guidance committee will determine the number of courses that will be accepted.

A student may pursue the Ph.D. with an emphasis in Comparative Literature by taking a minimum of five courses in the Comparative Literature program.

The Department offers an emphasis in Critical Theory designed to focus upon theoretical issues considered within the contextual realities of the Iberian Peninsula, Latin America, and U.S. Latino communities. Ph.D. students may earn a certificate in critical theory by taking four courses in theory, one of which should be taken outside the Department. To obtain all necessary application materials and for further information, contact the Emphasis Coordinator.

Teaching

The Department recognizes its responsibility to train all Ph.D. candidates as teachers and requires that all doctoral students with no prior teaching experience complete a minimum of three quarters of language teaching (Spanish 399). Moreover, all doctoral students are encouraged to complete a teaching practicum by co-teaching an upper-division course with a professor and enrolling in Spanish 292, which is graded Satisfactory/Unsatisfactory only.

Qualifying Examination

Upon completion of course work, the Ph.D. student advances to candidacy by passing the written and oral qualifying examinations by unanimous decision. The qualifying examination requires the student to develop two topics in close consultation with the examination committee. One topic must present a critical problem from a historical perspective, while the other may focus on a more specific area within the student's major field of interest. Students are encouraged to incorporate theoretical and interdisciplinary components into the formulation of their topics. A two-hour oral examination that includes discussion of the written examinations is also required. The normal time for advancement to candidacy is four years.

Dissertation

A dissertation topic is chosen by the candidate in consultation with the dissertation director and committee, and normally falls within the major field covered by the qualifying examinations. The candidate presents a study plan to the dissertation committee, which approves the proposal and a preliminary research outline. The student submits drafts of chapters to the dissertation director who corrects and approves the drafts and circulates them to other committee members for commentary. The normal time for completion of the Ph.D. is seven years, and the maximum time permitted is eight years.

Courses in Portuguese

LOWER-DIVISION

1A-B-C Fundamentals of Portuguese (4-4-4) F, W, S. Basic grammar, conversation, and composition with an initial exposure to the varied cultures of the Portuguese-speaking world. (1C: **VI**)

2A Intermediate Portuguese (4). Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar and review. Prerequisite: Portuguese 1C. **(VII-B)**

UPPER-DIVISION

120A, B, C Introduction to Portuguese and Brazilian Literature (4, 4, 4) F, W, S. General introduction to selected authors and works in relation to literary currents and to specific historical and cultural contexts. Taught in Portuguese. **120A:** Middle ages to eighteenth century. **120B:** Nineteenth century. **120C:** Twentieth century. Prerequisite: Portuguese 1C with a grade of C or better, or one year of college Portuguese, or equivalent. **(VII-B)**

121 Topics in Luso-Brazilian Literature (4) F, W, S. In English. Contextualized study of a major author, current, or genre in Brazilian, Portuguese, and/or Lusophone African literature. Examples: Gender, Race, and Sexualities in Post-Colonial Lusophone Literatures; Women and Writing in Brazil and Portugal; The Short Story. May be repeated for credit as topics vary. **(VII-B)**

122 Topics in Luso-Afro-Brazilian Culture (4) F, W, S. In English. Diachronic or synchronic study of a topic in the cultures of Portuguese expression through the use of printed media, music, art, and films. Examples: Africa in Brazil; From Dictatorship to Revolution. May be repeated for credit as topics vary. **(VII-B)**

190 Individual Studies (4-4-4) F, W, S

GRADUATE

243 Studies in Luso-Brazilian Literature and Culture (4) F. May be repeated for credit as topics vary.

290 Individual Study (4) F, W, S

Courses in Spanish

LOWER-DIVISION

NOTE: Spanish 1A and S1AB are open only to students who do not have prior knowledge of Spanish. Students must take a copy of their high school transcript to the Humanities Undergraduate Counseling Office, 143 Humanities Instructional Building, to activate their eligibility to enroll in Spanish 1A or S1AB.

1A-B-C Fundamentals of Spanish (5-5-5) 1A (F), 1B (W), 1C (S). Communicative approach with emphasis on conversational skills: the students and their environment, their experiences, and their opinions about issues. Reading and writing skills also introduced. Prerequisite for Spanish 1A: see NOTE above; for 1B: 1A or placement into 1B; for 1C: 1B or placement into 1C. Spanish 1A-B-C and Spanish S1AB-BC may not both be taken for credit. (1C: **VI)**

S1AB-BC Fundamentals of Spanish (7.5-7.5) Summer. First-year Spanish in an intensified form. Same as Spanish 1A-B-C during academic year. Prerequisite for Spanish S1AB: see NOTE above; for S1BC: S1AB or 1B, or placement into 1C. Spanish S1AB-BC and Spanish 1A-B-C may not both be taken for credit. (S1BC: **VI)**

2A-B-C Intermediate Spanish (4-4-4) 2A (F), 2B (W), 2C (S). Conversation, reading, and composition skills are developed using texts of literary and social interest. Emphasis on grammar review. Prerequisite for 2A: Spanish 1C or S1BC with a grade of C or better, three to four years of high school Spanish, or equivalent; for 2B: Spanish 2A with a grade of C or better, or equivalent; for 2C: Spanish 2B or S2AB with a grade of C or better, or equivalent. Spanish 2A-B not open to native or near-native speakers of Spanish; those students should take Spanish 5 instead. Spanish 2A-B-C and Spanish S2AB-BC may not both be taken for credit. **(VII-B)**

S2AB-BC Intermediate Spanish (6-6) Summer. Second-year Spanish in a time-intensive form. Equivalent to Spanish 2A-B-C during academic year. For description, see Spanish 2A-B-C. Prerequisite for S2AB: Spanish 1C or S1BC with a grade of C or better, three to four years of high school Spanish, or equivalent; for S2BC: Spanish 2B or S2AB with a grade of C or better, or equivalent. Spanish S2AB not open to native or near-native speakers of Spanish; those students should take Spanish 5 instead. Spanish S2AB-BC and Spanish 2A-B-C may not both be taken for credit. **(VII-B)**

5 Spanish for Spanish Speakers (4) F, W, S. Workshop for writing concise compositions in Spanish with emphasis on contrastive features and interferences from English. Learning by doing approach to teaching of Spanish grammar, vocabulary, and orthography. Equivalent to Spanish 2C. Prerequisite: Spanish 2B, or placement into 2C, and advanced (native-like) oral proficiency in Spanish. **(VII-B)**

10A-B Advanced Composition (4-4) F, W, S. 10A: Compositions on a variety of themes and types of writing, motivated and prepared in the classroom and arranged in order of difficulty. Review of selected grammatical topics. Prerequisite: Spanish 2C or 5, or authorization to enroll in 10A. **10B:** Includes introduction to literary analysis. Prerequisite: Spanish 10A. **(VII-B)**

15 Advanced Spanish Conversation (4) W, S. Primarily designed to improve the fluency of non-native speakers of Spanish. Concentrates on the active expansion of vocabulary, as well as listening and speaking skills in general. Introduction to Spanish dialect variations of both American and Peninsular Spanish. Not open to native or semi-native speakers of Spanish. Prerequisite: Spanish 10B.

44 Hispanic Literatures for Nonmajors (4). Focuses on major Spanish and Latin American literary texts within a historical and theoretical perspective. Taught in English with literary texts read in the original language. Prerequisites: Spanish 2C or 5 or equivalent; English majors only. **(VII-B)**

50 Latin America, U.S. Latino, and Iberian Cultures (4) F, W, S, Summer. Introduction (for non-majors) to the culture of the Spanish- and Portuguese-speaking worlds (Europe, Latin America, U.S., Africa). May focus on any time period. Taught in English. May be taken for credit three times as topics vary. **(IV, VII-B)**

97 Fundamentals of Spanish (with Emphasis on Reading) (4). Designed primarily for students interested in acquiring a solid reading knowledge of Spanish, and to facilitate the understanding and translating of Spanish texts dealing with a variety of disciplines. Not open to Spanish majors or minors. Does not serve as prerequisite for any higher-level Spanish courses or fulfill any undergraduate foreign language requirement. Prerequisite: consent of instructor.

UPPER-DIVISION

100A, B, C, D, E Introduction to Spanish, Latin American, and Chicano/Latino Literatures. Studies of works representative of historical periods of Peninsular, Latin American, and Chicano/Latino literature. Students also are introduced to literary analysis, research methods, and cultural critique. Prerequisite: Spanish 10B.

100A Introduction to Medieval and Golden Age Spanish Literature (4). (VII-B)

100B Introduction to Modern Spanish Literature: Eighteenth–Twentieth Centuries (4). (VII-B)

100C Introduction to Latin American Literature: Pre-Hispanic to Nineteenth Century (4). (VII-B)

100D Introduction to Latin American Literature: Nineteenth and Twentieth Centuries (4). (VII-B)

100E Introduction to Chicano and U.S. Latino Literature (4). (VII-A)

106A Methods for Elementary Bilingual Teachers (4). Direct observation of bilingual classrooms in local elementary schools, classroom lectures, discussions, and presentations on the culture and language of the bilingual student. Prerequisite: Spanish 10A or equivalent. Same as Education 140A.

106B Methods for Secondary Teachers of Spanish (4). Communicative approaches to teaching Spanish at the secondary school level. Theory and practice of oral proficiency acquisition techniques. Requires field work. Emphasis placed on training differences for native versus nonnative Spanish speakers. Prerequisite: Spanish 10A or equivalent. Same as Education 140B.

107 Advanced Spanish Grammar (4). Designed primarily for students who have demonstrated a substantial level of proficiency in their studies of the Spanish language. Takes a thorough approach to advanced grammatical problems, in order to assist students in their mastery of the elements of the Spanish language. Prerequisite: Spanish 10A or equivalent.

110A Peninsular Cultures (4). Prerequisite: Spanish 10B or equivalent. May be repeated for credit as topics vary. **(VII-B)**

110B Latin American Cultures (4). Prerequisite: Spanish 10B or equivalent. May be repeated for credit as topics vary. **(VII-B)**

110C U.S. Latino Cultures (4). Focuses on some aspect—literature, art, cultural production, history—of the multifaceted Latino cultures that have developed within the United States. Can focus on one group, such as Caribbean Americans, Chicanos, Central American, or take a comparative perspective of several groups. Prerequisite: Spanish 10B or equivalent. Same as Chicano/Latino Studies 134. **(VII-A)**

113A Spanish Phonetics (4). Introduction to basic notions of Spanish phonetics. Particular attention is paid to problems of pronunciation that arise in native and non-native speakers of Spanish due to interference between Spanish and English. Phonology (the system that underlies phonetics) and Spanish dialectology also included. Prerequisite: Spanish 10A or equivalent.

113B Introduction to Spanish Linguistics (4). Application of basic notions of linguistics to Spanish. Spanish phonology, morphology, syntax, and semantics. Special attention to the application of linguistics to the teaching of Spanish. Prerequisite: Spanish 10A or equivalent; Linguistics 3 recommended.

116 Medieval Spanish Literature (4). Medieval literature in Spain from ninth century to 1500. Works of lyric and epic poetry, prose fiction, and nonfiction. Substantial historical and cultural background explored. Prerequisite: Spanish 10B or equivalent. May be repeated for credit as topics vary. **(VII-B)**

119 Textual Analysis and Interpretation (4). Focus on analysis and interpretation of literary texts, with emphasis on narrative, poetry, theater/performance, and visual media. Also introduces students to the major currents in theoretical thought, such as cultural studies, postmodernism, and others. Oral presentations and short essays are required. Taught in Spanish. Prerequisite: Spanish 10B. **(VII-B)**

121 Golden Age Literature (4). Golden Age literature in Spain including the Renaissance and Baroque periods. Works of poetry, narrative, and theater. Historical and cultural background. Prerequisite: two courses from Spanish 100A, 100B, 100C, 100D, or 100E. May be taken for credit three times as topics vary. **(VII-B)**

122 Eighteenth- and Nineteenth-Century Spanish Literature (4). The main literary and ideological trends in eighteenth- and nineteenth-century Spain, including the enlightenment, romanticism, realism, and naturalism. Prerequisite: Spanish 10B or equivalent. May be taken for credit three times as topics vary.

123 Twentieth-Century Spanish Literature (4). Twentieth-century Spanish authors. Works of poetry, narrative, or theater. Historical context of the period and principles of literary theory. Prerequisite: Spanish 10B. May be taken for credit three times as topics vary.

130A Latin American Colonial Literature (4). Prerequisite: Spanish 10B. May be repeated for credit as topics vary. **(VII-B)**

130B Latin American Literature of the Nineteenth Century (4). Prerequisite: Spanish 10B. May be repeated for credit as topics vary. **(VII-B)**

130C Latin American Literature of the Twentieth Century (4). Prerequisite: Spanish 10B. May be repeated for credit as topics vary. **(VII-B)**

139 Writing about Literature (4). Requires at least 4,000 words of assigned English composition based on Peninsular Spanish and/or Latin American texts in English translation. Several essays required. Prerequisites: satisfactory completion of the lower-division writing requirement and upper-division standing.

140A, B Chicano Literature (4, 4). Focus on contemporary Chicano literature, in relation to Chicana literature, women's literature, American literature, and Latino literature. Prerequisite: Spanish 10B or consent of instructor. Same as Chicano/Latino Studies 110A, B. **(VII-A)**

142 Chicano Culture (4). Current research and perspectives on different aspects of Chicano culture: political, economic, sociological, artistic, and folkloric. Prerequisite: Spanish 10B or equivalent. May be taken twice for credit as topics vary. Same as Chicano/Latino Studies 111B. **(VII-A)**

150 Literature in Translation (4). Study of texts by modern and contemporary Peninsular, Latin American, and/or U.S. Latino writers in translation. Taught in English. Not applicable toward Spanish major or minor requirements. May be repeated for credit as topics vary. **(VII-B)**

160 Topics in Luso-Hispanic Film Studies (4). Study of Peninsular, Latin-American, and/or U.S. Latino film. In English or Spanish. Prerequisite: Spanish 10B when course taught in Spanish. May be taken for credit three times as topics vary. Same as Film and Media Studies 160. **(VII-B)**

161 Creative Writing Workshop (4). Focuses on the development of writing techniques based on discussion of student short fiction and poetry and relevant literary texts. Writing may be in English, Spanish, or bilingual. Prerequisite: consent of instructor.

185 Selected Topics in Peninsular Literature and Culture (4). Selection of representative topics in Spanish and/or Portuguese literature and culture. Prerequisite: Spanish 10B. May be repeated for credit as topics vary. **(VII-B)**

186 Selected Topics in Latin American Literature and Culture (4). Selection of representative topics in the history of Latin American literature and culture. Prerequisite: Spanish 10B or equivalent. May be repeated for credit as topics vary.

187 Selected Topics in Spanish Linguistics (4). Major topics in Spanish linguistics. Prerequisite: Spanish 10A or equivalent. May be repeated for credit as topics vary.

199 Independent Study (1 to 4) F, W, S. Research paper required. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

GRADUATE

The content of most courses changes every year. In addition to the following courses, graduate students might find Humanities 200A, B, C (History and Theory) and Humanities 220A, B, C (Studies in Literary Theory and Its History) of special interest.

201 History of the Spanish Language (4) W. Diachronic survey of phonological changes from Latin to Old Spanish to Modern Spanish. Focuses on Castilian including Romance languages and other peninsular dialects for comparative purposes. Morphological changes.

202 Spanish in the United States (4) S. Focuses on sociolinguistic functions of the various social and stylistic varieties of Spanish in the U.S. in spoken and written forms. Study of phonological, morphological, syntactical, and lexical differences and similarities with the standard Latin American and peninsular Spanish. Emphasis on recent work in Chicano discourse, and examination of relevant research on various dialects.

205 Spanish Dialectology (4) S. Phonological, morphological, and syntactic variations in Spanish as spoken in the Hispanic world, from synchronic and diachronic points of view. The study of Spanish as spoken in the United States.

212 Studies in Medieval Iberia (4) F. May be repeated for credit as topics vary.

214 Studies in Golden Age Literature and Culture (4) W. May be repeated for credit as topics vary.

218 Studies in Enlightenment and Romanticism (4) F. May be repeated for credit as topics vary.

219 Studies in Nineteenth Century (4) S. May be repeated for credit as topics vary.

220 Studies in Twentieth Century (4) W. May be repeated for credit as topics vary.

221 Topics in Iberian Studies (4) S. Cross-cultural connections and interactions between different ethnicities in the Iberian Peninsula. May be repeated for credit as topics vary.

231 Studies in Colonial Latin America (4) W. May be repeated for credit as topics vary.

232 Studies in Nineteenth-Century Latin America (4) S. May be repeated for credit as topics vary.

233 Studies in Twentieth-Century Latin America (4). May be repeated for credit as topics vary.

234 Topics in Latin America (4) S. Special topics in Latin American literatures and cultures. Topics may cover areas such as gender, national literatures, mass culture, ethnicity, and others. May be repeated for credit as topics vary.

235 Topics in Trans-Oceanic Studies (4) F. Focuses on meaningful connections between different geographical and cultural areas. May be repeated for credit as topics vary.

239A-B Introduction to Literary Theory I-II (4-4) F. May be repeated for credit as topics vary.

239C Special Topics in Theory (4). F, W, S. Focus on issues related to critical theory, theory of literature, cultural criticism and visual arts as they pertain specifically to Latin America, Spain, Portugal, and Brazil. Topics vary. Examples: Latin American cultural studies; theory, film, and media in postwar Spain.

240 Research Writing Workshop (4) F. Provides hands-on orientation and feedback during the various stages of research and writing to advanced M.A. and Ph.D. students working on a scholarly article, a dissertation proposal, or a chapter of the dissertation. Satisfactory/Unsatisfactory grading only. May be taken for credit twice.

245 Studies in Luso-Hispanic Film (4) F. May be repeated for credit as topics vary.

251 Studies in Chicano Literature and Culture (4) W. May be repeated for credit as topics vary.

252 Studies in U.S. Latino Literature and Culture (4) F. May be taken for credit as topics vary.

260 Seminar in Spanish (4) W. Topics vary. May be repeated for credit when topic changes.

270 Creative Writing Workshop in Spanish/English (4) F, W, S. Discussion of theory and practice of creative writing. Focus on critical analysis of participant's work in progress. Texts may be written in Spanish and/or English and may be written in poetry or prose format. May be repeated for credit as topics vary. Prerequisite: consent of graduate advisor.

290 Individual Study (4) F, W, S. May be repeated for credit as topics vary.

291 Directed Reading (4) F, W, S. Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary.

292 Teaching Practicum (4) F, W, S. Satisfactory/Unsatisfactory only.

293 Creative Writers' Project Consultation (4) F, W, S. May be repeated for credit as topics vary.

299 Dissertation Research (4 to 12) F, W, S. Satisfactory/Unsatisfactory only.

399 University Teaching (4) F, W, S. Limited to Teaching Assistants. May be repeated for credit.

GRADUATE PROGRAM IN VISUAL STUDIES

Faculty

George Bauer, Ph.D. Princeton University, *Professor of Art History* (Renaissance and Baroque art and architecture)

Linda Freeman Bauer, Ph.D. Institute of Fine Arts, New York University, *Professor of Art History* (Renaissance and Baroque art)

Edward Dimendberg, Ph.D. University of California, Santa Cruz, *Associate Professor of Film and Media Studies* (film history, audio-visual media and the built environment, contemporary architecture and urbanism, avant-garde cinema, modernism and modernity)

Anna Gonosová, Ph.D. Harvard University, *Associate Professor of Art History* (Byzantine and Medieval art and architecture)

James D. Herbert, Ph.D. Yale University, *Department Chair and Professor of Art History* (Modern European art, critical theory)

Judy C. Ho, Ph.D. Yale University, *Associate Professor of Art History* (Chinese art, archaeology, common religion, Buddhist art)

Victoria E. Johnson, Ph.D. University of Southern California, *Assistant Professor of Film and Media Studies and of African American Studies* (history and critical theory of U.S. television, popular film, and media; politics of geography, race, gender, and sexuality in popular culture; cultural studies)

Branden W. Joseph, Ph.D. Harvard University, *Assistant Professor of Art History* (contemporary art and critical theory)

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Assistant Professor of Film and Media Studies* (digital culture, media history, critical theory, visual studies and cultural memory)

Bliss (Felicidad) Cua Lim, Ph.D. New York University, *Assistant Professor of Film and Media Studies* (Filipino and Hong Kong cinema, Third World and postcolonial studies, Fantastic cinema and the philosophy of history, politics of genre)

Margaret M. Miles, Ph.D. Princeton University, *Associate Professor of Art History and Classics* (Greek and Roman art, archaeology)

Mark S. Poster, Ph.D. New York University, *Professor of History and of Film and Media Studies* (modern European intellectual history, media studies)

Fatimah Tobing Rony, Ph.D. Yale University, *Associate Professor of Film and Media Studies* (documentary film, race and representation, film history and criticism, film production)

Felicity D. Scott, Ph.D. Princeton University, *Assistant Professor of Art History* (modern and contemporary architecture)

Sally A. Stein, Ph.D. Yale University, *Associate Professor of Art History* (American art, photography and mass media, feminist theory)

Dickran Tashjian, Ph.D. Brown University, *Professor Emeritus of Art History* (American art and literature, American and European avant-garde, art and technology)

Cécile Whiting, Ph.D. Stanford University, *Associate Dean for Humanities Graduate Study and Research and Professor of Art History* (American art and culture, feminist theory)

Judith A. Wilson, Ph.D. Yale University, *Assistant Professor of African American Studies and Art History* (African American visual culture, post-colonial art and theory, race representation in American visual culture)

Bert Winther-Tamaki, Ph.D. Institute of Fine Arts, New York University, *Associate Professor of Art History* (Modern Japanese art, Asian American art, art and nationalism)

Affiliated Faculty

Philippe Barbé, Ph.D. Northwestern University; Doctorate, University of Paris, *Assistant Professor of French* (Francophone studies, twentieth-century French literature)

David Carroll, Ph.D. The Johns Hopkins University, *Director of European Studies and Professor of French* (literary theory and twentieth-century French literature)

Laura H. Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies and Comparative Literature* (feminist epistemologies and theories, cultural studies, ethnic studies)

Susan B. Klein, Ph.D. Cornell University, *Director of Religious Studies and Associate Professor of Japanese* (premodern and modern theatre and dance, Japanese religions, feminist critical theory)

Catherine Lord, M.F.A. State University of New York, Buffalo (Visual Studies Workshop), *Professor of Studio Art* (critical theory, feminism, photography)

Julia Reinhard Lupton, Ph.D. Yale University, *Professor of English* (Renaissance literature, literature and psychology)

William M. Maurer, Ph.D. Stanford University, *Associate Professor of Anthropology* (anthropology of law, globalization, transnationalism, citizenship and nationalism, finance capital, identity, Caribbean)

Glen Mimura, Ph.D. University of California, Santa Cruz, *Assistant Professor of Asian American Studies* (Asian American film and video, migrant and indigenous media in the Pacific, queer media)

Alejandro Morales, Ph.D. Rutgers University, *Professor of Spanish* (Latin American and Chicano literature, film studies, creative writing)

Gonzalo Navajas, Ph.D. University of California, Los Angeles, *Professor of Spanish* (eighteenth- through twentieth-century Spanish literature; film and visual arts; aesthetics and contemporary culture)

Robert F. Nideffer, Ph.D. University of California, Santa Barbara, *Associate Professor of Studio Art and Informatics* (virtual environments and behavior, interface theory and design, technology and culture, contemporary social history, gaming studies)

Nancy Lee Ruyter, Ph.D. Claremont Graduate School, *Professor of Dance* (dance history, Spanish dance, choreography, and research methods)

Jonathan M. Wiener, Ph.D. Harvard University, *Professor of History* (recent American history, theory and history)

The graduate program in Visual Studies, administered jointly by the faculties of the Department of Art History and the Department of Film and Media Studies, offers students the opportunity to pursue a doctorate in the cultural analysis of visual artifacts and experiences. Visual Studies synthesizes methodological insights from both component disciplines in order to examine the social practices of visual representation and visuality itself. The program leads to a Ph.D. degree in Visual Studies. While the program (in certain instances) grants an M.A. to students on route to their Ph.D., it admits only those students intending to complete their doctorate at UCI.

ADMISSION

The program is open to students applying with either a bachelor's or a master's degree, and applicants must meet the general requirements for admission to graduate study at UCI. A recent sample of academic writing—such as a representative undergraduate paper, or the master's thesis or a major research paper written at the master's level—should be submitted with the application packet.

The deadline for application is January 15, and the program accepts applicants for admission during the fall quarter only. Additional information is available from the Graduate Advisor for the Visual Studies program.

LANGUAGE REQUIREMENTS

All students are required to demonstrate a reading knowledge of at least one foreign language and are strongly encouraged to develop competence in a second. Students consult with the Graduate

Advisor and/or their principal advisor(s) to determine the appropriate language to be tested, based on their interests and program of study. Advisors, moreover, may require the demonstration of reading knowledge in additional languages according to the scholarly demands of the student's specific field. All language requirements must be satisfied before students are awarded a master's degree or, if they enter with an M.A., before they are advanced to candidacy for the Ph.D. degree.

COURSE REQUIREMENTS

Beyond the core series (Visual Studies 291, 292, 293A), students admitted with a B.A. are required to complete an additional 11 courses for a total of 14 courses. Out of this total, at least 10 courses (including the core series) must be within the program in Visual Studies (i.e., bearing Visual Studies, Art History, or Film and Media Studies course numbers) and at least two courses are to be from outside the Visual Studies discipline. In order to establish a level of expertise in one conventionally defined discipline, students entering with a B.A. must take (among their 10 courses noted above), at least three courses that have a strong component of art history *or* at least three courses that have a strong component of film studies. Courses bearing Art History or Film and Media Studies numbers automatically satisfy this requirement for their respective fields. In addition, particular seminars offered as Visual Studies 295 may satisfy either the art history or film studies requirement; a list of qualifying seminars is available in the program office.

Students admitted with an M.A. must complete an additional five courses beyond the core series, for a total of eight courses. While students may accrue units both for University Teaching (Art History 399 or Film and Media Studies 399) and Reading for the Qualifying Examination (Visual Studies 298), these do not count toward the required number of courses.

QUALIFYING EXAMINATION

By the end of the second year for students entering with a B.A., or the end of the first year for those entering with an M.A., students must reach agreement with one of the program's professors to serve as principal advisor. During the fall quarter of the following year—in most cases, the final quarter of standard course work—the student will work informally with the principal advisor who will supervise one examination field; two additional faculty members supervising examination fields, at least one of whom must be a member of the Visual Studies faculty; a fourth member from the Visual Studies faculty who will not supervise an examination field but will participate in the oral examination; and a designated "outside" member who must be a member of the UCI faculty but cannot hold either a primary or joint appointment in Visual Studies, Art History, or Film and Media Studies. Except in extraordinary circumstances (to be adjudicated by the program's Graduate Committee), students are required to include at least one member from Art History and one from Film and Media Studies among the three faculty members supervising the examination fields.

The student and principal advisor define three fields to be examined by the faculty. The fields should combine historical breadth and some variety in media. Over the course of the following two quarters, students normally enroll in eight to twelve units per quarter of Reading for the Qualifying Examination (Visual Studies 298) during which time they prepare reading lists in close consultation with their principal advisor and field supervisors, and complete the reading of those lists. The examination takes place near the end of those two quarters of study, normatively at the end of the academic year.

The first part of the examination consists of a written component, in which the student is called upon to respond to questions posed in the three examination fields. The student's written responses are circulated to all committee members. An oral examination follows, normally within two weeks, and consists of questions prompted both by the student's reading lists and by the written examinations. Based on the student's written and oral performance, the committee will determine whether the student has successfully passed the examination; if so (and provided all language requirements have been satisfied), the student is then advanced to candidacy for the Ph.D. degree. The normal time for advancement to candidacy is three years. If the committee is not satisfied with the student's performance, it may also decide to reexamine the student on one or more fields after a specific interval. Except in extraordinary circumstances, no student will be given more than two chances to pass any given section of the examination.

DISSERTATION

Within six months of advancement to candidacy, each student must submit a prospectus that defines the scope, approach, and rationale for a proposed dissertation. The student and the principal advisor consult to determine the composition of a doctoral committee of three members including the principal advisor, which then must unanimously approve the prospectus before the student proceeds with the dissertation. The doctoral committee, on the basis of the candidate's past academic performance and proposed dissertation topic, may require additional course work or other forms of preparation for the dissertation. The doctoral committee, under the direction of the principal advisor, supervises the student's research program and ultimately approves the dissertation. The normative time for completion of the Ph.D. program is six years, and the maximum permitted is eight years.

Graduate Courses in Visual Studies

Additional graduate courses satisfying the requirements of the Ph.D. program in Visual Studies are listed in the Department of Art History section. Graduate students may also enroll concurrently in any upper-division lecture class with the approval of the instructor.

291 Theories of Vision and Visuality (4). Introductory seminar surveys the key theories of vision and visuality. Examines the theoretical texts that have, over the past several decades, enabled the emergence of the hybrid discipline of Visual Studies and addresses the recent polemics written in support of and opposition to this new disciplinary practice.

292 Visual Studies and Historiography (4). History of art history and film studies to 1980. Examines the ways in which the visual has been constructed and places these constructions in their institutional and cultural contexts. Examines historiographic questions by interrogating the evidentiary power of visual artifacts.

293A Visual Studies Practicum (4). Visual Studies combines competencies from several fields and therefore requires a different kind of writing. This seminar is designed to apply theoretical and methodological insights (explored in Visual Studies 291 and 292) to a research paper on a specific topic in Visual Studies. Prerequisite: Visual Studies 291 or 292.

294 Getty Consortium Seminar (4). Special graduate seminar offered at the Getty Research Institute in Los Angeles, involving faculty and graduate students from the five graduate programs in Art History or Visual Studies located in southern California (UCI, UCLA, UCR, UCSB, and USC). May be repeated for credit as topics vary.

295 Graduate Seminar in Visual Studies (4). May be repeated for credit as topics vary.

296 Directed Reading (4). Directed reading on a specific topic agreed upon by student and instructor. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

298 Reading for the Comprehensive Examination (4 to 12). Directed reading in preparation for the qualifying examination. Satisfactory/ Unsatisfactory only. Prerequisite: consent of instructor. May be repeated for credit.

299 Dissertation Research (4 to 12). Research and writing of the dissertation. Satisfactory/Unsatisfactory only. Prerequisite: consent of instructor. May be repeated for credit.

INTERDISCIPLINARY PROGRAM IN WOMEN'S STUDIES

352 Murray Krieger Hall; (949) 824-4234
Inderpal Grewal, **Director**

Core Faculty

Lara Deeb, Ph.D. Emory University, *Assistant Professor of Women's Studies* (gender, modernity, and public spheres; religious and social movements; Islamic feminisms; Middle East studies)
Inderpal Grewal, Ph.D. University of California, Berkeley, *Director of the Program in Women's Studies and Professor of Women's Studies* (feminist theories of internationalism and transnationalism, cultural studies, British nineteenth-century studies, South Asia and its diasporas)
Susan Jarratt, Ph.D. University of Texas, Austin, *Campus Writing Coordinator and Professor of Comparative Literature* (rhetoric, composition pedagogy, feminist theory)
Laura H. Y. Kang, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies and Comparative Literature* (feminist epistemologies and theories, cultural studies, ethnic studies)
Kavita Philip, Ph.D. Cornell University, *Associate Professor of Women's Studies* (science and technology studies, South Asian studies, political ecology, critical studies of race, gender, colonialism, new media, and globalization)
Connie Samaras, M.F. A. Eastern Michigan University, *Professor of Studio Art* (photography, media, film criticism, gender studies, culture and technology)
Jennifer Terry, Ph.D. University of California, Santa Cruz, *Associate Professor of Women's Studies* (cultural studies, social theory; science and technology studies, formations of gender and sexuality; critical approaches to modernity; American studies in transnational perspective)
Linda Trinh Võ, Ph.D. University of California, San Diego, *Associate Professor of Asian American Studies* (Southeast Asian Americans, Asian American women, race relations)

Affiliated Faculty

Dina Al-Kassim, Ph.D. University of California, Berkeley, *Assistant Professor of Comparative Literature*
Joan Ariel, M.A. San Francisco State University, M.L.S. University of California, Berkeley, *Lecturer in Women's Studies and Women's Studies Librarian*
Victoria Bernal, Ph.D. Northwestern University, *Associate Professor of Anthropology*
Sharon B. Block, Ph.D. Princeton University, *Assistant Professor of History*
Tom Boellstorff, Ph.D. Stanford University, *Assistant Professor of Anthropology*
Kitty C. Calavita, Ph.D. University of Delaware, *Professor of Social Ecology and Sociology*
Teresa Caldeira, Ph.D. University of California, Berkeley, *Associate Professor of Anthropology*
Francesca M. Cancian, Ph.D. Harvard University, *Professor of Sociology*
Chungmoo Choi, Ph.D. Indiana University, *Associate Professor of Korean Culture*
Alice Fahs, Ph.D. New York University, *UCI Chancellor's Fellow and Associate Professor of History*
Ana Paula Ferreira, Ph.D. New York University, *Professor of Portuguese*
Susan Greenhalgh, Ph.D. Columbia University, *Professor of Anthropology*
Elizabeth Guthrie, Ph.D. University of Illinois, *Director of the French Language Program and Senior Lecturer with Security of Employment*
Jonathan M. Hall, Ph.D. University of California, Santa Cruz, *Assistant Professor of Comparative Literature*
Renée Riese Hubert, Ph.D. Columbia University, *Professor Emerita of French and Comparative Literature*
Helen Ingram, Ph.D. Columbia University, *Professor of Social Ecology and Political Science, and Drew, Chace and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation*
Valerie Jenness, Ph.D. University of California, Santa Barbara, *Chair of the Department of Criminology, Law and Society and Professor of Social Ecology and Sociology*
Ketu H. Katrak, Ph.D. Bryn Mawr College, *Professor of Asian American Studies and English*
Susan B. Klein, Ph.D. Cornell University, *Director of Religious Studies and Associate Professor of Japanese*
Karen R. Lawrence, Ph.D. Columbia University, *Dean of the School of Humanities and Professor of English and Comparative Literature*
Bliss (Felicidad) Cua Lim, Ph.D. New York University, *Assistant Professor of Film and Media Studies*
Akira Mizuta Lippit, Ph.D. The Johns Hopkins University, *Department Chair and Professor of Film and Media Studies*
Catherine Lord, M.F.A. State University of New York, Buffalo (Visual Studies Workshop), *Professor of Studio Art*
William M. Maurer, Ph.D. Stanford University, *Associate Professor of Anthropology*
Glen Mimura, Ph.D. University of California, Santa Cruz, *Assistant Professor of Asian American Studies*
Laura Mitchell, Ph.D. University of California, Los Angeles, *Assistant Professor of History*
Robert G. Moeller, Ph.D. University of California, Berkeley, *Professor of History*
Jane O. Newman, Ph.D. Princeton University, *Professor of Comparative Literature*
Carrie J. Noland, Ph.D. Harvard University, *Co-Director of the Major in Humanities and Arts and Associate Professor of French*
Margot Norris, Ph.D. State University of New York, Buffalo, *Professor of English and Comparative Literature*
Jen'nan G. Read, Ph.D. University of Texas, *Assistant Professor of Sociology*
Amelia C. Regan, Ph.D. University of Texas, Austin, *Associate Professor of Computer Science, Civil and Environmental Engineering, and Management*
Janelle Reinelt, Ph.D. Stanford University, *Associate Dean of Graduate Studies and Professor of Drama*
Bryan Reynolds, Ph.D. Harvard University, *Associate Professor of Drama and Head of Drama Doctoral Studies*
Jill Robbins, Ph.D. University of Kansas, *Associate Dean of the School of Humanities and Associate Professor of Spanish*
Belinda Robnett, Ph.D. University of Michigan, *Associate Professor of Sociology*
Judy B. Rosener, Ph.D. Claremont Graduate School, *Senior Lecturer with Security of Employment, Management and Social Ecology*
Annette Schlichter, Ph.D. Humboldt University of Berlin, *Assistant Professor of Comparative Literature*
Gabriele Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature*
John H. Smith, Ph.D. Princeton University, *Director of the Critical Theory Institute and Department Chair and Professor of German*
Sally A. Stein, Ph.D. Yale University, *Associate Professor of Art History*
Ulrike Strasser, Ph.D. University of Minnesota, *Associate Professor of History*
Katherine Tate, Ph.D. University of Michigan, *Professor of Political Science*
Heidi Tinsman, Ph.D. Yale University, *UCI Chancellor's Fellow and Associate Professor of History*
Deborah R. Vargas, Ph.D. University of California, Santa Cruz, *Assistant Professor of Chicano/Latino Studies and Sociology*
Anne Walthall, Ph.D. University of Chicago, Co-*Director of the Minor in Asian Studies and Professor of History and of East Asian Languages and Literatures*
Judith A. Wilson, Ph.D. Yale University, *Assistant Professor of African American Studies and Art History*
Hu Ying, Ph.D. Princeton University, *Associate Professor of Chinese*
Mei Zhan, Ph.D. Stanford University, *Assistant Professor of Anthropology*

UCI's Program in Women's Studies is dedicated to the study of women, gender, and sexuality in their complex articulation with race, ethnicity, class, religion, and nationality. The Program's goal is to foster both critical and creative analysis of the various disciplinary perspectives—historical, political, economic, representational, technological, and scientific—that have (or have not) constituted women, gender, and sexuality as objects of study. By emphasizing a rigorous interdisciplinary perspective in their teaching and research, the Women's Studies faculty seek to produce new knowledge about the social meanings of gender, race, class, and sexuality, and to equip students with a range of analytical and methodological skills.

The field of women's studies has developed at a phenomenal rate from a handful of student-initiated courses in the early 1970s to more than 600 programs in colleges and universities across the United States offering degrees at the B.A., M.A., and Ph.D. levels. UCI's Program in Women's Studies was founded in 1975 and has grown significantly since that time. The program offers a B.A. degree in Women's Studies, a minor in Women's Studies, a minor in Queer Studies, and a graduate emphasis in Feminist Studies.

Women's Studies provides a unique intellectual community for undergraduate and graduate students, where faculty and students share a commitment to interactive teaching and learning. Students work closely with faculty and the program's academic coordinator to plan a coherent program of study and to anticipate work toward advanced degrees and a wide variety of career options.

CAREER OPPORTUNITIES

A degree in Women's Studies prepares students for the expanding opportunities available in graduate programs and in numerous careers in both the public and private sectors. As more women work, business and corporations find the need for increased knowledge about women, and the growth of women's organizations and agencies—at the local, national, and global levels—is creating new opportunities for graduates with specializations in Women's Studies. Graduates bring unique skills and knowledge to the professions of law, medicine, social work, teaching, counseling, and to government service, all of which increasingly require expertise on issues concerning women and gender. A background in Women's Studies develops critical and analytical skills which prove valuable in the full range of life choices.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. In addition, the Women's Studies Office provides more specialized career counseling and information on graduate programs in Women's Studies and related fields.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN WOMEN'S STUDIES

University Requirements: See pages 56–60.

School Requirements: See pages 235–236.

Requirements for the Major

A. Three introductory core courses: Women's Studies 50A, plus two selected from 50B, 50C, 60A, 60B, 60C.

B. Three advanced core courses (one each from the Women's Studies 100, 110, and 120 series) and Women's Studies 197.

C. Four elective advanced core courses selected from Women's Studies 139–168.

D. Two additional advanced elective courses selected from Women's Studies 170–188. Students may request, by petition, one lower-division course to count in this category. This course should be primarily centered on the study of women, gender, and/or feminism.

Residence Requirement for the Major: A minimum of five upper-division courses required for the major must be completed successfully at UCI.

Requirements for the Minor

Completion of seven courses including: three lower-division courses selected from Women's Studies 50A, 50B, 50C, 60A, 60B, 60C; two courses selected from Women's Studies 100, 110, 120, 139, 155, 156, 157, 158, 165, 166, 167, 168; and two courses selected from Women's Studies 170–188.

Residence Requirement for the Minor: A minimum of four upper-division courses required for the minor must be completed successfully at UCI. By petition, two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

MINOR IN QUEER STUDIES

The Program in Women's Studies offers a minor in Queer Studies as the critical inquiry into sexuality has emerged to be a vital area of intellectual production, bringing together scholars and students from a variety of disciplines and interdisciplinary fields. Taking as a point of departure that sexuality is a complex historical and cultural phenomenon, Queer Studies assumes that thoughtful examination of this complexity is an important and compelling undertaking. Queer Studies draws upon methods from anthropology, history, psychology, sociology, literature, philosophy, biology, art, and art history. It also combines theory and methods from women's studies, gender studies, ethnic studies, critical legal studies, religious studies, science and technology studies, visual studies, area studies, and cultural studies.

Requirements for the Minor

A. Two lower-division introductory courses: Women's Studies 20 plus one course selected from Women's Studies 50A, 50B, 50C, 60A, 60B, 60C, and Sociology 69 (when topics address the sociology of sexuality).

B. Two upper-division core courses: Women's Studies 157A and 157B.

C. Three upper-division courses: History 128B, 146E, 146D, 169 (when topics address gender and sexuality in Latin America); Film and Media Studies 190 (when topics address issues on sexuality in representation and theory), 112 (when topics address issues on sexuality in representation and theory); Anthropology 129 (when topics address issues on sexuality and gender), 139 (when topics address issues on sexuality and HIV/AIDS); Drama 103 (when topics cover the representation of gays and lesbians in drama); Spanish 185 (when topics cover issues on sexuality in peninsular Spain and/or Portugal), 186 (when topics cover issues on sexuality in Latin American literature and culture); Women's Studies 100A, 100B, 100C, 110A, 110B, 110C, 120A, 120B, 120C, 165A, 165B, 167B, 168B.

Residence Requirement for the Minor: A minimum of four upper-division courses required for the minor must be successfully completed at UCI. Two of the four may be taken through the UC Education Abroad Program, provided course content is approved in advance by the appropriate department chair.

GRADUATE EMPHASIS IN FEMINIST STUDIES

The Program in Women's Studies offers an emphasis in Feminist Studies, which is available in conjunction with the Ph.D. programs in the Departments of Anthropology, Comparative Literature, East Asian Languages and Literatures, English, French and Italian, German, History, Philosophy, Political Science, Sociology, Spanish and Portuguese; the program in Visual Studies; and the M.F.A. programs in Drama and Studio Art. Satisfactory completion of the emphasis is certified by the Director of Women's Studies and is noted in the student's dossier.

Admission to the Program

Applicants must first be admitted to, or currently enrolled in, one of the participating programs noted above. Applicants must submit to the Women's Studies Graduate Program Committee: (1) an application form listing prior undergraduate and graduate course work related to Feminist Studies, institutions attended, and majors(s); and (2) a one- to two-page statement of purpose, including career objectives, areas of interest and research, record of research, teaching, community, and/or creative work.

The Committee determines admissions, in consultation with the Women's Studies Core Faculty, based upon the extent to which the applicant's research interests relate to Feminist Studies, the applicant's previous course work, and research or other experience related to Feminist or Women's Studies. Lack of prior course work does not preclude admission, so long as a compelling statement of research interests congruent with the graduate emphasis makes the case.

Emphasis Requirements

Minimum course work for the graduate emphasis in Feminist Studies consists of four courses: two core courses, Women's Studies 200A-B, a coherent sequence normally taken in consecutive quarters; and any two courses selected from the list of courses in Feminist Studies approved by the Committee, as long as one of these is a graduate course in the student's own department or area of interest. In keeping with the interdisciplinary focus of this emphasis, it is highly recommended that the other be a course from a discipline outside that department or area. The course requirements for Ph.D. and M.F.A. candidates are the same.

For doctoral students, the qualifying examination and dissertation topic should incorporate gender as a central category of analysis. One member of the candidate's qualifying examination committee and of the candidate's dissertation committee is normally a member of the Women's Studies and affiliate faculty. There are no requirements concerning qualifying examinations or theses for M.F.A. students.

Courses in Women's Studies

LOWER-DIVISION

INTRODUCTORY CORE COURSES

Courses of general interest for all students. No prerequisites. Designed to survey and to introduce methods and premises of interdisciplinary studies. Many of these courses fulfill part of the UCI breadth requirement.

20 Introduction to Queer Studies (4). Study of sexuality from the perspective of lesbian, gay, queer, transgender scholarship spanning humanities, social sciences, arts. **(VII-A)**

50A Gender and Feminism in Everyday Life (4). What is gender? Why does studying it matter? Explores how feminism has understood not only gender as a category of social analysis, but how gender structures personal identities, family, citizenship, work and leisure, social policy, sexuality, and language. **(IV, VII-A)**

50B Reproducing and Resisting Inequality (4). From bedroom to boardroom to voting booth to international division of labor, how are societal institutions and politics "gendered"? Examines relationships of gender, race, ethnicity, class, and region in sexual and reproductive experiences, households, education, work, and politics, including community activism. **(IV, VII-A)**

50C Gender and Popular Culture (4). An investigation of gender, race, and sexuality in film, TV, video, music, and advertising, with attention to the ways that popular culture shapes understandings of technology, national identities, leisure and work, historical memory, international communication, and multicultural representation. **(IV, VII-A)**

60A Gender and Science (4). Examines science from a variety of feminist viewpoints in order to explore how science influences everyday life. Special attention is given to the ways science shapes our understanding of gender, race, and sexuality. **(III)**

60B Gender and Law (4). Introduction to the relationship between gender, race, sexuality, and the law. Critical thinking about how law defines citizenship, political representation, and democracy, focusing on the history of legal reform undertaken in the name of women as a social group. **(III)**

60C Gender and Religion (4). Introduces the topic of religion in a feminist context by performing cross-cultural exploration of gender, authority, and faith in various traditions. Study includes (but is not limited to) writings of contemporary Jewish, Christian, and Muslim feminists. **(III)**

UPPER-DIVISION

Courses in which students gain experience in analysis, interpretation, and writing.

ADVANCED CORE COURSES

100: THEORY, KNOWLEDGE, CULTURE

100A Producing Feminist Knowledge (4). Explores alternative ways that feminist scholars frame research questions, conduct research or creative activity. Examines challenges that feminist scholarship poses to the academy and the challenges the academy poses to feminist scholars. Formerly Women's Studies 159.

100B Feminist Theory (4). Introduction to historical traditions in theory and various conceptual frameworks informing Women's Studies' scholarship. Concepts include (but are not limited to) identity, representation, and political economy. Formerly Women's Studies 140.

100C Key Concepts in Feminist Cultural Studies (4). Investigation of the theories and methods that inform the feminist study of culture. Focuses on the interpretation of the visual arts and literature created by, and predominantly for, women.

110: UNDERSTANDING POWER AND GENDER

110A Gender, State, and Nation (4). Examination of gender and sexuality in relation to the production of identities created through participation in state and nation. Examines complexity of relationship between feminism and nationalism, feminism and state. **(VII-B)**

110B Money, Sex, and Power (4). Examination of gender and sexuality in relation to the emergence of the modern world, modernity, and capitalism; commodification, circulation, and transnational exchanges relating to race, gender, class, sexuality, religion, and nationality.

110C Producing Gender Transnationally (4). Examination of how ideas and formations of gender cross national and international boundaries; encounters between feminist and sexual identity movements; how terms such as "sex" and "gender" change meanings according to time and place. **(VII-B)**

120: INTERPRETING BODIES AND PLEASURES

120A Modern Pleasures: Bodies and Practices (4). Focus on the theory and history of pleasure within academic disciplines as well as in social and cultural processes and networks.

120B Image Problems: Stereotypes and Representations (4). Examination of scholarly approaches to gender stereotypes and politics of representation as they present possibilities for critical analysis and produce problems and limitations; how powerful ideas of gender intersect with other forms of social differentiation such as race and class. **(VII-A)**

120C Engendering Colonial Bodies (4). Examination of the production of gender and sexuality in the contexts of colonialism and modernization; representations of colonialist and nationalist struggles over gender and race; female bodies as sites of contestation. **(VII-B)**

ADVANCED ELECTIVE CORE COURSES

139 Topics in Gender Studies (4). Various topics in gender studies. Includes issues of gender, culture, race and class, including issues of sexualities and social justice. Prerequisite: satisfactory completion of the lower-division writing requirement. May be repeated for credit as topics vary. **(VII-A)**

155 Special Topics in Women's Studies (4). Designed to provide students with an opportunity to do advanced work in women's studies. May be repeated for credit as topics vary. Formerly Humanities 155.

156: GENDER AND RACE STUDIES

156A Race and Gender (4). Examines the roles and intersections of racism, sexism, and heterosexism in U.S. culture and society. Through history and literature, explores the process of immigration, colonization (of identity, language, and the body), and cultural interaction. **(VII-A)**

156B Gender, Race, and the Built Environment (4). Examination of the ways in which houses, buildings, streets, cities, and indeed all social spaces reveal cultural conceptualizations of gender and sexuality in relation to other social relations and processes. **(VII-A)**

157: QUEER STUDIES

157A Topics in Lesbian and Gay Studies (4). Explores issues in lesbian and gay studies from one or more of the following perspectives: theoretical, historical, legal, economic, political, sociological, and representation in the arts. May be repeated for credit as topics vary. Formerly Women's Studies 161. **(VII-A)**

157B Queer Lives and Knowledges (4). Explores the emergence and historical elaboration of non-normative sexual identities, practices, and communities; focuses on medical, legal, literary, aesthetic, scientific, and religious notions about homosexuality and appropriations and subversions of these notions by queer people. Formerly Women's Studies 161B. Women's Studies 161B/157B and Studio Art 122 may not both be taken for credit.

158: GENDER AND THE PRODUCTION OF KNOWLEDGE

158A Gender and the Politics of Information (4). Investigates from feminist perspectives the challenges in the "information age" and its embedded gender and political dimensions. Examines the increasingly complex identification, evaluation, application, and transmission of information. Formerly Women's Studies 160. **(VII-A)**

158B Defining Women of Color (4). Examination of women of color as a historical movement emerging as a result to anti-racist struggle in the late twentieth century; who counts as a woman of color, who is included and excluded, the advantages and limitations of this approach to racism. **(VII-A)**

165: GENDER AND SCIENCE

165A Gender, Biology, and Environmental Ethics (4). What is "nature" and how do we know and represent it? Introduces students to the history of "nature" produced within scientific knowledge, as well as historical developments.

165B HIV/AIDS (4). Explores HIV/AIDS from a feminist perspective focusing on cultural and political-economic analysis and representations of the disease both within the U.S. and globally. **(VII-B)**

165C New Reproductive Technologies (4). Examination of representation, implication, and bioethics of new reproductive technologies in different cultures; effects of new reproductive technologies on identities and bodies.

165D Gender and Science in Colonial India (4). Examination of British colonial policies and politics of science and gender in India; comparison of British India with other colonial contexts; importance of science for colonial rule and history of colonial science and technology. **(VII-B)**

165E Gender and Cyberspace (4). How has gender and sexuality been produced in the cyberspace frontier during its brief but volatile history? Takes an interdisciplinary approach to this question that engages with debates in urban studies, history of science, anthropology, and political ecology.

165F Gender and Technology (4). Using a variety of disciplinary methods, examines how various technological processes and products produce culturally complex meanings associated with gender and technology.

166: GENDER AND RELIGION

166A Contemporary Issues in Gender and Islam (4). Exploration of lives of Muslim women in different cultural contexts; critical examination of various Islamic constructions and interpretations of gender, sexuality, and human nature. **(VII-B)**

167: THE POLITICAL ECONOMY OF GENDER

167A Militarism and Gender (4). Feminist approach to militarism, war, and political violence drawing on representations of women as both victims of and participants in military violence; effects of militarism on formations of gender; effects of military industrial complex on nationalism and identity. **(VII-B)**

167B Sexual Traffic (4). Interdisciplinary approaches to understanding the concept of "sexual traffic" as it impacts the formation of sexualized bodies and sexual subjects within and across national boundaries. **(VII-B)**

168: GENDER AND CULTURAL STUDIES

168A Music and Audio Cultures (4). Examination of the significance of gender, power, and identity in music and audio cultures; changing technologies and connections to gender; political economy of music and audio cultures; representation of women in popular music; performance and reception across different cultures. **(VII-A)**

168B The Politics of Style (4). Examination of the emergence of style and lifestyle in relation to gender and sexuality; analysis of subcultures, politics, and representation of style in relation to formation of social identities.

ADVANCED ELECTIVE COURSES

170 Gender, Feminism, Literature, and Language (4). Topics cover issues in language and literature which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

171 Gender, Feminism, and History (4). Topics cover issues in history which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

173 Gender, Feminism, and Philosophy (4). Topics cover issues in philosophy which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

174 Gender, Feminism, and the Arts (4). Topics cover issues in the arts which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

180 Gender, Feminism, and Anthropology (4). Topics cover issues which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

181 Gender, Feminism, and Cognitive Psychology (4). Topics cover issues in cognitive psychology which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

182 Gender, Feminism, and Economics (4). Topics cover issues in economics which relate to women and gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

183 Gender, Feminism, and Sociology (4). Topics cover issues in sociology which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

184 Gender, Feminism, and Political Science (4). Topics cover issues in political science which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

185 Gender, Feminism, and Social Sciences (4). Topics cover issues in social sciences which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

187 Gender, Feminism, and Social Ecology (4). Topics cover issues in social ecology which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

188 Gender, Feminism, and Science (4). Topics cover issues in science which relate to women or gender, or which are taught from a feminist methodological perspective. May be repeated for credit as topics vary.

197 Senior Seminar in Women's Studies (4) S. Students read advanced scholarship in Women's Studies and complete a major seminar paper. Prerequisite: Women's Studies 139. **(VII-A)**

199 Directed Research (1 to 4) F, W, S. Directed reading and research in consultation with a faculty member. Substantial written work required. Prerequisite: consent of sponsoring faculty member.

GRADUATE

200A Feminist Knowledge and Social Change (4). Provides a broad and introductory overview of Women's Studies and feminist knowledges, including key concepts, theoretical frameworks, disciplinary approaches and methods, and critical debates that have shaped the field. May be taken for credit twice.

200B Problems in Feminist Research (4). Colloquium on analytic approaches to interdisciplinary feminist research in Women's Studies and exploration of how feminist knowledges are produced in different academic disciplines. Prerequisite: Women's Studies 200A or consent of instructor. May be taken twice for credit as topics vary.

201 Special Topics in Feminist Theory (4). Seminars on various topics in feminist theory. Prerequisite: Women's Studies 200A-B. May be repeated for credit as topics vary.

210A Graduate Feminist Theory (4). In-depth introduction to various theoretical frameworks that have and continue to inform scholarship in Women's Studies including (but not limited to) identity, representation, and political economy.

260A Advanced Seminar in Women's Studies (4). Covers various areas of research within Women's Studies as an interdisciplinary field. Recommended for advanced graduate students.

290 Directed Research (2 to 12). Directed graduate study/research in Women's Studies. May be taken for credit for a total of 24 units.

399 University Teaching (4). Limited to Teaching Assistants. Must be admitted to the graduate emphasis in Feminist Studies. Satisfactory/Unsatisfactory only. May be taken for credit six times.

DONALD BREN SCHOOL OF INFORMATION AND COMPUTER SCIENCES

Debra J. Richardson, **Dean**

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Lecturers

Stephen Franklin, Ph.D. University of Chicago, *Lecturer in Information and Computer Science* (computer-based educational technology, computer graphics, teaching of programming)
Daniel Frost, Ph.D. University of California, Irvine, *Lecturer in Information and Computer Science* (artificial intelligence, software engineering, computer graphics, Windows NT programming)
Norman Jacobson, B.S. University of California, Irvine, *Lecturer in Information and Computer Science* (computer science education, ethics in computing, forensic computing)
Shannon Tauro, M.S., University of California, Irvine, *Lecturer in Information and Computer Science* (logic design, programming languages, compilers and interpreters, computer organization)
Alex Thornton, B.S. University of California, Irvine, *Lecturer in Information and Computer Science* (software engineering, programming methodologies, data structures, programming languages, compilers)

Overview

By establishing the University of California's flagship computer science school in 2002, UC Irvine made an investment in the future that reflects its historical commitment of raising the bar of excellence. From pioneering computer science courses more than three decades ago to the creation of the Donald Bren School of Information and Computer Sciences (ICS), UCI continues to be an institute that leads information technology education and research across the globe.

The Bren School of ICS began as a department in 1968 and has given creation to some of computing's most significant advancements including revolutionizing computer-aided drafting techniques; the creation of the current Hypertext Transfer Protocol (HTTP/1.1); development of the Internet standards for HTTP and Uniform Resource Identifiers (URI); the founding of the Apache HTTP Server Project that produces the software for over 60 percent of public Internet Web sites; and the creation of the Domain Name System (DNS) that translates Web and e-mail addresses into the numeric system used to route information along the Internet.

The vibrant ICS community continues to explore innovative topics ranging from building complete computer systems on chips smaller than a human fingernail to developing user interface systems that allow engineers on opposite sides of the world to collaborate effectively. From improving how first responders communicate during a crisis situation, to applying computer science to analyze biological data and thereby expediting biological research, ICS continues to focus on how to bring computing and information technology to bear in solving a diverse set of problems from across the campus and throughout the industry.

Named a school in December 2002, and renamed in honor of Donald Bren for his visionary leadership and generous gift in June 2004, ICS has created three departments that, when combined with the School's natural interdisciplinary nature, give way to the creation of new areas of study and research. ICS is one of less than 40 computer-specific schools in the country and one of only a handful to have established a department dedicated to the study of informatics alongside a more traditional department of computer science and a forward-thinking partnership with its department of statistics. This three-department structure affords ICS a unique perspective of the information technology disciplines and allows the flexibility to build educational programs that explore the many applications of the computing discipline: from circuits, networks, and systems to software engineering, statistical theory, and the human aspects of computing.

By blending research with education in multiple disciplines, ICS is leading interdisciplinary efforts that provide students with an education for the future of computer science, now.

COMPUTING RESOURCES

The School offers a wide range of instructional and research machines, including UNIX servers, 50 SPARC workstations, more than 300 high-performance Pentium III/IV PCs, and several specialized labs with more than 700 varying types of UNIX workstations, servers, and PCs that support research ranging from computational biology, ubiquitous computing, and homeland security, to visualization, graphics, and multimedia research initiatives. The School's wireless network follows the IEEE 802.11b standards and employs 17 Cisco AP350 access points deployed throughout the ICS complex for 100 percent signal coverage. These access points work in conjunction with the Cisco 350 series client cards to provide encryption (dynamic WEP) and user authentication (LEAP).

DEGREES

Computer Science	B.S.
Computer Science and Engineering[1]	B.S.
Informatics	B.S.
Information and Computer Science	B.S., M.S., Ph.D.
Networked Systems[1, 2]	M.S., Ph.D.

[1] Offered jointly with The Henry Samueli School of Engineering.
[2] See the Interdisciplinary Studies section of the *Catalogue* for information.

Honors

Honors at graduation, e.g., *cum laude, magna cum laude, summa cum laude,* are awarded to approximately 12 percent of the graduating seniors. Students are nominated for honors based on criteria such as grade point average (including overall, ICS, mathematics); number of upper-division ICS courses completed beyond the minimum; courses taken outside ICS beyond required breadth; and research activities. To be eligible for honors, a general criterion is that students must have completed at least 72 units in residence at a University of California campus by the end of the winter quarter of the academic year in which they graduate. Other important factors are considered (see page 52).

CAREERS

Graduates of the Donald Bren School of Information and Computer Sciences pursue a variety of careers. Many graduates specify, design, and develop a variety of computer-based systems comprised of software and hardware in virtually every application domain, such as aerospace, automotive, biomedical, consumer products, engineering, entertainment, environmental, finance, investment, law, management, manufacturing, and pharmacology. Graduates also find jobs as members of research and development teams, developing advanced technologies, designing software and hardware systems, and specifying, designing, and maintaining computing infrastructures for a variety of institutions. Some work for established or start-up companies while others work as independent consultants. After a few years in industry, many move into management or advanced technical positions. Some students also use the undergraduate major as preparation for graduate study in computer science or another field (e.g., medicine, law, engineering, management).

UNDERGRADUATE PROGRAM

The School's undergraduate program prepares students for professions and careers in industry and provides students with the tools for advanced education at the graduate level. Many graduates follow career paths immediately after graduation; others go on to advanced study in a variety of fields, including computer science, management, engineering, law, medicine, and so on. An ICS undergraduate education is a blend of scholarship, science, technology, and practical application that forms an excellent foundation for professional life in the twenty-first century and prepares a student with serviceable skills useful for a lifetime.

The basis of the undergraduate program is a set of fundamental courses in mathematics and computer science, supplemented by breadth requirements from other academic disciplines. A premium is placed on writing and quantitative skills. Students start early with hands-on experience with advanced computing systems, and intense use of computer and network technologies continues throughout the undergraduate program. Students study data organization, algorithm design and analysis, design and organization of hardware and network systems, software engineering, artificial intelligence, social aspects of system design and use, and management of technology. In the process, students work with state-of-the-art hardware and software technologies, learn several contemporary programming languages, and make extensive use of computer-based utilities such as electronic mail.

The Donald Bren School of Information and Computer Sciences offers four majors: Information and Computer Science (ICS), Computer Science (CS), Computer Science and Engineering (CSE), and Informatics.

B.S. in Information and Computer Science. The overall field of information and computer science spans a vast spectrum of topics. At the one end, it includes computer system design and networking, detailing how modern computer hardware and networks operate on a day-to-day basis. At the other end are human factors, such as how software should be structured to facilitate cooperative work among groups of people. The B.S. in Information and Computer Science (ICS) provides students with a broad introduction to these topics. Through the selection of elective courses, students may choose to specialize in one or more of six areas: artificial intelligence, computer systems, implementation and analysis of algorithms, information systems, networks and distributed systems, or software systems. See page 315.

B.S. in Computer Science. Computer science as an area of study has been around for over four decades now. During that time, the field has evolved and grown considerably. The Computer Science (CS) major provides students with an education that focuses on the operation of computers and the software that runs them. Additionally, students may take a variety of courses to broaden their knowledge and/or specialize in particular areas. For instance, the major is well-suited for a more in-depth study in traditional topics such as artificial intelligence, advanced data structures, expert systems, and computer graphics, as well as more modern topics such as computational biology and computer games. See page 320.

B.S. in Computer Science and Engineering. This program is designed to provide students with the fundamentals of computer science, both hardware and software, and the application of engineering concepts, techniques, and methods to both computer systems engineering and software system design. The Computer Science and Engineering major gives students access to multidisciplinary problems in engineering with a focus on total systems engineering. Students learn the computer science principles that are critical to development of software, hardware, and networking of computer systems. From that background, engineering concepts and methods are added to give students exposure to circuit design, network design, and digital signal processing. Elements of engineering practice include systems view, manufacturing and economic issues, and multidisciplinary engineering applications. The program is administered jointly by the Bren School of ICS and the Department of Electrical Engineering and Computer Science in The Henry Samueli School of Engineering. See page 321.

B.S. in Informatics. Within the overall discipline of information and computer science, the Informatics major is concerned with the relationship between what is inside the computer and what is outside. The Informatics major addresses the broad set of issues surrounding design, ranging from initial requirements gathering to estimating and measuring the impact of alternative solutions—all from a multidisciplinary perspective that includes computer science, information science, organizational science, social science, and cognitive science. See page 323.

Major and Minor Restrictions

The major in Information and Computer Science (ICS) cannot be combined with the major in Computer Science (CS) or the major in Informatics.

The major in Computer Science (CS) cannot be combined with the major in Computer Science and Engineering (CSE).

The major in Computer Science and Engineering (CSE) cannot be combined with the major or minor in Information and Computer Science (ICS).

The major in Computer Science and Engineering (CSE) cannot be combined with the major in Computer Engineering (offered by The Henry Samueli School of Engineering).

Bren School of ICS majors may not minor in Informatics.

Students also may wish to consult the list of courses offered by the School of Engineering. Some Engineering courses can count toward intermediate-level and project course requirements for the ICS major. See the **upper-division** requirements for details.

Students enrolled in other degree programs who are interested in digital computer programming and the field of computer science will normally begin their studies with Introduction to Computer Science I (ICS 21) and continue in the programming sequence with Introduction to Computer Science II and Fundamental Data Structures (ICS 22 and 23) as far as their interests require and their programs permit.

The ICS Student Affairs Office is staffed by professional academic counselors and peer advisors. These individuals are available to assist students with program planning, questions on University and School policies and procedures, progress toward graduation, and other questions that arise in the course of a student's education. Faculty also are available for advising, generally for suggestions of additional course work in the student's area of specialization and on preparation for graduate school.

ADMISSIONS

Freshmen

In the event the School receives more qualified applicants than can be accommodated, applicants may be subject to screening beyond minimum University of California admissions requirements.

Transfer Student Policy

Students transferring to UCI must satisfy the following requirements:

1. Completion of one year of college mathematics. Courses equivalent to Mathematics 6A-B-C (Discrete Mathematics) are preferred as this facilitates scheduling after transfer to UCI. If these are not available, students should take first-year calculus. A semester of pre-calculus and a semester of calculus may not be used to satisfy this requirement.
2. Completion of one year of computer science courses. The course work must contain one UC-transferable programming course involving concepts such as those found in C++, Java, Eiffel, or another object-oriented, high-level language; programming-only courses in Basic, Fortran, Cobol, Pascal, and C are not acceptable. For the remaining courses, it is strongly recommended that students select UC-transferable courses that do not focus strictly on learning a programming language but instead focus on topics such as object-oriented design, data structures, algorithms, and computer architecture, if such courses are available.

   Since Java is used extensively in the curriculum, students who come in without the ability to program in Java should plan to learn it, by study on their own or by taking a Java programming course, prior to taking courses that assume knowledge of Java.

NOTE: These majors require a series of lower-division courses, and prerequisites constrain the order in which they can be taken. Students who transfer to UCI as juniors and must complete a significant part of this sequence will therefore find that it will take longer than two years to complete their degree.

To ensure admission consideration for the fall quarter, students should be sure to file their application by November 30 of the prior year. The selection criteria include grades, test scores, and other considerations. Note, however, that in cases where the number of incoming freshmen and advanced standing students who elect a major offered by the School exceeds the number of positions available, not all applicants will be accommodated.

Change of Major

Students interested in changing their major to one offered by the School should contact the ICS Student Affairs Office for more information and assistance. Information is also available at http://www.due.uci.edu/Change_of_Major.html.

Major and minor restrictions: See page 314.

SPECIAL PROGRAMS AND COURSES

The 3-2 Program with The Paul Merage School of Business

Outstanding students who are interested in a career in management may wish to apply for entry into The Paul Merage School of Business' 3-2 Program. Students normally apply for this program early in their junior year. See The Paul Merage School of Business section for additional information.

Campuswide Honors Program

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. Additional information is available in the Center for International Education section.

Undergraduate Major in Information and Computer Science

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN INFORMATION AND COMPUTER SCIENCE

University Requirements: See pages 56–60.

Major Requirements

Lower-division (some or all of these are prerequisites for required upper-division ICS courses):

A. ICS 6A/Mathematics 6A, Mathematics 6B, Mathematics 6C or 3A, Mathematics 2A-B, Statistics 67/Mathematics 67.

B. ICS 21, 22, 23, 51, 52.

Upper-division:

A. ICS 121, 131, 141, 142, 143, 151, 152, 161, 171.

B. One intermediate course in each of two areas, selected from ICS 102; 104, 122, 123; 132; 144, 148; ICS 153, Engineering EECS143, EECS151; ICS 162, 163, 164, 168; ICS 172, 173, Engineering EECS136; Engineering EECS104 or ICS 183; ICS184.

C. Three project courses selected from ICS 105, 125, 126A-B, 127, 135, 145A, 145B, 155A, 155B, 156, 165, 175A, 175B, 185, 187, 188, Engineering EECS151L. NOTE: ICS 127 may not be used to satisfy any part of the project course requirement in conjunction with ICS 126A-B.

D. Two additional courses chosen from this list that have not been used to satisfy another ICS major requirement: Mathematics 105A-B, 114A-B, 118A-B, 120A-B, 121A-B, 130B-C, 131B-C, 132B-C, 140A-B, 141, 150, 151, 152, 162A-B, 171A-B-C, 173A-B, 180, 182; ICS 162, 163, 178; Philosophy 105A-B-C.

Specializations: Students may elect to complete one or more specializations within the major in Information and Computer Science. Courses taken for a specialization must be taken for a letter grade and may be used to satisfy upper-division requirements for the major. Courses may also be used to satisfy requirements of more than one specialization, subject to the following limitation: four of the courses used to satisfy the requirements for any one specialization may not be used to satisfy the requirements for any other specialization.

One individual study course (ICS H198 or 199) in the area of specialization may be substituted for one designated course (indicated by *) in the specialization requirements, upon prior approval of the ICS Associate Dean for Undergraduate Education.

Artificial Intelligence: four courses* selected from ICS 163 or 165, 172-179.

Computer Systems: four courses selected from ICS 123, 144-149, 153-159, 168, 183.

Implementation and Analysis of Algorithms: two courses selected from ICS 163, 164, 165; two courses* selected from ICS 125, 145A, 145B, 156, 175A, 175B.

Information Systems: three courses selected from ICS 102, 105, 108, 125, 132, 135; one course* selected from ICS 104, 123, 134, 137, 153, 175B, 184.

Networks and Distributed Systems: four courses selected from ICS 123, 145B*, 148, 153, 156*, 168.

Software Systems: two courses selected from ICS 102, 104, 105, 122, 123; two software project courses, either ICS 125 and 127* or 126A-B.

Major and minor restrictions: See page 314.

Requirements for the Minor in Information and Computer Science

ICS 21, 22, 23; ICS 6A or Mathematics 6A; ICS 51 or 52; two upper-division courses from ICS 100–189, excluding ICS 139 and 180.

Honors Program in Information and Computer Science

The honors program in ICS provides an opportunity for selected students majoring in ICS to pursue advanced work in one of the research areas in the School. Admission to the program is based on a formal application submitted to the School in the spring. Applications are available each year beginning May 1 and should be submitted by June 1 to ensure consideration.

For an application to be considered, the following conditions must be met (although exceptions may be granted in unusual circumstances):

1. The student must have completed the required lower-division ICS courses and Mathematics 6A-B-C by the end of the spring quarter in which the application is made.
2. The student must have the following grade point averages:
   a. an overall grade point average of at least 3.2;
   b. a grade point average of 3.5 or higher in the required lower-division ICS courses;
   c. a grade point average of 3.5 or higher in Mathematics 6A-B-C.
3. Application must be made in the spring of the student's sophomore year. Certain exceptions are available, for example, for transfer students whose completion of the lower-division courses is delayed and for Campuswide Honors students.

In selecting students for the honors program, the School also considers evidence of ability and interest in research. Students admitted to the program participate in the ICS Honors Seminar (ICS H197), which provides an introduction to research areas in the School, followed by a minimum of two quarters of independent supervised research (ICS H198). Passing these two 198s counts for one of the project courses required for the major, provided that one other project course is taken in a different area. In order for the student to be considered to have successfully completed the honors program, the work must be written up as a final report and certified to be of honors quality by the student's advisor and by the program advisor.

Courses in Information and Computer Science

BREADTH COURSES FOR NONMAJORS

Nonmajors may also take other ICS courses for which they have the prerequisites.

10A Information: Presentation and Representation (4). Kinds of information, including quantitative, probabilistic, textual, graphic, audio. Locating information, evaluating reliability. Representing information on paper, in computer systems, in other media. Organization into hierarchies, networks, tables. Effectiveness and efficiency of alternative representations and organizations. Measuring information; redundancy, compression. Open to nonmajors only. Formerly ICS 10. **(V)**

10B Computer-Based Information Systems (4). The analysis, design, implementation, quality assurance, deployment, and ongoing management of computer-based information systems, and related software, hardware and networking issues; end-user customization of applications and interfaces, and selection of information, via query macro and scripting languages. Prerequisite: ICS 10A. Open to nonmajors only. Formerly ICS 11. **(V)**

10C Networked Information Discovery and Retrieval (4). Network-based communication and information resources, including electronic mail, news, and other sources. Technical, personal, and social aspects of their development, access, and use. Extensive use of a wide range of established and developing technologies. Prerequisite: ICS 10B. Open to nonmajors only. Formerly ICS 1C. **(V)**

LOWER-DIVISION

COURSES FOR MAJORS AND NONMAJORS

6A Discrete Mathematics for Computer Science (4). Covers essential tools from discrete mathematics used in computer science with an emphasis on the process of abstracting computational problems and analyzing them mathematically. Topics include: combinatorics, mathematical induction, elementary probability, and asymptotic analysis. Prerequisite: high school mathematics through trigonometry. Same as Mathematics 6A. **(V)**

21 Introduction to Computer Science I (6). First of a three-quarter introductory course. Introduces fundamental concepts related to computer software design and construction. Develops initial design and programming skills using a high-level programming language (primarily C++/Java). Introduces useful computer-based tools for analysis, expression, discovery. Same as CSE21. Only one course from ICS 21/CSE21 and ICS H21 may be taken for credit. **(V)**

H21 Honors Introduction to Computer Science (6). First of a three-quarter introductory sequence. Introduces basic concepts, fundamental laws and principles of software and hardware organization, program construction, applications, and policy and social issues. Develops initial programming skills using a high-level programming language (primarily C/C++/Java). Introduces useful computer-based tools for analyses, expression, and discovery. Prerequisite: enrollment open to ICS majors in the Campuswide Honors Program or by consent of the Donald Bren School of Information and Computer Sciences. Only one course from ICS H21 and ICS 21/CSE21 may be taken for credit. **(V)**

22 Introduction to Computer Science II (6). Second of a three-quarter introductory sequence. Abstract behavior of classic data structures (stacks, queues, priority queues, tables, trees), alternative implementations, analysis of time and space efficiency. Recursion. Object-oriented and functional programming. Models of computation. Prerequisite: ICS 21/CSE21 with a grade of C or better. Same as CSE22. Only one course from ICS 22/CSE22, ICS H22, or Informatics 42 may be taken for credit. (V)

H22 Honors Introduction to Computer Science II (6). Second of a three-quarter introductory sequence. Covers in-depth concepts of programming and mathematical tools for analyzing programs. Topics include: combinatorics, program analysis and correctness, advanced structures, system design techniques, and programming paradigms. Prerequisite: ICS H21 with a grade of B- or better or ICS 21/CSE 21 with a grade of A or better. Only one course from ICS H22 and ICS 22/CSE22 may be taken for credit. (V)

23 Fundamental Data Structures (4). Focuses on implementation and mathematical analysis of fundamental data structures and algorithms. Covers storage allocation and memory management techniques. Prerequisites: ICS 22/CSE22 with a grade of C or better or Engineering EECS40; Mathematics 6A or ICS 6A. Same as CSE23. Only one course from ICS 23/CSE23 and ICS H23 may be taken for credit. (V)

H23 Introduction to Computer Science III (4). Third of a three-quarter introductory course. Builds on ICS H22 with respect to mathematical tools and analysis. Focuses on fundamental algorithms in computer science, basic data structures for primary and secondary memory, storage allocation and management techniques, data description, and design techniques. Prerequisites: ICS H22 with a grade of B- or better or ICS 22 with a grade of A or better; Mathematics 6A or ICS 6A. Only one course from ICS H23 and ICS 23/CSE23 may be taken for credit. (V)

51 Introductory Computer Organization (6). Multilevel view of system hardware and software. Operation and interconnection of hardware elements. Instruction sets and addressing modes. Virtual memory and operating systems. Laboratory work using low-level programming languages. Prerequisites: ICS 21 with a grade of C or better; Mathematics 6B.

52 Introduction to Software Engineering (6). Introduction to the concepts, methods, and current practice of software engineering. The study of large-scale software production; software life cycle models as an organizing structure; principles and techniques appropriate for each stage of production. Laboratory work involves a project illustrating these elements. Prerequisite: ICS 23 with a grade of C or better. ICS 52 and Informatics 43 may not both be taken for credit.

53 Embedded Computing Systems (4). Principles of embedded computing systems: embedded systems architecture, hardware/software components, system software and interfacing, real-time operating systems, hardware/software co-development, and communication issues. Examples of embedded computing in real-world application domains. Simple programming using an embedded systems development environment. Prerequisites: ICS 21, 22, 23, 51.

53L Embedded Computing System Laboratory (2). Laboratory to accompany ICS 53. Corequisite: ICS 53.

54 Programming for Multitasking Operating Systems (4). In-depth study of principles and concepts embodied in modern Internet-connected, multi-user, multitasking operating systems, including shells, filters, pipelines, programmability and scripting, extensibility, concurrent processing, and inter-process communication. Several integral tools and utilities are presented. UNIX used to provide concrete examples. Prerequisite: ICS 23 with a grade of C or better.

80 Special Topics in Information and Computer Science (2 to 4). May be repeated for credit if title or topic varies.

92 Introduction to University Success (0). Survey of the attitudes and skills required for academic success. Designed primarily for new freshmen in technical fields who are first-generation college students, low-income students, or students with disabilities. Focus on specific tools and proven methods to improve academic performance. Study planning and independent studies. Students may receive a maximum of four units of workload credit only. Pass/Not Pass only.

93 Strategies for Success in ICS (0). Develops students' study skills for ICS and breadth requirement courses through instruction, small group activities, and application assignments. Topics include goal setting, note taking, text reading, examination preparation, memory and concentration, and problem solving. Pass/Not Pass only. Two units of workload credit only.

UPPER-DIVISION

NOTE: Empirical studies are one method used to advance the state-of-the-art in computer science. As such, participation in experiments is part of the regular structure of ICS 121 and 125, as well as other courses. Students' abilities to achieve their grade in a course will not be affected by their participation in experiments.

102 Requirements Analysis and Engineering (4). Aims to equip students to develop techniques of software-intensive systems through successful requirements analysis techniques and requirements engineering. Students learn systematic process of developing requirements through co-operative problem analysis, representation, and validation. Prerequisites: ICS 121/Informatics 111; ICS 6A/Mathematics 6A; Statistics 7/Mathematics 7 or Statistics 67/Mathematics 67. Same as Informatics 113.

104 Human Computer Interaction (4). Presents basic principles of human-computer interaction (HCI). Introduces students to user interface design techniques, design guidelines, and usability testing. Students gain the ability to design and evaluate user interfaces and become familiar with some of the outstanding research problems in HCI. Prerequisites: one course (with a grade of C or better) selected from ICS 10A, ICS 21, Informatics 42, Engineering ENGR10, CEE10, EECS10, MAE10, or equivalent. Same as Informatics 131.

105 Project in Human-Computer Interaction and User Interfaces (4). The goal of this project course is to prepare students to develop and evaluate user interfaces to software systems through a one-quarter project. Prerequisites: ICS 104, 121, 131, and 141; or Informatics 131. Same as Informatics 132.

108 Medical Information Systems (4). Concepts related to the incorporation of computing and information technology into health-care environments, covering both the technological challenges and the social challenges. Topics include computer-based patient record systems, decision support systems, medical imaging, and databases. Prerequisites: one course (with a grade of C or better) selected from ICS 1A, ICS 10A, ICS 21, Engineering E10, Engineering EECS11, or equivalent; ICS 6A, Mathematics 6A, or equivalent; and upper-division standing.

121 Software Tools and Methods (4). Concepts and techniques of constructing software in a systematic fashion, including detailed design techniques, specifications, programming methods, quality-inducing procedures, development tools, team techniques, testing, estimation, and performance improvement. Laboratory work involves exercises to illustrate important concepts, methods, and tools. Prerequisites: ICS 52 or CSE90 with a grade of C or better; Mathematics 6A or ICS 6A; Mathematics 6B; Mathematics 6C or 3A; or Informatics 43 with a grade of C or better; and satisfactory completion of the lower-division writing requirement. Same as CSE121 and Informatics 111.

122 Software Specification and Quality Engineering (4). Aims to prepare students to develop high-quality software through successful specification and quality engineering techniques. Students learn what high-quality means, how to plan for and achieve it, and how to measure it. Prerequisites: ICS 6A/Mathematics 6A; Statistics 7/Mathematics 7 or Statistics 67/Mathematics 67; either Mathematics 6B or 13 or Philosophy 29 or 30; ICS 121/Informatics 111. Same as Informatics 115.

123 Software Architectures, Distributed Systems, and Interoperability (4). Prepares students to engineer well-structured software systems. Students learn a wide range of software architectural styles, architectural platforms that provide standard services to applications, and formal architecture description languages. Prerequisites: Informatics 122 or the following: ICS 51 with a grade of C or better; ICS 121 and 141; Mathematics 2A-B and Statistics 67/Mathematics 67. Same as Informatics 123.

125 Project in Software System Design (4). Specification, design, construction, testing, and documentation of a complete software system using concepts learned in ICS 52, 121, and 141. Special emphasis on the need for and use of teamwork, careful planning, and other techniques for working with large systems. Prerequisites: ICS 51 with a grade of C or better; ICS 121 and 141; Mathematics 2A-B and Statistics 67/Mathematics 67.

126A-B Comprehensive Project in Software System Evolution (4). Provides students with an industrial-like software development experience. Students undergo the vicissitudes of developing a large-scale software system from several points of view and specify, design, construct, test, document, and evolve a complete software system. Students must enroll in both quarters. In-Progress grade assigned for ICS 126A; final grades assigned after completion of 126B. Prerequisites: ICS 51 with a grade of C or better; ICS 121 and 141; Mathematics 2A-B and Statistics 67/Mathematics 67.

127 Advanced Project in Software Engineering (4). Students work in teams to specify, design, construct, test, and document a complete software system in a specialized application domain using application/domain-specific techniques. Each offering's topic is announced the preceding spring. Prerequisites: ICS 125 or 126A with a grade of C or better; Mathematics 2J or Statistics 67/Mathematics 67.

131 Social Analysis of Computerization (4). Introduction of computerization as a social process. Examines the social opportunities and problems raised by new information technologies, and the consequences of different ways of organizing. Topics include computerization and work life, privacy, virtual communities, productivity paradox, systems risks. Prerequisites: one course (with a grade of C or better) selected from ICS 10A, ICS 21, Informatics 43, Engineering ENGR10, or equivalent; satisfactory completion of the lower-division writing requirement. Same as Informatics 161.

132 Organizational Information Systems (4). Introduction to role of information systems in organizations, components and structure of organizational information systems, and techniques used in information systems analysis, design, and implementation. Prerequisite: ICS 131 or Informatics 161. Same as Informatics 162.

134 Computer-Supported Cooperative Work (4). Introduces concepts and principles of collaborative systems. Topics may include shared workspaces, group interaction, workflow, architectures, interaction between social and technical features of group work, and examples of collaborative systems used in real-world settings. Students develop a simple collaborative application. Prerequisites: ICS 23 or Informatics 43 with a grade of C or better; ICS 131 or Informatics 161. Same as Informatics 153.

135 Project in the Social and Organizational Impacts of Computing (4). Students undertake projects intended to gather and analyze data from situations in which computers are used, organize and conduct experiments intended to test hypotheses about impacts, and explore the application of concepts learned in previous courses. Prerequisite: ICS 132 or Informatics 162. Same as Informatics 163.

137 Electronic Publishing and Digital Archives (4). Analytical introduction to electronic publishing and accessing electronic documents through digital archives. Examines how these communication media link authors and readers via diverse mediating institutions and information technologies. Concrete activities may use the World Wide Web and HTML. Prerequisite: ICS 131.

139 Technical Writing and Communication Skills (4). Study and practice of critical and technical writing as it applies to the field of computer science. Each student writes essays of varying lengths, totaling at least 4,000 words. Prerequisite: satisfactory completion of the lower-division writing requirement; upper-division standing; Bren School of Information and Computer Sciences majors only.

141 Concepts in Programming Languages I (4). In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style. Prerequisites: ICS 23/CSE23 and ICS 51 or CSE31/EECS31 with grades of C or better. Same as CSE141.

142 Compilers and Interpreters (4). Introduction to the theory of programming language processors covering lexical analysis, syntax analysis, semantic analysis, intermediate representations, code generation, optimization, interpretation, and run-time support. Prerequisite: ICS 141/CSE141. Prerequisite for Computer Engineering majors only: EECS40. Same as CSE142.

143 Principles of Operating Systems (4). Principles and concepts of process and resource management, especially as seen in operating systems. Processes, memory management, protection, scheduling, file systems, and I/O systems are covered. Concepts illustrated in the context of several well-known systems. Prerequisites: ICS 23/CSE23, and ICS 51 or EECS31/CSE31 with grades of C or better. Same as CSE104. Only one course from ICS 143/CSE104 and EECS111 may be taken for credit.

144 High-Performance Computers and Program Optimization (4). Analyzes the relationship between computer architecture and program optimization. High-performance and parallelizing compilers for RISC, Superscalar, and VLIW architectures are discussed. Prerequisite: ICS 51 with a grade of C or better. Recommended: ICS 142.

145A Language Processor Construction (4). Project course which provides working laboratory experience with construction and behavior of compilers and interpreters. Students build actual language processors and perform experiments which reveal their behaviors. Prerequisite: ICS 142.

145B Project in Operating System Organization (4). Detailed specification and design of critical components of an actual operating system including a memory manager, a process server, and a file/IO subsystem. Hardware/software tradeoffs. Emphasis on logical organization of system and communication. Prerequisite: ICS 143.

148 Distributed Computing (4). Introduction to systems implemented within network-based computer architectures. Issues in distributed programming, operating systems, and applications. Specific topics covered include programming constructs, timing/coordination problems, data/service replication, transactions/concurrency control, fault-tolerance, recovery, file systems, security. Prerequisite: ICS 141. Recommended: ICS 153.

151 Digital Logic Design (4). Boolean algebra. Design/analysis of combinational and sequential systems using SSI/MSI/LSI modules. Number systems. Error detecting and correction codes. Arithmetic algorithms. Hardware/firmware implementation of algorithms. Prerequisites: ICS 23 and 51 with grades of C or better; Mathematics 6A or ICS 6A; Mathematics 6B.

152 Computer Systems Architecture (4). Design of computer elements: ALU, control unit, and arithmetic circuits. Memory hierarchy and organization. Caches. Function unit sharing and pipelining. I/O and interrupt processing. RTL and behavioral modeling using hardware description languages. Microprocessor organization and implementation techniques. Prerequisite: ICS 151. Only one course from ICS 152 and CSE132/EECS112 may be taken for credit.

153 Computer Networks (4). An introductory course on computer network architectures. Layering approach of communication protocols is introduced, and the function of each layer is explained. Various examples are shown from long-haul networks and local area networks to B-ISDN and high speed networks. Prerequisites: ICS 23 and 51 with grades of C or better; Mathematics 6A or ICS 6A; Mathematics 6B; Mathematics 6C or 3A.

155A Logic Design Laboratory (4). Introduction to standard integrated circuits: gates, flip-flops, shift registers, counters, latches. Construction and debugging techniques. Design of digital systems using LSI and MSI components. Practical use of circuits in a laboratory environment, including implementation of small digital systems such as arithmetic modules, displays, and timers. Prerequisites: ICS 151 or concurrent enrollment; satisfactory completion of the lower-division writing requirement.

155B Computer Design Laboratory (4). Design of basic computer components and small complete digital systems. Emphasis on practical use of Computer-Aided Design (CAD) tools, modeling of computer systems, and design practices in a laboratory environment. Prerequisite or corequisite: ICS 151.

156 Advanced Computer Networks (4). Fundamental principles in computer networks are applied to obtain practical experience and skills necessary for designing and implementing computer networks, protocols, and network applications. Various network design techniques, simulation techniques, and UNIX network programming are covered. Prerequisite: ICS 153 or equivalent, or consent of instructor.

158 Parallel Architectures and Algorithms (4). Parallel processing systems: emphasis on theory and application of arrays, trees, and hypercubes. Computational models and applications: sorting, integer arithmetic, matrix operations, fast Fourier transform, and others. Interconnection networks: framework for the description, analysis, and construction of hypercube-like interconnect. Prerequisite: ICS 152. ICS 161 recommended.

160E Engineering Data Structures and Algorithms (4). Design of efficient algorithms for practical data structures in engineering applications. Models of computation. NP-completeness. Prerequisite: EECS40. Same as EECS114.

161 Design and Analysis of Algorithms (4). Time and space complexity of algorithms. Models of computation, techniques for efficient algorithm design, effect of data structure choice on efficiency of an algorithm. Fast algorithms for problems such as sorting, set manipulation, graph problems, matrix multiplication, Fourier transforms, and pattern matching. NP-complete problems. Prerequisites: ICS 23/CSE23 and ICS 51 or CSE31/EECS31 with grades of C or better; Mathematics 6B; Mathematics 6C or 3A; Mathematics 2B; satisfactory completion of the lower division writing requirement. Same as CSE161.

162 Formal Languages and Automata (4). Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability; Turing machines, random access machines, undecidable problems, NP-completeness. Prerequisites: ICS 23 and 51 with grades of C or better; Mathematics 2A-B and Statistics 67/Mathematics 67; Mathematics 6A/ICS 6A; Mathematics 6B; Mathematics 6C or 3A. Same as Linguistics 102.

163 Graph Algorithms (4). Algorithms for solving fundamental problems in graph theory. Graph representations, graph traversal, network flow, connectivity, graph layout, matching problems. Prerequisite: ICS 161.

164 Principles of Computational Geometry (4). Algorithms and data structures for geometric computation and graphics programming. Fundamental problems of computational geometry such as convex hulls, Voronoi diagrams, Delaunay triangulations, polygon partitioning, arrangements, geometric searching, hidden surface elimination, motion planning. Prerequisite: ICS 161.

165 Project in Algorithms and Data Structures (4). Design, implementation, execution, and analysis of algorithms for problems such as sorting, searching, data compression, and data encryption. Time-space-structure trade-offs. Prerequisite: ICS 161.

168 Computer and Network Security (4). Overview of modern computer and networks security, attacks, and countermeasures. Authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Also covers secure e-commerce and applications of public key methods, digital certificates, and credentials. Prerequisites: ICS 6A, 23, and 143. Both ICS 153 and 161 are recommended.

171 Introduction to Artificial Intelligence (4). Different means of representing knowledge and uses of representations in heuristic problem solving. Representations considered include predicate logic, semantic nets, procedural representations, natural language grammars, and search trees. Prerequisites: ICS 52 with a grade of C or better; Mathematics 2A-B and Statistics 67/Mathematics 67.

172 Programming Techniques in Artificial Intelligence (4). The study of methods for implementing artificial intelligence programs in high-level languages. Exercises on implementation of data structures for representing rules, frames, grammars, networks, and algorithms for search, inference, language processing, and learning. Prerequisite: ICS 171.

173 Neural Networks (4). An introduction to the rapidly growing field of neural networks, i.e., algorithms derived from brain circuitry. Models covered include the Hopfield model, delta rule, perceptrons, backpropagation, competitive learning. Mathematical analysis, applications, and biological bases of neural network algorithms. Prerequisites: ICS 52 with a grade of C or better; Mathematics 2A-B and Statistics 67/Mathematics 67; Mathematics 6C or 3A.

174 Bioinformatics (4). Introduces fundamental problems in biology that lend themselves to computational approaches. The lectures present the necessary biological background to understand the importance of the problem and the data available for algorithmic analysis. Prerequisites: ICS 21, 22, and 23; ICS 171 with a grade of C or better.

175A Project in Artificial Intelligence (4). Construction of a working artificial intelligence system. Evaluation of capabilities of the system including impact of knowledge representation. Prerequisite: ICS 171.

175B Introduction to Expert Systems (4). Introduction to the methodology of design and implementation of expert systems. Laboratory work uses expert system shells to construct knowledge-based systems. Emphasis on techniques for representing and organizing domain and control knowledge as opposed to the theory and implementation of inference engines. Prerequisite: ICS 171.

177 Information Retrieval (4). An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multimedia documents. Prerequisites: ICS 23 or Informatics 43; Statistics 7/Mathematics 7 or Statistics 67/Mathematics 67.

178 Applications of Probability in Computer Science (4). Application of probability to real-world problems in computer science. Typical topics include analysis of algorithms and graphs, probabilistic language models, network traffic modeling, data compression, and reliability modeling. Prerequisites: Mathematics 2A-B and Statistics 67/Mathematics 67; ICS 6A/Mathematics 6A; Mathematics 6B; and either Mathematics 6C or 3A.

180 Special Topics in Information and Computer Science (4). May be repeated for credit if title or topic varies. Prerequisites vary.

181 Digital Image Processing (4). Introduction to the fundamental concepts of digital signal and image processing as applicable in areas such as multimedia, graphics, AI, data mining, databases, vision, or video games. Topics include image representation, space- and frequency-domain transformations, filters, segmentation, and compression. Prerequisites: ICS 23/CSE23, ICS 6A/Mathematics 6A, and Mathematics 6C or 3A with grades of C or better. ICS 181 and EECS107 may not both be taken for credit.

183 Computer Graphics (4). Introduction to the fundamental principles of 3D computer graphics including polygonal modeling, geometric transformations, visibility algorithms, illumination models, texturing, and rasterization. Use of an independently-learned 3D graphics API to implement these techniques. Prerequisite: ICS 52 with a grade of C or better. Formerly ICS 186A.

184 Introduction to Data Management (4). Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and Structured Query Language (SQL) programming. Prerequisites: ICS 52 or Informatics 43, either with a grade of C or better (for ICS or Informatics majors); ICS 23 or EECS114, either with a grade of C or better (for Computer Engineering majors). Same as EECS116.

185 Project in Database Management (4). Introduces students to advanced database technologies. Students gain experience in programming complex applications using database management systems. Topics include object-oriented and object-related technologies, XML, and Internet databases. Prerequisite: ICS 184.

187 Computer Game Development (4). Introduction to the principles of interactive two- and three-dimensional computer game development. Concepts in computer graphics, algorithms, software engineering, art and graphics, music and sound, story analysis, and artificial intelligence are presented and are the basis for student work. Prerequisites: ICS 183, and ICS 121 or 161 or 171; or Music 151; or Studio Art 106; or consent of instructor.

188 Projects in Advanced 3D Computer Graphics (4). Projects in advanced 3D graphics such as illumination, geometric modeling, visualization, and animation. Topics may include physically based and global illumination, solid modeling, curved surfaces, multiresolution modeling, image-based rendering, basic concepts of animation, and scientific visualization. Prerequisite: ICS 183 or equivalent; recommended: ICS 161, 164, 165. Formerly ICS 186B.

196 Tutoring in ICS (1 to 4). Offers opportunities to tutor both on an individual, as needed basis and as part of regularly scheduled courses. Specific tutoring assignments depend on the courses with which the student is working, as determined by the instructor in charge. In most cases includes time in individual tutoring and a term paper or project. May be taken for credit for a total of eight units. Pass/Not Pass only.

H197 Honors Seminar (2). An overview of computer science and selected recent trends in research. Students attend talks on current faculty research, with opportunities for discussion. Prerequisite: participation in the ICS Honors Program or Campuswide Honors Program. Pass/Not Pass only. Formerly ICS 197.

H198 Honors Research (4). Directed independent research in computer science for honors students. Prerequisites: ICS H197; upper-division standing and satisfactory completion of the lower-division writing requirement; participation in the ICS Honors Program or Campuswide Honors Program; consent of instructor.

199 Individual Study (2 to 5)

DEPARTMENT OF COMPUTER SCIENCE

360 Computer Science Building, (949) 824-4478
Lubomir Bic, **Department Co-Chair,** Computer Systems Division
David Eppstein, **Department Co-Chair,** Computing Division

Computer Systems Division Faculty

Nader Bagherzadeh: Parallel processing, computer architecture, computer graphics, VLSI design
Lichun Bao: Protocol design and performance evaluation of wireless and mobile communication networks
Lubomir Bic: Parallel and distributed computing, mobile agents
Elaheh Bozorgzadeh: Design automation and synthesis for embedded systems, VLSI CAD, and reconfigurable computing
Pai Chou: Hardware/software co-design, embedded systems, component-based design, specification methodology, interface synthesis, real-time systems
Nikil Dutt: Design modeling, languages and synthesis, CAD tools, computer architecture
Magda El Zarki: Telecommunications, networks, wireless communication, video transmission
Michael Franz: Programming languages and their implementation; extensible systems; software architectures, component-ware and portable software that migrates across computer networks
Daniel Gajski: Computer and information systems, software/hardware codesign, algorithms and methodologies for embedded systems, CAD environments, science of design
Jean-Luc Gaudiot: Parallel processing, computer architecture, processor architecture
Tony Givargis: Embedded systems, platform-based system-on-a-chip design, low-power electronics
Ian Harris: Hardware/software covalidation, manufacturing test
Ramesh C. Jain: Computer vision, media information systems, experimental environments
Stephen F. Jenks: Parallel and distributed processing, multithreading, embedded systems
Scott Jordan: Modeling and analysis of behavior, control, and pricing in computer/telecommunication networks
David G. Kay: Computer law, computer science education
Alfred Kobsa: User modeling, human-computer interaction, artificial intelligence, cognitive science, interdisciplinary computer science
Fadi Kurdahi: VLSI system design, design automation of digital systems
Chen Li: Database systems, data integration, multimedia information systems, Web-based database systems, semi-structured data systems
Aditi Majumder: Computer graphics and visualization, large area displays, human-computer interaction
Sharad Mehrotra: Multimedia information systems, multidimensional databases, uncertainty processing in databases, data structures, information retrieval, distributed databases, workflow automation
Alexandru Nicolau: Architecture, parallel computation, and programming languages and compilers
Renato Pajarola: 3D computer graphics, scientific visualization, real-time rendering, image-based rendering, remote visualization, geometry and image compression
Isaac Scherson: Parallel computing architectures, massively parallel systems, parallel algorithms, complexity, orthogonal multiprocessing systems
Tatsuya Suda: Computer networks; distributed systems; performance evaluation
Gene Tsudik: Security and cryptography, networks and operating systems
Alexander Veidenbaum: Computer architecture, interconnection networks, compilers, embedded systems
Nalini Venkatasubramanian: Parallel and distributed systems, multimedia servers and applications, internetworking, high-performance architectures, resource management
Xiaowei Yang: Networks, distributed systems, protocol design, performance analysis, and security

Computing Division Faculty

James Arvo: Computer graphics, global illumination, human-computer interaction
Pierre Baldi: Bioinformatics, machine learning
Rina Dechter: Complexity of automated reasoning models, constraint-based reasoning, distributed connectionist models, causal models, probabilistic reasoning
Michael Dillencourt: Computational geometry, analysis of algorithms, data structures
Paul Dourish: Human-computer interaction, computer-supported cooperative work
David Eppstein: Analysis of algorithms, computational geometry, graph theory
Michael Goodrich: Computer security, algorithm design, data structures, Internet algorithmics, geometric computing, graphic drawing
Richard Granger: Computational and cognitive neuroscience
Wayne Hayes: High-performance scientific computing, dynamical systems and chaos, applied mathematics, graph theory, optimization
Daniel Hirschberg: Analysis of algorithms; concrete complexity; data structures; models of computation
Sandra Irani: Analysis of algorithms; online algorithms; graph theory and combinatorics
Stanislaw Jarecki: Cryptography, security, fault-tolerant distributed computing
Dennis Kibler: Machine learning, genomic analysis
Richard Lathrop: Modeling structure and function, machine learning, intelligent systems and molecular biology, protein structure/function prediction
George Lueker: Computational complexity; probabilistic analysis of algorithms; data structures
Gopi Meenakshisundaram: Geometry and topology for computer graphics, image-based rendering, object representation, surface reconstruction, collision detection, virtual reality, telepresence
Eric Mjolness: Neural networks, computational biology, bioinformatics, artificial intelligence, machine learning
Michael Pazzani: Human and machine learning, natural language understanding, cognitive science
Amelia Regan: Operations research, network optimization, data mining
Alice Silverberg: Theory of abelian varieties, application of arithmetic algebraic geometry to cryptography
Padhraic Smyth: Statistical pattern recognition, automated analysis of large data sets, applications of probability and statistics to problems in artificial intelligence
Max Welling: Statistical machine learning and probablistic inference with applications to pattern recognition and computer vision
Hong-Kai Zhao: Computational applied mathematics

The Systems Division faculty in the Department of Computer Science also contribute to the following concentration in the ICS graduate program: Systems. The Computing Division faculty in the Department of Computer Science also contribute to the following concentrations in the ICS graduate program: Algorithms and Data Structures, Artificial Intelligence, and Informatics in Biology and Medicine.

Undergraduate Major in Computer Science

The undergraduate major in Computer Science provides a solid foundation in computer science, focusing especially on algorithms and data structures, programming languages and compilers, operating systems, and digital logic and computer architecture. This can serve as preparation for either graduate study or a career in industry.

Admissions: See page 315.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN COMPUTER SCIENCE

University Requirements: See pages 56–60.

Major Requirements

Lower-division (some or all of the items listed in A and B are prerequisites for required upper-division ICS courses):

A. Mathematics 6A/ICS 6A, Mathematics 6B, Mathematics 6C or 3A, Mathematics 2A-B, Statistics 67/Mathematics 67, Philosophy 29 or 30 or Mathematics 13.

B. ICS 21, 22, 23, 51, 52.

C. A three-quarter science sequence chosen from Physics 3A-B-C and 3LB-LC; Physics 7A-B and 7D or 7E, with corresponding laboratories where available; Chemistry 1A-B-C and 1LB-LC; or two from Biological Sciences 94, 97, and E106, *and* completion of Biological Sciences 100L (Biological Sciences 194S is a prerequisite for this course).

Upper-division:

A. ICS 139.

B. ICS 141, 142, 143, 151, 152, 153, 161, 162 or 163, 171.

C. Three project courses selected from the following list: ICS 145A, 145B, 155A, 155B, 156, 165, 175A, 185, 187, 188.

D. Two additional upper-division ICS courses.

No course may be counted toward more than one of the above categories.

CS majors must enroll in ICS 161 no later than the second quarter after they have earned 90 units.

Major and minor restrictions: See page 314.

Undergraduate Major in Computer Science and Engineering

Program Educational Objectives: Graduates of the program will have (1) received a broad fundamental training in the areas of computer science, engineering, mathematics, physical science, and statistics that will serve as the foundation for future professional development; (2) covered in sufficient depth those fundamental areas required to research, develop, and evaluate complex hardware/software systems; (3) gained awareness of contemporary issues in computer science and engineering in a global and societal context and an understanding of the professional and ethical responsibilities of their profession; (4) acquired a skill for effective communication in oral and written forms and responsible multidisciplinary teamwork, to prepare students for a diversified working environment and for lifelong learning. (Program educational objectives are those aspects of computer science and engineering that help shape the curriculum; achievement of these objectives is a shared responsibility between the student and UCI.)

This program is designed to provide students with the fundamentals of computer science, both hardware and software, and the application of engineering concepts, techniques, and methods to both computer systems engineering and software system design. The program gives students access to multidisciplinary problems in engineering with a focus on total systems engineering. Students learn the computer science principles that are critical to development of software, hardware, and networking of computer systems. From that background, engineering concepts and methods are added to give students exposure to circuit design, network design, and digital signal processing. Elements of engineering practice include systems view, manufacturing and economic issues, and multidisciplinary engineering applications. The program is administered jointly by the Department of Electrical Engineering and Computer Science and the Donald Bren School of Information and Computer Sciences.

Career Paths. Most likely careers will involve building the hardware infrastructure—computers, networks, embedded devices, as well as operating systems, compilers, and networking software. The focus is on cooperation between hardware and software to yield the highest performance. Examples of such problem areas would be in traffic management, flight control, earthquake monitoring, automotive control, and smart homes.

ADMISSIONS

High School Students: Students must have completed four years of mathematics through pre-calculus or math analysis and are advised to have completed one year each of chemistry and physics. One semester of programming course work is also advised. That preparation, along with honors courses and advanced placement courses, is fundamental to success in the program.

Beginning with the class of 2006, UCI requires applicants to take two SAT Subject Tests, selected from two different subject areas, for example, science and history/social studies, or literature and language. If one of the selected subject areas is mathematics, applicants must take Math Level 2. Also, The Henry Samueli School of Engineering recommends that freshmen applicants in Engineering majors take the SAT Subject Test, Math Level 2, as one of the two required SAT Subject areas.

Transfer Students. Students are encouraged to complete as many of the lower-division degree requirements as possible prior to transfer, including one year of calculus, one year of engineering physics (with laboratory) including electromagnetism, one year of Java programming, and one additional approved course for the major. Students who enroll at UCI in need of completing lower-division course work may find that it will take longer than two years to complete their degrees. For further information, contact the Donald Bren School of Information and Computer Sciences at (949) 824-5156. NOTE: The major in Computer Science and Engineering will be available to transfer students effective fall 2006.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN COMPUTER SCIENCE AND ENGINEERING

University Requirements: See pages 56–60.

Major Requirements:

Mathematics and Basic Science Courses:

Mathematics Courses: Students must complete a minimum of 32 units of mathematics including Mathematics 2A-B, 2D, 2J, 6A-B, 6C or 3A, and 67.

Basic Science Courses: Students must complete a minimum of 18 units of basic science courses including Physics 7A-B-D and 7LA-LB-LD.

Students select, with the approval of a faculty advisor, one additional basic science course needed to satisfy school and department requirements.

Engineering and Computer Topics Courses:

Students must complete a minimum of 72 units of *engineering topics,* which includes 24 units of engineering design, and a minimum of 60 units of *computer topics,* which includes 36 units of upper-division computer topics. The following courses must be completed:

CSE21, CSE22, CSE23, CSE25, CSE31, CSE31L, CSE70A, CSE90, CSE104, CSE112, CSE120A, CSE121, CSE132, CSE135A, CSE135B, CSE141, CSE142, CSE151, CSE161, CSE181A-B-C, ICS 183 or,EECS104, EECS148 or ICS 153.

Students select, with the approval of a faculty advisor, any additional engineering and computer topics courses needed to satisfy school and department requirements.

Tracks: Students must complete one of the tracks listed below.

Algorithms: Students complete ICS 163, ICS 164.

Artificial Intelligence: Students complete ICS 171 and one course from ICS 172, ICS 173, ICS 175A or 175B.

Embedded Systems: Students complete ICS 53, ICS 53L.

Parallel Computing: Students complete EECS117, ICS 158.

(The nominal Computer Science and Engineering program will require 190 units of courses to satisfy all university and major requirements. Because each student comes to UCI with a different level of preparation, the actual number of units will vary).

NOTE: Students majoring in Computer Science and Engineering may not complete the major in Computer Engineering, the major in Computer Science, the major or minor in Information and Computer Science, or the minor in Informatics.

Sample Program of Study — Computer Science and Engineering

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
CSE21	CSE22	Breadth
	CSE25	Breadth
Sophomore		
Mathematics 6A	Mathematics 6B	Mathematics 6C or 3A
Mathematics 2J	CSE23	Science Elective
CSE31	CSE31L	CSE70A
Breadth	CSE90	Breadth
	Breadth	
Junior		
CSE112	CSE104	EECS148 or ICS 153
CSE121	CSE132	CSE120A
CSE161	Mathematics 67	Breadth
Breadth	Breadth	Breadth
Senior		
CSE181A	CSE181B	CSE181C
CSE135A	CSE141	CSE142
CSE151	CSE135B	Breadth
ICS 183 or EECS104	Track	Track

Courses in Computer Science and Engineering

LOWER-DIVISION

CSE21 Introduction to Computer Science I (6). First of a three-quarter introductory course. Introduces fundamental concepts related to computer software design and construction. Develops initial design and programming skills using a high-level programming language (primarily C++/Java). Introduces useful computer-based tools for analysis, expression, discovery. Same as ICS 21. Only one course from CSE21/ICS 21 and ICS H21 may be taken for credit. (V)

CSE22 Introduction to Computer Science II (6). Second of a three-quarter introductory sequence. Abstract behavior of classic data structures (stacks, queues, priority queues, tables, trees), alternative implementations, analysis of time and space efficiency. Recursion. Object-oriented and functional programming. Models of computation. Prerequisite: CSE21/ICS 21 with a grade of C or better. Same as ICS 22. Only one course from CSE22/ICS 22, ICS H22, or Informatics 42 may be taken for credit. (V)

CSE23 Fundamental Data Structures (4). Focuses on implementation and mathematical analysis of fundamental data structures and algorithms. Covers storage allocation and memory management techniques. Prerequisites: CSE22/ICS 22 with a grade of C or better or EECS40; Mathematics 6A or ICS 6A. Same as ICS 23. Only one course from CSE23/ICS 23 and ICS H23 may be taken for credit. (V)

CSE25 Computing Tools for Computer Science and Engineering (2). Introduces computer-based mathematical and engineering tool usage and the C programming language. Prerequisites: CSE21/ICS 21 and Mathematics 2A.

CSE31 Introduction to Digital Systems (4) F, Summer. Digital representation of information. Specifications of combinational and sequential systems. Analysis and design of networks of gates and flip flops. Standard modules and their use. Introduction to algorithmic systems: datapath and control. Prerequisite: CSE21/ICS 21, EECS10, or MAE10. Same as EECS31. (Design units: 2)

CSE31L Introduction to Digital Logic Laboratory (3) W. Introduction to common digital building blocks: gates, memory circuits, MSI components. Operating characteristics, specifications, and applications. Design of simple combinational and sequential digital systems (processors state machines). Construction and debugging techniques, using hardware description languages and CAD tools. Corequisite: CSE31/EECS31. Prerequisites: CSE31/EECS31; EECS10 or EECS 12 or CSE22/ICS 22. Same as EECS31L. Formerly CSE31LB. (Design units: 3)

CSE70A Network Analysis I (4) W, Summer. Modeling and analysis of electronic networks. Basic network theorems. Sinusoidal steady state and transient analysis of RLC networks and the impedance concept. Corequisite: Mathematics 2J or 3D. Prerequisites: Physics 7D; CSE21/ICS 21, EECS10, or MAE10. Same as EECS70A. (Design units: 1)

CSE90 Systems Engineering and Technical Communications (2). Introduces systems engineering concepts, including specifications and requirements, hardware and software design, integration, testing, and documentation. Emphasizes organization and writing of reports and effective presentations.

UPPER-DIVISION

CSE104 Principles of Operating Systems (4). Principles and concepts of process and resource management, especially as seen in operating systems. Processes, memory management, protection, scheduling, file systems, and I/O systems are covered. Concepts illustrated in the context of several well-known systems. Prerequisites: CSE23/ICS 23, and ICS 51 or CSE31/EECS31 with grades of C or better. Same as ICS 143. Only one course from CSE104/ICS 143 and EECS111 may be taken for credit.

CSE112 Electronic Devices and Circuits (4). Semiconductor properties, carrier transport, P-N junctions, metal-semiconductor junctions, diodes, MOS transistors, transistor equivalent circuits, amplifiers, invertors, digital circuits, CMOS circuits, and logic gates. Prerequisites: Physics 7D, CSE70A/EECS70A. (Design units: 1)

CSE120A Discrete-Time Signals and Systems (4) W. Analysis of discrete-time linear-time-invariant (DTLTI) systems in the time domain and using z-transforms. Introduction to techniques based on Discrete-Time, Discrete, and Fast Fourier Transforms. Examples of their application to digital signal processing and digital communications. Prerequisite: CSE70A/EECS70A. Same as EECS150B. CSE120A/EECS150B and EECSH150B may not both be taken for credit. (Design units: 0)

CSE121 Software Tools and Methods (4). Concepts and techniques of constructing software in a systematic fashion, including detailed design techniques, specifications, programming methods, quality-inducing procedures, development tools, team techniques, testing, estimation, and performance improvement. Laboratory work involves exercises to illustrate important concepts, methods, and tools. Prerequisites: CSE90 or ICS 52 with a grade of C or better; Mathematics 6A or ICS 6A; Mathematics 6B; Mathematics 6C or 3A; or Informatics 43 with a grade of C or better; and satisfactory completion of the lower-division writing requirement. Same as ICS 121 and Informatics 111.

CSE132 Organization of Digital Computers (4) W. Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/out devices and interfaces. Microprogramming and microprocessors. Prerequisite: CSE31L/EECS31L. Same as EECS112. Only one course from CSE132/EECS112, CSEH132/EECSH112, and ICS 152 may be taken for credit. (Design units: 4)

CSEH132 Honors Organization of Digital Computers (4) W. Building blocks and organization of digital computers, the arithmetic, control, and memory units, and input/out devices and interfaces, including advanced microarchitecture topics such as: pipelining, superscalar, multithreading, reconfigurable and microprocessor design. Prerequisite: CSE31L/EECS31L. Same as EECSH112. Only one course from CSEH132/EECSH112, CSE132/EECS112, and ICS 152 may be taken for credit. (Design units: 4)

CSE135A Digital Signal Processing (3) F. Nature of sampled data, sampling theorem, difference equations, data holds, z-transform, w-transform, digital filters, Butterworth and Chebychev filters, quantization effects. Prerequisite: CSE120A/EECS150B. Same as EECS152A. (Design units: 2)

CSE135B Digital Signal Processing Design and Laboratory (3) W. Students plan and perform 10 core laboratory exercises covering signal synthesis and analysis with various filter and frequency transform processes. Models of radio and radar/sonar signal processing are included. Prerequisite: CSE135A/EECS152A. Same as EECS152B. (Design units: 3)

CSE141 Concepts in Programming Languages I (4). In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style. Prerequisites: CSE23/ICS 23 and CSE31/EECS31 or ICS 51 with grades of C or better. Same as ICS 141.

CSE142 Compilers and Interpreters (4). Introduction to the theory of programming language processors covering lexical analysis, syntax analysis, semantic analysis, intermediate representations, code generation, optimization, interpretation, and run-time support. Prerequisite: CSE141/ICS 141. Prerequisite for Computer Engineering majors only: EECS40. Same as ICS 142.

CSE151 Introduction to VLSI (4) F. A first course in the design of Very Large Scale Integrated (VLSI) systems and chips. Review of CMOS VLSI technology. Analysis and synthesis of basic and complex CMOS gates. Introduction to CAD methodology and usage of CAD Tools. Prerequisite: CSE132/EECS112. Same as EECS115. (Design units: 4)

CSE161 Design and Analysis of Algorithms (4). Time and space complexity of algorithms. Models of computation, techniques for efficient algorithm design, effect of data structure choice on efficiency of an algorithm. Fast algorithms for problems such as sorting, set manipulation, graph problems, matrix multiplication, Fourier transforms, and pattern matching. NP-complete problems. Prerequisites: CSE23/ICS 23, and CSE31/EECS31 or ICS 51 with grades of C or better; Mathematics 6B; Mathematics 6C or 3A; Mathematics 2B; satisfactory completion of the lower division writing requirement. Same as ICS 161.

CSE181A-B Senior Design Project (3-3). Teaches problem definition, detailed design, integration and testability with teams of students specifying, designing, building, and testing complex systems. Lectures include engineering values, discussions, and ethical ramifications of engineering decisions. Corequisite: CSE135A/EECS152A. Prerequisite: CSE104/ICS 143. (Design units: 3-3)

CSE181C Senior Design Project (3). Completion, documentation, and presentation of projects started in CSE181A-B. Teaches engineering documentation writing and presentation skills. Students write comprehensive project reports individually and participate in a public presentation of the project's results. Prerequisites: CSE181A-B and satisfactory completion of the lower-division writing requirement.

DEPARTMENT OF INFORMATICS

221 Computer Science II Building; (949) 824-2901
David F. Redmiles, **Department Chair**

Faculty

Thomas Alspaugh: Software development, requirements engineering
Christopher Dobrian: Electronic music, composition
Paul Dourish: Human-computer interaction, computer-supported cooperative work
Magda El Zarki: Telecommunications, networks, wireless communication, video transmission
Tony Givargis: Embedded systems, platform-based system-on-a-chip design, low-power electronics
Vijay Gurbaxani: Economics of information systems management, impact of information technology on organization and market structure
David G. Kay: Computer law, computer science education
K. H. (Kane) Kim: Distributed real-time computer systems, fault-tolerant computer systems, real-time learning systems
Alfred Kobsa: User modeling, human-computer interaction, artificial intelligence, cognitive science, interdisciplinary computer science
Kenneth L. Kraemer: Economics and management of computing; organizational and social impacts of computing; information technology and public policy; management information systems/decision support systems
Cristina Videira Lopes: Programming languages, acoustic communications, operating systems, software engineering
Gloria Mark: Computer-supported cooperative work, human-computer interaction
Bonnie Nardi: Computer-supported collaborative work, human-computer interaction, computer-mediated communication, user studies methods, activity theory, cultural responses to technology development
Robert Nideffer: Electronic intermedia, interface theory and design, technology and culture, contemporary social theory
Michael Pazzani: Human and machine learning, natural language understanding, cognitive science
Simon Penny: Robotic sculpture, interactive environments, electronic media, art practice history, and critical theory
David F. Redmiles: Design environments, human-computer interaction, usability engineering, knowledge-based support
Debra J. Richardson: Software engineering; program testing; life-cycle validation; software environments
Susan E. Sim: Software engineering, research methodology, program comprehension
Richard Taylor: Software engineering, user interfaces, environments, team support
Bill Tomlinson: Autonomous characters, computational social behavior, interactive media, real-time animation
Andre van der Hoek: Software engineering
Alladi Venkatesh: Social impacts of information technology, Internet and the New Economy, Smart Home technologies, children and multimedia
Mark Warschauer: Language, literacy, technology

The faculty in the Department of Informatics also contribute to the following concentrations in the ICS graduate program: Software track, Interactive and Collaborative Technology track, and Informatics in Biology and Medicine.

Informatics is the interdisciplinary study of the design, application, use, and impact of information technology. It goes beyond technical design, to focus on the relationship between information system design and use in real-world settings. These investigations lead to new forms of system architecture, new approaches to system design and development, new means of information system implementation and deployment, and new models of interaction between technology and social, cultural, and organizational settings.

Undergraduate Major in Informatics

Within the overall discipline of information and computer science, the Informatics major is the most outward looking. Traditional computer science concerns itself primarily with the internal features, structure, and behavior of computer systems; the Informatics major focuses more on the relationship between what is inside the computer and what is outside. So, courses in the Informatics major study software architecture; software development, design, and analysis; programming languages; ubiquitous computing; information retrieval and management; human-computer interaction; computer-supported cooperative work; and other topics that address the relationship between information technology design and use in social and organizational settings. As such, the Informatics major addresses the broad set of issues surrounding design, ranging from initial requirements gathering to estimating and measuring the impact of alternative solutions—all from a multidisciplinary perspective that includes computer science, information science, organizational science, social science, and cognitive science.

Courses in the degree program are carefully designed to offer extensive treatment of the conceptual underpinnings of the discipline and provide in-depth practical experiences, often performed on real-world examples and involving outside organizations sponsoring the project. Students completing the major will be exceptionally suited for advanced careers in information technology or for further study at the graduate level. Specific careers include, but certainly are not limited to: software engineer; software architect; system, software, and information analyst; system, software, and information designer; project manager; and interface and interaction designer. Career choices include new start-ups, multinational corporations, small software houses, consultancy, and game companies. More information is available at http://www.ics.uci.edu/informatics/ugrad.

ADMISSIONS

Freshmen Applicants. See page 315.

Transfer Students. Admission to the Informatics major for transfer students will be available fall 2006. Students transferring into the major must satisfy the following requirements:

1. Completion of 60 transferable semester units prior to the start of the intended quarter.
2. Completion of one year of college mathematics. Courses equivalent to ICS 6A/Mathematics 6A (discrete mathematics), Statistics 7/Mathematics 7 or Statistics 67/Mathematics 67, and Philosophy 29 or Philosophy 30 or Mathematics 13 (symbolic logic) are preferred as this facilitates scheduling after transfer to UCI. A semester of pre-calculus and a semester of calculus are not sufficient to satisfy this requirement.
3. Completion of one year of computer science courses. The course work must contain at least one UC-transferable programming course involving the concepts of object-oriented programming in such languages as C++, Java, Smalltalk, or Eiffel, or functional programming in such languages as Scheme, Lisp, or ML. Programming-only courses in Basic, Fortran, Cobol, Pascal, or C are not acceptable. It is strongly recommended that students select UC-transferable courses that do not focus strictly on learning a programming language but instead focus on topics such as software design, software engineering, human-computer interaction, programming language concepts, data structures, and algorithms, if such courses are available.

   Additional courses beyond the one UC-transferable programming course required for admission are strongly recommended. Transfer students must enter UCI with knowledge of Java since it is used in many of the lower-division Informatics requirements and serves as a foundation for upper-division programming-related courses.

   Courses equivalent to Informatics 41, 42, 43 are strongly preferred, although courses equivalent to ICS 21, 22, 52 are acceptable as alternatives.
4. Completion of at least one year of college-level courses in English composition, academic writing, research writing, or technical writing. Students should have strong reading and writing skills and facility with quantitative reasoning and critical, logical thinking. Courses in design would also be beneficial, though not required.

More information available at http://www.ics.uci.edu/informatics/ugrad/ or the ICS Student Affairs Office; telephone (949) 824-5156; e-mail: ucounsel@uci.edu.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN INFORMATICS

University Requirements: See pages 56–60.

Major Requirements

Lower-division:

A. Introductory courses: Informatics 41, 42, 43, 44.

B. ICS 23.

C. ICS 6A/Mathematics 6A, Statistics 7/Mathematics 7 or Statistics 67/Mathematics 67, Philosophy 29 or 30 or Mathematics 13.

Upper-division:

A. Intermediate Informatics courses: Informatics 102, 111, 113, 115, 121, 131, 132.

B. ICS 141, 177, 184, 185.

C. Advanced Informatics courses: Informatics 122, 123, 143, 151, 153, 161, 162, 163, 191A, 191B, 191C.

Major and minor restrictions: See page 314.

Sample Program of Study — Informatics

FALL	WINTER	SPRING
Freshman		
Informatics 41	Informatics 42	Informatics 43
Writing	Writing	Breadth
Philosophy 29 or 30, or Math 13	ICS 6A/Math 6A	ICS 23
		Informatics 44
Sophomore		
Statistics 7 or 67	Informatics 131	Informatics 132
ICS 141	Informatics 102	Informatics 121
Breadth	Breadth	Breadth
Informatics 111	Informatics 113	Informatics 115
Junior		
Informatics 161	Informatics 162	Informatics 163
Informatics 122	Informatics 123	ICS 184
Breadth	Breadth	Breadth
Breadth/Elective	Breadth/Elective	Breadth/Elective
Senior		
Informatics 191A	Informatics 191B	Informatics 191C
Informatics 151	Informatics 153	Breadth
ICS 185	ICS 177	Informatics 143
Breadth/Elective	Breadth/Elective	Breadth/Elective

Minor in Informatics

The minor provides a focused study of Informatics to supplement a student's major program of study and prepares students for a profession, career, or academic pursuit in which information and software design is an integral part but is not the primary focus. The minor allows students sufficient flexibility to pursue courses that complement their major field or address specific interests. The minor particularly centers on understanding the relationships among computers and people, and how these relationships must be addressed in information and software design. Alternatively put, Informatics designs solutions in context, and takes into account the social, cultural, and organizational settings in which computing and information technology will be used.

Requirements for the Minor: Informatics 41, 42, 43, 44, 111, and 131; and at least one of the following pairs of courses: ICS 141 and Informatics 102, Informatics 113 and 115, Informatics 151 and 153, Informatics 161 and 162, Informatics 132 and 143, ICS 184 and 185.

Before enrolling in any course for the Informatics minor, students should ensure that they meet its prerequisites. See the course prerequisites listed in the *Catalogue* or on the Informatics Web site at http://www.ics.uci.edu/informatics/ugrad/.

NOTE: A maximum of two courses can be taken Pass/Not Pass to satisfy the minor in Informatics. Students majoring in Information and Computer Science, Computer Science, or Computer Science and Engineering cannot minor in Informatics. Students who are considering a major in Informatics must complete the Informatics courses with a letter grade.

Courses in Informatics

LOWER-DIVISION

41 Informatics Core Course I (6). Fundamental concepts of computer software design and construction. Data, algorithms, functions, and abstractions. Overview of computer systems: data representation, architectural components, operating systems, networks. Introduction to information systems: parties involved, architectural alternatives, usability, organizational and social concerns. May not be taken for credit after ICS 22. (V)

42 Informatics Core Course II (6). Alternative data structure implementations; analysis of time and space efficiency. Object-oriented programming concepts and techniques: classes, objects, inheritance, interfaces. Formal languages and automata. Problem modeling and design tradeoffs. Prerequisite: Informatics 41 with a grade of C or better. Only one course from Informatics 42, ICS 22/CSE22, or ICS H22 may be taken for credit. May not be taken for credit after ICS 21. (V)

43 Informatics Core Course III (6). Concepts, methods, and current practice of software engineering. Large-scale software production, software life cycle models, principles and techniques for each stage of development. Laboratory project applying these concepts. Prerequisite: Informatics 42 with a grade of C or better. Informatics 43 and ICS 52 may not both be taken for credit.

44 Seminar in Informatics Research Topics (2). Introduction to current research topics in Informatics. Various faculty members present current research and relate it to the course content of the Informatics degree program.

UPPER-DIVISION

102 Concepts of Programming Languages II (4). In-depth study of major programming paradigms: imperative, functional, declarative, object-oriented, and aspect-oriented. Understanding the role of programming languages in software development and the suitability of languages in context. Domain-specific languages. Designing new languages for better software development support. Prerequisite: ICS 141 with a grade of C or better.

111 Software Tools and Methods (4). Concepts and techniques of constructing software in a systematic fashion, including detailed design techniques, specifications, programming methods, quality-inducing procedures, development tools, team techniques, testing, estimation, and performance improvement. Laboratory work involves exercises to illustrate important concepts, methods, and tools. Prerequisite: Informatics 43 with a grade of C or better or the following: ICS 52 or CSE90 with a grade of C or better; Mathematics 6A or ICS 6A; Mathematics 6B; Mathematics 6C or 3A; and satisfactory completion of the lower-division writing requirement. Same as CSE121 and ICS 121.

113 Requirements Analysis and Engineering (4). Aims to equip students to develop techniques of software-intensive systems through successful requirements analysis techniques and requirements engineering. Students learn systematic process of developing requirements through co-operative problem analysis, representation, and validation. Prerequisites: Informatics 111/ICS 121; ICS 6A/Mathematics 6A; Statistics 7/Mathematics 7 or Statistics 67/Mathematics 67. Same as ICS 102.

115 Software Specification and Quality Engineering (4). Aims to prepare students to develop high-quality software through successful specification and quality engineering techniques. Students learn what high-quality means, how to plan for and achieve it, and how to measure it. Prerequisites: ICS 6A/Mathematics 6A; Statistics 7/Mathematics 7 or Statistics 67/Mathematics 67; either Mathematics 6B or 13 or Philosophy 29 or 30; Informatics 111/ICS 121. Same as ICS 122.

121 Software Design I (4). Introduction to software design principles, paradigms, tools, and techniques. Topics include alternative architectural styles, iterative refinement, design patterns, mapping design onto code, design tools, and design notations. Includes extensive practice in creating designs and study of existing designs. Prerequisite: Informatics 102 with a grade of C or better.

122 Software Design II (4). Introduction to advanced software design principles, paradigms, and techniques. Topics include large-scale design, software reuse, product-line architectures, design recovery, refactoring, application frameworks, real-time systems, design-for-context. Case studies of existing designs and extensive practice with real-world designs. Prerequisite: Informatics 121.

123 Software Architectures, Distributed Systems, and Interoperability (4). Prepares students to engineer well-structured software systems. Students learn a wide range of software architectural styles, architectural platforms that provide standard services to applications, and formal architecture description languages. Prerequisites: Informatics 122 or the following: ICS 51 with a grade of C or better; ICS 121 and 141; Mathematics 2A-B and Statistics 67/Mathematics 67. Same as ICS 123.

131 Human Computer Interaction (4). Presents basic principles of human-computer interaction (HCI). Introduces students to user interface design techniques, design guidelines, and usability testing. Students gain the ability to design and evaluate user interfaces and become familiar with some of the outstanding research problems in HCI. Prerequisites: one course (with a grade of C or better) selected from Informatics 42, ICS 10A, ICS 21, Engineering ENGR10, CEE10, EECS10, MAE10, or equivalent. Same as ICS 104.

132 Project in Human-Computer Interaction and User Interfaces (4). The goal of this project course is to prepare students to develop and evaluate user interfaces to software systems through a one-quarter project. Prerequisites: Informatics 131 or the following: ICS 104, 121, 131, and 141. Same as ICS 105.

143 Information Visualization (4). Introduction to interactive visual interfaces for large datasets, and to principles of human visual perception and human computer interaction that inform their design. Various applications for data analysis and monitoring are discussed. Corequisite or prerequisite: Informatics 131.

151 Project Management (4). Introduces theoretical and practical aspects of project management. Topics include organizational theory, group behavior, project management skills, case studies, personal and group productivity tools, management of distributed work, stakeholders, consultants, and knowledge management. Students do a project exercise. Prerequisites: Informatics 131 and 161.

153 Computer-Supported Cooperative Work (4). Introduces concepts and principles of collaborative systems. Topics may include shared workspaces, group interaction, workflow, architectures, interaction between social and technical features of group work, and examples of collaborative systems used in real-world settings. Students develop a simple collaborative application. Prerequisites: Informatics 43 or ICS 23 with a grade of C or better; Informatics 161 or ICS 131. Same as ICS 134.

161 Social Analysis of Computerization (4). Introduction of computerization as a social process. Examines the social opportunities and problems raised by new information technologies, and the consequences of different ways of organizing. Topics include computerization and work life, privacy, virtual communities, productivity paradox, systems risks. Prerequisites: one course (with a grade of C or better) selected from Informatics 43, ICS 10A, ICS 21, Engineering ENGR10, or equivalent; satisfactory completion of the lower-division writing requirement. Same as ICS 131.

162 Organizational Information Systems (4). Introduction to role of information systems in organizations, components and structure of organizational information systems, and techniques used in information systems analysis, design, and implementation. Prerequisite: Informatics 161 or ICS 131. Same as ICS 132.

163 Project in the Social and Organizational Impacts of Computing (4). Students undertake projects intended to gather and analyze data from situations in which computers are used, organize and conduct experiments intended to test hypotheses about impacts, and explore the application of concepts learned in previous courses. Prerequisite: Informatics 162 or ICS 132. Same as ICS 135.

191A-B-C Senior Design Project (4-4-4). Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis. In-progress grading. Informatics 191A-B-C must be taken in the same academic year. Corequisite: Informatics 151. Prerequisites: Informatics 123, 132, 163; ICS 184; senior standing.

DEPARTMENT OF STATISTICS

346 Computer Science; (949) 824-5392: Fax: (949) 824-9863
E-mail: stat@uci.edu; World Wide Web: http:www.stat.uci.edu/
Hal S. Stern, **Department Chair**

Faculty

Daniel L. Gillen: Biostatistics, survival analysis and longitudinal methods, group sequential methods, design and analysis of clinical trials, applications to biological and clinical studies

Wesley O. Johnson: Bayesian semi-parametric inference, survival analysis, prediction, specification of priors, applications in epidemiology, diagnostic testing, longitudinal and mixed modeling, asymptotics

Gang Liang: Statistical inference, graphical models, and machine learning

Hal S. Stern: Bayesian methodology, model diagnostics, applications to biological and social sciences, sports and statistics

David van Dyk: Statistical computation, Bayesian methodoloy, hierarchical modeling, causal inference, and application in astronomy and the physical and social sciences

Statistics is the science concerned with developing and studying methods for collecting, analyzing, interpreting, and presenting empirical data. Statistical principles and methods are important for addressing questions in public policy, medicine, industry, and virtually every branch of science. Interest in statistical methods has increased dramatically with the abundance of large databases in fields like computer science (Internet and Web traffic), business and marketing (transaction records), and biology (the human genome and related data). It is the substantive questions in such various areas of application that drive the development of new statistical methods and motivate the mathematical study of the properties of these methods.

Courses in Statistics

LOWER-DIVISION

7 Basic Statistics (4). Lecture, three hours; discussion, one to two hours. Introduces basic inferential statistics including confidence intervals and hypothesis testing on means and proportions, t-distribution, Chi Square, regression and correlation. F-distribution and nonparametric statistics included if time permits. Same as Mathematics 7. Statistics 7/Mathematics 7 and Biological Sciences 7 may not both be taken for credit. No credit for Statistics 7/Mathematics 7 if taken after Mathematics 67. **(V)** *F, W offered for seniors only.*

67 Introduction to Probability and Statistics for Computer Science (4). Lecture, three hours; discussion, two hours. Introduction to the basic concepts of probability and statistics with discussion of applications to computer science. Prerequisites: Mathematics 2B, 6A, and 6C or 3A. No credit for Statistics 7/Mathematics 7 or Biological Sciences 7 if taken after Statistics 67/Mathematics 67. Same as Mathematics 67.

UPPER-DIVISION

100A-B-C Foundations of Applied Statistics I, II, III (4-4-4). Lecture, four hours; laboratory, three hours. **100A-B:** Descriptive statistical concepts and techniques most widely used in social science research. Weekly laboratories employ computer graphics to investigate concepts. 100A: Pass/Not Pass only. **100C:** Classical statistical inference, limited to simple random sampling or simple randomization designs. Characteristics of sampling distributions; bias, standard error, mathematical models, estimation, hypothesis testing. Same as Social Sciences 100A-B-C and Social Ecology 166A-B-C. **(V)**

101 Introduction to Statistical Computing with SAS (4). Lecture, two hours; laboratory, two hours. Data definition, data acquisition, and data management using SAS procedures and commands. Statistical procedures available from the SAS Statistical Software Package. SAS/GRAPH procedures for producing statistical graphics. Prerequisites: completion of one year of statistics, or concurrent enrollment in Statistics 100C, or consent of instructor. Pass/Not Pass only. Same as Social Ecology 166E and Social Science 101E.

120A-B-C Introduction to Probability and Statistics (4-4-4). Lecture, three hours; discussion, one to two hours. Introductory course covering basic principles of probability and statistical inference. **120A:** Axiomatic definition of probability, random variables, probability distributions, expectation. **120B:** Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference. **120C:** Linear regression, analysis of variance, model checking. Prerequisites: for 120A-B: Mathematics 2A-B; 2D-2J or 4; for 120C: Statistics 120A-B; Mathematics 3A or 6C. Same as Mathematics 131A-B-C. Only one course from Statistics 120A, Mathematics 130A, and Mathematics 132A may be taken for credit.

GRADUATE PROGRAM IN ICS

The University of California is the State's primary research institution, and the Donald Bren School of Information and Computer Sciences is the only independent computer science school on any UC campus. Established in December 2002 when the 35-year-old Department of Information and Computer Science was promoted to independent school status, ICS embodies the University's tradition of excellence as a world leader in information and computer sciences. ICS recently received a $20-million endowment from The Irvine Company Chairman Donald Bren to assist in recruiting and retaining distinguished faculty scholars. ICS began construction on a new, six-story research and administrative facility during the winter of 2004 with completion expected in 2007. Committed to increasing diversity in computing, ICS created the Ada Byron Research Center in 2003 to address research and outreach topics aimed at increasing the participation of women and other underrepresented populations in computer science and information technology.

Faculty and student-driven research in ICS is supported through a variety of grants, gifts, and contracts from public and private institutions such as the State of California, the U.S. Department of Education, various U.S. defense agencies, the National Science Foundation, the National Institutes of Health, NASA, and several companies, including Boeing, Conexant, HP, IBM, Intel, Microsoft, Raytheon, Sun, Toshiba, and Unisys. Since 2000, ICS has received more than $66 million in extramural funding, in addition to the recent $20-million endowment. Faculty within the School are active participants and leaders of numerous research institutes spanning computer science, including: the Institute for Genomics and Bioinformatics, Institute for Software Research, Center for Embedded Computer Systems, California Institute for Telecommunications and Information Technology, Center for Pervasive Communications and Computing, and the Ada Byron Research Center.

ICS offers M.S. and Ph.D. degrees in Information and Computer Science. Enrollments in the M.S. program are being limited to those students with an undergraduate degree in computer science or a closely related field.

Both M.S. and Ph.D. students may complete one of the following concentrations: Algorithms and Data Structures (Theory); Artificial Intelligence (AI); Informatics (INF); Informatics in Biology and Medicine (IBaM); Information Access and Management (IAM); Statistics (Stats); and Systems (SYS).

Three additional concentrations are available to M.S. students-Embedded Systems; Knowledge Discovery in Data; and Arts Computation Engineering (ACE). In addition, the School also offers a general M.S. degree that does not identify with any specific concentration.

The M.S. and Ph.D. degree program in Networked Systems is supervised by an interdepartmental faculty group. Information is available in the Interdisciplinary Studies section of the *Catalogue.*

ADMISSION

Applicants will be evaluated on the basis of their prior academic record. Applicants for the M.S. degree are expected to have a bachelor's degree in computer science or a related field. Those who do not have an undergraduate degree in computer science may take the Computer Science Advanced GRE test to demonstrate sufficient background in the field. Scores are reviewed on a case-by-case basis. Ph.D. applicants will be evaluated in their potential for creative research and teaching in Information and Computer Science.

Applicants are expected to have (1) skills in computer programming at least equivalent to those obtained in college-level courses in programming and language development; (2) skills in mathematics equivalent to those obtained in complete college-level courses in logic and set theory, analysis, linear algebra and modern algebra, or probability and statistics; (3) data structures, analysis of algorithms, automata theory, or formal languages; and (4) computer architectures.

All applicants are evaluated on the materials submitted: letters of recommendation, official GRE test scores, official college transcripts, and personal statement. For more information, contact the ICS graduate counselor at (949) 824-5156 or send e-mail to gcounsel@ics.uci.edu.

Financial Assistance

Financial assistance is available to Ph.D. students in the form of fellowships, teaching assistantships, and research assistantships. Although assistance varies, it is the School's goal to support all entering Ph.D. students, subject to availability of funds. International students who are not citizens of countries where English is either the primary or dominant language, as approved by Graduate Council, and who apply for teaching assistantships must take the Test of Spoken English (TSE) or the Speaking Proficiency English Assessment Kit (SPEAK) examination and earn a minimum score of 50 to be considered for an award.

Financial assistance may be available through teaching assistantships and corporate internships for ICS M.S. students.

Students with a Previously Earned Master's Degree

Credit for one or all required courses may be given at the time of admission to those students who have completed a master's degree in computer science or a closely related field. Course equivalency will be determined by the ICS Associate Dean for Graduate Studies following a written recommendation from a sponsoring research advisor. Research advisors can require that a student take additional courses when this is appropriate.

An additional M.S. degree will not be awarded if the student currently holds an M.S. degree in computer science or a related field from another university.

Course Substitutions

A student who has taken relevant graduate courses at UCI or another university may petition to have a specific course certified as equivalent to one which satisfies ICS requirements. The petition should describe the course and can be approved either by a committee composed of the student's faculty advisor, the ICS Associate Dean for Graduate Studies and a faculty member who is in the concentration area in which the course is taught, or by the ICS Graduate Policy Committee. Only two courses can be substituted.

Master of Science Program

The Master of Science program offers concentrations in the same areas as the Ph.D. concentrations described under the Doctor of Philosophy heading below. For each of these concentrations, the course requirements for the M.S. are determined by the concentration track and are identical to those of the Ph.D., although completion plans differ.

In addition, the Master of Science program offers a general M.S. in ICS, a concentration in Embedded Systems, a concentration in Knowledge Discovery in Data, and a concentration in Arts Computation Engineering.

Detailed course requirements for the M.S. and Ph.D. degrees are listed in the following pages under each concentration area. M.S. students may select one of two options: thesis plan or comprehensive examination plan, as described below. The normative time for completion of the M.S. program is two years. All study must be completed within four calendar years from the date of admission.

Plan I: Thesis Plan. The thesis option is available for graduate students who may wish to continue on to a Ph.D. program or those who wish to concentrate on a specific problem. To qualify for this option, the student must be in good academic standing with the Department. The student must enroll in at least two quarters of Thesis Supervision (ICS 298) that will substitute for two required courses as specified under the concentration area or specialization of choice. All required courses must be completed with a grade of B or better, and the student must write a research or thesis project. A committee of three faculty members (voting members of the Academic Senate) will guide the student and give final approval of the thesis. The committee will consist of an advisor (ICS faculty member) who is willing to supervise the thesis project, and two other faculty members (one of which must be from ICS) who are willing to serve on the committee as readers of the thesis. An oral presentation of the thesis to the committee will be required. Seminar courses such as 229, 239, 259, 269, and 279 cannot be applied to the required "other graduate courses" units.

Plan II: Comprehensive Examination Plan. The student completes the required units as specified under the concentration area. Each course must be completed with a grade of B or better. Seminar courses such as 229, 239, 249, 259, 269, and 279 cannot be applied to the required "other graduate courses" units. The student must take a written comprehensive examination given by ICS faculty. The examination covers the core requirements and is given twice a year (fall and spring quarters).

ICS GENERAL M.S. DEGREE PROGRAM

The ICS general M.S. degree program is designed for students who do not wish to specialize in any specific area. Students can explore many of the advanced fields in computer science. These areas include: embedded systems, networking, databases, computational geometry, neural networks, data mining, machine learning, graph algorithms, VLSI, parallel architectures, user interfaces, bioinformatics, graphics and visualization, security and cryptography, HCI/CSCW, software engineering, data structures, and ubiquitous computing.

Required Courses

The following courses must be completed with a grade of B or better. Five courses, including at least one from each of the following three categories: *Theory:* Fundamentals of the Design and Analysis of Algorithms (ICS 260), Data Structures (ICS 261), Analysis of Algorithms (ICS 263); *Architecture/CAD/Hardware:* Embedded Systems Concepts (ICS 212), Computer Systems Architectures (ICS 241A), Computer Networks (ICS 243A), Introduction to Computer Design (ICS 252); *Software and Systems:* Human-Computer Interaction (ICS 205), Advanced Compiler Construction (ICS 211), Principles of Data Management (ICS 214A), Software Engineering (ICS 221), Distributed Computer Systems (ICS 242).

Seven additional courses which are either ICS graduate courses or ICS undergraduate project courses. At most two undergraduate project courses can count toward this requirement. (A course taken as an undergraduate student cannot count toward this requirement.) The undergraduate project courses are: Project in Human-Computer Interaction (ICS 105), Project in System Design (ICS 125), Comprehensive Project in Software System Evolution (ICS 126A-B), Advanced Project in Software Engineering (ICS 127), Project in the Social and Organizational Impacts of Computing (ICS 135), Language Processor Construction (ICS 145A), Project in Operating System Organization (ICS 145B), Logic Design Laboratory (ICS 155A), Computer Design Laboratory (ICS 155B), Advanced Computer Networks (ICS 156), Project in Algorithms and Data Structures (ICS 165), Project in Artificial Intelligence (ICS 175A), Introduction to Expert Systems (ICS 175B).

Comprehensive Examination

Each student must pass a general written comprehensive examination administered and evaluated by a committee assembled by the Associate Dean for Graduate Studies.

M.S. CONCENTRATION IN EMBEDDED SYSTEMS

The goal of the M.S. concentration in Embedded Systems is to prepare ICS students for the challenges in exploiting technologies that are driving computing-based systems into new and emerging application domains. The ever-increasing integration of communications, multimedia, computing and relentless digitization of data continues to expand the scope and the complexity of embedded systems. To appreciate these advances, and to productively contribute to future advances of these systems, a critical appreciation of the underlying scientific principles is a must. The goal of this program is to develop a comprehensive understanding of the hardware and software technologies used in embedded systems. Students will develop an understanding of the technology capabilities and limitations and the methods to evaluate design trade-offs between different technology choices.

Required Courses

The following courses must be completed with a grade of B or better: all students must complete Introduction to Embedded and Ubiquitous Computing Systems (ICS 212); five courses from the following: List A: Compilation and Compiler Design (ICS 211), Software for Embedded Systems (ICS 213), Validation and Testing of Embedded Systems (ICS 216), Prototyping of Embedded Systems (ICS 217), Computer Systems Architecture (ICS 241A), Computer Networks (ICS 243A), Network and Distributed Systems Security (ICS 243G), Parallel Computing (ICS 244), Introduction to Computer Design (ICS 252), and Advanced System Software (EECS 211).

Six additional courses chosen in one of the following two ways: (1) for students pursuing the M.S. thesis option, two four-unit courses in Thesis Supervision (ICS 298) plus four graduate courses taken from List A or the following List B; or (2) for all other students, six graduate courses taken from List A or the following List B: Introduction to Ubiquitous Computing (ICS 203A), Software Engineering (ICS 221), User Interfaces and Software Engineering (ICS 227), Modern Microprocessors (ICS 241B), Distributed Computer Systems (ICS 242), Wireless and Mobile Networking (ICS 243E), High-Performance Architectures and Their Compilers (ICS 245), Digital System Verification and Testing (ICS 251), Design Description and Modeling (ICS 253), VLSI System Design (ICS 254), Design Synthesis (ICS 256), System Tools (ICS 257), Combinational Algorithm for Design Synthesis (ICS 258), Data Compression (ICS 267), Graph Algorithms (ICS 265), Real-Time Computer Systems (Engineering EECS 223). M.S. students who do not have an undergraduate degree in Computer Science or equivalent must also take ICS 260.

Suggested Electives. Students may focus their studies in specific domains within embedded systems by completing groups of electives as shown below.

Embedded System Architectures Focus: ICS 241A and ICS 241B, ICS 244, ICS 245, ICS 252, ICS 253.

Embedded Software Focus: ICS 221, ICS 227, ICS 245.

Distributed and Networked Embedded Systems Focus: select four of the following five courses: ICS 241A, ICS 242, ICS 243A or ICS 243E, ICS 244.

Micro-Electronic Embedded Systems Focus: ICS 251, ICS 253, ICS 254, ICS 256, ICS 257.

System Reliability and Fault Tolerance Focus: ICS 241A, ICS 251, ICS 253.

Theoretical Foundations of Embedded Systems Focus: ICS 242, ICS 243A, ICS 258, ICS 265.

Comprehensive Examination or Thesis

Each student must either: (1) pass a written comprehensive examination administered by the Embedded Systems faculty; or (2) submit a thesis for approval by a three-person committee consisting of an advisor (who is an ICS Embedded Systems full-time faculty member) and two other full-time faculty members (one of which must be from ICS).

M.S. CONCENTRATION IN KNOWLEDGE DISCOVERY IN DATA

The goal of the M.S. concentration in Knowledge Discovery and Data is to educate students in both the fundamental principles of computational methods for modeling data, as well as to provide a broad foundation in emerging methods for knowledge discovery and data mining. Technological advances in digital data collection, memory capacity, and computational power, have revolutionized our view of data analysis in the past 10 years. The volumes of data being collected in science, business, medicine, and government are truly vast in nature. Across all of these areas, there is a rapidly increasing demand for better theories and tools to provide users with improved understanding of their data and to leverage their data for decision support.

Knowledge discovery in databases (KDD) is an emerging discipline within computer science, focused on the principles of how patterns and structure can be inferred from large data sets. It is an area of significant academic interest and research opportunity. For example, a Special Interest Group in Knowledge Discovery in Databases (SIGKDD) was recently started by the Association for Computing Machinery (ACM) to promote both research and professional activities in this area; a new journal called *Data Mining and Knowledge Discovery* was started in 1997; and the field sponsors an annual international conference with over 500 attendees. In addition, the National Science Foundation has recently begun a large interdisciplinary research program in Knowledge and Distributed Intelligence (KDI), based in part on recent research and interest in KDD. Industry participation is also very active with broad demand for graduates in this area, across a wide variety of companies engaged in leveraging scientific and business data for strategic purposes.

Required Courses

The following courses must be completed with a grade of B or better: Principles of Data Management (ICS 214A), Machine Learning (ICS 273A), Probabilistic Learning (ICS 274A), Data Mining (ICS 278), Descriptive Multivariate Statistics I (ICS 238A), and any two courses from the Artificial Intelligence Core Course List and any two courses from the Statistics Core Course List.

For students pursuing the M.S. thesis option, two four-unit courses in Thesis Supervision (ICS 298) plus any one course from the General Computer Science Course List completed with a grade of B or better.

For students not pursuing the thesis option, the following additional courses must be completed with a grade of B or better: any two courses from the General Computer Science List and one elective. For the elective, a non-ICS course can only be taken with the approval of a KDD faculty member.

Artificial Intelligence Core Course List: Project in Artificial Intelligence (ICS 175A), Information Retrieval, Filtering, and Classification (ICS 207), Introduction to Artificial Intelligence (ICS 270A), Network-Based Reasoning/Constraint Networks (ICS 275A), Network-Based Reasoning/Belief Networks (ICS 275B), Neural Networks (ICS 276A), Representations and Algorithms for Molecular Biology (ICS 277A).

Statistics Core Course List: Descriptive Multivariate Statistics II (ICS 238B), Discrete Mathematics and Probability (Psychology 203A), Introduction to Mathematical Statistics (Psychology 203B), Experimental Design (Psychology 203C), Theory of Mathematical Statistics (Mathematics 201A), Probability (Mathematics 270A-B-C).

General Computer Science Course List: Project in System Design (ICS 125), Human Computer Interaction (ICS 205), Software Engineering (ICS 221), Software Analysis and Testing (ICS 224), Advanced User Interface Architectures (ICS 227), Fundamentals of the Design and Analysis of Algorithms (ICS 260), Data Structures (ICS 261), Analysis of Algorithms (ICS 263), Graph Algorithms (ICS 265), Computational Geometry (ICS 266).

Comprehensive Examination

All students not pursuing the thesis option must pass a written comprehensive examination administered and evaluated by the KDD faculty.

M.S. CONCENTRATION IN ARTS COMPUTATION ENGINEERING (ACE)

As digital technologies infiltrate increasingly diverse aspects of cultural practice, and human culture at large is influenced by the presence of digital technologies, there is a profound need for a new type of professional in the entertainment industry, in education, and in the arts, who can help to construct, manage, and monitor these changes. Such a professional must be technically skilled, artistically skilled, and theoretically skilled, all at an equally high and rigorous level. The goal of the M.S. concentration in Arts Computation Engineering is to provide students with a broad-based and interdisciplinary training at the intersection of digital technology and cultural and artistic practices. The ACE program is coordinated across the Donald Bren School of Information and Computer Sciences, The Henry Samueli School of Engineering, and the Claire Trevor School of the Arts, and places equal emphasis on technical, artistic, and critical proficiency. Strongly practical in composition, it provides students with the opportunity to explore in detail topics such as telematic performance, immersive and augmented environments, embodied interaction, and the cultural impact of new technologies.

Graduation is by publicly presented thesis project and written thesis, in addition to completion of course work.

Required Courses

The ACE concentrations in all three fields consist of a two-year curriculum. The following courses are required:

ACE Core: five ACE interdisciplinary theory seminars (Informatics 270), four ACE studio/labs (Informatics 271–277), two ACE project internships (Informatics 279), and one quarter of ACE thesis research (Informatics 278).

(NOTE: A total of 48 units of Core courses must be completed. Any of the ACE core category courses may be reduced by one and replaced with a different ACE core course or an elective, in consultation with the student's advisor.)

Electives: a minimum of four ICS electives including one from each of the following three categories, passed with a grade of B or better:

Theory: Fundamentals of the Design and Analysis of Algorithms (ICS 260), Data Structures (ICS 261), Analysis of Algorithms (ICS 263);

Architecture/CAD/Hardware: Embedded Computing Systems (ICS 212), Computer Systems Architectures (ICS 241A), Computer Networks (ICS 243A), Introduction to Computer Design (ICS 252);

Software Systems: Human-Computer Interaction (ICS 205), Advanced Compiler Construction (ICS 211), Data Management (ICS 214A), Software Engineering (ICS 221), Distributed Computer Systems (ICS 242).

Two additional breadth electives: that may be chosen by students in consultation with an advisor, and/or may be assigned by the ACE program committee in consultation with the student. These courses will compensate for lacunae in the student's background and may include upper-division undergraduate courses when appropriate and approved in advance by the candidate's advisor.

A program faculty member from the School of ICS will advise on elective selection and may be on the thesis committee.

Doctor of Philosophy Program

The Doctor of Philosophy program offers concentrations in one of seven areas: Algorithms and Data Structure (Theory), Artificial Intelligence (AI); Informatics (INF); Informatics in Biology and Medicine (IBaM); Information Access and Management (IAM); Statistics (STATS); Systems (SYS).

The program is research oriented and encourages students to work together with faculty to solve advanced problems in computer science. The program is designed for full-time study, and the normal time for completion of the Ph.D. is five years (four years for students who entered with a master's degree), with the exception of the Informatics concentration which has a normal time of six years. The maximum time permitted for any of the concentrations is seven years. Students enrolled in the Ph.D. program must maintain satisfactory academic progress.

Course Requirements

Course requirements for each concentration area are listed on the following pages. In addition, every student must complete the following core course requirements with a grade of B or better.

Seminar in Research in ICS (ICS 200); one course in Theory selected from: Fundamentals of the Design and Analysis of Algorithms (ICS 260), Data Structures (ICS 261), or Analysis of Algorithms (ICS 263); one course in Architecture/CAD/ Hardware selected from: Embedded Systems Concepts (ICS 212), Computer Systems Architectures and Languages (ICS 241A), Computer Networks (ICS 243A), or Introduction to Computer Design (ICS 252); and one course in Software and Systems selected from: Human-Computer Interaction (ICS 205), Compiler Construction (ICS 211), Principles of Data Management (ICS 214A), Software Engineering (ICS 221), or Distributed Computer Systems (ICS 242).

Teaching Requirements for the Ph.D. Program

All ICS doctoral students are required to participate in a minimum of two quarters of teaching activities before graduating. Teaching activities in summer or night school or service at other U.S. universities may be accepted in fulfillment of this requirement.

Examinations and Dissertation for the Ph.D. Program

Each doctoral student must present a research talk to a group of faculty and graduate students and pass a comprehensive examination which will be evaluated by the faculty. The comprehensive examination and all course requirements must be satisfied prior to the student's application for advancement to candidacy. The normal time for advancement to candidacy is three years (two years for students who entered with a master's degree), with the exception of the Informatics concentration which has a normal time of four years. Information on the selection of committees, advancement to candidacy, development of a doctoral dissertation, and final examination on the dissertation is available from the ICS Associate Dean for Graduate Studies and the ICS Graduate Student Affairs Office.

CONCENTRATION IN ALGORITHMS AND DATA STRUCTURES (THEORY)

The goal of research in theoretical computer science is to produce results, supported by rigorous proof, about problems dealing with computers and their applications. The questions to be investigated are often motivated by practical problems, but the goal of understanding the underlying combinatorial properties of the problem is often as important as producing a solution of immediate applicability. The actual problems to be solved are often very complicated, so researchers seek some abstraction that can be rigorously studied. In particular, they often seek to investigate the fundamental combinatorial structure of a problem abstracted away from the original physical setting. For example, the problem of placing a set of files onto as few floppy disks as possible without exceeding their storage capacity is fundamentally the same as the problem of loading a set of items onto as few trucks as possible without exceeding their weight limit. Many problems, from a variety of application areas, fall into the category of efficient algorithm design.

A key property of work in this area is its emphasis on the amount of resources required by a given algorithm; this is called the complexity of the algorithm. The resource most commonly considered is time, but other resources often considered are the amount of memory required and, in the case of parallel computation, the number of processors required. For many problems, an efficient solution has been obtained only after deep insights into the nature of the problem. For many problems, the efficiency of the best solution possible remains unknown.

Research in algorithms and data structures grapples with such questions. It is a young science with an inherently interdisciplinary flavor. Problems to be investigated have come from a variety of sources, such as computer vision, scheduling, resource allocation, scientific computing, image processing, genetics, transportation, and artificial intelligence. Solution methods are brought to bear from areas such as discrete applied mathematics, probability theory, and a rich body of insights developed within theoretical computer science. The goal of the research, as in mathematics, is to produce results supported by rigorous proof; the emphasis on complexity gives this area its unique flavor. Results that first might appear to be only of theoretical value are sometimes of profound relevance to practical problems.

Required Courses

The following courses must be completed with a grade of B or better: Seminar in Research in ICS (ICS 200); Data Structures (ICS 261); Computational Complexity (ICS 262); Analysis of Algorithms (ICS 263); two courses from: Computer Security Algorithms (ICS 247), Topics in Online Algorithms (ICS 264), Graph Algorithms (ICS 265), Computational Geometry (ICS 266), Special Topics in ICS (ICS 280) taught by Theory faculty; at least three quarters of Seminar in Theory (ICS 269); and five graduate courses outside of Theory, at least three of which must be within ICS (for M.S. students pursuing the thesis option, two of the five courses must be substituted with two four-unit courses in Thesis Supervision, ICS 298); if the student has an optional minor, at least two of these courses must be outside the minor.

Paper Requirement for the Ph.D. Degree

Each student must write a survey paper and a research paper of publishable quality.

CONCENTRATION IN ARTIFICIAL INTELLIGENCE (AI)

Research in Artificial Intelligence (AI) is aimed at understanding the computational mechanisms that underlie intelligent behavior, and at designing computational systems that exhibit it. The AI group at ICS is involved in research on machine learning and knowledge discovery; deductive and probabilistic reasoning; constraint satisfaction techniques; neural networks and cognitive architectures; sophisticated image and signal processing; scientific reasoning in domains such as molecular biology, medicine, and space science; intelligent Web-based agents; and the psychological investigation of human learners. The group is interested in basic research into the fundamental principles of intelligence; the methods by which knowledge is acquired, summarized, organized, and utilized to solve complex problems; the construction of computational artifacts that support algorithmically, cognitively, or conceptually challenging tasks and embody behavior associated with intelligent systems; and applications that confront intelligent systems with real-world tasks. Within the general field of AI, ICS faculty specialize in machine learning, knowledge discovery and data mining, automated reasoning, constraint-based and probabilistic-based reasoning, and brain modeling.

Required Courses

The following courses must be passed with a grade of B or better:

Seminar in Research in ICS (ICS 200).

Eight courses from List A, where List A consists of (a) all ICS courses numbered between 270A and 278 in addition to (b) 207 (Information Retrieval), Logic and Philosophy of Science 209 (Logic for Artificial Intelligence), and any single 280 course taught by an AI faculty member. Of these eight courses, five or more must be taken from the following subset of List A: Information Retrieval, Filtering, and Classification (ICS 207), Introduction to Artificial Intelligence (ICS 270A), Machine Learning (ICS 273A), Kernel-Based Learning (ICS 273B), Probabilistic Learning (ICS 274A), Learning in Graphical Models (ICS 274B), Network-Based Reasoning/Constraint Networks (ICS 275A), Network-Based Reasoning/Belief Networks (ICS 275B), Neural Networks (ICS 276A), Logic for Artificial Intelligence (Logic and Philosophy of Science 209).

Five other graduate courses of which at least four are not from List A above and only one of which can be an ICS 280 class (for M.S. students pursuing the thesis option, two of the five courses must be substituted with two four-unit courses in Thesis Supervision, ICS 298).

Paper Requirement for the Ph.D. Degree

Each student must write two research papers of publishable quality.

CONCENTRATION IN INFORMATICS (INF)

Informatics is the interdisciplinary study of the design, application, use, and impact of information technology. It goes beyond technical design to focus on the relationship between information system design and use in real-world settings. These investigations lead to new forms of system architecture, new approaches to system design and development, new means of information system implementation and deployment, and new models of interaction between technology and social, cultural, and organizational settings.

In the Donald Bren School of Information and Computer Sciences, Informatics is concerned with software architecture, software development, design and analysis, programming languages, ubiquitous computing, information retrieval and management, human-computer interaction, computer-supported cooperative work, and other topics that lie at the relationship between information technology design and use in social and organizational settings. Effective design requires an ability to analyze things from many different perspectives, including computer science, information science, organizational science, social science, and cognitive science. Relevant courses in those disciplines are therefore an integral part of the program and give this concentration a unique interdisciplinary flavor—which is imperative as the computing and information technology fields play such a pervasive role in our daily lives.

Students who choose the Informatics concentration must complete all courses of the ICS core, a Seminar in Research in ICS (ICS 200), the Informatics Core, and a focus track in either General Informatics, Software, or Interactive and Collaborative Technology. All courses must be passed with a grade of B or better. Ph.D. students must additionally write a survey paper with an extensive bibliography, and a research paper of publishable quality.

Informatics Core: Human-Computer Interaction (ICS 205), Software Engineering (ICS 221), Social Analysis of Computing (ICS 230), and three quarters of Seminar in Informatics (ICS 229).

General Informatics Track (INF:GEN)

Additional Informatics Core: Introduction to Ubiquitous Computing (203A), Information Retrieval, Filtering, and Classification (ICS 207).

Software Electives: two courses chosen from: Formal Specification and Modeling (ICS 222), Software Architecture (ICS 223), Software Analysis and Testing (ICS 224), Software Processes (ICS 225), Applied Software Design Techniques (ICS 226), Advanced User Interface Architecture (ICS 227), Software Environments (ICS 228).

ICT Electives: two courses chosen from: Ubiquitous Computing and Interaction (ICS 203B), Knowledge-Based User Interfaces (ICS 206), Computer-Supported Cooperative Work (ICS 233), Computerization, Work, and Organizations (ICS 234A), Theories of Computerization and Information Systems (ICS 234B), Computing and Cyberspace (234C), Qualitative Research Methods in Information Systems (ICS 235A) or Social Ecology 217 or Management 290, Quantitative Research Methods in Information Systems (ICS 235B) or Descriptive Multivariate Statistics I and II (ICS 238A and 238B) or Social Science 201A-B.

Special Topics: two courses of ICS 280 taught by Informatics faculty.

M.S. students pursuing the thesis option must substitute two four-unit courses in Thesis Supervision (ICS 298) for two courses from the Electives or Special Topics.

Software Track (INF:SW)

Software has transformed society in dramatic and powerful ways. From the World Wide Web to pilotless vehicles to spreadsheets, software systems inform, control, and enhance daily activities. Software research at UCI is aimed at creating new software technology and solutions, furthering the information revolution. Perspectives of engineering, science, mathematics, and human-computer interaction guide the work. The central goal of all the research is improvement in software development, evolution, deployment, quality, and cost-effectiveness.

Specific research emphases of the faculty members in the concentration include: analysis and testing, software understanding, empirically guided analysis, environments, software architectures, hypermedia, workflow, user interface software, process, formal methods, specification languages, extensible component-based software systems, distributed event-based systems, and programming languages. A valuable and unusual feature of the concentration is the opportunity to work with the Software group's industrial partners. These companies provide opportunities for internships, support research projects, and provide a test-bed for evaluation of new ideas. Graduates of the program have taken careers in research universities, industrial research laboratories, colleges, and industry.

Background: Students must have basic competency in the following computer science topics: programming language concepts, data structures, analysis of algorithms, automata theory or formal languages, artificial intelligence, computer architecture, and operating systems. The software faculty will evaluate, upon entry to the Ph.D. program, whether a student has satisfied these requirements through courses taken previously (e.g., at the undergraduate level) or through equivalent experience. Satisfaction of any unfulfilled requirements may be achieved through either graduate or undergraduate classes in an individualized program worked out with a Software area graduate advisor.

Required Courses

Software Electives: five courses from Knowledge-Based User Interfaces (ICS 206), Formal Specification and Modeling (ICS 222), Software Architecture (ICS 223), Software Analysis and Testing (ICS 224), Software Processes (ICS 225), Applied Software Design Techniques (ICS 226), Advanced User Interface Architectures (ICS 227), Software Environments (ICS 228), Special Topics taught by Software area faculty (ICS 280; no more than two).

ICS Breadth: three graduate courses outside of Software, drawn from a list maintained by the Software faculty.

M.S. students pursuing the thesis option must substitute two four-unit courses in Thesis Supervision (ICS 298) for two of the Software Electives.

Interactive and Collaborative Technology Track (INF:ICT)

UCI enjoys an international reputation for its research on the human and social dimensions of computer system design and use. There are two principal strands to this work. The first concerns the interaction between people and computers, including novel forms of interactive experience beyond traditional desktop computing. The second concerns the role that computer systems can play in collaborative work between individuals, groups, and organizations. Examples of topics that ICT researchers investigate include: adoption and diffusion of collaborative technologies; software architectures for user-adaptive systems; universal access to interactive systems; design principles for information visualization; and new patterns of computer-mediated work such as virtual teams.

The approach used places equal emphasis on three areas of investigation—empirical, theoretical, and technical. The empirical work involves studying technology in use, using both laboratory techniques and fieldwork investigations of real-world settings. The theoretical research employs and develops analytic understanding of the relationships among technology, people, organizations, and social settings. Finally, in the technical work, ICT researchers develop new models and technologies for interaction with and collaboration through technology. Students in the ICT track gain a thorough grounding in all three areas.

The cornerstone of this approach is to study real use of technology, as it occurs in real-world settings. ICT researchers believe that the success or failure of technology depends on how people can fit that technology into real practice, balancing technical, cognitive, social, and cultural dimensions. Using an interdisciplinary approach, ICT research aims at a deeper understanding of interaction with and collaboration through technology, and at exploiting these insights for the design of better systems.

Required Courses

ICT Electives (group 1): two courses chosen from: Computerization, Work, and Organizations (ICS 234A), Theories of Computerization and Information Systems (ICS 234B), Qualitative Research Methods in Information Systems (ICS 235A) or Social Ecology 217 or Management 290, Quantitative Research Methods in Information Systems (ICS 235B) or Descriptive Multivariate Statistics I and II (ICS 238A and 238B) or Social Science 201A-B.

ICT Electives (group 2): two courses chosen from: Introduction to Ubiquitous Computing (203A), Knowledge-Based User Interfaces (ICS 206), Advanced User Interface Architectures (ICS 227), Computer-Supported Cooperative Work (ICS 233).

ICT Breadth: Students must choose four courses outside of Informatics that form a coherent area of study. Students are encouraged, but not required, to take them outside of ICS.

A maximum of two ICT Electives may be substituted by ICS 280 courses taught by ICT faculty. M.S. students pursuing the thesis option must substitute two four-unit courses in Thesis Supervision (ICS 298) for two of the ICS Breadth courses.

CONCENTRATION IN INFORMATICS IN BIOLOGY AND MEDICINE (IBAM)

Biology and medicine have become data-intensive information sciences. Massive data acquisition technologies, such as genome sequencing, high-throughput drug screening, and DNA arrays, generate biological information in quantities that overwhelm conventional approaches. Cost-effective health care and quality medical decision-making require integrating large amounts of up-to-date information and knowledge. Biological systems have also inspired computer science advances with new concepts, including genetic algorithms, artificial neural networks, computer viruses and synthetic immune systems, DNA computing, artificial life, and hybrid VLSI-DNA gene chips. New computational opportunities such as these create a critical need for theoretical and algorithmic advances in storing, retrieving, networking, processing, analyzing, and visualizing biomedical information.

Informatics in Biology and Medicine is an interdisciplinary concentration at the interface between computer sciences, biological sciences, and medicine. It addresses problems that are specific to the information technologies in biology, medicine, and health care. Research topics include gene finding, protein structure and function prediction, structural and functional genomics, proteomics, electronic patient record systems, medical decision support systems, guideline-based health care, medical information access, and human-computer interfaces for medical applications. To make advances in these areas, society needs people with knowledge and skills that bridge those taught in conventional biological, medical, and computer science curricula. This area provides for such an interdisciplinary computer science education.

Background: Students should have already taken at least one undergraduate course in basic biology, or must make up that deficit during their first year with one of these courses: Patterns of Diversity, Ecology, and Evolution (Biological Sciences 94), Biochemistry (Biological Sciences 98), Molecular Biology (Biological Sciences 99), Developmental and Cell Biology (Biological Sciences 108), Human Physiology (Biological Sciences 109).

Required Courses

The following courses must be completed with a grade of B or better: Seminar in Research in ICS (ICS 200); Introduction to Medical Informatics (ICS 208); Representations and Algorithms for Molecular Biology (ICS 277A); at least three quarters of Seminar in Informatics in Biology and Medicine (ICS 209); four courses from: Human-Computer Interaction (ICS 205), Knowledge-Based User Interfaces (ICS 206), Information Retrieval, Filtering, and Classification (ICS 207), Advanced Topics in Data Management (ICS 215), Advanced User Interface Architectures (ICS 227), Computerization, Work, and Organizations (ICS 234A), Computational Geometry (ICS 266), Machine Learning (ICS 273A), Probabilistic Learning: Theory and Algorithms (ICS 274A), Network-Based Reasoning/Belief Networks (ICS 275B), Neural Networks (ICS 276A), Cognitive and Computational Neuroscience (ICS 276C), Probabilistic Modeling of Biological Data (ICS 277B), Data Mining (ICS 278), special topics taught by one of the faculty in this area (ICS 280—only one 280 course counts toward the advanced topics requirement) (for M.S. students pursuing the thesis option, two of the four courses must be substituted with two four-unit courses in Thesis Supervision, ICS 298); two courses from: Systems, Anatomy, and Physiology I (Engineering 210A), Environmental Health Sciences III: Biostatistics and Epidemiology (Environmental Analysis and Design E226), Decision Analysis (Management 283), Molecular Evolutionary Methods (Ecology and Evolutionary Biology 251), Problems in Genomic Analysis (Biological Chemistry 204), Structure and Biosynthesis of Nucleic Acids (Molecular Biology and Biochemistry 203), Structure and Biosynthesis of Proteins (Molecular Biology and Biochemistry 204), Macromolecular Structure, Function, and Interaction (Molecular Biology and Biochemistry 240), Cellular and Molecular Neuroscience (Physiology and Biophysics 202); upon petition, an undergraduate course may be substituted for one of the above interdisciplinary graduate-level courses; and ICS core course requirements.

Paper Requirement for the Ph.D. Degree

Each student must write a survey paper and a research paper of publishable quality.

CONCENTRATION IN INFORMATION ACCESS AND MANAGEMENT (IAM)

The Internet has made vast amounts of textual and multimedia information available to the general public, yet we still have many problems accessing this information efficiently and effectively. Research in Information Access and Management aims to address such problems. It concerns the study and development of concepts, technologies, and tools for searching, retrieving, storing, organizing, and presenting information. The foundation of this concentration combines the areas of databases, information retrieval, and human-computer interaction, which serve as the core of the formal course work. Additional electives allow students to explore in detail a particular subtopic within this field or take courses in Cognitive Science, Economics, or Anthropology to complement the technical courses. Specific research emphases of the IAM faculty members include: intelligent information gathering agents, information visualization, hyperware for linking heterogeneous information sources, multimedia content extraction and representation, multimedia servers, adaptive Web sites, and collaborative information filtering.

Required Courses

The following courses must be completed with a grade of B or better: Seminar in Research in ICS (ICS 200); Human-Computer Interaction (ICS 205); Information Retrieval, Filtering, and Classification (ICS 207); Principles of Data Management (ICS 214A); three courses from: Knowledge-Based User Interfaces (ICS 206), Advanced Topics in Data Management (ICS 215), Multimedia Systems (ICS 216), Formal Specification and Modeling (ICS 222), Advanced User Interface Architectures (ICS 227), Computer-Supported Cooperative Work (ICS 233), Computing and Cyberspace (ICS 234C), Machine Learning (ICS 273A), Probabilistic Learning: Theory and Algorithms (ICS 274A), Data Mining (ICS 278), special topics taught by one of the faculty in this concentration (ICS 280—only one 280 course counts toward this requirement); three other graduate courses (for M.S. students pursuing the thesis option, two of the three courses must be substituted with two four-unit courses in Thesis Supervision, ICS 298); and ICS core course requirements.

Paper Requirement for the Ph.D. Degree

Each student must write two research papers of publishable quality.

CONCENTRATION IN STATISTICS (STATS)

Statistics is the science concerned with developing and studying methods for collecting, analyzing, interpreting, and presenting empirical data. Statistical principles and methods are important for addressing questions in public policy, medicine, industry, and virtually every branch of science. Interest in statistical methods has increased dramatically with the abundance of large databases in fields like computer science (Internet and Web traffic), business and marketing (transaction records), and biology (the human genome and related data). It is the substantive questions in the various areas of application that drive the development of new statistical methods and motivate the mathematical study of the properties of these methods.

Research in Statistics can range from mathematical studies of the theoretical underpinnings of a statistical model or method to the development of novel statistical models and methods and a thorough study of their properties. Frequently, statistics research is motivated and informed by collaborations with experts in a particular substantive field. Their scientific studies and data collection efforts may yield complex data that cannot be adequately handled using standard statistical methodology. Statisticians aim to develop methods that address the scientific or policy questions of the researcher. In doing so, statisticians must consider how efficiently and effectively the proposed methodology can be implemented and what guarantees can be provided as to the performance of the proposed methods. Such questions can often be answered using a combination of mathematical, analytical, and computational techniques.

Background: Individuals from a variety of backgrounds can make significant contributions to the field of statistics as long as they have sufficient background in mathematics. Undergraduate preparation in mathematics and statistics should include multivariate calculus (the equivalent of UCI courses Mathematics 2A-B, 2D-E), linear algebra (121A), elementary analysis (140A-B), and introductory probability and statistics (Statistics 120A-B-C). For students with undergraduate majors outside of mathematics and statistics, it is possible to make up one or two missing courses during the first year in the program.

Required Courses

Intermediate Probability and Statistics (Statistics 200A-B-C); Statistical Methodology (Statistics 210, 211, 212); five other graduate courses in or related to statistics, at least three of which are offered by the Statistics Department. (For M.S. students pursuing the thesis option, two of the five courses must be substituted with two four-unit courses in Thesis Supervision, ICS 298.)

The entire program of courses must be approved by the Statistics Department Graduate Committee. Students with previous graduate training in statistics may petition the Committee to substitute other courses for a subset of the required courses.

Other Requirements for the Ph.D. Degree

Additional courses required of Ph.D. students: Advanced Probability and Statistics Topics (Statistics 220A-B); Statistical Computing (Statistics 230).

Each Ph.D. student is required to take a comprehensive examination, ordinarily at the end of the first year, covering the material from Statistics 200A-B-C, 210, 211, and 212.

Ph.D. students are required to demonstrate substantive knowledge of an application area outside of statistics (e.g., computer science, economics, cognitive sciences, biology, or medicine). Such knowledge can be demonstrated by course work in the application area (three quarter courses), co-authorship of publishable research in the application area, or other evidence of supervised collaborative work that is substantiated by an expert in the field. In the case of a theoretically oriented student, the outside application area may be mathematics. The student should submit a proposal for meeting this requirement to the Statistics Department Graduate Committee by the end of the third year of enrollment.

CONCENTRATION IN SYSTEMS (SYS)

This concentration focuses on better understanding of the fundamental properties of computer systems and networks. It seeks to develop new abstractions, approaches, and tools for designing, building, analyzing, measuring, and maintaining future computer systems and networks.

Future computer systems will be required to control a greater variety of computing, communication, storage, and external devices; to support a broader range of even more demanding applications; and to control hundreds of asynchronous activities correctly, securely, and reliably. The Systems concentration supports research and education activities that address these requirements in a variety of systems, including distributed systems, embedded systems, multiple-component systems, parallel systems, and trusted systems.

Future networks are likely to exhibit unpredictable and complex behavior and dynamics; to span a broad range of technologies and bandwidths, from wireless sensors to a high-performance core; and to carry increasingly large amounts of increasingly demanding traffic. The Systems concentration supports a range of research and education activities, including networking research, new technologies, and networking research test beds.

The specific research topics studied by faculty members of the Computer Systems division include the following: system software and middleware; programming languages and compilers; parallel and distributed systems; computer networks; wireless and sensor networks; mobile and ubiquitous computing and networking; biologically inspired computing; embedded systems; computer-aided design; computer architecture; reconfigurable systems; high-performance systems and grid computing; data and information management; database systems; multimedia information systems and applications; visual computing, graphics, and scientific visualization; computer and network security, cryptography, and privacy.

Required Courses

The following courses must be completed with a grade of B or better and an average GPA of 3.5 or better:

Seminar in Research in ICS (ICS 200).

One of the following: Fundamentals of the Design and Analysis of Algorithms (ICS 260), Data Structures (ICS 261), Analysis of Algorithms (ICS 263).

Four of the following: Advanced Compiler Construction (ICS 211), Principles of Data Management (ICS 214A), Computer Systems Architecture (ICS 241A), Distributed Computer Systems (ICS 242), Computer Networks (ICS 243A), Introduction to Computer Design (ICS 252).

Five of the following: Ubiquitous Computing and Interaction (ICS 203B), Human Computer Interaction (ICS 205), Introduction to Embedded Computing Systems (ICS 212), Software for Embedded Systems (ICS 213), Transaction Processing and Distributed Data Management (ICS 214B), Validation and Testing of Embedded Systems (ICS 216), Design Automation and Prototyping of Embedded Systems (ICS 217), Multimedia Systems and Applications (ICS 218), Modern Microprocessors (ICS 241B), Networking Laboratory (ICS 243B), High-Speed Networks (ICS 243C), Internet Technology (ICS 243D), Wireless and Mobile Networking (ICS 243E), Middleware for Networked and Distributed Systems (ICS 243F), Network and Distributed Systems Security (ICS 243G), Parallel Computing (ICS 244), High-Performance Architectures and Their Compilers (ICS 245), Computer Security Algorithms (ICS 247), Queuing Theory (ICS 248), Digital System Verification and Testing (ICS 251), Design Description and Modeling (ICS 253), Design Synthesis (ICS 256), System Tools (ICS 257), Computational Complexity (ICS 262), Graph Algorithms (ICS 265), Computational Geometry (ICS 266), Data Compression (ICS 267), Cryptography and Computer Security (ICS 268), Computer Graphics (ICS 285), Advanced Topics in 3D Computer Graphics (ICS 286), VLSI System Design (EECS217), Fault-Tolerant Computing (EECS224).

Other Requirements for the Ph.D. Degree

Ph.D. students must also write a survey or research paper of publishable quality relevant to the student's area of research, pass a comprehensive examination, write a document describing their intended dissertation topic and a plan for completing the work, and publicly defend their final Ph.D. dissertation.

Graduate Courses in Information and Computer Science

200 Seminar in Research in ICS (2). Graduate orientation program and colloquium series. Includes talks by ICS faculty in all areas about their current research. Satisfactory/Unsatisfactory only. Formerly ICS 202.

203A Introduction to Ubiquitous Computing (4). The "disappearing computer" paradigm. Differences to the desktop computing model: applications, interaction in augmented environments, security, alternate media, small operating systems, sensors, and embedded systems design. Evaluation by project work and class participation.

203B Ubiquitous Computing and Interaction (4). Principles and design techniques for ubiquitous computing applications. Conceptual basis for tangible and embodied interaction. Interaction in virtual and augmented environments. Design methods and techniques. Design case studies. Examination by project work. Prerequisite: ICS 203A or 205.

205 Human–Computer Interaction (4). The design and evaluation of interfaces to computer systems and applications with special attention to their fit to human cognitive capabilities and organizational practices. Includes coverage of hypermedia, groupware, and other rapidly emerging developments.

206 Knowledge-Based User Interfaces (4). Concepts related to the development of interactive software systems with a focus on knowledge-based tools and human-centered design. Topics span the fields of human-computer interaction, software engineering, and knowledge representation. Prerequisite: ICS 171 or equivalent.

207 Information Retrieval, Filtering, and Classification (4). Algorithms for the storage, retrieval, filtering, and classification of textual and multimedia data. The vector space model, Boolean and probabilistic queries, and relevance feedback. Latent semantic indexing; collaborative filtering; and relationship to machine learning methods. Prerequisites: B.S. degree in computer science, or ICS 161, 171; Mathematics 3A or 6C; and a course in basic probability.

209 Seminar for Informatics in Biology and Medicine (2). Current research and research trends in bioinformatics and medical informatics. Forum for presentation and criticism by students of recently published research and work in progress. Prerequisite: ICS 208, 277A, or 277B, or a basic understanding of bioinformatics or medical informatics. May be repeated for credit.

211 Advanced Compiler Construction (4). Advanced study of programming language implementation techniques: optimizations such as common sub-expression elimination, register allocation, and instruction scheduling. Implementation of language features such as type-directed dispatch, garbage collection, dynamic linking, and just-in-time code generation. Prerequisite: ICS 142 or equivalent.

212 Introduction to Embedded and Ubiquitous Systems (4). Embedded and ubiquitous system technologies including processors, DSP, memory, and software. System interfacing basics; communication strategies; sensors and actuators, mobile and wireless technology. Using pre-designed hardware and software components. Design case studies in wireless, multimedia, and/or networking domains. Prerequisites: B.S. degree in computer science; or ICS 51, 152; Mathematics 3A or 6C or ICS 6A; ICS 161.

213 Software for Embedded Systems (4). Embedded computing elements, device interfaces, time-critical IO handling. Embedded software design under size, performance, and reliability constraints. Software timing and functional validation. Programming methods and compilation for embeddable software. Embedded runtime systems. Case studies of real-time software systems. Prerequisites: B.S. degree in computer science; or ICS 51, 152; Mathematics 3A or 6C or ICS 6A; ICS 161.

214A Principles of Data Management (4). Covers fundamental principles underlying data management systems. Content includes key techniques including storage management, buffer management, record-oriented file system, access methods, query optimization, and query processing. Prerequisites: ICS 143, 148, 152, and 184. Formerly ICS 214.

214B Transaction Processing and Distributed Data Management (4). Covers fundamental principles underlying transaction processing including database consistency, concurrency control, database recovery, and fault-tolerance. Includes transaction processing in centralized, distributed, parallel, and client-server environments. Prerequisite: ICS 214A.

215 Advanced Topics in Data Management (4). Selected advanced topics in data management. Content differs in each offering and with instructor's interests. Intended for students interested in data management with focus on reading and critiquing recent research papers, presentations, and substantial research projects. Prerequisites: ICS 143, 152, 161, 214A, 214B, or consent of instructor.

216 Validation and Testing of Embedded Systems (4). Embedded system building blocks including IP cores. Co-simulation. Formal verification using model checking. Verification environments. Test challenges in core integration: compliance, feature, random, and collision testing. Core access and test integration. Interface-based verification and standards. Prerequisite: B.S. degree in computer science or basic courses in algorithms and data structures, calculus, discrete mathematics, linear algebra, symbolic logic.

217 Design Automation and Prototyping of Embedded Systems (4). System representation and modeling. Abstract and language models. Simulation as a modeling activity. Computation and hw/sw systems prototypes. System analysis using models. Constraint and interface modeling. Behavioral compilation and synthesis. Prerequisites: B.S. degree in computer science or ICS 51, 152, 161, 212, and Mathematics 3A or 6C.

218 Multimedia Systems and Applications (4). Organization and structure of modern multimedia systems; audio and video encoding/compression; quality of service concepts; scheduling algorithms for multimedia; resource management in distributed and multimedia systems; multimedia protocols over high-speed networks; synchronization schemes; multimedia applications and teleservices. Prerequisites: undergraduate degree in computer science or ICS 143 and 161. ICS 148, 153, and 156 are also recommended. Undergraduates may enroll with consent of instructor.

219 Seminar in Compilers and Operating Systems (2). Current research and research trends in system-level software such as compilers and operating systems. Forum for presentation and criticism by students of new published research and work in progress. Prerequisites: undergraduate degree in computer science or ICS 142 and 143. May be taken for credit twice.

221 Software Engineering (4). Study of the concepts, methods, and tools for the analysis, design, construction, and measurement of complex software-intensive systems. Underlying principles emphasized. State-of-the-art software engineering and promising research areas covered, including project management. Formerly ICS 221A.

222 Formal Specification and Modeling (4). Examination of formal specification and modeling techniques, including algebraic, scenario-based, model-based, state-based, temporal and other logics, along with their related uses in software development.

223 Software Architecture (4). Study of the concepts, representation techniques, development methods, and tools for architecture-centric software engineering. Topics include domain-specific software architectures, architectural styles, architecture description languages, software connectors, and dynamism in architectures.

224 Software Analysis and Testing (4). Studies techniques for developing confidence in software from traditional testing schemes to integrated, multi-technique analytic approaches. Considers strengths and weaknesses and explores opportunities for synergistic technique application. Emphasis is on approaches integrated into the software process. Formerly ICS 224A.

225 Software Processes (4). Explores vehicles for modeling, coding, and analyzing software processes. Considers integration of software process programming approaches with traditional management issues. Explores the use of software process execution as a vehicle for effective integration of tools into environments.

226 Applied Software Design Techniques (4). Study of concepts, representations, techniques, and case studies in structuring software systems, with an emphasis on design considerations. Topics include static and dynamic system structure, data models, abstractions, naming, protocols and application programmer interfaces.

227 Advanced User Interface Architecture (4). Architectural concerns in advanced interactive systems. The design of current and emerging platforms for novel interactive systems. Paradigms such as constraint-based programming, multimodal interaction, and perceptual user interfaces for individual, distributed, and ubiquitous applications.

228 Software Environments (4). Study of the requirements, concepts, and architectures of comprehensive, integrated, software development and maintenance environments. Major topics include process support, object management, communication, interoperability, measurement, analysis, and user interfaces in the environment context.

229 Seminar in Informatics (2). Current research and research trends in Informatics. Forum for presentation and criticism by students of research work in progress. May be repeated for credit.

230 Social Analysis of Computing (4). The social and economic impacts of computing and information technologies on groups, organizations, and society. Topics include computerization and changes in the character of work, social control and privacy, electronic communities, and risks of safety-critical systems to people.

233 Computer-Supported Cooperative Work (4). The role of information systems in supporting work in groups and organizations. Examines various technologies designed to support communication, information sharing, and coordination. Focuses on behavioral and social aspects of designing and using group support technologies.

234A Computerization, Work, and Organizations (4). Selected topics in the influence of computerization and information systems in transforming work and organizations. Theories of organization and organizational change. Processes by which diverse information technologies influence changes in work and organizations over short and long time periods. Prerequisite: ICS 230 or 233.

234B *Theories of Computerization and Information Systems* (4). Social and economic conceptions of information technology. Macrosocial and economic conditions that foster changes in information technologies. Social construction of information and computer technology in professional worlds. Theories of information technology and large-scale social change. Prerequisite: ICS 230 or 233.

234C Computing and Cyberspace (4). Selected topics in Internet-level computerization and systems, including electronic communities, distributed information services, electronic commerce, and digital libraries. Surveys systems and architectures. Theories of social interaction, computer-mediated communication, and social-technical system design. Examines social studies of cyberspace use and impacts. Prerequisite: ICS 230 or 233.

235A Qualitative Research Methods in Information Systems (4). Introduction to qualitative research methods used to study computerization and information systems, such as open-ended interviewing, participant observation, and ethnography. Studies of the methods in practice through examination of research literature. Prerequisite: ICS 230 or 233.

235B Quantitative Research Methods in Information Systems (4). Quantitative research methods used to study computerization and information systems. Design of instruments, sampling, sample sizes, and data analysis. Validity and reliability. Longitudinal versus cross-sectional designs. Analysis of secondary data. Studies of the methods through examination of research literature. Prerequisites: basic knowledge of elementary statistics; ICS 230 or 233.

238A Descriptive Multivariate Statistics I (4). Mathematical tools to organize and illuminate the multivariate methods. Multiple regression analysis. Multi-dimensional scaling and cluster analysis. Statistical computing via MDS(x), DMDP, and SPSS. Students must enroll in the laboratory section which meets on Wednesdays. Satisfactory/Unsatisfactory grading only. Prerequisite: Social Science 100A-B-C or equivalent. Same as Social Ecology 290A, Social Science 201A, and Management 290X.

238B Descriptive Multivariate Statistics II (4). Presentation of the principle methods of multivariate statistics including criteria for appropriate use and the interpretation of resulting measurements. Computer exercises are used to demonstrate concepts. Prerequisite: ICS 238A. Same as Social Ecology 290B, Social Science 201B, and Management 290Y.

239 Seminar in Research on Social Analysis and Information Systems (2). Current research and research trends in topics covered within computing, organization, policy, and society. Topics may emphasize, but are not limited to, social and organizational analysis pertinent to computerized information systems, Computer Supported Cooperative Work (CSCW), and studies of emerging information technologies. May be repeated for credit.

241A Computer Systems Architecture (4). Study of architectural issues and their relation to technology and software: design of processor, interconnections, and memory hierarchies. Prerequisites: ICS 143 and 153, or equivalent. Formerly ICS 241.

241B Modern Microprocessors (4). Fundamental concepts and recent advances in computer architecture necessary to understand and use modern microprocessors. Topics span out-of-order execution, multiple instruction issue, control/data speculation, predication, advanced cache and DRAM organizations, embedded systems, DSP and multi-media instructions. Prerequisite: ICS 241A or equivalent.

242 Distributed Computer Systems (4). Principles of distributed computing systems. Topics covered include message-passing, remote procedure calls, distributed shared memory synchronization, resource and process/thread management, distributed file systems, naming and security. Prerequisite: consent of instructor. Formerly ICS 247.

243A Internet (4). A broad overview of basic Internet concepts. Internet architecture and protocols, including addressing, routing, TCP/IP, quality of service, and streaming. Prerequisite: EECS148, ICS 153, or consent of instructor. Same as EECS248A and Networked Systems 201.

243B Networking Laboratory (4). A laboratory-based introduction to basic networking concepts such as addressing, sub-netting, bridging, ARP, and routing. Network simulation and design. Structured around weekly readings and laboratory assignments. Prerequisite: ICS 153 or EECS148. Same as Networked Systems 202.

243C Advanced Networks (4). Fundamental concepts of switching, advanced medium access control methods, virtual circuits, integrated services, quality of service, performance models, simulation, measurement. Prerequisite: ICS 243A. Same as Networked Systems 210.

243D Internet Technology (4). Application layer Internet protocols, potentially including client/server, WWW, file sharing, group communications, Internet programming. Prerequisite: ICS 243A. Same as Networked Systems 220.

243E Wireless and Mobile Networking (4). Introduction to wireless networking. The focus is on layers 2 and 3 of the OSI reference model, design, performance analysis, and protocols. Topics covered include: an introduction to wireless networking, digital cellular, next generation cellular, wireless LANs, and mobile IP. Prerequisites: ICS 153 or EECS148, and an introductory course in probability or consent of instructor. Same as Networked Systems 230.

243F Middleware for Networked and Distributed Systems (4). Discusses concepts, techniques, and issues in developing distributed systems middleware that provides high performance and Quality of Service for emerging applications. Also covers existing standards (e.g., CORBA, DCOM, Jini, Espeak) and their relative advantages and shortcomings. Prerequisite: undergraduate-level course in operating systems and networks or consent of instructor. Same as Networked Systems 260.

243G Network and Distributed Systems Security (4). Overview of modern computer and networks security: attacks and countermeasures. Authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Group communication and multicast security techniques. Also covers secure e-commerce and applications of public key methods, digital certificates, and credentials. Prerequisite: ICS 153 or EECS148. Same as Networked Systems 240.

244 Parallel Computing (4). Definition of parallel processing systems. Theory and application of arrays, trees, and hypercubes. Computational models, applications: sorting, integer arithmetic, matrix operations, Fast Fourier Transform, and others. Interconnection networks: a framework for the description, analysis, and construction of hypercube-derived networks.

245 High-Performance Architectures and Their Compilers (4). Emphasis on the development of automatic tools (i.e., compilers/environments) for the efficient exploitation of parallel machines, and the trade-offs between hardware and software in the design of supercomputing and high-performance machines.

247 Computer Security Algorithms (4). Algorithms and data structures for performing computer security services. Network security, digital certificates and credentials, authenticated dictionaries, dynamic coalition management, and techniques for authorization and non-repudiation. Prerequisites: ICS 161, 163, 260, 261, 262, 263, or equivalent.

248 Queueing Networks (4). Probability, random processes, and queueing theory applied to computer networks. Poisson processes, Markov chains, queues, queueing networks, simulation. Prerequisites: ICS 243A and an introductory course in probability. Same as Networked Systems 251.

249 Seminar in Parallel Distributed and Network Systems (2). Current research and research trends in parallel distributed and network systems. Forum for presentation and criticism by students of research work in progress. May be repeated for credit.

251 Digital System Verification and Testing (4). Techniques for simulation, verification, and testing of hardware and mixed-mode systems. Fault models, test generation, algorithms, and functional testing. Design for testability. Prerequisite: consent of instructor.

252 Introduction to Computer Design (4). The methodology and use of CAD tools for computer design, accomplished by a lab in which students practice design using commercially available silicon compilers and other tools. Prerequisite: ICS 151 and 152 or equivalent.

253 Design Description and Modeling (4). Introduction to design modeling. Overview of design description languages and demonstration of design modeling at different abstraction levels. Techniques and methodologies for simulating and testing of design. Prerequisites: ICS 151, 152, and 241; or consent of instructor.

256 Design Synthesis (4). Methods, algorithms, and tools for design synthesis on different levels of design: logic, register-transfer, behavioral, and system. CAD laboratory assignments using design tools for exploration of different synthesis algorithms. Prerequisites: ICS 152 (or 241), or 252, or consent of instructor.

257 System Tools (4). Specification and requirement analysis of integrated systems. Support for early system-design decisions. Estimation and prediction of design metrics. System partitioning, modeling of hardware/software codesign. Synthesis from executable specifications. Prerequisites: ICS 252 and 253; or consent of instructor.

259 Seminar in Design Science (2). Current research and research trends in design science. Forum for presentation and criticism by students of research work in progress. May be repeated for credit.

260 Fundamentals of the Design and Analysis of Algorithms (4). Covers fundamental concepts in the design and analysis of algorithms and is geared toward non-specialists in theoretical computer science. Topics include: deterministic and randomized graph algorithms, fundamental algorithmic techniques like divide-and-conquer strategies and dynamic programming, and NP-completeness. Prerequisite: ICS 161 or equivalent undergraduate algorithms course.

261 Data Structures (4). An in-depth treatment of data structures and their associated management algorithms including resource complexity analysis. Prerequisite: ICS 23 and 161.

262 Computational Complexity (4). Advanced course in computational models and complexity classes. Covers the fundamentals of Turing Machines, Decidability, and NP-completeness. Includes discussion of more advanced topics including polynomial hierarchy, randomized complexity classes, #P-completeness and hardness of approximation. Prerequisite: ICS 162.

263 Analysis of Algorithms (4). Analysis of correctness and complexity of various efficient algorithms; discussion of problems for which no efficient solutions are known. Prerequisites: ICS 161 and 261.

264 Topics in Online Algorithms (4). Design and analysis of algorithms which make decisions with partial information. Focuses primarily on the use of competitive analysis, a means of evaluating online algorithms, although some probabilistic analyses are covered. Application areas covered vary. Prerequisite: ICS 161 or equivalent.

265 Graph Algorithms (4). Graph definitions, representation methods, graph problems, algorithms, approximation methods, and applications. Prerequisites: ICS 161 and 261.

266 Computational Geometry (4). An overview of some of the basic problems in computational geometry and of some algorithmic and data-structuring techniques appropriate to their solution. Prerequisites: ICS 161 and 261.

267 Data Compression (4). An introduction to the theory and practice of modern data compression techniques. Topics include codes, coding, modeling, text compression, lossless and lossy image compression standards and systems, audio compression. Prerequisite: ICS 161, 260, or 261.

268 Cryptography and Computer Security (4). Overview of modern cryptography; security threats and countermeasures; secret and public key cryptography; digital signatures and non-repudiation; cryptographic strength; block ciphers and stream ciphers; computer and network security; data privacy and data integrity; authentication and identification; freshness and timeliness. Prerequisites: ICS 161, 162, 260, 261, 262, 263, or equivalent; consent of instructor.

269 Seminar in the Theory of Algorithms and Data Structures (2). Current research and research trends in the theory of algorithms and data structures. May be repeated for credit.

270A Introduction to Artificial Intelligence (4). The study of theories and computational models for systems which behave and act in an intelligent manner. Fundamental subdisciplines of artificial intelligence including knowledge representation, search, deduction, planning, probabilistic reasoning, natural language parsing and comprehension, knowledge-based systems, and learning.

273A Machine Learning (4). Computational approaches to learning algorithms for classifications, regression, and clustering. Emphasis is on discriminative classification methods such as decision trees, rules, nearest neighbor, linear models, and naive Bayes. Prerequisites: ICS 270A and ICS 282. Formerly ICS 273.

273B Kernel-Based Learning (4). Principles of kernel methods, support vector machines, and related machine learning methods. Applications to regression, classification, prediction, and other data analysis problems. Typical areas of application range from bioinformatics, to image analysis, to pattern recognition. Prerequisites: ICS 271 and ICS 273A, or consent of instructor.

274A Probabilistic Learning: Theory and Algorithms (4). An introduction to probabilistic and statistical techniques for learning from data, including parameter estimation, density estimation, regression, classification, and mixture modeling. Prerequisite: ICS 282 or consent of instructor. Formerly ICS 274.

274B Learning in Graphical Models (4). Models for data analysis are presented in the unifying framework of graphical models. The emphasis is on learning from data but inference is also covered. Real world examples are used to illustrate the material. Prerequisite: ICS 274A or consent of instructor.

275A Network-Based Reasoning/Constraint Networks (4). Study of the theory and techniques of constraint network model. Covers techniques for solving constraint satisfaction problems: backtracking techniques, consistency algorithms, and structure-based techniques. Tractable subclasses. Extensions into applications such as temporal reasoning, diagnosis, and scheduling. Prerequisite: a basic course in algorithm design and analysis, or consent of instructor.

275B Network-Based Reasoning/Belief Networks (4). Focuses on reasoning with uncertainty using "Bayes Networks" that encode knowledge as probabilistic relations between variables, and the main task is, given some observations, to update the degree of belief in each proposition. Prerequisite: a basic course in probability or consent of instructor.

276A Neural Networks (4). Introduction to concepts of artificial neural networks (ANNs). Architectures of supervised and unsupervised networks. Basic math of learning and performance rules.

276B Seminar in Models of the Brain (4). Basic neural anatomy and physiology. Fundamental cell types and their channel properties. Organization of telencephalic circuitry. Cortico-Hippocampal pathways. Synaptic plasticity: long-term potentiation. Behavioral implications of plasticity, interpretation of lesion experiments, computational network models based on physiology of plasticity.

276C Cognitive and Computational Neuroscience (4). Computational analysis and simulation of physiological rules as sited in anatomical circuitries. Synaptic plasticity in the brain and its behavioral and psychological consequents in learning and memory. Theories of hippocampal function; thalamocortical function and interactions among neocortical layers.

277A Representations and Algorithms for Molecular Biology (4). Introduction to computational methods in molecular biology, aimed at those interested in learning about this interdisciplinary area. Covers computational approaches to understanding and predicting the structure, function, interactions, and evolution of DNA, RNA, proteins, and related molecules and processes. Prerequisite: a basic course in algorithms, or a basic course in molecular biology, or consent of instructor. Formerly ICS 277.

277B Probabilistic Modeling of Biological Data (4). A unified Bayesian probabilistic framework for modeling and mining biological data. Applications range from sequence (DNA, RNA, proteins) to gene expression data. Graphical models, Markov models, stochastic grammars, structure prediction, gene finding, evolution, DNA arrays, single- and multiple-gene analysis. Prerequisite: a basic course in algorithms and molecular biology, or ICS 277A or equivalent, or consent of instructor.

277C Computational Systems Biology (4). Computational inference and modeling of gene regulation networks, signal transduction pathways, and the effects of regulatory networks in cellular processes, development, and disease. Introduction of required mathematical, computational, and data handling tools. Prerequisites: ICS 277A or 277B or Biological Sciences 99 and Mathematics 2D and 2J, or consent of instructor.

278 Data Mining (4). Introduction to the general principles of inferring useful knowledge from large data sets (commonly known as data mining or knowledge discovery). Relevant concepts from statistics, databases and data structures, optimization, artificial intelligence, and visualization are discussed in an integrated manner. Prerequisite: ICS 273 or 274 or consent of instructor.

279 Seminar in Artificial Intelligence (2). Current research and research trends in artificial intelligence. May be repeated for credit.

280 Special Topics in Information and Computer Science (4) F, W, S

282 Principles of Scientific Computing (4). Overview of widely used principles and methods of numerical and scientific computing, including basic concepts and computational methods in linear algebra, optimization, and probability. Prerequisites: basic courses in multivariate calculus, linear algebra, and probability. ICS 282 and Statistics 230 may not both be taken for credit.

285 Computer Graphics (4). Euler characteristics, genus, manifolds; graphics, pipeline; lighting; texture-, bump-, and mip-mapping; spatial hierarchies; back-face/view-frustum culling; color theory; anti-aliasing, dithering; introduction to certain advanced topics like Monte Carlo methods, radiosity, ray tracing.

286 Advanced Topics in 3D Computer Graphics (4) F, W, S. Advanced topics in 3D graphics on rendering, geometric modeling, and visualization. Subjects range from illumination and shading, and multiresolution representations, to other advanced algorithms and data structures in graphics. Also looks at trends that go beyond traditional computer graphics. Prerequisites: ICS 161, 164, 186 or 285, and 266.

288 Introduction to Visual Perception (4). Introduction to the process of human visual perception. Offers the physiological and psychophysical approach to understand vision, introducing concepts of perception of color, depth, movement. Examples of the quantification and application of these models in computer vision, computer graphics, multimedia, HCI. Prerequisite: Mathematics 121A.

290 Research Seminar (2). Forum for presentation and criticism by students of research work in progress. Presentation of problem areas and related work. Specific goals and progress of research. Satisfactory/Unsatisfactory only.

291 Directed Research (2 to 12)

298 Thesis Supervision (2 to 12). Individual research or investigation conducted in preparation for the M.S. thesis option or the dissertation requirements for the Ph.D. program.

299 Individual Study (2 to 12). Individual research or investigation under the direction of an individual faculty member.

398A Teaching Assistant Training Seminar (2) F. Theories, methods, and resources for teaching computer science at the university level, particularly by teaching assistants. Classroom presentations, working with individuals, grading, motivating students. Participants will give and critique presentations and may be videotaped while teaching. Satisfactory/Unsatisfactory only. Formerly ICS 398.

398B Advanced Teaching Assistant Seminar (2) F. Teaching computer science at the university level, emphasizing issues in teaching an entire course. Course organization, designing examinations and projects, grading, motivating students. Participants will begin to assemble teaching portfolios. Satisfactory/Unsatisfactory only. Prerequisite: ICS 398A or consent of instructor.

399 University Teaching (4). Involves on-the-job experience for Teaching Assistants. Limited to and required of Teaching Assistants.

Graduate Courses in Informatics

201 Research Methodology for Informatics (4). Introduction to strategies and idioms of research in informatics. Includes examination of issues in scientific inquiry, qualitative and quantitative methods, and research design. Both classic texts and contemporary research literature are read and analyzed.

264 Computer Law (4). The American legal system and its provisions affecting computer systems, computer networks, and information processing. Intellectual property, contracts, privacy, liability for malfunction, computer crime, constitutional issues, transborder data flow, computer-based evidence, and litigation. Prerequisite: graduate standing or consent of instructor.

270 Arts Computation Engineering Interdisciplinary Theory Seminar: Special Topics (4). Counterposes technological discourses with fine arts discourses and practices, with a focus on historical contextualization, utilizing critical theory and science and technology studies perspectives. Topics vary and are not repeated in any three-year period. May be repeated for credit as topics vary. Same as Engineering 270 and Arts Interdisciplinary 270.

271 Arts Computation Engineering Studio/Laboratory: Interactive Installation and Performance Design Workshop (4). Designing persuasive spatialized interactive experiences: spatially and temporally distributed narratives. User-system relationships. "Freedom" in interaction: authoriality and control. Audience and the spect-actor. Sensors, behavior logics, and multimodal output. Machine learning and autopedagogic systems. Training in relevant technologies. May be taken twice for credit. Same as Engineering 271 and Arts Interdisciplinary 271.

272 Arts Computation Engineering Studio/Laboratory: Games and Algorithmic Systems in Literature and the Arts (4). Explores the cultural tradition of the game and game play with particular reference to the automation of games in computational systems and the close relation between gaming, improvisation, hypertext, and interactive art. Game programming techniques and projects. May be taken twice for credit. Same as Engineering 272 and Arts Interdisciplinary 272.

273 Arts Computation Engineering Studio/Laboratory: Spatial Interaction: Sensors and Input/Output (4). Designing and building sensor and effector systems for cultural applications. Sensors, sensor combinations, sensor data collection and interpretation, input/output techniques and devices. Same as Engineering 273 and Arts Interdisciplinary 273.

274 Arts Computation Engineering Studio/Laboratory: Real Space Interaction (4). Designing and building machine artworks, motion control, mechatronic, animatronic, and mobile robotic projects. Mechanics, electro-mechanics, electronics, microcontrollers, motor control. Aesthetico-critical as well as technical aspects subject to assessment. Same as Engineering 274 and Arts Interdisciplinary 274.

275 Arts Computation Engineering Studio/Laboratory: Cultural Practice in Immersive Media (4). Examines and moves beyond existing paradigms of virtuality. Sensor and input devices, their logics and limitations. Embodied and symbolic interaction. Panoramic and stereoscopic image technologies. Stereoscopic graphics and spatialized sound. Technical components and their integration. Collaborative projects. Same as Engineering 275 and Arts Interdisciplinary 275.

276 Arts Computation Engineering Studio/Laboratory: Telematic Performance and Teleoperative Art (4). Art and performance projects utilizing real time and quasi-real time distance interaction. Synchronous performance and distributed choreography. Network technologies and protocols. Speed, bandwidth, latency. Web-based technologies. Video and sound. Teleoperation/remote machine control. Same as Dance 276, Engineering 276, and Arts Interdisciplinary 276.

277 Arts Computation Engineering Studio/Laboratory: Special Topics (4). Focuses on currently emerging technologies, techniques, and cultural and critical issues. May be repeated for credit as topics vary. Same as Engineering 277 and Arts Interdisciplinary 277.

278 Arts Computation Engineering Thesis Research (4 to 12). Independent research for thesis and thesis project. May be taken for a total of 36 units. Same as Engineering 278 and Arts Interdisciplinary 278.

279 Special Topics in the Arts Computation Engineering (4). Prerequisites vary. May be repeated for credit as topics vary. Same as Engineering 279 and Arts Interdisciplinary 279.

Graduate Courses in Statistics

200A-B-C Intermediate Probability and Statistical Theory (4-4-4). 200A: Basics of probability theory, random variables and basic transformations, univariate distributions—discrete and continuous, multivariate distributions. **200B:** Random samples, transformations, limit laws, normal distribution theory, introduction to stochastic processes, data reduction, point estimation (maximum likelihood). **200C:** Interval estimation, hypothesis testing, decision theory and Bayesian inference, basic linear model theory. Prerequisites: Statistics 120A-B-C or equivalent or consent of instructor.

210 Statistical Methods I: Linear Models (4). Statistical methods for analyzing data from surveys and experiments. Topics include randomization and model-based inference, two-sample methods, analysis of variance, linear regression and model diagnostics. Prerequisite: knowledge of basic statistics (at the level of Statistics 7), calculus, linear algebra.

211 Statistical Methods II: Advanced Statistical Modeling (4). Analysis of data using extensions of the traditional linear model. Topics include generalized linear models (logistic and poisson regression), linear mixed models. Different approaches to inference are considered including likelihood-based methods and estimating equations. Prerequisite: Statistics 210 or equivalent.

212 Statistical Methods III: Longitudinal Data Analysis (4). Statistical methods for analyzing longitudinal data from experiments and cohort studies. Topics covered include survival methods for censored time-to-event data, linear mixed models, non-linear mixed effects models, and generalized estimating equations. Prerequisite: Statistics 211 or equivalent.

220A-B Advanced Probability and Statistics Topics (4-4). Advanced topics in probability and statistical inference including measure theoretic probability, large sample theory, decision theory, resampling and Monte Carlo methods, nonparametric methods. Prerequisites: Statistics 200A-B-C.

225 Bayesian Statistical Analysis (4). Introduction to the Bayesian approach to statistical inference. Topics include univariate and multivariate models, choice of prior distributions, hierarchical models, computation including Markov chain Monte Carlo, model checking, and model selection. Prerequisites: either Economics 220A-B, Mathematics 201A-B, Mathematics 131A-B-C/Statistics 120A-B-C, Psychology 203A-B, or consent of instructor.

230 Statistical Computing Methods (4). Numerical computations and algorithms with applications in statistics. Topics include optimization methods including the EM algorithm, random number generation and simulation, Markov chain simulation tools, and numerical integration. Prerequisites: two quarters of upper-division or graduate training in probability and statistics; possible courses include Economics 220A-B, Mathematics 131A-B-C/Statistics 120A-B-C, Mathematics 201A-B, Psychology 203A-B, and Statistics 225. Statistics 230 and ICS 282 may not both be taken for credit.

240 Multivariate Statistical Methods (4). Theory and application of multivariate statistical methods. Topics include: likelihood and Bayesian inference for the multivariate normal model, visualization of multivariate data, data reduction techniques, cluster analysis, and multivariate statistical models. Prerequisites: Statistics 200A-B-C and Mathematics 121A.

245 Time Series Analysis (4). Statistical models for analysis of time series from time and frequency domain perspectives. Emphasizes theory and application of time series data analysis methods. Topics include ARMA/ARIMA models, model identification and estimation, linear operators, Fourier analysis, spectral estimation, state space models, Kalman filter. Prerequisites: Statistics 200A-B-C.

250 Biostatistics (4). Statistical methods commonly used to analyze data arising from clinical studies. Topics include analysis of observational studies and randomized clinical trials, techniques in the analysis of survival and longitudinal data, approaches to handling missing data, meta-analysis, nonparametric methods. Prerequisite: Statistics 210.

255 Statistical Methods for Survival Data (4). Statistical methods for analyzing survival data from cohort studies. Topics include parametric and nonparametric methods, the Kaplan-Meier estimator, log-rank tests, regression models, the Cox proportional hazards model and accelerated failure time models, efficient sampling designs, discrete survival models. Prerequisite: Statistics 211.

260 Inference with Missing Data (4). Statistical methods and theory useful for analysis of multivariate data with partially observed variables. Bayesian and likelihood-based methods developed. Topics include EM-type algorithms, MCMC samplers, multiple imputation, and general location model. Applications from economics, education, and medicine are discussed. Prerequisites: Statistics 200A-B-C and 210.

265 Causal Inference (4). Various approaches to causal inference focusing on the Rubin causal model and propensity-score methods. Topics include randomized experiments, observational studies, non-compliance, ignorable and non-ignorable treatment assignment, instrumental variables, and sensitivity analysis. Applications from economics, politics, education, and medicine. Prerequisites: Statistics 200A-B-C and 210.

INTERDISCIPLINARY STUDIES

UCI offers a variety of interdisciplinary programs which provide students with opportunities to pursue subject areas deriving from the interaction of different disciplines. These programs span the boundaries of traditional academic scholarship. Faculty participation is determined by research and teaching interests and, as such, faculty may be drawn from various departments and schools across the campus.

This section presents information about the Chicano/Latino Studies major, honors program, and minor; the minors in Global Sustainability, History and Philosophy of Science, and Native American Studies; and the graduate degree programs in Networked Systems and Transportation Science.

See the School of Humanities section for information about the interdisciplinary programs in African American Studies, Asian Studies, Latin American Studies, Religious Studies, and Women's Studies. Information about the interdisciplinary minor in Conflict Resolution is available in the School of Social Sciences section.

UNDERGRADUATE STUDY

Chicano/Latino Studies

383 Social Science Tower; (949) 824-7180
World Wide Web: http://www.socsci.uci.edu/clstudies
Leo Chávez, **Director**

Core Faculty

Louis DeSipio, Ph.D. University of Texas at Austin, *Associate Professor of Chicano/Latino Studies and Political Science*
Cynthia Feliciano, Ph.D. University of California, Los Angeles, *Assistant Professor of Chicano/Latino Studies and Sociology*
Raúl Fernández, Ph.D. Claremont Graduate School, *Professor of Chicano/Latino Studies and Social Sciences*
Lisa García Bedolla, Ph.D. Yale University, *Assistant Professor of Chicano/Latino Studies and Political Science*
Gilbert González, Ph.D. University of California, Los Angeles, *Professor of Chicano/Latino Studies and Social Sciences*
Michael J. Montoya, Ph.D. Stanford University, *Assistant Professor of Chicano/Latino Studies and Anthropology*
Vicki L. Ruiz, Ph.D. Stanford University, *Professor of Chicano/Latino Studies and History*
Rodolfo D. Torres, Ph.D. Claremont Graduate School, *Associate Professor of Chicano/Latino Studies, Social Ecology, and Political Science*
Deborah R. Vargas, Ph.D. University of California, Santa Cruz, *Assistant Professor of Chicano/Latino Studies*

Affiliated Faculty

Frank Bean, Ph.D. Duke University, *Professor of Sociology*
Leo Chávez, Ph.D. Stanford University, *Director of Chicano/Latino Studies and Professor of Anthropology*
Gilberto Q. Conchas, Ph.D. University of Michigan, *Assistant Professor of Education*
Susan Bibler Coutin, Ph.D. Stanford University, *Associate Professor of Social Ecology*
Robert Garfias, Ph.D. University of California, Los Angeles, *Professor of Anthropology*
José Rodrigo Lazo, Ph.D. University of Michigan, *Assistant Professor of English*
Alejandro Morales, Ph.D. Rutgers University, *Professor of Spanish*
Caesar D. Sereseres, Ph.D. University of California, Riverside, *Associate Dean for Undergraduate Studies, School of Social Sciences, and Associate Professor of Political Science*
James Diego Vigil, Ph.D. University of California, Los Angeles, *Professor of Social Ecology*

Chicano/Latino Studies is an interdisciplinary program designed to provide undergraduate students with an opportunity to examine the historical and contemporary experiences of Americans of Latin American origin. This diverse population includes people who trace their heritage to Mexico, Puerto Rico, Cuba, El Salvador, Guatemala, Nicaragua, and many other Latin American and Caribbean nations. The curriculum seeks to provide an awareness, knowledge, and appreciation of the language, history, culture, literature, sociology, anthropology, politics, social ecology, health, medicine, and creative (art, dance, drama, film, music) accomplishments in Chicano/Latino communities. The Program offers a B.A. degree in Chicano/Latino Studies and a minor.

Change of Major. Students who wish to change their major to Chicano/Latino Studies should contact the program office for information about change of major requirements, procedures, and policies. Information is also available at http://www.due.uci.edu/Change_of_Major.html.

Center for Research on Latinos in a Global Society

Interdisciplinary research in Chicano/Latino Studies is conducted under the auspices of the Center for Research on Latinos in a Global Society (CRLGS). Its multifold goals are: (1) to examine the emerging role of Latinos as actors in global economic, political, and cultural events; (2) to promote Latino scholarship; (3) to enhance the quality of research in Latino studies; (4) to provide a forum for intellectual exchange and the dissemination of research finding; and (5) to promote the participation of undergraduate and graduate students in research on Latino issues. The use of the term "global society" underscores the faculty's perception that, as a society, the United States is becoming "globalized," meaning that it is increasingly affected by worldwide economic, political, demographic, and cultural forces and that Latinos are at the center of this. Latinos in the United States, individually and as a sociopolitical group, play important roles in the multiple processes—immigration, trade, international capital flow, and international political movements—which are changing the traditional demarcation between domestic and foreign, and national and international politics, economics, and society.

Scholarship Opportunities

The Jeff Garcilazo Fellowship/Scholarship Fund, in honor and memory of the late Chicano/Latino Studies and History professor, was established to provide opportunities for students to examine the historical and contemporary experiences of Americans of Latin American origin. Funds are awarded to current UCI students.

The Hispanic Scholarship Fund (HSF), formerly the National Hispanic Scholarship Fund, awards scholarships annually to students enrolled in and attending an accredited college full-time from the fall through the spring (or summer) terms.

CAREER OPPORTUNITIES

Many career opportunities exist for students who graduate with a B.A. degree in Chicano/Latino Studies, such as service with national and international organizations which seek knowledge of American multicultural society in general, and of Chicano/Latino peoples and cultures in particular; positions as area specialists with state and federal government agencies; careers in the private sector with corporations or private organizations which have a significant portion of their activities in the U.S. and Mexico, Puerto Rico, Cuba, El Salvador, Guatemala, and other Latin American countries; and positions of service and leadership within Chicano/Latino communities such as education, human services, law, health fields, journalism, and public policy. Students may also continue their education and pursue professional or graduate degrees.

Employers and admission officers understand that many of their employees and graduates will one day work in communities with significant Chicano/ Latino populations, and for this reason they give due consideration to applicants who have in-depth knowledge of Chicano/Latino culture.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

Requirements for the Major

A. Familiarity with basic mathematical, computational, and statistical tools underlying modern social sciences. This requirement is met by passing a three-course sequence in mathematics selected from Anthropology 10A-B-C, Mathematics 2A-B, 7, Psychology 10A-B-C, Social Science 10A-B-C, Social Science 100A-B-C, or Sociology 10A-B-C. Computer education is essential for a complete social science education. This requirement can be satisfied by passing Information and Computer Science 10A, 10B, or 21, or Social Science 3A. This course requirement should be taken during the student's first year. (NOTE: ICS 10A, 10B, 21, and Social Science 100A may be taken Pass/Not Pass.)

B. An understanding of the fundamental concepts, analytical tools, and methods of social science. This requirement is met by taking two four-unit introductory courses in the School of Social Sciences bearing a one-digit course number. These courses normally should be taken during the student's first year.

C. Five core courses: Chicano/Latino Studies 61, 62, 63, 101, 102.

D. Spanish 2A or its equivalent; students are encouraged to continue their Spanish language education through Spanish 2C.

E. One comparative ethnic studies course selected from either African American Studies, Asian American Studies, or Education 124. Course must focus on the study of African American or Asian American communities in the U.S.

F. Four upper-division electives are required; each course must be completed in a separate category selected from the following five: Literature, Arts, Media, Culture (Chicano/Latino Studies 110–129); History (Chicano/Latino Studies 130–139); Society, Labor, Politics, Law, Gender, Race, Ethnicity (Chicano/Latino Studies 140–159); Globalization, Transnationalism, Immigration, U.S.-Mexico Border (Chicano/Latino Studies 160–169); Health, Medicine, Psychosocial Dynamics (Chicano/Latino Studies 170–179).

G. Three additional elective courses, two of which must be upper-division, selected from Chicano/Latino Studies courses. Electives may include Field Research/Independent Studies courses (Chicano/Latino Studies 190–199). Students may obtain credit for one of these three courses through participation in a study abroad program in Mexico.

Residence Requirement for the Major: A minimum of five upper-division courses required for the major must be completed successfully at UCI. Courses taken through the UC Education Abroad Program will be counted toward satisfaction of the residence requirement by student petition and upon prior approval of course content by the Chicano/Latino Studies Program Committee.

Optional Senior Research Project

Students are encouraged to pursue field research and write a substantial research paper on topics of their choice under the guidance of Chicano/Latino faculty members. Often, this project will grow out of issues examined in the Chicano/Latino Research Seminar (102). Research projects typically involve a combination of library research and fieldwork in one of the local Chicano/Latino communities. Methods and analytical frameworks vary depending on the student and faculty advisors. Interested students should enroll in Chicano/Latino Studies 196 (Field/Research Senior Project), which may be taken for credit three times.

Honors Program in Chicano/Latino Studies

The Honors Program in Chicano/Latino Studies is designed to allow undergraduates to pursue field research and write an honors thesis on topics of their choice under the guidance of Chicano/Latino Studies faculty members. Research projects typically involve a combination of library research and field research. The program is open to all senior Chicano/Latino Studies majors with a grade point average of 3.3 or better overall, with 3.5 in Chicano/Latino Studies courses (at least five courses). Successful completion of the Honors Program and the honors thesis satisfies the upper-division writing requirement.

Although course work for the Honors Program does not start until the senior year, it is highly recommended that during the spring quarter of the junior year, students find a professor willing to serve as their research project advisor on the basis of a mutually acceptable abstract that indicates the goal and significance of their project. If extensive research is to be undertaken at this time, students should enroll in Chicano/Latino Studies 196.

During the fall quarter of the senior year, students enroll in Chicano/Latino Studies H190A and write a proposal describing their research question, the relevant background literature, and the method of data collection and analysis. Field work for the project may begin during this quarter.

In the winter quarter of the senior year, students begin or continue their research by enrolling in Chicano/Latino Studies H190B. In the spring quarter of the senior year, students enroll in Chicano/Latino Studies H190C and complete a senior honors thesis that is typically 40 to 80 pages long. Honors theses are read and evaluated by the advisor and a second faculty member chosen by the Director of the Chicano/Latino Studies Program in consultation with the advisor.

Requirements for the Minor

Completion of three core courses: Chicano/Latino Studies 61, 62, 63; three upper-division courses selected from Chicano/Latino Studies 100–179; and Spanish 2A or its equivalent.

Residence Requirements for the Minor: Other than the language requirement, no more than two courses taken at other academic institutions may be used toward satisfaction of minor.

While students will be responsible for designing their minor according to the above requirements, the curriculum should be planned in consultation with Chicano/Latino Studies Program (CLSP) faculty. Curricula must receive approval from one faculty member in CLSP as well as the Director or designated representative. Students must also file intent to pursue the minor with the CLSP office.

In addition to satisfying the requirements for the major or minor, students are encouraged to take advantage of the variety of unique educational opportunities available at UCI. Through the Education Abroad Program (EAP), students receive academic credit while studying at universities in Mexico, Chile, Costa Rica, Brazil, or Spain. Internship opportunities with private and public institutions concerned with the Chicano/Latino communities are available in Orange County, Sacramento, and Washington, D.C. Independent research with faculty on Chicano/Latino issues is also encouraged. Student research is conducted and given academic credit through independent study or group research courses offered in each academic unit. The Undergraduate Research Opportunities Program (UROP) and the Summer Academic Enrichment Program (SAEP) are examples of programs at UCI which allow students to work as research assistants with professors.

Courses in Chicano/Latino Studies

LOWER-DIVISION

61 Introduction to Chicano/Latino Studies I (4). Introduces links between culture, history, and sociology of Chicano/Latino communities. Examines the formation, evolution, and adaptation of Chicano/Latino communities within a national and international perspective. Reviews literature on Chicano/Latino Studies as a field of intellectual inquiry. **(III, VII-A)**

62 Introduction to Chicano/Latino Studies II (4). Foundations of Latinos from pre-history to present with emphasis on race, class, gender, and culture. Examines institutions/processes of: indigenous culture; conquests, colonialism/neocolonialism; racialization; capitalist industrialization; immigration; Americanization. History, literary, and artistic materials/texts of Latino subgroups. **(III, VII-A)**

63 Introduction to Chicano/Latino Studies III (4). An introduction to Chicano/Latino Studies through inter- and intra-group comparisons of various Latino groups in the United States. Issues examined include immigration, political participation and protest, socioeconomic status, gender relations and sexuality, and ethnic and racial discrimination. **(III, VII-A)**

64 Introduction to Minority Politics (4). Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics, while also looking at the political attitudes and behaviors of ethnic and racial populations in order to measure their contemporary political influence. Same as Political Science 61A. **(III, VII-A)**

65 Immigration and the New Second Generation (4). Focusing on Asian, Latino, and Black immigrants, examines the generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities. Same as Sociology 68A. **(VII-A)**

UPPER-DIVISION

101 Research in the Latino Community (4). Students engage in firsthand research in the local Orange County environment. Students identify a research problem, conduct a literature review, develop questions and/or hypotheses, appropriate methods, and write a proposal. Formerly Chicano/Latino Studies 195A.

102 Chicano/Latino Research Seminar (4). Taught as a writing and research seminar in Chicano/Latino Studies. Student develops own project; engages in peer editing; drafts, writes, and presents paper at spring research conference. Prior course work in Chicano/Latino Studies helpful, i.e., Chicano/Latino Studies 61, 62, 63. Prerequisites: Chicano/Latino Studies 101, satisfactory completion of the lower-division writing requirement, and upper-division standing. Formerly Chicano/Latino Studies 100C. **(VII-A)**

103 Comparative Latino Populations (4). Provides foundation for understanding of Chicano/Latino Studies as an interdisciplinary field of inquiry. Focus on the history, arts, cultures of distinct (Mexican, Cuban, Puerto Rican, Central American) Latino communities. Topics include: precolonial history and culture, conquest, mestizaje, colonialism/neocolonialism, resistance. Same as Social Science 173K. Formerly Chicano/Latino Studies 100A. **(VII-A)**

104 Latinos in a Global Society (4). Examines interconnections between diverse Latino groups in the U.S. and the effects of globalization on their social, cultural, political realities. Topics include: immigration, demographics, socioeconomic differentiation, familial relations, political protest/resistance, law and policy, and links to "homeland" issues. Prerequisite: Chicano/Latino Studies 103. Same as Social Science 173L. Formerly Chicano/Latino Studies 100B. **(VII-A)**

110–129: LITERATURE, ARTS, MEDIA, CULTURE

110A, B Chicano Literature (4, 4). Focus on contemporary Chicano literature, in relation to Chicana literature, women's literature, American literature, and Latino literature. Prerequisite: Spanish 10B or consent of instructor. Same as Spanish 140A, B. **(VII-A)**

111A Critical Issues in Chicano Studies (4). A critical survey of social science literature on the Chicano experience and a general discussion of the various models and theories applied by social scientists to the study of oppressed national minorities. Discussion of race and class within the context of the Chicano experience. **(VII-A)**

111B Chicano Culture (4). Current research and perspectives on different aspects of Chicano culture: political, economic, sociological, artistic, and folkloric. Prerequisite: Spanish 10B or equivalent. May be taken for credit twice as topics vary. Same as Spanish 142. **(VII-A)**

113 Literature and Ethnicity (4). Examines the works of several American minority authors in order to discuss the relationship of ethnicity as a social phenomenon to literature. Same as Social Science 175A. **(VII-A)**

114 Film Media and the Latino Community (4). Uses film as a resource for understanding contemporary issues and problems facing the Chicano/Latino community. (Does not study cinema as a genre.) Same as Social Science 173G. **(VII-A)**

115A Latino Music: A View of Its Diversity and Strength (4). A survey of the music of the many Latin cultures of the Americas including Mexico, Central and South America, as well as the Caribbean, and of those many Latin cultures which thrive and survive in the United States. Same as Anthropology 138Q. **(VII-B)**

115B Music of Greater Mexico (4). A wide range of musics exists in Mexico, and in the Mexican traditions within the United States. From the indigenous traditions of Mexico and the ancient Aztec and Mayan civilizations through the Colonial and Revolutionary periods, the variety of Mexican music is explored. Same as Anthropology 138S.

115C Afro-Latin American Music (4). Musical culture of Afro-Latin American peoples, emphasizing Spanish-speaking Caribbean. Topics include: background in West Africa, the persistence of traditions in the Caribbean, the commercial music of the twentieth century, the connections between musical culture, religion, and the economy. Same as Social Science 176A. **(VII-B)**

116 Reading Images Culturally (4). Students are provided with the analytical tools necessary to undertake research on visual representations. Images, as cultural productions, are steeped in the values, ideologies, and taken-for-granted beliefs of the culture which produced them. Of concern are representations of race, identity, gender, and the "Other." Same as Anthropology 137A.

117 Chicano/Latino Experience: History, Society, and Culture in Autobiography (4). Examines how history, society, and culture are manifested in autobiography and studies how Chicano/Latino subjects have recorded their life experience before and during the twentieth century. Same as Social Science 173J. **(VII-A)**

119 Chicana, Chicano/Latina, Latino Cultural Studies (4). Explores sites of cultural production within the scholarship area of Chicano/Latino Cultural Studies. Considers questions pertaining to social structural processes as they relate to cultural productions and considers potential political strategies for challenging inequality within cultural sites. **(VII-A)**

121 Latina/Latino Pop: Latina/Latino Popular Culture (4). With a focus on the politics of language and space/place, prepares students to critically analyze sites of Latina/Latino popular culture including: music, film, performance, sports, media, and varied subcultures.

129 Special Topics in Literature, Arts, Media, Culture (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

130–139: HISTORY

131 History of Chicano Education (4). Examines the relationship between the development of the public education system and the Chicano community in the U.S. Same as Social Science 173H. **(VII-A)**

132A Chicana/Chicano History: Pre-Colonial to 1900 (4). Examines social history of the Southwest region from antiquity to 1900. Discusses major questions, theory and research methods pertinent to Chicanas/Chicanos. Themes include: indigenous empires, conquest, colonialism, social stratification, ideology, marriage, sexuality, industrial capitalism, accommodation and resistance. Same as History 151A. **(VII-A)**

132B Chicana/Chicano History: Twentieth Century (4). Examines social history of the Southwest with emphasis on Mexican-origin people. Discusses major questions, theory, and research methods pertinent to Chicana/Chicano history. Themes explored include: immigration, xenophobia, class struggle, leadership, generational cohorts, unionization, education, barrioization, ethnicity, patriarchy, sexuality. Same as History 151B. **(VII-A)**

133A Nineteenth-Century Mexico (4). Examines the history of Mexico in the nineteenth century. Focuses on the social, economic, political, and cultural transformation of Mexico in the 1800s. Same as History 161B. **(VII-B)**

133B Twentieth-Century Mexico (4). Examines the history of contemporary Mexico beginning with the Mexican Revolution and concluding with the present administration. Social, economic, and political effects of the Revolution; formation of a "one-party democracy"; economic transformation of the nation; the present crisis. Same as History 161C. **(VII-B)**

134 U.S. Latino Cultures (4). Focuses on some aspect—literature, art, cultural production, history—of the multifaceted Latino cultures that have developed within the United States. Can focus on one group, such as Caribbean Americans, Chicanos, Central Americans, or take a comparative perspective of several groups. Prerequisite: Spanish 10B or equivalent. Same as Spanish 110C. **(VII-A)**

135 Latinas in the Twentieth-Century U.S. (4). Latinas in the U.S. from 1900 to present, offering a diversity of their cultures, regional histories, sexualities, generations, and classes. Same as History 151C. **(VII-A)**

139 Special Topics in Chicano/Latino History (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

140–159: SOCIETY, LABOR, POLITICS, LAW, GENDER, RACE, ETHNICITY

140 Latino Social Movements and Organizations (4). An examination of social movement theories and organizational theories and research through an analysis of ways in which Latinos have organized to confront discrimination and secure full and fair participation in the labor market, education, politics, and other societal institutions. Same as Social Science 166.

140A Latina/Latino Queer Sexualities (4). Introduces students to the notion of "queer" in relation to Chicanas/Chicanos and Latinas/Latinos and provides students with theoretical frameworks to explore the shifting categories of sexuality, gender, Chicano, Latino within the scholarship areas of Chicana/Chicano and Latina/Latino Studies.

141 Chicano/Chicana Labor History (4). Examines origins of Latino/Latina labor from colonial period to present. Emphasis on the issues of race, culture, class, and gender. Focus on processes and institutions including: encomienda, migration, unions, informal economies, Bracero program, domestic work. Same as Social Science 167. **(VII-A)**

142 Latinos and the Law (4). Examines a range of theoretical, empirical, and policy approaches to legal issues affecting the Latino population, with emphasis on California. Discusses topics concerning the purpose of law, the creation of law, and the enforcement of law. Same as Criminology, Law and Society C171.

143 Mexican-Americans and Politics (4). Examines political development of Mexican-Americans. Topics include their "territorial" roots in the Southwest, demographics, political leadership and organization; policy issues of immigration, bilingualism, education, and economics; relations with other minority groups; the role of Mexican-Americans in U.S.-Mexico relations. Same as Political Science 126A. **(VII-A)**

147 Comparative Minority Politics (4). Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements. Same as African American Studies 151, Asian American Studies 132, and Political Science 124C. **(VII-A)**

148 Racial and Ethnic Relations in the United States (4). Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues. Prerequisite: satisfactory completion of the lower-division writing requirement. Same as Sociology 167A.

151 Latinos in U.S. Politics (4). Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, nonelectoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy. Same as Political Science 124B. **(VII-A)**

152 Race and Citizenship in America (4). The role U.S. citizenship policy has played in the social construction of race. Looks comparatively at citizenship experiences of different racial/ethnic groups to understand how the meaning of being a U.S. "citizen" has varied over time and across groups. Same as Political Science 124D. **(VII-A)**

153 Cross-Cultural Research on Urban Gangs (4). Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them. Same as Criminology, Law and Society C156.

154 Latino Metropolis (4). Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities. Same as Environmental Analysis and Design E190U. **(VII-A)**

155 Culture Change and the Mexican People (4). Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people. Same as Criminology, Law and Society C172. **(VII-A)**

158 Chicana Feminisms (4). Surveys the development of Chicana feminist thought and practice. Focuses on historical contemporary writings by and about Chicana feminists. Draws from interdisciplinary scholarship in order to survey the diversity of Chicana feminisms. Formerly Chicano/Latino Studies 120. **(VII-A)**

159 Special Topics in Society, Labor, Politics, Law, Gender, Race, Ethnicity (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

160–169: GLOBALIZATION, TRANSNATIONALISM, IMMIGRATION, U.S.–MEXICO BORDER

160 Perspectives on the U.S.–Mexican Border (4). Economic aspects of the historical development of the U.S.-Mexican border. The current economic situation in the Southwest and border areas as it affects both Mexico and the Latino/Chicano population is also examined. Same as Social Science 173I. **(VII-A)**

161 Immigration in Comparative Perspective (4). Examines issues related to the migration and settlement of immigrants. Although the focus is on the Mexican migration to the United States, comparisons are also made to immigrant groups from Korea, Japan, Southeast Asia, Central America, the Caribbean, and Europe. Same as Anthropology 125X. **(VII-A)**

162 Social Ecology of the Borderlands (4). An introduction to the most important socioeconomic issues affecting the urban-regional context of the U.S.–Mexico border area. Borderlands regional development, urbanization, migration, industrialization, labor market, and environmental issues are considered. Prerequisite: Environmental Analysis and Design E8. Same as Environmental Analysis and Design E143U. **(VII-B)**

163 U.S. Immigration Policy (4). Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy. Same as Political Science 126C. **(VII-A)**

164 U.S.–Mexican Relations (4). Realism and interdependence theories are applied to this asymmetric relationship. Analysis of NAFTA, relations with Canada, current issues in trade, capital flows, migration, narcotics control, and energy. Emphasis on interplay of domestic politics (California, Mexican-Americans) and foreign policy. Same as Political Science 145B. **(VII-B)**

165 Latin American and Latino Cultures I (4). Surveys the history, social and economic conditions, gender issues, problems of economic and social development in Latin America and their relation to U.S. Latinos. Topics include the colonial experience, economic relations with the U.S., Latin American migration to the U.S. Same as Social Science 172F. **(VII-B)**

169 Special Topics in Globalization, Transnationalism, Immigration, U.S.–Mexico Border (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

170–179: HEALTH, MEDICINE, AND PSYCHOSOCIAL DYNAMICS

170 Chicano/Latino Families (4). Introduction to the research, literature, and issues surrounding the topic of Chicano/Latino families in the United States. Topics include: cultural history of Chicano/Latino families, demographic changes, social organization, traditions, lifestyles, values, beliefs, generational differences, ethnic identity, immigration, regional variation. Formerly Chicano/Latino Studies 144. **(VII-A)**

171 Chicano/Latino Psychology (4). Examines research and literature investigating Chicano/Latino ethnicity as a variable influencing behavior. Explores mental health needs and issues of Chicano/Latinos and discusses competent, sensitive methods of mental health service delivery. Prerequisite: Psychology 7A or 9A-B-C. Same as Psychology 174F. Formerly Chicano/Latino Studies 145. **(VII-A)**

172 Culture and Health (4). Explores America's cultural diversity by examining differing systems of belief and behavior in relation to illness, curing, disease, practitioner behavior, and use of conventional medical services. Groups focused on include Native Americans, African Americans, Latinos, and Asians. Same as Anthropology 134D. Formerly Chicano/Latino Studies 146.

173 The Chicana/Latina: A Psychosocial Perspective (4). Provides an in-depth psychosocial perspective of the Chicana/Latina experience in the U.S. Topics include the historical contributions of Latina women in Latino communities; Chicana feminist theories, gender roles and sexuality, ethnic identity, education, health, and models of multicultural counseling. Prerequisite: satisfactory completion of the lower-division writing requirement. Formerly Chicano/Latino Studies 149. **(VII-A)**

174 Multicultural Counseling (4). Covers both theories and application of multicultural counseling that are of greatest relevance to psychology. Topics include the historical foundations of multicultural counseling; theories and models of multicultural counseling; multicultural assessment and prediction; counseling and effective interventions for minorities. Prerequisite: satisfactory completion of the lower-division writing requirement. Formerly Chicano/Latino Studies 150. **(VII-A)**

175 Latinos/Latinas and Medicine (4). Introduction to medical social science perspectives of Latinos/Latinas in a variety of settings. Emphasis placed on understanding the intersection of immigration, mental health, gender, reproduction, and spirituality in analyzing how the experience of health and illness is shaped by these factors. Same as Anthropology 133A. Formerly Chicano/Latino Studies 156. **(VII-A)**

176 Race, Science, and Disease (4). Contemporary issues of race, ethnicity, and the science of disease. "Race" as a biological, social, legal, and cultural construct is examined from three interlinked axes: genetic ideologies, disease explanations, and social inequalities. Historical and current analyses of health and inequality. Same as Anthropology 128B. **(VII-A)**

179 Special Topics in Health, Medicine, and Psychosocial Dynamics (1 to 4). Prerequisites: vary. May be repeated for credit as topics vary.

190–199: SPECIAL COURSES

H190A Honors Research Preparation (4). Students write a proposal describing their research question, the relevant background literature, and the method of data collection and analysis. Field work for the project may begin during this quarter. Prerequisites: open only to students in the Honors Program in Chicano/Latino Studies; consent of instructor.

H190B Honors Field Research (4). Students begin or continue their research for their senior honors thesis. Prerequisites: Chicano/Latino Studies H190A; consent of instructor.

H190C Honors Thesis (4). Students draft a senior honor thesis (typically) with the following sections: problem statement, literature review, description of the methods, results, and conclusions. Prerequisites: Chicano/Latino Studies H190A-B; satisfactory completion of the lower-division writing requirement; consent of instructor.

191A-B-C HABLA: Language Intervention for Disadvantaged Children (4-4-4). Trains students (fall quarter) to deliver home visits (winter and spring) that promote school readiness among two–four year-olds from low SES and educational backgrounds. Covers fundamentals of child language, literacy, cognitive development; procedures, ethics of home visitation. Work with parents and children to create better home literacy and language environment. Prerequisites: must pass an interview by instructor, be fluent in English and one other language (Spanish most typically), must have experience with preschool children and be culturally sensitive. Same as Psychology 144A-B-C and Social Science 186A-B-C.

196 Field/Research Project (4). Allows students the opportunity to apply classroom knowledge to projects in local businesses and agencies. Groups of five to ten students work with faculty and graduate students to research and propose solutions to agency-posed questions. Prerequisites: satisfactory completion of the lower-division writing requirement and consent of instructor. Limited to School of Social Science majors and Chicano/Latino majors. May be taken for credit three times.

198 Group Directed Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topics vary.

199 Independent Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topics vary.

Minor in Global Sustainability

321 Steinhaus Hall; (949) 824-6006; Fax (949) 824-2181
Peter J. Bryant and Peter A. Bowler, **Co-directors**

Core Faculty

Peter A. Bowler, Ph.D. University of California, Irvine, *Director of the UCI Arboretum, UC Natural Reserve System Academic Coordinator, and Lecturer with Security of Employment, Ecology and Evolutionary Biology*

Peter J. Bryant, Ph.D. University of Sussex, *Director of the Graduate Program in Molecular Biology, Genetics, and Biochemistry and Professor of Developmental and Cell Biology*

Michael L. Burton, Ph.D. Stanford University, *Department Chair and Professor of Anthropology and Professor of Social Ecology*

William S. Reeburgh, Ph.D. The Johns Hopkins University, *Department Chair and Professor of Earth System Science*

Susan E. Trumbore, Ph.D. Columbia University, *Professor of Earth System Science*

The interdisciplinary minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet.

As a result of population growth and the pursuit of higher standards of living, humanity has initiated many global trends that cannot be sustained indefinitely. Some of these trends are physicochemical in nature, such as the rapid depletion of fossil fuels and the increasing pollution of our environment, including the accumulation of ozone-depleting chemicals with consequent increase of ultraviolet radiation at the earth's surface, and the buildup of carbon dioxide that is almost certainly causing global warming. Other trends are biological ones including the degradation of agricultural land, the destruction of many kinds of wildlife habitat with associated high rates of species extinction, and the depletion of wildlife populations by over-exploitation. Global changes are also taking place in the human situation including loss of cultural diversity, a growing income gap between rich and poor nations leading to deepening poverty and additional pressure for biological resource exploitation, accelerating urbanization with associated social problems, and regional population and economic imbalances leading to escalating political tensions and potential for conflict. This program examines the causes of, and interrelationships between, these problems and considers new approaches to solving them. Its goal is to provide broad, interdisciplinary training that will allow students to better understand and effectively deal with the serious environmental problems that we will face in the twenty-first century.

The minor is open to all UCI students. Course descriptions are available in the academic department sections of the *Catalogue*.

Requirements for the Minor

Completion of an introductory sequence of three core courses: Earth System Science 1 (The Physical Environment), Biological Sciences 65 (Biodiversity and Conservation), and Environmental Analysis and Design E8 (Introduction to Environmental Analysis and Design).

Three relevant elective courses (12 units): One elective course must be taken in each of the following three disciplines, and at least two of these must be upper division. Students may select from the following list and must have their choices approved by a panel of participating faculty:

Biological Sciences: 55 (Introduction to Ecology), 94 (From Organisms to Ecosystems), E106 (Processes in Ecology and Evolution), E150 (Conservation Biology), E175 (Restoration Ecology), E178 (Ocean Ecology), E179 (Limnology and Freshwater Biology), E181 (Conservation in the American West), E186 (Population and Community Ecology).

Physical Sciences/Engineering: Earth System Science 3 (Oceanography), 5 (The Atmosphere); Engineering 20 (Energy and Society); Civil and Environmental Engineering CEE121 (Transportation Systems I: Analysis and Design), CEE122 (Transportation Systems II: Operations and Control), CEE123 (Transportation Systems III: Planning and Forecasting); Physics 16 (Physics and Global Issues), 20C (Observational Astronomy).

Social Sciences/Social Ecology: Anthropology 125A (Economic Anthropology), 125B (Ecological Anthropology); Environmental Analysis and Design E3 (Human Environments), E5 (Introduction to Environmental Quality and Health), E15 (Native American Religions and the Environmental Ethic), E105U (Environmental Law), E106 (Human Ecology), E111 (Dynamics of Human Populations), E160 (Microbial Ecology of Natural and Polluted Waters); Economics 145E (Economics of the Environment); Political Science 149 (when topic is Global Environmental Politics); Social Science 172E (Native American Culture); Sociology 44 (Populations).

Senior Seminar on Global Sustainability I, II, III: During their final year in this program, students complete Biological Sciences 191A-B-C (same as Earth System Science 190A-B-C and Social Ecology 186A-B-C) which includes a seminar, directed study, and independent research in a relevant area. This work forms the basis for a senior research paper which is completed and presented near the end of spring quarter in a colloquium.

Minor in the History and Philosophy of Science

(949) 824-6495
Brian Skyrms, **Director**

Participating Faculty

Francisco J. Ayala, Ph.D. Columbia University, *University Professor and Donald Bren Professor of Biological Sciences*
Jeffrey A. Barrett, Ph. D. Columbia University, *Department Chair and Associate Professor of Logic and Philosophy of Science*
William H. Batchelder, Ph.D. Stanford University, *Professor of Cognitive Sciences*
Paul C. Eklof, Ph.D. Cornell University, *Department Vice Chair for Undergraduate Studies and Professor of Mathematics*
Matthew D. Foreman, Ph.D. University of California, Berkeley, *Professor of Mathematics and Philosophy*
Douglas M. Haynes, Ph.D. University of California, Berkeley, *Associate Professor of History*
Donald Hoffman, Ph.D. Massachusetts Institute of Technology, *Professor of Cognitive Sciences*
Karl G. Hufbauer, Ph.D. University of California, Berkeley, *Professor Emeritus of History*
Mary-Louise Kean, Ph.D. Massachusetts Institute of Technology, *Professor of Cognitive Sciences*
Stuart M. Krassner, Sc.D. The Johns Hopkins University, *Professor of Developmental and Cell Biology*
J. Karel Lambert, Ph.D. Michigan State University, *Professor Emeritus of Philosophy*
R. Duncan Luce, Ph.D. Massachusetts Institute of Technology, *UCI Distinguished Professor Emeritus of Cognitive Sciences and Economics*
Penelope Maddy, Ph.D. Princeton University, *UCI Chancellor's Professor of Logic and Philosophy of Science and of Mathematics*
Robert May, Ph.D. Massachusetts Institute of Technology, *Professor of Logic and Philosophy of Science*
Louis Narens, Ph.D. University of California, Los Angeles, *Professor of Cognitive Sciences*
Alan Nelson, Ph.D. University of Illinois at Chicago, *Professor of Philosophy*
Riley Newman, Ph.D. University of California, Berkeley, *Professor of Physics*
Robert Newsom, Ph.D. Columbia University, *Professor Emeritus of English*
Terence D. Parsons, Ph.D. Stanford University, *Professor of Philosophy, UCLA*
A. Kimball Romney, Ph.D. Harvard University, *Professor Emeritus of Anthropology*
Michael R. Rose, Ph.D. University of Sussex, *Professor of Ecology and Evolutionary Biology*
Jonas Schultz, Ph.D. Columbia University, *Professor Emeritus of Physics*
Brian Skyrms, Ph.D. University of Pittsburgh, *Director of the Minor in the History and Philosophy of Science and UCI Distinguished Professor of Logic and Philosophy of Science and of Economics*
Norman M. Weinberger, Ph.D. Case Western Reserve University, *Professor of Neurobiology and Behavior*
Peter Woodruff, Ph.D. University of Pittsburgh, *Professor Emeritus of Philosophy*

The minor in the History and Philosophy of Science is intended for students who wish to study the history of science, the philosophical foundations of scientific inquiry, and the relationship between science and other fields. The history of science explores how science is actually done and how it has influenced history. This may involve tracking down an idea's source or its influences, evaluating the cultural forces at work in the generation of a scientific theory or the reaction of culture to science, or taking a detailed look at the work of a particular scientist or movement within science.

The philosophy of science is concerned with determining what science and mathematics are, accounting for their apparent successes, and resolving problems of philosophical interest that arise in the sciences. Philosophy of science courses cover such topics as the role of logic and language in science and in mathematics, scientific explanation, evidence, and probability. These courses may also cover work that has been done on the philosophical problems in specific sciences—for example, the direction of time in physics, the model of mind in psychology, the structure of evolution theory in biology, and the implications of Gödel's incompleteness theorems for mathematics.

The minor is available to all UCI students. Course descriptions may be found in the academic department sections of the *Catalogue*.

Requirements for the Minor

Completion of seven courses as follows:

1. Two courses selected from: Logic and Philosophy of Science 31, 40; History 60.
2. Two courses selected from: History 135A, 135B, 135C, 135D, 135E; Philosophy 110–115 (when topic is science); Political Science 136B; Psychology 120H.
3. Three courses selected from: Linguistics 141, 143; Logic and Philosophy of Science 106, 107, 108, 140, 141A, 141B, 141C, 141D, 142, 143, 145, 146, 147A, 147B.

Minor in Native American Studies

Participating Faculty

Jaime E. Rodríguez, Ph.D. University of Texas, *Director of Latin American Studies and Professor of History*

Gabriele Schwab, Ph.D. University of Konstanz, *UCI Chancellor's Professor of Comparative Literature*

Tanis Thorne, Ph.D. University of California, Los Angeles, *Lecturer in History*

Steven C. Topik, Ph.D. University of Texas, *Professor of History*

Affiliated Faculty

John Carlos Rowe, Ph.D. State University of New York, Buffalo, *Professor Emeritus of Comparative Literature*

The minor in Native American Studies is an interdisciplinary, interschool program which focuses on history, culture, religion, and the environment. The three core courses serve as an introduction to the Native American experience from the perspective of different historical periods and frameworks of analysis. Study in the minor is enriched by the research and teaching interests of faculty from different departments.

The minor is open to all UCI students. Advising information is available from the undergraduate counseling offices in the Schools of Humanities, Social Ecology, and Social Sciences.

Course descriptions are available in the academic department sections and on the World Wide Web at http://eee.uci.edu/clients/tcthorne/idp/.

Requirements for the Minor

Core courses: Environmental Analysis and Design E15 (Native American Religions and the Environmental Ethic); History 15A (Native American History); and Sociology 65 (Cultures in Collision: Indian-White Relations Since Columbus; same as Anthropology 85A).

Four upper-division courses selected from: Anthropology 121D (Cross-Cultural Studies of Gender), 135A (Religion and Social Order), 162A (Peoples and Cultures of Latin America); Art History 175 (Studies in Native and Tribal Art); Education 124 (Multicultural Education in K–12 Schools); History 161A (Indian and Colonial Societies in Mexico); Philosophy 131E (Race and Gender); Social Science 172E (Native American Culture), 175B (Ethnic and Racial Communities); Spanish 100C (Introduction to Latin American Literature: Pre-Hispanic to Nineteenth Century); Women's Studies 162 (Race and Gender), 163 (Women of Color).

Students may also select from the following courses when the topics presented relate to Native American Studies: Anthropology 149 (Special Topics in Archaeology), 169 (Special Topics in Area Studies); Comparative Literature CL 105 (Multicultural Topics in Comparative Literature); English E 105 (Multicultural Topics in English-Language Literature); Sociology 149 (Special Topics: Structures), 169 (Special Topics: Age, Gender, Race, and Ethnicity).

GRADUATE STUDY

Graduate Program in Networked Systems

(949) 824-8584
http://www.networkedsystems.uci.edu
Magda El Zarki, **Director**

Faculty

Lichun Bao, Ph.D. University of California, Santa Cruz, *Assistant Professor of Computer Science* (mobile ad-hoc networks, medium access control, channel access scheduling, topology management, sensor networks, quality of service)

Magda El Zarki, Ph.D. Columbia University, *Director of Networked Systems and Professor of Computer Science, Informatics, and Electrical Engineering and Computer Science* (telecommunications, networks, wireless communication, video transmission)

Scott Jordan, Ph.D. University of California, Berkeley, *Associate Professor of Electrical Engineering and Computer Science, and of Computer Science* (modeling and analysis of behavior, control, and pricing in computer/telecommunication networks)

Raymond O. Klefstad, Ph.D. University of California, Irvine, *Assistant Adjunct Professor of Electrical Engineering and Computer Science* (distributed object computing and high-performance, real-time ORBs, design patterns for object-oriented communication systems, object-oriented communication software frameworks, flexible and adaptive distributed, parallel, and concurrent systems, generative programming and aspect-oriented programming)

K. H. (Kane) Kim, Ph.D. University of California, Berkeley, *Professor of Electrical Engineering and Computer Science and of Informatics* (ultra-reliable distributed and parallel computing, real-time object-based system engineering)

Tatsuya Suda, Ph.D. Kyoto University, *Professor of Computer Science and of Electrical Engineering and Computer Science* (computer networks, distributed systems, performance evaluation)

Wei Kang (Kevin) Tsai, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Electrical Engineering and Computer Science* (flow control and routing in integrated networks, digital signal processing, neural networks, and multi-objective optimization)

Gene Tsudik, Ph.D. University of Southern California, *Professor of Computer Science* (security and applied cryptography, mobile/ad-hoc networks and distributed systems)

Nalini Venkatasubramanian, Ph.D. University of Illinois at Urbana-Champaign, *Associate Professor of Computer Science* (parallel and distributed systems, multimedia servers and applications, internetworking, high-performance architectures, resource management)

The graduate program in Networked Systems is administered by faculty from two academic units: the Department of Computer Science (CS) in the Donald Bren School of Information and Computer Sciences, and the Department of Electrical Engineering and Computer Science (EECS) in The Henry Samueli School of Engineering. The program offers M.S. and Ph.D. degrees in Networked Systems.

The Networked Systems program provides education and research opportunities to graduate students in the areas of computer networks and telecommunication networks. Networked Systems include telephone networks, cable TV networks, cellular phone networks, and the Internet, as well as other emerging networks. Networked Systems are inherently interdisciplinary. By their design, they connect devices such as computers and phones using communications methods. Networked Systems therefore must address the combination of software, hardware, and communications. As a result, the Networked Systems area spans traditional departmental boundaries. At a minimum, the area draws heavily from Computer Science, Computer Engineering, and Electrical Engineering. At UCI, these areas are housed in two departments, CS and EECS. The Networked Systems program unites the strengths of these two departments and provides integrated M.S. and Ph.D. degrees in this area.

Program requirements include core, breadth, and concentration courses. The **core courses** are taken by all Networked Systems students and form a foundation for networking topics. The **breadth courses** may be selected from technical courses (including distributed systems, algorithms, data structures, operating systems, databases, random processes, and linear systems) and management and applications of technology (including educational technology, management of information technology, and social impact). The **concentration courses** may be selected from a long list including courses on networks, performance, middleware, communications, and operations research. Core, breadth, and concentration course lists are available on the Networked Systems Web site at http://www.networkedsystems.uci.edu or from the Networked Systems Program Office.

As an alternative to the Networked Systems program, students interested in networks may wish to consider: the Systems concentration, offered by the CS Department, which includes courses in networks, compilers, computer architecture, distributed systems, algorithms, and data structures; the Computer Networks and Distributed Computing concentration, offered by the EECS Department, which includes courses in networks, algorithms, operating systems, databases, and computer architecture; or the Electrical Engineering concentration, offered by the EECS Department, which includes courses in networks, random processes, communications, linear systems, and signal processing.

Admission

Prospective graduate students apply directly to the Networked Systems program, specifying whether they wish to pursue the M.S. degree only, the M.S. and Ph.D. degrees, or the Ph.D. degree only. Applicants who do not hold a bachelor's degree in Computer Science, Computer Engineering, or Electrical Engineering may be required to take supplementary course work to demonstrate sufficient background in the field.

Applicants are evaluated on the basis of their prior academic record and their potential for creative research and teaching, as demonstrated in their application materials including official university transcripts, letters of recommendation, GRE test scores, and statement of purpose.

Master of Science Program

Students pursuing the M.S. degree may choose either Plan I (Thesis Plan) or Plan II (Comprehensive Examination Plan.) Both plans require the completion of three core courses; three courses chosen from the breadth course list, with at most two chosen from the Management and Applications of Technology list; and five courses chosen from the concentration course lists, with at least one course chosen from at least three different concentrations.

Students following Plan I complete the 11 courses above and a thesis. Students following Plan II must complete two additional courses chosen with the approval of the advisor, for a total of 13 courses.

Doctor of Philosophy Program

The Ph.D. degree requires the following 15 courses: three core courses; four courses chosen from the breadth course list, with at most two chosen from the Management and Applications of Technology list; six courses chosen from the concentration course lists, with at least one course chosen from at least three different concentrations; and two additional courses, chosen with the approval of the research advisor. Students must also complete three teaching practicum courses (ICS 399) and a dissertation.

Courses applied to the M.S. degree can also be applied to the Ph.D. degree. Students who have taken similar graduate-level courses at another university may petition to apply these courses to the Ph.D. requirements. Ph.D. students who have served as teaching assistants, readers, or tutors at another university may petition to apply this experience toward the teaching practicum requirement. The normal time for advancement to candidacy is three years (two for students who entered with a master's degree). The normal time for completion of the Ph.D. is six years (five for students who entered with a master's degree), and the maximum time permitted is seven years.

Courses in Networked Systems

201 Internet (4) F. A broad overview of basic Internet concepts. Internet architecture and protocols, including addressing, routing, TCP/IP, quality of service, and streaming. Prerequisite: EECS148, ICS 153, or consent of instructor. Same as EECS248A and ICS 243A.

202 Networking Laboratory (4) F. A laboratory-based introduction to basic networking concepts such as addressing, sub-netting, bridging, ARP, and routing. Network simulation and design. Structured around weekly readings and laboratory assignments. Prerequisite: EECS148 or ICS 153. Same as ICS 243B.

210 Advanced Networks (4) W. Fundamental concepts of switching, advanced medium access control methods, virtual circuits, integrated services, quality of service, performance models, simulation, measurement. Prerequisite: Networked Systems 201. Same as ICS 243C.

220 Internet Technology (4) F. Application layer Internet protocols, potentially including client/server, WWW, file sharing, group communications, Internet programming. Prerequisite: Networked Systems 201. Same as ICS 243D.

230 Wireless and Mobile Networking (4) S. Introduction to wireless networking. The focus is on layers 2 and 3 of the OSI reference model, design, performance analysis, and protocols. Topics covered include: an introduction to wireless networking, digital cellular, next generation cellular, wireless LANs, and mobile IP. Prerequisites: EECS148 or ICS 153, and an introductory course in probability or consent of instructor. Same as ICS 243E.

240 Network and Distributed Systems Security (4) S. Overview of modern computer and networks security: attacks and countermeasures. Authentication, identification, data secrecy, data integrity, authorization, access control, computer viruses, network security. Group communication and multicast security techniques. Also covers secure e-commerce and applications of public key methods, digital certificates, and credentials. Prerequisite: EECS148 or ICS 153. Same as ICS 243G.

250 Performance Analysis of Computer Communication Networks (3) W. Mathematical modeling and optimization of network performance and design. Data link layer and media access protocols. Queuing models for communication networks. Routing and congestion control. Prerequisite: Networked Systems 201. Same as EECS248B.

251 Queueing Networks (4) W. Probability, random processes and queueing theory applied to computer networks. Poisson processes, Markov chains, queues, queueing networks, simulation. Prerequisites: Networked Systems 201 and an introductory course in probability. Same as ICS 248.

252 Computer Network Characterization (4) F. Stochastic models of computer and telecommunication network traffic and capacity. Loss networks, traffic characterization, large deviations results, models of wireless networks. Prerequisites: Networked Systems 201, and EECS240 or consent of instructor.

253 Linear Optimization Methods (3) W. Formulation, solution, and analysis of linear programming and linear network flow problems. Simplex methods, dual ascent methods, interior point algorithms and auction algorithms. Duality theory and sensitivity analysis. Shortest path, max-flow, assignment, and minimum cost flow problems. Prerequisite: Mathematics 2J or consent of instructor. Same as EECS261A.

254 Nonlinear Optimization Methods (3) S. Formulation, solution, and analysis of nonlinear programming problems. Unconstrained optimization, optimization over a convex set, Lagrange multiplier theory, Lagrange multiplier algorithms, duality theory, convex programming, dual methods, and multi-objective optimization theory. Emphasizes mathematical analysis. Prerequisite: Mathematics 2J or consent of instructor. Same as EECS261B.

260 Middleware for Networked and Distributed Systems (4) W. Discusses concepts, techniques, and issues in developing distributed systems middleware that provides high performance and Quality of Service for emerging applications. Also covers existing standards (e.g., CORBA, DCOM, Jini, Espeak) and their relative advantages and shortcomings. Prerequisite: undergraduate-level course in operating systems and networks or consent of instructor. Same as ICS 243F.

261 Distributed Computer Systems (3) S. Design and analysis techniques for decentralized computer architectures, communication protocols, and hardware-software interface. Performance and reliability considerations. Design tools. Prerequisites: EECS211 and EECS213. Same as EECS218.

270 Topics in Networked Systems (4). Study of Networked Systems concepts. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

295 Networked Systems Seminar (2). Current research in networked systems. Includes talks by UCI faculty, visiting researchers, and Networked Systems graduate students. Satisfactory/Unsatisfactory only. May be repeated for credit.

Graduate Program in Transportation Science

(949) 824-5989, -5906; Fax (949) 824-8385
Michael McNally, **Director**

Faculty

Marlon G. Boarnet, Ph.D. Princeton University, *Chair of the Department of Planning, Policy, and Design and Professor of Social Ecology and Economics*
David Brownstone, Ph.D. University of California, Berkeley, *Professor of Economics*
Jan K. Brueckner, Ph.D. Stanford University, *Professor of Economics*
Joseph F. DiMento, Ph.D., J.D. University of Michigan, *Professor of Social Ecology and Management*
Gordon J. Fielding, Ph.D. University of California, Los Angeles, *Professor Emeritus of Social Sciences*
R. (Jay) Jayakrishnan, Ph.D. University of Texas at Austin, *Associate Professor of Civil and Environmental Engineering*
Charles Lave, Ph.D. Stanford University, *Professor Emeritus of Economics*
Michael McNally, Ph.D. University of California, Irvine, *Director of Transportation Science and Associate Professor of Civil and Environmental Engineering and of Planning, Policy, and Design*
Wilfred W. Recker, Ph.D. Carnegie-Mellon University, *Director of the Institute of Transportation Studies and Professor of Civil and Environmental Engineering*
Amelia C. Regan, Ph.D. University of Texas, Austin, *Associate Professor of Computer Science, Civil and Environmental Engineering, and Management*
Stephen G. Ritchie, Ph.D. Cornell University, *Professor of Civil and Environmental Engineering*
Jean-Daniel Saphores, Ph.D. Cornell University, *Assistant Professor of Social Ecology, Civil and Environmental Engineering, and Economics*
Kenneth A. Small, Ph.D. University of California, Berkeley, *Professor of Economics and Social Ecology*
Kurt Van Dender, Ph.D. Katholieke Universiteit Leuven (Belgium), *Assistant Professor of Economics*

Affiliated Faculty

Arthur S. DeVany, Ph.D. University of California, Los Angeles, *Professor Emeritus of Economics*
Amihai Glazer, Ph.D. Yale University, *Professor of Economics*
Sandra S. Irani, Ph.D. University of California, Berkeley, *Professor of Computer Science and of Civil and Environmental Engineering*
Raymond W. Novaco, Ph.D. Indiana University, *Professor of Social Ecology*
Luis Suarez-Villa, Ph.D. Cornell University, *Professor of Social Ecology*
Carole J. Uhlaner, Ph.D. Harvard University, *Associate Professor of Political Science*
Christian Werner, Ph.D. The Free University of Berlin, *Professor Emeritus of Economics*

The graduate program in Transportation Science is administered by faculty from three academic units: the Department of Civil and Environmental Engineering in The Henry Samueli School of Engineering, the Department of Economics in the School of Social Sciences, and the Department of Planning, Policy, and Design in the School of Social Ecology. The program is designed to educate students in a broad set of competencies and perspectives that mirror the actual practice of current transportation research. The M.S. and Ph.D. degrees in Transportation Science are offered.

Admission

Admission is limited to a small number of exceptionally talented, independent, and self-disciplined students. The deadline for application for admission is January 15 for fall quarter. Students are admitted for winter or spring quarters only under exceptional circumstances. Late applications are considered on a space-available basis. All applicants must take the Graduate Record Exam (GRE) prior to the application deadline. Applicants whose first language is not English must also submit Test of English as a Foreign Language (TOEFL) scores.

Requirements

All students must complete a core curriculum consisting of eight courses from Civil Engineering, Economics, and Social Ecology plus the graduate colloquium. Students may apply to the Director of Graduate Studies for exemption from specific courses based upon the evidence of prior course work. Students also must successfully complete at least six courses from among the four specialization areas: (1) Methods and Analysis, (2) Transportation Economics, (3) Traffic Analysis, and (4) Planning and Policy Analysis. At least four of these six courses must be from one specialization.

Other requirements include: a replication project, in which students replicate the empirical work of a published paper from a major transportation journal; the qualifying examination, which consists of the oral defense of the student's dissertation proposal; and completion of the dissertation.

The normal time for advancement to candidacy is three years. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Research Facilities

UCI is a major research university and has an excellent library collection, as well as special interlibrary loan arrangements with other University of California libraries including the Transportation Library at Berkeley. Research is coordinated with the Irvine branch of the Institute of Transportation Studies (ITS). About 25 to 30 graduate students are employed as research assistants each year in ITS.

Research covers a broad spectrum of transportation issues. Current funded research projects focus upon: intelligent transportation systems (ITS), particularly advanced transportation management systems; planning and analysis of transportation systems; transportation systems operation and control; artificial intelligence applications; transportation engineering; transportation safety; road and congestion pricing; environmental and energy issues and demand for alternative fuel vehicles; public transit operations, transportation-land use interactions, demand for autos, and travel demand.

ITS is part of the University of California Transportation Center, one of ten federally designated centers of excellence for transportation research. The transportation research program at UCI is also supported by the Advanced Transportation Management Systems (ATMS) Laboratories.

The Institute maintains a regular publications series documenting research conducted within its programs and is the editorial headquarters of four international journals: *Transportation Research,* parts A, B, and C, and *Accident Analysis and Prevention.*

THE PAUL MERAGE SCHOOL OF BUSINESS

Andrew J. Policano, **Dean**

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World Wide Web: http://www.gsm.uci.edu/

Faculty

Dennis J. Aigner, Ph.D. University of California, Berkeley, *Professor of Management and Economics* (corporate environmental management, U.S. competitiveness in global markets, foreign investment and state and local economic issues)

Christine M. Beckman, Ph.D. Stanford University, *Assistant Professor of Management* (creation, transformation and influence of inter-organizational relationships, organizational learning and change, entrepreneurship, diversity, women and organizations)

David H. Blake, Ph.D. Rutgers-The State University of New Jersey, *Professor of Management* (corporate strategies and executive leadership)

George W. Brown, Ph.D. Princeton University, *Professor Emeritus of Management* (mathematical statistics, game theory, dynamic decision processes, operations research, computer design, operation, applications, information networks)

Thomas C. Buchmueller, Ph.D. University of Wisconsin, Madison, *Associate Professor of Management, Economics, and Social Ecology* (health economics, particularly the economics of employer-provided health insurance, health insurance reform and managed competition)

Reynold Byers, Ph.D. University of Rochester, *Assistant Professor of Management* (service operations management, financial service operations strategy, design and management of telephone centers, performance measurement in services)

Christopher S. Carpenter, Ph.D. University of California, Berkeley, *Assistant Professor of Management and Economics* (health economics, labor economics, policy evaluation)

Maria Chandler, M.D. University of California, Irvine, *Associate Clinical Professor of Pediatrics and Management*

Nai-Fu Chen, Ph.D. University of California, Berkeley; Ph.D. University of California, Los Angeles, *Professor of Management* (financial investments and markets)

Vidyanand Choudhary, Ph.D. Purdue University, *Assistant Professor of Management* (economics of information systems, impact of emerging technologies on firm's business strategies, analytical modeling of electronic marketplaces, product differentiation and price discrimination for information goods, intertemporal pricing of software products and upgrades)

Imran S. Currim, Ph.D. Stanford University, *UCI Chancellor's Professor of Management* (marketing research, customer choice, and the design and marketing of products and services)

Sanjeev Dewan, Ph.D. University of Rochester, *Associate Professor of Management* (value of information technology investments, electronic commerce, information technology in financial markets)

Joseph F. DiMento, Ph.D., J.D. University of Michigan, *Professor of Social Ecology and Management* (planning, land use and environmental law, use of social science in policy making, legal control of corporate behavior)

Henry Fagin, M.S. Columbia University, *Professor Emeritus of Management* (societal context of organizations)

Martha Feldman, Ph.D. Stanford University, *Professor of Social Ecology, Management, Sociology, and Political Science, and Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management* (organization theory and behavior, stability and change in organizations, decision making and information processing)

Paul J. Feldstein, Ph.D. University of Chicago, *Professor of Management, Economics, and Social Ecology, and Robert Gumbiner Chair in Health Care Management* (economics of health care)

David B. Fitoussi, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Management* (information technology and organizations)

Cristina Gibson, Ph.D. University of California, Irvine, *Associate Professor of Management* (multicultural collaboration; communication, interaction, and effectiveness in teams; impact of culture and gender on work behavior; social cognition; international management)

Mary C. Gilly, Ph.D. University of Houston, *Professor of Management* (marketing, with an emphasis on services marketing, customer service, internal marketing, and e-commerce quality)

John Graham, Ph.D. University of California, Berkeley, *Professor of Management* (global marketing, international business negotiations, and business in Japan)

Vijay Gurbaxani, Ph.D. University of Rochester, *Professor of Management and Informatics* (business strategy and information technologies, outsourcing of information systems, economics of information technologies, emerging technologies, organization and management of information systems)

Joanna L. Ho, Ph.D. University of Texas at Austin, *Professor of Management* (decision making related to accounting and auditing)

Philippe Jorion, Ph.D. University of Chicago, *Professor of Management and Economics* (international finance, exchange rates and risk management)

Christo S. Karunananthan, Ph.D. University of Michigan, *Assistant Professor of Management* (executive compensation, managerial performance evaluation and turnover, corporate governance)

L. Robin Keller, Ph.D. University of California, Los Angeles, *Professor of Management* (decision analysis, risk analysis, problem structuring, management science and behavioral decision theory)

Bradley L. Killaly, Ph.D. University of Michigan, *Assistant Professor of Management* (evolutionary economics with specific attention to the causes of firm change, organizational decision making, learning, and organizational ecology, the relationship between organizational experience and performance)

Kenneth L. Kraemer, Ph.D. University of Southern California, *Director of the Center for Research on Information Technology and Organizations, Professor of Management and Informatics, and Taco Bell Chair in Information Technology Management* (use and impact of information technology in organizations, globalization of information technology production and use, and management of information systems)

Loraine G. Lau-Gesk, Ph.D. University of California, Los Angeles, *Assistant Professor of Management*

Barbara A. Lougee, Ph.D. Cornell University, *Assistant Professor of Management* (financial reporting, compensation, corporate governance)

Dmitry Lukin, Ph.D. INSEAD (France), *Assistant Professor of Management* (corporate finance, market microstructure)

Newton Margulies, Ph.D. University of California, Los Angeles, *Professor Emeritus of Management* (organizational behavior, organizational change and development, analysis of team functioning, organizational behavior in health care organizations)

Joseph W. McGuire, Ph.D. Columbia University, *Professor Emeritus of Management* (business strategy, entrepreneurship, organizational economics)

Martin C. McGuire, Ph.D. Harvard University, *Professor of Economics and Management, and Clifford and Elaine Heinz Chair in the Economics and Public Policy of Peace* (economic theory of group formation and behavior, economic models of international conflict, interactions between trading partnerships and military alliances in the structure of international relations)

Richard B. McKenzie, Ph.D. Virginia Polytechnic Institute and State University, *Professor of Management and Economics, and Walter B. Gerken Chair in Enterprise and Society* (Microsoft antitrust case and public policies relating to digital economics)

Alexander Mood, Ph.D. Princeton University, *Professor Emeritus of Management*

Peter Navarro, Ph.D. Harvard University, *Associate Professor of Management* (electric utilities regulation, growth management, industrial policy, public policy)

David M. Obstfeld, Ph.D. University of Michigan, *Assistant Professor of Management* (knowledge creation, innovation, social networks, knowledge management, entrepreneurship)

Jone L. Pearce, Ph.D. Yale University, *Professor of Management* (employee perceptions of workplace trust and justice, contract labor, compensation, management practices in the transition from communism, personal relationships as the basis for organization)

Cornelia Pechmann, Ph.D. Vanderbilt University, *Professor of Management and Social Ecology* (consumer behavior, advertising strategy, health care marketing, evaluation research)

Andrew J. Policano, Ph.D. Brown University, *Dean of The Paul Merage School of Business and Professor of Management* (financial institutions and markets, macroeconomics, monetary theory and policy)
Lyman W. Porter, Ph.D. Yale University, *Professor Emeritus of Management* (organizational behavior, management education, personnel management)
Amelia C. Regan, Ph.D. University of Texas, *Associate Professor of Computer Science, Civil and Environmental Engineering, and Management* (transportation logistics, online freight marketplace, intermodal operations, commercial vehicle operator and firm behavior, shipper behavior and third party logistics)
Judy B. Rosener, Ph.D. Claremont Graduate School, *Senior Lecturer with Security of Employment, Management and Social Ecology* (business and government, cultural diversity, gender and management)
Claudia B. Schoonhoven, Ph.D. Stanford University, *Professor of Management* (creation and testing of organization theory related to organizational survival and performance in high-velocity environments, technological innovation, entrepreneurial dynamics, new venture management, top management teams, strategic alliance formation and strategic management of innovation and technology entrepreneurship)
Carlton H. Scott, Ph.D. The University of New South Wales (Australia), *Professor of Management and of Electrical Engineering and Computer Science* (operations research, production management, total quality management)
Charles Shi, Ph.D. University of Minnesota, *Assistant Professor of Management* (measurement and valuation of intangible assets, the role of accounting information in securities—stock and bond—valuations, and the economic consequences of accounting disclosure)
Kut C. So, Ph.D. Stanford University, *Professor of Management* (operations management, design of production and service systems, just-in-time production systems, supply chain management, time-based management)
Neal M. Stoughton, Ph.D. Stanford University, *Professor of Management* (corporate finance, strategic financial management, risk management and pension fund management from the corporate point of view)
Eli Talmor, Ph.D. University of North Carolina at Chapel Hill, *Professor of Management* (corporate finance, executive compensation and managerial accounting)
Rajeev Tyagi, Ph.D. University of Pennsylvania, *Associate Professor of Management* (competitive marketing strategies and game theory)
Alladi Venkatesh, Ph.D. Syracuse University, *Professor of Management and Informatics* (new media and information technologies in the home, marketing on the Internet, postmodern theory and marketing, cross-cultural consumer behavior)
Wenqing Wang, Ph.D. University of California, Los Angeles, *Assistant Professor of Management* (empirical asset pricing, liquidity, institutional investment behavior, learning)
Margarethe F. Wiersema, Ph.D. University of Michigan, *Professor of Management* (top management, executive succession, and corporate strategy)
Fan Yu, Ph.D. Cornell University, *Assistant Professor of Management* (theoretical and empirical analysis of credit risk, option pricing, term structure modeling, accounting transparency and asset pricing)
Fuqiang Zhang, Ph.D. University of Pennsylvania, *Assistant Professor of Management* (supply chain management, design of production and service systems, and incentives in operations management)
Kevin Xiaoguo Zhu, Ph.D. Stanford University, *Assistant Professor of Management* (economic and organizational impacts of information technology, economics of information systems and electronic markets, strategic impact of emerging technologies, adoption of new standards, real options, game theory, information transparency in supply chains)

OVERVIEW

The Paul Merage School of Business offers the M.B.A. (Master of Business Administration) degree, the Ph.D. degree in Management, and undergraduate minors in Management and Accounting. The Master's degree is professional in nature and is intended to provide future managers with a firm foundation in the basic disciplines and in management tools and techniques; the Ph.D. in Management is for those who wish to pursue a career in scholarly research. The undergraduate minor is designed for those who wish to gain some insight into issues of modern management, as well as those who anticipate future graduate work in Management.

Educational Objectives

The Paul Merage School of Business offers a generalist M.B.A. degree and a learning experience that prepares graduates for a lifetime of professional and personal growth with increasingly important enterprise-wide responsibilities. The rigorous curriculum, combined with extensive professional and interpersonal training and opportunities made available through the School's Career Services Office and Center for Leadership Development, allows students to gain theoretical perspectives that are in turn tested and affirmed with practical application. The result is an environment that fosters the development of professional and personal skills vital to contemporary executives or managers. Students are encouraged to develop their ability to lead change by mastering communication skills, to work productively and actively within a team-oriented environment, to gain a solid grasp of quantitative skills, and to appreciate and effectively employ those solutions that involve the integration and implementation of information and technology to offer creatively viable business options.

The School has developed a strategic focus on Information Technology for Management (ITM), a theme that is incorporated in many areas of the curriculum. Although a solid grounding in basic business disciplines provides the foundation for effective management, graduates are encouraged to aim higher. They learn about change as it takes place within the context of a knowledge-based, technology-driven society where information and its effective use are vital to establishing a competitive edge. Students, whether they are interested in finance, marketing, general management, strategic planning, accounting, operations, health care, human resources, international business, or other areas, will be thoroughly imbued and comfortable with the nature, importance, and handling of information in all of these and other fields. Further, they will understand the technology and the technological processes that enable the gathering, analysis, dissemination, and use of information to change the way business is done. The strategic focus of the School is to provide skills that will enable its graduates to be effective managers who are not only proficient in business procedures but have the leadership qualities and know-how to affect change by transforming conventional business practices or perhaps even inventing new business processes and management techniques.

The Paul Merage School of Business has created an information-rich environment that cuts across all business disciplines by providing its students, faculty, and staff with technological tools that enable each member of the School to retrieve and analyze information that can be used to develop new processes or solve complex problems. Five ITM laboratories in the core disciplines are a critical part of the learning experience, and students' familiarity and ease with Information Technology for Management serve as backdrop for many other courses. .

Additionally, has also achieved a national reputation for excellence in graduate management education in the health care industry through the Health Care Executive M.B.A. (HCEMBA) program. Industry managers and health care professionals learn about managerial challenges and issues in the health care industry where hundreds of health care providers, medical device and instrumentation companies, and biosciences firms are headquartered. A joint M.D./M.B.A. program also is available.

General Admission Requirements

Evaluation of the applicant's file for admission to the Master's and Ph.D. degree programs will consist of an integrated assessment of all materials (test scores, transcripts of previous academic work, statement of purpose, and letters of recommendation). The University admission standard of a 3.0 or better undergraduate grade point average (on a 4.0 scale) is required. The minimum TOEFL (Test of English as a Foreign Language) score acceptable for study at the School is 600 for all M.B.A. programs. Substantive work experience is considered for applicants to M.B.A. programs.

Requests for application material should be addressed to either the Full-Time M.B.A., M.B.A. Programs for Working Professionals, or Ph.D. Program at the University of California, Irvine, The Paul Merage School of Business, Irvine, CA 92697-3125; e-mail: gsm-mba@uci.edu, or gsm-phd@gsm.uci.edu; World Wide Web: http://www.gsm.uci.edu/.

Doctor of Philosophy in Management

The Paul Merage School of Business admits students for the Ph.D. in the fall quarter only. The deadline for application is January 4. The Ph.D. program requires a commitment to full-time study. In addition to the other requirements, Ph.D. applicants are encouraged to submit a previously prepared paper (research report, Master's thesis, essay, case study) which may be indicative generally of the applicant's interests and capabilities.

The School offers the Ph.D. in Management to students with backgrounds in a variety of disciplines. While a master's degree is preferred, students may be admitted to the doctoral program directly from the baccalaureate degree. There are many appropriate undergraduate majors, including (but not limited to) psychology, political science, business or public administration, mathematics, computer sciences, economics, sociology, and so forth. Students with academic strengths in disciplines not usually considered as precursors for management (e.g., natural sciences, humanities, and the arts) are encouraged to apply. The Ph.D. program is designed to prepare students for academic careers in a number of the fields of management, e.g., organization and strategy, operations and decision technologies, management information systems, finance, accounting, and marketing. Requirements of the Ph.D. program include a broad knowledge of core management disciplines. In addition, the Ph.D. student must qualify as a skilled researcher and must complete a dissertation demonstrating these skills. There are no foreign language requirements in the Ph.D. program.

The Ph.D. program is divided into two phases: qualification and dissertation. In the qualification phase the student prepares for dissertation research in an area of specialization. This phase is completed when an oral qualifying examination is passed and the candidacy committee recommends advancement to candidacy for the Ph.D. The normal time for advancement to candidacy is three years. The dissertation phase involves a significant original research project which demonstrates the Ph.D. student's creativity and ability to launch and sustain a career of research. Students are expected to complete the Ph.D. in four years. The maximum time permitted is six years.

Requests for information should be addressed to the University of California, Irvine, The Paul Merage School of Business, Doctoral Program Admissions Office, 418 Graduate School of Management, Irvine, CA 92697-3125; e-mail: gsm-phd@ gsm.uci.edu; World Wide Web: http://www.gsm.uci.edu/doctoral/.

Master's Degree Programs

The Paul Merage School of Business offers a variety of programs leading to the M.B.A. (Master of Business Administration) degree. These include a two-year, full-time M.B.A. program, and three part-time M.B.A. programs: a 21-month Executive M.B.A. program, a two-year Health Care Executive M.B.A. program, and a three-year Fully Employed M.B.A. program. A five-year joint M.D./M.B.A. program is offered in conjunction with the School of Medicine.

M.B.A. PROGRAM

The Paul Merage School of Business admits students to the two-year, full-time M.B.A. program in the fall quarter. Students from a variety of undergraduate disciplines, including liberal arts, social sciences, physical or biological sciences, computer science, and engineering, are encouraged to apply. The final deadline for completion of all phases of the application procedure is May 6. In addition to the general University rules governing admission to graduate study, the School normally requires the following:

1. Completion of the Graduate Management Admission Test (GMAT).
2. Completion of a course in both introductory calculus and statistics with probability with a grade of B or better.

The evaluation of an applicant's file for admission consists of an integrated assessment of all materials submitted including test scores, transcripts of previous academic work, statements on application forms, and letters of recommendation. Above and beyond these factors, substantive work experience is given serious consideration in the evaluation process.

The full-time M.B.A. program requires a minimum of 92 units with a minimum grade point average of 3.0 in the Core and overall. The curriculum consists of courses divided into two groups designed to achieve specific educational objectives. The courses are divided as follows: 13 required Common Core Courses (50 units) and 42 units of elective courses which students select to emphasize career goals and educational interests. A thesis is not required.

Required Course Work. Common Core Courses, each of which is four units, are: Management of Complex Organizations, Statistics for Management, Management Science, Operations Management, Organizational Analysis for Management, Financial and Managerial Accounting for Management, Microeconomics, Macroeconomics for Management or Government and Public Policy, Information Technology for Management, Marketing Management, Managerial Finance, Business Strategy.

International Requirement. Students must fulfill the requirement in one of the following ways: completion of a Paul Merage School of Business international elective in a functional area; participation in a Paul Merage School of Business international exchange program; or completion of an upper-division or graduate international course offered by another UC school, with the approval of The Paul Merage School of Business Associate Dean.

ITM Electives. Students must complete 12 units of ITM course work, which can be fulfilled by successful completion of ITM-designated laboratory or non-laboratory electives. Non-laboratory electives (typically four-unit courses) are special topic courses (some numbered 294, others with specific numbers, such as 271 and 275). ITM laboratories are numbered 295A, B, C, D, E, G. Students may meet the ITM requirements by successfully completing any combination of the above special topic courses and discipline-based ITM laboratory electives totaling at least 12 units.

Electives. In addition to the ITM electives, 30 more units of elective courses are required. The major emphasis in the elective courses is to develop additional depth in a discipline or interdisciplinary area or specialized competence in the use of a particular set of technical tools and methods. Students select their electives in light of their educational and career goals and interests.

The 3-2 Program for Undergraduates

In addition to the full-time master's program for students who have already received a bachelor's degree, outstanding UCI undergraduate students may apply to enter a cooperative 3-2 Program with the School and most other campus units. Acceptance into the 3-2 Program constitutes advanced admission to the graduate program. Such students complete their undergraduate major requirements by the end of their junior year. During their senior year, they take graduate courses in the School. These courses are used to satisfy their undergraduate unit requirements, and at the same time apply toward their graduate degree. Successful completion of the requirements in the program normally leads to the bachelor's degree in the cooperating discipline after the fourth year, and the M.B.A. degree after the fifth year. Students should consult with their academic counselor in their major school early in their academic careers for further information about completing undergraduate requirements in three years. Students contemplating entering such a program should contact The Paul Merage School of Business prior to, or early in, the start of their junior year for the purpose of program consultation.

NOTE: With the exception of 3-2 students, no undergraduates will be enrolled in Paul Merage School of Business graduate-level courses.

M.D./M.B.A. Degree Program

The M.D./M.B.A. program requires five or six years for completion. It is aimed at individuals who are exceptional in ability and motivation and who seek a career as physicians with major responsibility for administration and management in health care organizations and institutions. Students in this program pursue a combined curriculum for an M.D. degree from the School of Medicine and an M.B.A. degree from The Paul Merage School of Business.

Students must be currently enrolled in the M.D. program and in good academic standing in order to apply to the combined M.D./M.B.A. program. During their second or third year of medical school, interested students submit an application to The Paul Merage School of Business Admissions Committee, after review by the School of Medicine. Final acceptance to the program is granted by The Paul Merage School of Business, and M.B.A. course work begins following completion of the student's third year of medical school. Students should be aware that enrollment in the M.D. program does not guarantee acceptance into the M.B.A. program.

The MCAT, along with the completion of three years of medical school training in good standing and passage of USMLE Step I, currently serve as a waiver for the GMAT entrance examination usually required for application to the M.B.A. program. The total number of units required to graduate for each program separately are satisfied in the M.D./M.B.A. program. Contact the M.D./M.B.A. Advisor at (949) 824-5388 for more information.

Special Opportunities

Within the M.B.A. program, the School created an underlying curriculum in Information Technology for Management that provides students with sophisticated, state-of-the-art knowledge and practical experience in this rapidly evolving arena. Students take the customary M.B.A. core courses, augmented by a set of ITM application courses in various functional areas. In addition, many of the electives are specialized courses that reflect the changing nature of organizational management. Representative electives are: Networks and Telecommunications, Management of Information Systems, Electronic Business, Strategic Information Systems, Database Marketing, Marketing on the Internet, and Change Management. Additional activities designed to supplement this innovative curriculum include seminars given by industry leaders and relevant internships.

In addition to the standard admissions criteria, the Admissions Committee is particularly interested in how prospective candidates envision the current role and future potential of information technology in business.

The Paul Merage School of Business offers course work in health care management within the M.B.A. program. The courses provide training not only in health care and related issues, but also expose students to professionals in the areas of management, finance, marketing, and strategic planning.

In today's interconnected global business world, it has become increasingly important for management students to learn to operate in an international environment. M.B.A. students in the full-time program can gain first-hand knowledge of the culture and management practices of other industrialized countries by participating in an academic exchange with universities located abroad. This experience, combined with course work in international management, prepares students for the demands and complexities of the growing global economic environment. Currently, The Paul Merage School of Business has exchange relationships with the ESSEC Graduate School of Management, Cergy-Pontoise, France; Katholieke University, Leuven, Belgium; Budapest University of Economic Sciences (BUES), Budapest, Hungary; Vienna University of Economics and Business Administration, Wirtschafts Universitat, Wien, Vienna, Austria; ITESM (The Monterrey Institute of Technology and Higher Education), Monterrey, Mexico; Hong Kong University of Science and Technology, Kowloon, Hong Kong; and National University of Singapore, Singapore.

Opportunities for students to take part in ongoing research exist through the Center for Research on Information Technology and Organizations (CRITO), which was recently designated by the National Science Foundation (NSF) as one of six industry-University Information Research Centers in the United States. CRITO is a consortium of corporations working together with faculty at UCI and elsewhere to better understand the evolving fabric of the information society and its implications for the design, use, and management of information and technology in various user environments. These environments range from the individual user's environment to work-groups, organizations, social communities, and society. The aim is to determine how organizations can more effectively use information and better design and manage new technology for improving organizational performance and society more generally.

CRITO faculty associates are recognized internationally for their excellence in the study of information technology as it applies to complex organizations. This tradition of excellence has been established by faculty from The Paul Merage School of Business, the Donald Bren School of Information and Computer Sciences, and the School of Social Sciences. These associates have collaborated since 1974 on theoretical and empirical research projects studying a broad array of questions about the relationship between information technology and organizational structure, society, political behavior, productivity, and performance. Research conducted through CRITO focuses on the management, use, and impact of information technology in the emerging global, competitive marketplace and the policy issues raised by such use. CRITO facilitates a match between the technical and organizational dimensions and between academic researchers and information technology professionals, and also assists organizations in exploiting the potential offered by information technology. CRITO's goals are to conduct theoretical and empirical research, bring multiple intellectual perspectives and methods to bear on interdisciplinary research, and facilitate the collaboration of faculty, students, and the professional community utilizing the expertise, facilities, and activities provided by CRITO. Qualified Paul Merage School of Business students are encouraged to participate in the various CRITO research activities and to avail themselves of this unique opportunity to interact with scholars from allied disciplines and to study in-depth the effects of the information technology revolution.

M.B.A. Career Center

The M.B.A. Career Center, located within the School, was established to serve the unique placement needs of M.B.A. students and alumni. It has two main functions: (1) attracting a variety of organizations to interview and hire graduates and (2) counseling students in career opportunities and the techniques necessary to conduct effective job searches, not only for their first jobs but throughout their careers. The relatively small size of the M.B.A. program allows considerable interaction between the Career Center and students.

EXECUTIVE M.B.A. PROGRAM

The Executive M.B.A. (EMBA) program presents a challenging 21-month course of study specifically designed for working professionals and managers with a minimum of eight years of work experience. Students meet on alternate weekends (Friday and Saturday) at The Paul Merage School of Business. Class size allows students the opportunity to actively participate in class discussions and interact closely with their peers. Information technology is an integral part of the program.

The program offers an applications-oriented curriculum with an international focus designed to give the working professional contemporary management tools for successfully doing business on a national and international level. Students participate in an in-depth, week-long international seminar abroad. The added dimension of overseas study provides them with first-hand knowledge of the challenges inherent in doing business on a global scale, and brings them in direct contact with global markets.

Further information may be obtained by contacting the University of California, Irvine, M.B.A. Programs for Working Professionals, 202 Graduate School of Management, Irvine, CA 92697-3125; telephone (949) 824-4565; Web site: http://www.gsm.uci.edu/.

HEALTH CARE EXECUTIVE M.B.A. PROGRAM

The Health Care Executive M.B.A. program is a two-year program designed for professionals and managers with experience in the health care industry. Classes are held once a month on a Thursday evening beginning at 7 p.m. and continuing until noon on Sunday. In addition, there are three week-long residential courses which address specific issues and topics while developing team-building skills.

The curriculum is a carefully structured program that assures each student exposure to the full range of disciplines which are essential components of a management education. The core and elective courses are specifically customized for application to a health care professional's daily challenges. Distinguished speakers from the industry are an integral part of the program. This activity has been approved for AMA PRA credit.

Further information may be obtained by contacting the University of California, Irvine, M.B.A. Programs for Working Professionals, 202 Graduate School of Management, Irvine, CA 92697-3125; telephone (949) 824-4565; Web site: http://www.gsm.uci.edu/.

FULLY EMPLOYED M.B.A. PROGRAM

The Fully Employed M.B.A. (FEMBA) program gives emerging managers an opportunity to earn an M.B.A. degree with minimal disruption to their professional lives. Students attend classes on weeknights and/or Saturdays during the program. The FEMBA Program admits new students for enrollment in spring or fall. Students beginning the program in spring attend classes nine consecutive quarters and complete the program in 27 months. Students beginning the program in fall attend classes nine non-consecutive quarters (summers off) and complete the program in 33 months.

The program consists of both core courses and electives, allowing students to establish a solid foundation of traditional business skills and then customize their education based on personal interests and goals. The curriculum provides constant interaction between information presented in the classroom and what is being used on the job, reinforcing and enhancing the student's learning experience.

In addition to classroom work, students attend three residential sessions including one abroad focusing on global markets. In this concentrated setting, students and faculty have an opportunity to explore in depth a variety of business challenges and how those challenges can best be met using contemporary management tools.

Further information may be obtained by contacting the University of California, Irvine, M.B.A. Programs for Working Professionals, 202 Graduate School of Management, Irvine, CA 92697-3125; telephone (949) 824-4565; Web site: http://www.gsm.uci.edu/.

Undergraduate Minor in Management

The Paul Merage School of Business faculty offer an undergraduate minor in Management which consists of seven courses: one lower-division introductory course and six upper-division courses.

In establishing the undergraduate minor in Management, the faculty anticipated three types of students to be drawn to courses in administration: (1) students who wish to learn about the management of organizations as a way of preparing for a career in business, (2) students preparing for careers in other fields that require some knowledge of management, and (3) students who expect to go on to graduate work in management who wish early guidance and undergraduate work appropriate to this career objective.

Students are eligible to apply for the minor in Management if they have completed all prerequisite courses (including Management 5) with a grade no lower than C (2.0) and have upper-division standing. Completion of the prerequisite courses does not guarantee admission to the minor in Management. Admission is on a competitive basis and students must submit an application, transcripts, and a statement of purpose. Applications are accepted on a quarterly basis. Interested students are encouraged to obtain further information from the Undergraduate Program Office, 101 Multipurpose Academic and Administrative Building; World Wide Web: http://www.gsm.uci.edu/.

Prerequisite Courses

The following are prerequisites for enrolling in the upper-division undergraduate minor courses: Management 5; Economics 20A; and one course or one sequence selected from Anthropology 10A-B-C, Engineering CEE11, Economics 10A-B-C, Mathematics 7, Mathematics 131A-B-C, Psychology 10A-B-C, Social Ecology 13, Social Ecology 166A-B-C, Social Science 9A-B-C or 10A-B-C, or Sociology 10A-B-C.

Transfer students should check with their college counselor for established equivalencies for these prerequisite courses.

NOTE: Individual courses that students may select within the minor may require additional prerequisites, including Mathematics 2A.

Requirements for the Undergraduate Minor in Management

Completion of seven courses:

A. One lower-division core course: Management 5.

B. Four upper-division core courses selected from: Management 181, 183, 185, 186, 187, 188.

C. Two additional courses selected from: the upper-division core course list above, Management 160, and Management 190.

With faculty approval, a student may substitute a maximum of one course. Students participating in the UC Education Abroad Program may substitute a maximum of two courses, with Paul Merage School of Business faculty approval.

NOTE: Students may not receive both the minor in Management and the minor in Accounting.

Undergraduate Minor in Accounting

The Paul Merage School of Business faculty offer an undergraduate minor in Accounting consisting of seven upper-division courses. In addition, two lower-division introductory accounting courses, one lower-division microeconomics course, and one lower-division single variable calculus course are prerequisites to the minor program.

In establishing the undergraduate minor in Accounting, the faculty anticipated three types of students to be drawn to courses in accounting: (1) students who wish to meet the accounting course work eligibility requirements to sit for the uniform CPA examination, (2) students preparing for careers in private accounting or in other fields that require some knowledge of accounting, and (3) students planning to pursue a graduate degree in accounting who wish early guidance and undergraduate work appropriate to this career objective.

Students are eligible to apply for the minor in Accounting if they have upper-division standing and have completed Management 30A and 30B with a grade no lower than B (3.0) and all other prerequisite courses with a grade no lower than C (2.0). Completion of the prerequisite courses does not guarantee admission to the minor in Accounting. Admission is on a competitive basis and students must submit an application, transcripts, and a statement of purpose. Applications are accepted on a quarterly basis. Interested students are encouraged to obtain further information from the Undergraduate Program Office, 101 Multipurpose Academic and Administrative Building; Web site: http://www.gsm.uci.edu.

Prerequisite Courses

The following are prerequisites for enrolling in the upper-division undergraduate minor courses: Economics 20A, Mathematics 2A, Management 30A, and Management 30B.

Transfer students should check with their college counselor for established equivalencies for these prerequisite courses. Students not taking Management 30A and 30B at UCI during regular session or summer session must complete Management 131A with a minimum grade of B prior to admission in the program.

NOTE: Individual courses that students may select within the minor may require additional prerequisites.

Requirements for the Undergraduate Minor in Accounting

Completion of seven upper-division courses:

A. Three core accounting courses: Management 131A, 131B, 132.

B. Two accounting elective courses selected from: Management 133, 134, 136, 137, 138.

C. Two additional courses selected from: the upper-division accounting elective course list above, Management 139, 160, 181, 183, 186, 187, 188, and 190 (provided topics have not been covered in other accounting courses).

With Paul Merage School of Business faculty approval, a student may substitute a maximum of one minor course.

NOTE: Students may not receive both the minor in Accounting and the minor in Management.

Courses in Management

UNDERGRADUATE

5 Managing in Contemporary Organizations (4) F, W, S, Summer. Equips students with working knowledge of several major subject areas within the context of business and society studies. Topics include: role of management in organizations, corporate social responsibility and responsiveness, ethics and values in business, government regulation, and international business.

30A Principles of Accounting I (4). First in a series of two introductory-level courses in accounting theory and practice. Emphasis on financial accounting concepts including the corporate financial statements, their content and interpretation, and the impact of financial transactions upon them.

30B Principles of Accounting II (4). Second in a two-course series. Continuation of financial accounting concepts and introduction of managerial accounting concepts. Managerial accounting topics include product costing and decision making. Prerequisite: Management 30A.

131A Intermediate Accounting I (4). First in a series of two intermediate-level courses in financial accounting theory and practice. Concepts include valuation and reporting of current and long-term assets, current liabilities and contingencies, and revenue recognition issues. Prerequisite: Management 30A.

131B Intermediate Accounting II (4). Second in a two-course series. Topics include the recognition and valuation of long-term liabilities, accounting for stockholders' equity, and the Statement of Cash Flows. Prerequisite: Management 131A.

132 Individual Taxation (4). Fundamentals of federal income taxation pertaining to individuals. Topics include income, deductions, credits, property transactions, and the impact of taxes on business and investment decisions. Prerequisite: Management 30B.

133 Corporate and Partnership Taxation (4). A study of the federal income taxation of partnerships and corporations, including subchapter S corporations. Emphasis on the tax issues associated with formation, operation, and termination of these entities. Prerequisite: Management 132.

134 Special Topics in Taxation (4). Taxation topics of particular interest to undergraduate students. Content may vary each quarter depending on the interests of the instructors and the students. Prerequisite: Management 132. May be repeated for credit as topics vary.

136 Accounting Information Systems and Spreadsheets (4). Fundamentals of accounting information systems including internal controls and transaction processing cycles. Development of efficient spreadsheets as applied to financial and managerial accounting concepts. Prerequisite: Management 30B.

137 Advanced Accounting (4). Accounting theory and practice with emphasis on business combinations, consolidated financial statements, foreign exchange transactions, and governmental and nonprofit organizations. Prerequisite: Management 131B.

138 Auditing (4). An introduction to auditing practice with emphasis on the verification of financial statements and related information. Topics include professional ethics, assessment of audit risk, study and evaluation of internal control, gathering and evaluating audit evidence, and audit reporting. Prerequisite: Management 131B.

139 Business Law (4). A study of the legal environment of business. Topics include contracts, agency, partnerships, corporations, and other basic principles of law as they relate to business transactions.

160 Introduction to Business and Government (4). Introduces undergraduate students to the study of public administration. Designed for those expecting to take further courses in the field or considering a public service career. Prerequisites: Management 5 and upper-division standing.

181 Managing Organizational Behavior (4). Basic theory and concepts which provide the manager with tools for understanding behavior of people in organizations. Areas such as individual, group, and organizational determinants. Prerequisites: Management 5 and upper-division standing.

183 Quantitative Methods for Management (4). Basic processes and tools of managerial decision making. Identification of objectives, controllable and noncontrollable variables, phases of decision making, role of computers, quantitative tools for managerial decision making. Prerequisites: Management 5 and upper-division standing, and a basic course in statistics with probability.

185 Introduction to Financial Accounting (4). Acquisition, reporting, and use of financial information in a business organization. Emphasis on use of information generated by the accounting system for decision making, planning, and control. Public sector analogies considered wherever possible. Prerequisites: Management 5 and upper-division standing.

186 Introduction to Managerial Finance (4). Basics of financial administration. Capital budgeting, cost of capital, cash budgeting, working capital management, and long-term sources of funds. Provides a basic understanding of issues and techniques involved in financial decision making. Prerequisites: Management 5 and 185; upper-division standing.

187 Introduction to Marketing (4). Basic marketing concepts; discussion of the role marketing plays in modern society. Topics: industrial and consumer marketing, promotion, distribution, and pricing theory. Prerequisites: Management 5 and upper-division standing.

188 Introduction to Management Information Systems (4). Provides exposure to the major features and issues relating to the deployment, use, and impact of information technology within public and private organizations. Topics include selection and feasibility assessment of information technology (IT), and application of IT to business and design and implementation of IT. Open only to students enrolled in the minor in Management.

190 Special Topics in Management (4). Special topics courses are offered from time to time, but not on a regular basis. Prerequisites vary. May be repeated for credit as topics vary.

198A-B-C Administrative Internship (4-4-4). Selected undergraduates participate as interns in three-quarter seminar. Students serve as managers within administrative units on campus with course work complementing the intern experience. Topics include: management ethics, study of non- and for-profit institutions, and changing nature of the work force.

199 Independent Study (1 to 4). Individual study under the direction of a selected faculty member. Prerequisite: consent of instructor. May be repeated for credit.

FULL-TIME M.B.A. PROGRAM

200 Management of Complex Organizations (4). An introduction to management. In learning about the job of the manager, students examine some of the basic concepts of strategic and organizational management, including competitive analysis, corporate strategy, organizational design, and techniques for improving organizational effectiveness. Satisfactory/Unsatisfactory only.

201A Statistics for Management (4). Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics: classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting. Prerequisite: basic statistics with probability.

201B Management Science (2). An introduction to computer-based models for decision making. Topics include optimization (linear programming, integer programming, network flow models) and computer simulation. Uses spreadsheets extensively, including Excel built-in and add-in packages.

202 Organizational Analysis for Management (4). Develops a better understanding of the causes and consequences of individual and group behavior, and the frameworks by which to analyze and understand complex organizations; and enhances the skills required to manage and lead an organization.

203A Financial Accounting for Management (4). Nature and purpose of accounting, principal accounting instruments, and valuation problems.

203B Managerial Accounting for Management (4). Focuses on the needs of the manager rather than the needs of stockholders and others. Introduces the concepts and tools of internal reporting. Emphasis on use of internal accounting reports and analyses for decision making. Prerequisite: Management 203A.

204A Microeconomics for Management (4). Provides basic tools for analyzing economic decisions of consumers and firms, the determinants and consequences of market structure and market failure. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, and introductory game theory.

204B Macroeconomics for Management (4). Covers key topics in macroeconomics, including the principal determinants of national income and employment, with emphasis on concepts, tools, and data. Application of classical, Keynesian, and other models to fiscal and monetary policy. Enrollment preference given to second-year students. Prerequisite: Management 204A.

205 Marketing Management (4). Introduction to the field of marketing. Objectives include: developing familiarity with terms, techniques, and institutions in the marketing environment; acquainting students with the type of decisions made by marketing managers regarding product, pricing, distribution, promotion, and research.

206 Business and Government (4). Focuses on the relationship between business and government, and the ways in which members of the business community help shape local, state, and federal public policy. Topics include: issues management, lobbying, impact of technology, impact of the media, and privatization.

207 Information Technology for Management (4). Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines role of technology in organizations, how technology can be used to execute an organization's business strategy, and to enable new, innovative business strategies.

208 Operations Management (4). Introduction to strategic and tactical issues in production and operations management. A blend of quantitative and qualitative considerations. Topics: product planning, process design, capacity management, production planning, inventory control, distribution management, just-in-time manufacturing, quality management.

209A Managerial Finance (4). Introduces students to financial theory and concepts. The main topics covered are time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice. Prerequisites: Management 201A, 203A, 204A.

210 Business Strategy (4). The study of the functions and responsibilities of senior management and the decisions that determine the direction of the organization and shape its future. Methods include application of concepts, frameworks, and analytical techniques to the strategic issues which real-world companies face. Prerequisites: Management 202, 205, 209A.

ELECTIVES

209B Investments (4). Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies. Prerequisite: Management 209A.

213 New Venture Management: A Course in Entrepreneurship (4). Focuses on survival and growth of new ventures. Methods include analysis of live cases, guest speakers, discussion, and field projects with contemporary entrepreneurs to learn about successful new venture management and surviving the liabilities of newness. Prerequisites: Management 202 and 205.

214 Entrepreneurship: Planning the New Venture (4). Project course in which student teams develop a business plan to launch a new venture. The final business plan is presented to a panel of private investors, venture capitalists, entrepreneurs, experienced executives, and faculty. Prerequisites: Management 202, 205, 210.

215 Global Competitive Strategy (4). Examines the challenges and opportunities for international business focusing on how and why companies go global, global industry structure and competition, international market development and market entry, and the management of international business risks. Extensive use of cases and discussions. Prerequisites: Management 202, 205, 210.

216 Management of High-Technology Companies (4). Focuses on the unique array of managerial problems that derive from operating in high-velocity, high-change environments. Methods include rigorous case analyses, readings, and visiting experts to enhance knowledge.

217 Management Consulting (4). Designed to provide a practical introduction to consulting by addressing organizational and business diagnostics, the roles played by consultants in changing business processes, client relations, markets for consulting services, the economic of the consulting business.

218 Business Dynamics (4). Addresses how managers can successfully face the continuous challenges to their survival in a time-efficient, strategically sound manner. Builds on the core strategy course by tackling an extended range of strategic responses to dynamic and competitive environments. Prerequisites: Management 200, 202, 210.

220 Organizational Change (4). Focuses in the implementation of change. Focus is on identifying the features of successful change in organizations of varying sizes and configurations, with an emphasis on the reasons why individuals resist or embrace change. Prerequisites: Management 200, 202.

224 Strategic Human Resources Management (4). Focuses on managing human resources, with an emphasis on how firms' human resources system choices match various organizational strategies and contribute to firm performance. Topics include the design of staffing, training and development, performance appraisal, and rewards systems. Prerequisite: Management 200.

225 Negotiations (4). Using a combination of theory and practice via negotiation simulations, students expand their repertoire of negotiating skills and develop their ability to analyze different negotiation situations and contexts. Prerequisites: Management 200, 202.

228 International Management (4). Introduction to the effects of different national cultures and political/economic systems on the assumptions, expectations, organizational practices, and organizational forms relevant to cross-national organizational work. Prerequisites: Management 200, 202.

229 Leadership Strategies (4). Examines various theories and functions of leadership, situational context, use and abuse of power, the role of character and values, and leadership strategies. Using cases and real life experiences, students develop their own capabilities for the exercise of leadership. Prerequisites: Management 200, 202.

231A, B Financial Reporting Standards (4, 4). A user-oriented intermediate financial accounting course that covers topics such as revenue and expense recognition, taxes, leases, inventories, long-lived assets, earnings per share, and cash flows. **231A:** Focuses on implications of these items for financial statement analysis. **231B:** Provides in-depth understanding of contemporary reporting issues. Prerequisite: Management 203A.

232 Federal Taxation (4) S. Methods of researching federal laws governing income taxation of individuals and corporations, and provisions for a tax-exempt status. Prerequisite: Management 203A.

234 Financial Statement Analysis (4). Designed to prepare the student to interpret and analyze financial statements effectively. The emphasis is on assisting the student (the investor, the banker, the shareholder, the company's CEO or CFO) in investment and credit-granting decisions. Prerequisite: Management 203A.

235 Advanced Managerial Accounting (4). Design of cost information and systems used to plan and control organizational activities; procedures used to account for unit, process, and program costs; cybernetic evaluation of costing procedures; cost estimation, analysis, and accounting via computers. Prerequisites: Management 203A, 203B.

242 Portfolio Management (4). Advanced portfolio decision making. Topics include index models, portfolio performance measures, bond portfolio management and interest immunization, stock market anomalies and market efficiency. Prerequisites: Management 201B, 209B.

243 Bonds and Fixed Income (4). During the past decade, there has been a tremendous amount of innovation in the design and use of debt securities. Focuses on techniques and methodologies for valuing different types of debt as well as their uses. Prerequisite: Management 209B.

244 Multinational Finance (4). Focuses on financial issues facing multinational corporations, the most important of which is the management of foreign exchange risk. Other topics covered are investments and financing decisions in international capital markets. Prerequisites: Management 201B, 204B, 209A, 209B, or consent of instructor.

245 Financial Institutions (4). Focuses on financial intermediaries such as banking and brokerage. Explains the risks faced by institutions and the integration through electronic markets. Covers issues such as online trading, global capital markets, securitization, deposit insurance, and bank regulations. Prerequisite: Management 209B.

248 Creating Wealth (4). A case study course using the principles of financial value creation for optimum performance. Specific topics include venture capital, IPOs, real options, mergers and acquisitions, stock buybacks, dividends, and recapitalizations. Prerequisite: Management 209B.

249 Derivatives (4). Studies options, futures, and other derivatives. The first part covers forward, futures, and swaps. The second part examines the pricing of options. Applications of these instruments are emphasized. Prerequisite: Management 209B.

250 Consumer Behavior (4). Examines consumer decision-making process with emphasis on application of concepts and research findings from behavioral sciences for solution of marketing problems. Includes models of consumer decision making, information processing theories, and sociological influences on consumer decision making. Prerequisite: Management 205.

251A Marketing Research (4). Methods of measuring, examining, and predicting factors that affect the marketing process. Various aspects of the research process examined, including problem formulation, research design, data collection methods, sampling, statistical analysis, and methodological considerations. Prerequisite: Management 205.

252A Advertising Management (4). Considers advertising management issues within the framework of an integrated marketing communications scheme. Some of the topics covered include elements of a marketing communications plan, marketing information and research, creating brand value, and media strategies. Prerequisite: Management 205.

252D New Product Development (4). Designed to introduce the new product development process and techniques to identify markets, develop new product ideas, measure consumer preferences, position and design new products, as well as test them prior to launch. Analytical thinking and techniques are emphasized. Prerequisite: Management 205.

254 International Marketing (4). Provides an understanding of the problems and perspectives of marketing across national boundaries, and develops analytical abilities for structuring and controlling marketing programs related to overseas businesses. Financial, legal, and cultural barriers to international marketing are emphasized. Prerequisite: Management 205.

255 Database Marketing (4). Database marketing leverages information technology, together with established analytical methodologies, to facilitate highly targeted marketing. Students learn about database marketers' general strategies and objectives, their analytical methods, and the technologies they employ. Prerequisite: Management 205.

256 Direct Marketing (2 to 4). Covers all the fundamentals and some of the finer nuances of marketing products and services directly to individual customers. Processes and implementation are emphasized. The history of direct marketing, core concepts, key analytical and presentation tools (spreadsheets, reports, graphs) are discussed. Prerequisite: Management 205.

257 Marketing on the Internet (4). Examines impact of the Internet on traditional methods of doing marketing. Explores existing and future uses of the Internet for the marketing of goods and services. Considers utility of the Internet as a "tool" for marketing to increase effectiveness, efficiency, competitiveness. Prerequisite: Management 205.

262 Managing Nonprofits (4). Focuses on the similarities and differences between for-profit and nonprofit organizations, with emphasis on the management of nonprofits. Topics include: marketing, fundraising, staffing, management/director relationships, use of volunteers, and emerging career opportunities.

263 Valuing Cultural Diversity (4). Focuses on issues related to managing in a diverse workforce (i.e., gender, color, ethnicity, age) and making the business case for valuing diversity. Topics include: stereotyping, communication, legal mandates, and international issues associated with working in a global economy.

266 Economics of Health Care Services (4). Uses microeconomics to study the organization, financing, and delivery of medical care in the U.S. The economic criteria of efficiency and equity are used to evaluate the performance of health care markets, government programs, and public policies. Prerequisite: Management 204A.

267 Understanding Managed Care (4). Covers all aspects of the "managed care revolution," emphasizing the latest development and future trends. Topics include market competition and organizational strategy, the changing role of providers, integrated delivery systems, quality management, and the impact of new technologies.

268 Economics of Strategy (4). Uses game theory to analyze and inform strategic decision making. Applications include strategic pricing and investment decisions, with an emphasis on technology and information-based industries. Concepts are presented via simulation exercises, case studies, and outside speakers. Prerequisite: Management 204A.

271 Systems Analysis and Design (4). Systems analysis and design is a complex, organizational process a team of business and technical professionals uses to identify, design, and create information-based solutions to business challenges. Explores the concepts, methodologies to create business value for the organization. Prerequisite: Management 207.

272 Critical IT Decisions for Business Executives (4). Develops frameworks to help business executives make critical IT decisions. Examples include how much to invest in IT, determining management practices to maximize return on IT investment, sourcing strategies for IT and business process outsourcing, strategies for digital environments. Prerequisite: Management 207.

274 Database Management and Applications (4). Examines contemporary business applications of databases including CRM, segmentation, data-warehousing, data-mining, and business intelligence. Also covers the database design process with a focus on enabling business decision making including capturing the linkages among data, querying, and data administration. Prerequisite: Management 207.

275 Strategic Information Systems (4). Focuses on the strategic and competitive implications of IT, the Internet, and e-business for firms, industries, and countries. Topics include: globalization; IT alignment with business strategy; value of IT; business transformation; national IT policy; strategy and IT in the network era. Prerequisite: Management 207.

276 Networks and Telecommunications (4). Designed to provide students with a better understanding of the fundamentals of networking technologies and their applications. Covers TCP/IP and OSI standards, networking concepts, Intranet/Internet topologies, communication protocols, and an overview of the applications that use them to operate.

277 Managing Electronic Business (4). Helps managers to understand the key issues of doing business in the information age. Studies how existing business processes can be made more efficient. Examines strategies, business models, electronic markets, e-supply chains, business-technology integration, new trends, and real-world cases.

278 Information Systems Project Management (4). Concentrates on project management techniques in the context of information systems projects: organizing, planning, budgeting, scheduling, management, leadership, and control. Special emphasis is placed on issues of system implementation and management of organizational change. Prerequisite: Management 207.

280 Forecasting (4). Basic theory and techniques used to forecast future activities in technological, economic, social, and political arenas. Impact of forecasting on managerial decision making.

283 Decision Analysis (4). Models of preferences and uncertainty; exercises in creative problem solving. The assessment and use of preference models (von Neumann-Morgenstern expected utility and measurable value functions) for private, public, and not-for-profit decision making. The assessment and use of subjective probabilities in decision making.

285 Supply Chain Management (4). Studies the basics of supply chain management and examines recent innovations enabled by advancements in information technologies. Topics include transportation and logistics, inventory and forecasting, channel restructuring, supplier management, information and electronic mediated environment, outsourcing and strategic alliances.

286 Service Operations (4). Analyzes processes from a wide array of services to examine process structure, information and technology requirements, performance, and support of business objectives. Case intensive; cases include hotel, airline, e-commerce, fast food, entertainment, banking, and health care.

287 Project Management (4). Examines the fundamental components of project management and its role in the modern corporation. Emphasis is on how to initiate, implement, control, and terminate a project. Use of computer package for project management.

288 Advanced Topics in Operations Management (4). Delves more deeply into topics that are currently influencing advances in practice of operations management in both manufacturing and service industries. Topics include modeling and analysis of manufacturing systems, yield management, and workforce scheduling. Appropriate applications in Southern California included. Prerequisite: consent of instructor.

289 Field Studies in Operations Management (4). Participation in a small group project sponsored by local companies in Southern California. Involves the applications of various concepts taught in operations management and related areas to address real issues faced by the sponsoring companies. Prerequisite: consent of instructor.

290 Special Topic Seminars (2 to 4) F, W, S. Seminar, three hours. Each quarter a number of special topic seminars are offered in the 290 series. These seminars are not sequential and may be repeated for credit providing the topic varies. Examples of possible topics include Communication in Organizations, Power and Authority in Organizations, Health Care Administration, Real Estate Development. May be repeated for credit as topics vary.

292 Business Law (4). Detailed study from a business viewpoint of contract theories, assignments, delegation of duties, third-party beneficiary contracts, defenses to consensual contracts, types of conditions, methods of excusing conditions, remedies, and types of damages.

294 Special Topic ITM Seminars (2 to 4). Each quarter a number of special topic Information Technology for Management (ITM) seminars are offered in the 294 series. Examples of possible topics include: Business Intelligence, Technologies for E-commerce. Open to Paul Merage School of Business students only. May be repeated for credit as topics vary.

295B Principles of Marketing Laboratory (2). Covers emerging trends in marketing information systems, focusing on Geographic Information Systems and Single Source Scanner Data Systems. Students obtain hands-on experience with elading software packages and market databases and learn pertinent concepts and analytical tools. Corequisite: Management 205.

295C Management Science Laboratory (2). Tightly integrated with Management 201B. Provides hands-on experience in setting up spreadsheet models and conducting experiments to aid decision making. Excel built-in tools are covered: Excel-Solver for optimization, Crystal Ball for simulation, and templates for queuing analysis. Corequisite: Management 201B.

295D Operations Management Laboratory (2). Use up-to-date information to make intelligent decisions for effective manufacturing and service operations management. Students obtain hands-on experience with visual interactive software packages to analyze and manage operations. Corequisite: Management 208.

295G E-Business Laboratory (2). Demonstrates key technologies and tools to build commercial Web sites, intranets and extranets. Students learn the conceptual framework and gain hands-on experience with the software and hardware needed to design, manage, and host e-business solutions.

298 Consulting Practicum (4). Provides students with an opportunity to put into practice concepts, skills, and tools acquired in other parts of the M.B.A. program. Seminar sessions augment internship experiences with analyses of relevant administrative issues. Satisfactory/Unsatisfactory only. Open only to second-year M.B.A. students.

299 Individual Directed Study (2 to 12). Individual study under the direction of a selected faculty member. Prerequisite: determined by instructor.

Ph.D. PROGRAM

227 Doctoral Seminar in Organizational Behavior (4). Seminar, three hours. Examines recent research and literature in the field of organizational behavior. Open only to advanced Ph.D. students in organizational behavior and related areas.

297A Doctoral Proseminar (4). Analysis of the central theories and theoretical controversies in the field of management. Examination of the formal education for managerial careers and exploration of issues relating to professional careers in research and scholarship in the field of management. Satisfactory/Unsatisfactory only.

297B Doctoral Seminar in Research Methods (4). Provides a first exposure to some fundamental issues in the conduct of research and development of the domain of knowledge relevant to their fields. Satisfactory/Unsatisfactory only.

297C Doctoral Seminar in Statistical Analysis (4). Emphasizes techniques for the testing of hypotheses derived from organizational theory (or social science theories in general); touches lightly on traditional business statistics used in organizations. Satisfactory/Unsatisfactory only.

297E Doctoral Seminar in Research Methods (4). Provides foundation in research design and methodology. Topics include statistical analysis, philosophy of science, and experimental design. Prerequisites: Management 297A-B-C.

297G University Teaching (4). Designed to prepare students for teaching career; incorporates seminars addressing topics of classroom dynamics, syllabus preparation, teaching techniques; establishes mentor relationship with faculty member in student's teaching area, provides classroom experience and includes option of videotape analysis of teaching style.

EXECUTIVE M.B.A. PROGRAM

Admission to the Executive M.B.A. Program is a prerequisite for enrollment in the following courses.

EP200 Management of Complex Organizations (7). An introduction to management. In learning about the job of the manager, students examine some of the basic concepts of strategic and organizational management, including competitive analysis, corporate strategy, organizational design, and techniques for improving organizational effectiveness. Satisfactory/Unsatisfactory only.

EP201A Statistics for Management (5). Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics: classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

EP201B Management Science (5). Introduction to management science tools for aiding managerial decision making with emphasis on model applicability, formulation, and interpretation. Use of computer laboratory's management science software packages. Topics: mathematical programming, stochastic processes, queueing systems, simulation.

EP202 Organizational Analysis for Management (5). Develops a better understanding of the causes and consequences of individual and group behavior, and the frameworks by which to analyze and understand complex organizations; and enhances the skills required to manage and lead an organization.

EP203A Financial Accounting for Management (5). Nature and purpose of accounting, principal accounting instruments, and valuation problems. Satisfactory/Unsatisfactory only.

EP203B Managerial Accounting for Management (5). Focuses on the needs of the manager rather than the needs of stockholders and others. Introduces the concepts and tools of internal reporting. Emphasis on use of internal accounting reports and analyses for decision making.

EP204A Microeconomics for Management (5). Provides basic tools for analyzing economic decisions of consumers and firms, the determinants and consequences of market structure and market failure. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, and introductory game theory.

EP204B Macroeconomics for Management (5). Covers key topics in macroeconomics, including the principal determinants of national income and employment, with emphasis on concepts, tools, and data. Application of classical, Keynesian, and other models to fiscal and monetary policy. Prerequisite: Management EP204A.

EP205 Marketing Management (5). Introduction to the field of marketing. Objectives include developing familiarity with terms, techniques, and institutions in the marketing environment; acquainting students with the type of decisions made by marketing managers regarding product pricing, distribution, promotion, and research.

EP207 Information Technology for Management (5). Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines role of technology in organizations, how technology can be used to execute an organization's business strategy, and to enable new, innovative business strategies.

EP208 Operations Management (5). Introduction to strategic and tactical issues in production and operations management. A blend of quantitative and qualitative considerations. Topics: product planning, process design, capacity management, production planning, inventory control, distribution management, just-in-time manufacturing, quality management.

EP209A Managerial Finance (5). Introduces students to financial theory and concepts. The main topics covered are time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice. Prerequisites: Management EP201A, EP203A, EP204A.

EP209B Investments (5). Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies. Prerequisite: Management EP209A.

EP210 Business Strategy (5). The study of the functions and responsibilities of senior management and the decisions that determine the direction of the organization and shape its future. Methods include application of concepts, frameworks, and analytical techniques to the strategic issues which real-world companies face. Prerequisites: Management EP202, EP205, EP209A.

NOTE: For course descriptions *not* shown below, refer to the corresponding course number in the Full-Time M.B.A. Program list.

EP213 New Venture Management: A Course in Entrepreneurship (5). Prerequisites: Management EP202, EP205, EP210.

EP214 Entrepreneurship: Planning the New Venture (5). Prerequisites: Management EP202, EP205, EP210.

EP215 Global Competitive Strategy (5). Prerequisites: Management EP202, EP205, EP210.

EP218 Business Dynamics (5). Prerequisites: Management EP200, EP202, EP210.

EP225 Negotiations (5). Prerequisites: Management EP200, EP202.

EP229 Leadership Strategies (5). Prerequisites: Management EP200, EP202.

EP234 Financial Statement Analysis (5). Prerequisite: Management EP203A.

EP248 Creating Wealth (5). Prerequisite: Management EP209B.

EP252D New Product Development (5). Prerequisite: Management EP205.

EP263 Valuing Cultural Diversity (5)

EP272 Critical IT Decisions for Business Executives (5). Prerequisite: Management EP207.

EP274 Database Management and Applications (5). Prerequisite: Management EP207.

EP275 Strategic Information Systems (5). Prerequisite: Management EP207.

EP277 Managing Electronic Business (5)

EP278 Information Systems Project Management (5). Prerequisite: Management EP207.

EP283 Decision Analysis (5)

EP290A-H Special Topics (2 to 5). May be repeated for credit as topic varies.

EP292 Business Law (5)

EP294 Special Topic ITM Seminars (5). May be repeated for credit as topics vary.

EP295 Global Business (8). Emphasizes and reinforces international perspectives contained in the Executive M.B.A. program curriculum by providing a week-long intensive seminar abroad in the second year. Scholars and business people from the host country instruct students in specially designed class sessions and company visits. Satisfactory/Unsatisfactory only.

EP299 Individual Study (1 to 8). Individual study under the direction of a selected faculty member. May be repeated for credit as topics vary.

HEALTH CARE EXECUTIVE M.B.A. PROGRAM

Admission to the Health Care Executive M.B.A. Program is a prerequisite for enrollment in the following courses.

HC200 Management of Complex Organizations (7). An introduction to management. In learning about the job of the manager, students examine some of the basic concepts of strategic and organizational management, including competitive analysis, corporate strategy, organizational design, and techniques for improving organizational effectiveness. Satisfactory/Unsatisfactory only.

HC201A Statistics for Management (5). Methods of statistical inference, emphasizing applications to administrative and management health care decision problems. Topics: classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

HC201B Management Science (5). Introduction to management science tools for aiding health care managerial decision making, with emphasis on model applicability, formulation, and interpretation. Use of computer laboratory's management science software packages. Topics: mathematical programming, stochastic processes, queueing systems, simulation.

HC202 Organizational Analysis for Management (5). Develops a better understanding of the causes and consequences of individual and group behavior, and the frameworks by which to analyze and understand complex organizations; and enhances the skills required to manage and lead an organization.

HC203A Financial Accounting for Management (4). Nature and purpose of accounting, principal accounting instruments, and valuation problems as they apply to health care organizations.

HC203B Managerial Accounting for Management (4). Focuses on the needs of the manager rather than the needs of stockholders and others in a health care organization. Introduces the concepts and tools of internal reporting. Emphasis on use of internal accounting reports and analyses for decision making.

HC204A Microeconomics for Management (5). Provides basic tools for analyzing economic decisions of consumers and firms, the determinants and consequences of market structure and market failure. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, and introductory game theory.

HC205 Marketing Management (5). Introduction to the field of marketing. Objectives include developing familiarity with terms, techniques, and institutions in the marketing environment; acquainting students with the type of decisions made by marketing managers regarding product pricing, distribution, promotion, and research.

HC206 Business and Government (2). Focuses on the relationship between business and government, and the ways in which members of the business community help shape local, state, and federal public policy. Topics include: issues management, lobbying, impact of technology, impact of the media, and privatization.

HC207 Information Technology for Management (5). Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines role of technology in organizations, how technology can be used to execute an organization's business strategy, and to enable new, innovative business strategies.

HC209A Managerial Finance (5). Introduces students to financial theory and concepts. The main topics covered are time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice. Prerequisites: Management HC201A, HC203A, HC204A.

HC209B Investments (3). Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies. Prerequisite: Management HC209A.

HC210 Business Strategy (5). The study of the functions and responsibilities of senior management and the decisions that determine the direction of the organization and shape its future. Methods include application of concepts, frameworks, and analytical techniques to the strategic issues which real-world companies face. Prerequisites: Management HC202, HC205, HC209A.

NOTE: For course descriptions *not* shown below, refer to the corresponding course number in the Full-Time M.B.A. Program list.

HC213 New Venture Management: A Course in Entrepreneurship (5). Prerequisites: Management HC202, HC205, HC210.

HC214 Entrepreneurship: Planning the New Venture (2 to 5). Prerequisites: Management HC202, HC205, HC210.

HC215 Global Competitive Strategy (5). Prerequisites: Management HC202, HC205, HC210.

HC218 Business Dynamics (5). Prerequisites: Management HC200, HC202, HC210.

HC225 Negotiations (2 to 5). Prerequisites: Management HC200, HC202.

HC229 Leadership Strategies (5). Prerequisites: Management HC200, HC202.

HC234 Financial Statement Analysis (2 to 5). Prerequisite: Management HC203A.

HC245 Financial Institutions (2 to 5). Prerequisite: Management HC209B.

HC248 Creating Wealth (2 to 5). Prerequisite: Management HC209B.

HC272 Critical IT Decisions for Business Executives (5). Prerequisite: Management HC207.

HC274 Database Management and Applications (5). Prerequisite: Management HC207.

HC275 Strategic Information Systems (5). Prerequisite: Management HC207.

HC277 Managing Electronic Business (5)

HC278 Information Systems Project Management (5). Prerequisite: Management HC207.

HC283 Decision Analysis (2 to 5)

HC290 Special Topics (2 to 5). May be repeated for credit as topics vary.

HC292 Business Law (2 to 5). May be repeated for credit as topics vary.

HC294 Special Topic ITM Seminars (3 to 5). May be repeated for credit as topics vary.

HC295 Federal Policy in Health Care (7). National/international one-week residential course. Exploring political analysis as related to management of health care organizations. Topics include political environment of management, concepts, and processes central to political analysis, bureaucratic politics, politics, and the manager. Satisfactory/Unsatisfactory only.

HC296 Executive Leadership (7). Focuses on the conceptual, practical, and personal dimensions of executive leadership in health care. Past and current leadership theories are addressed. Individual personal assessment and diagnosis.

HC299 Individual Study (1 to 8). Individual study under the direction of a selected faculty member. May be repeated for credit as topics vary.

FULLY EMPLOYED M.B.A. PROGRAM

Admission to the Fully Employed M.B.A. Program is a prerequisite for enrollment in the following courses.

FE200 Management of Complex Organizations (6). An introduction to management. In learning about the job of the manager, students examine some of the basic concepts of strategic and organizational management, including competitive analysis, corporate strategy, organizational design, and techniques for improving organizational effectiveness. Satisfactory/Unsatisfactory only.

FE201A Statistics for Management (4). Methods of statistical inference, emphasizing applications to administrative and management decision problems. Topics: classical estimation and hypothesis testing, regression, correlation, analysis of variance, decision analysis, and forecasting.

FE201B Management Science (4). Introduction to management science tools for aiding managerial decision making with emphasis on model applicability, formulation, and interpretation. Use of computer laboratory's management science software packages. Topics: mathematical programming, stochastic processes, queueing systems, simulation.

FE202 Organizational Analysis for Management (4). Develops a better understanding of the causes and consequences of individual and group behavior, and the frameworks by which to analyze and understand complex organizations; and enhances the skills required to manage and lead an organization.

FE203A Financial Accounting for Management (4). Nature and purpose of accounting, principal accounting instruments, and valuation problems.

FE203B Managerial Accounting for Management (4). Focuses on the needs of the manager rather than the needs of stockholders and others. Introduces the concepts and tools of internal reporting. Emphasis on use of internal accounting reports and analyses for decision making.

FE204A Microeconomics for Management (4). Provides basic tools for analyzing economic decisions of consumers and firms, the determinants and consequences of market structure and market failure. Topics include demand and supply analysis, production and cost theory, perfect competition, monopoly, and introductory game theory.

FE204B Macroeconomics for Management (4). Covers key topics in macroeconomics, including the principal determinants of national income and employment, with emphasis on concepts, tools, and data. Application of classical, Keynesian, and other models to fiscal and monetary policy. Prerequisite: Management FE204A.

FE205 Marketing Management (4). Introduction to the field of marketing. Objectives include developing familiarity with terms, techniques, and institutions in the marketing environment; acquainting students with the type of decisions made by marketing managers regarding product pricing, distribution, promotion, and research. Formerly Management FE205A.

FE206 Business and Government (4). Focuses on the relationship between business and government, and the ways in which members of the business community help shape local, state, and federal public policy. Topics include: issues management, lobbying, impact of technology, impact of the media, and privatization.

FE207 Information Technology for Management (4). Focuses on the technological and managerial issues surrounding the development and use of IT in organizations. Examines role of technology in organizations, how technology can be used to execute an organization's business strategy, and to enable new, innovative business strategies.

FE208 Operations Management (4). Introduction to strategic and tactical issues in production and operations management. A blend of quantitative and qualitative considerations. Topics: product planning, process design, capacity management, production planning, inventory control, distribution management, just-in-time manufacturing, quality management.

FE209A Managerial Finance (4). Introduces students to financial theory and concepts. The main topics covered are time value of money, valuation of stocks and bonds, capital budgeting, portfolio theory, capital structure choice. Prerequisites: Management FE201A, FE203A, FE204A.

FE209B Investments (4). Foundations of investment management. Theory and empirical evidence related to portfolio theory, market efficiency, asset pricing models, factor models, and option pricing theory. Students are expected to combine market research results and electronic information sources to create optimal investment strategies. Prerequisite: Management FE209A.

FE210 Business Strategy (4). The study of the functions and responsibilities of senior management and the decisions that determine the direction of the organization and shape its future. Methods include application of concepts, frameworks, and analytical techniques to the strategic issues which real-world companies face. Prerequisites: Management FE202, FE205, FE209A.

NOTE: For course descriptions *not* shown below, refer to the corresponding course number in the Full-Time M.B.A. Program list.

FE213 New Venture Management: A Course in Entrepreneurship (4). Prerequisites: Management FE202, FE205, FE210.

FE214 Entrepreneurship: Planning the New Venture (4). Prerequisites: Management FE202, FE205, FE210.

FE215 Global Competitive Strategy (4). Prerequisites: Management FE202, FE205, FE210.

FE216 Management of High-Technology Companies (4)

FE217 Management Consulting (4)

FE218 Business Dynamics (4). Prerequisites: Management FE200, FE202, FE210.

FE220 Organizational Change (4). Prerequisites: Management FE200, FE202.

FE224 Strategic Human Resources Management (4). Prerequisites: Management FE200.

FE225 Negotiations (4). Prerequisites: Management FE200, FE202.

FE228 International Management (4). Prerequisites: Management FE200, FE202.

FE229 Leadership Strategies (4). Prerequisites: Management FE200, FE202.

FE234 Financial Statement Analysis (4). Prerequisite: Management FE203A.

FE242 Portfolio Management (4). Prerequisite: Management FE209B.

FE243 Bonds and Fixed Income (4). Prerequisite: Management FE209B.

FE244 Multinational Finance (4). Prerequisite: Management FE209B.

FE248 Creating Wealth (4). Prerequisite: Management FE209B.

FE249 Derivatives (4). Prerequisite: Management FE209B.

FE250 Consumer Behavior (4). Prerequisite: Management FE205.

FE251A Marketing Research (4). Prerequisite: Management FE205.

FE252A Advertising Management (4). Prerequisite: Management FE205.

FE252D New Product Development (4). Prerequisite: Management FE205.

FE254 International Marketing (4). Prerequisite: Management FE205.

FE257 Marketing on the Internet (4). Prerequisite: Management FE205.

FE271 Systems Analysis and Design (4). Prerequisite: Management FE207.

FE272 Critical IT Decisions for Business Executives (4). Prerequisite: Management FE207.

FE274 Database Management and Applications (4). Prerequisite: Management FE207.

FE275 Strategic Information Systems (4). Prerequisite: Management FE207.

FE276 Networks and Telecommunications (4)

FE277 Managing Electronic Business (4)

FE278 Information Systems Project Management (4). Prerequisite: Management FE207.

FE280 Forecasting (4)

FE283 Decision Analysis (4)

FE285 Supply Chain Management (4)

FE286 Service Operations (4)

FE290A-H Special Topics (2 to 4). May be repeated for credit as topic varies.

FE292 Business Law (4)

FE294 Special Topic ITM Seminars (4). May be repeated for credit as topics vary.

FE295 Global Business (8). Emphasizes and reinforces international perspectives contained in the FEMBA curriculum by providing a week-long intensive seminar abroad in the second year. Scholars and business people from the host country instruct FEMBA students in specially designed class sessions and company visits. Satisfactory/Unsatisfactory only.

FE296 Executive Leadership (6). Focuses on the conceptual, practical, and personal dimensions of executive leadership. Past and current leadership theories are addressed. Individual personal assessment and diagnosis. Satisfactory/Unsatisfactory only.

FE299 Individual Directed Study (1 to 8). Individual study under the direction of a selected faculty member.

SCHOOL OF PHYSICAL SCIENCES

Ronald J. Stern, **Dean**
180 Rowland Hall
Academic Counseling: (949) 824-6507
World Wide Web: http://www.physsci.uci.edu/

The School of Physical Sciences offers both professional training and general education in the Departments of Chemistry, Earth System Science, Mathematics, and Physics and Astronomy. The faculty, active in research and graduate education, are at the same time vitally concerned with undergraduate teaching. Curricula of the School are designed to meet the needs of a wide variety of students ranging from those with little technical background who seek insight into the activities and accomplishments of physical scientists to those seeking a comprehensive understanding that will prepare them for creative research in physical science.

Over the course of the past century and a half, physics, chemistry, and mathematics have evolved into interdependent but separate intellectual disciplines. This development is reflected in the departmental structure of the School of Physical Sciences. In the same period, these fundamental disciplines have moved into domains of abstraction unimagined by early scientists. This trend to abstraction with its concomitant increase in understanding of the physical universe provides the major challenge to the student of the physical sciences. Mathematics, physics, and chemistry, while providing the foundation of the technology that dominates contemporary civilization, underlie to an ever-increasing extent the new developments in the biological and social sciences. Earth system science is grounded in the traditional physical sciences while breaking new paths in the quantitative study of changes in the global environment.

DEGREES

Chemistry	B.S., M.S., Ph.D.
Earth and Environmental Sciences	B.S.
Earth System Science	M.S., Ph.D.
Mathematics	B.S., M.S., Ph.D.
Physics	B.S., M.S., Ph.D.

Honors

Criteria used by the School of Physical Sciences in selecting candidates for honors at graduation are as follows: Approximately 1 percent will be awarded *summa cum laude,* 3 percent *magna cum laude,* and 8 percent *cum laude.* Honors are awarded on the basis of a student's performance in research, cumulative grade point average, and performance in upper-division courses in the major. Students considered for honors at graduation must have completed 72 units in residence at a University of California campus by the end of the winter quarter of the academic year in which they graduate. Other important factors are considered (see page 52). The School of Physical Sciences also grants special honors to students who have distinguished themselves by their work in their major subject.

Undergraduate Programs

Each department offers courses that are of value to nonmajors and majors in the sciences. The programs for majors are designed to meet the needs of students planning careers in business or industry, of students planning advanced professional study, and of students planning graduate work that continues their major interest. Students who wish to complete a coordinated set of courses beyond the introductory level in Mathematics and in Earth and Atmospheric Sciences may pursue minors in these areas. Introductory courses in chemistry, mathematics, and physics meet the needs of students majoring in the sciences, mathematics, and engineering and are also appropriate for students in other disciplines who seek a rigorous introduction to the physical sciences. In addition, a number of courses within the School have few or no prerequisites and are directed particularly toward students majoring in areas remote from the sciences.

PLANNING A PROGRAM OF STUDY

Students who choose a major in the School of Physical Sciences have a variety of academic advising and counseling resources available to them. In addition to faculty advisors, there is a Chief Academic Advisor in each department who is responsible for interpreting degree requirements, reviewing student petitions, and assisting with special advising problems. An academic advising and counseling staff, employed in the Associate Dean's Office, is available to serve a broad range of student advising needs. In consultation with their faculty advisor or an academic counselor, students should plan a course of study leading to a major in one of the departments of the School. In carrying out this major, students may often concentrate very heavily in a second department within the School or in some other school. Occasionally students choose to pursue a double major. Permission to do so may be sought by a petition submitted to the Office of the Associate Dean of Physical Sciences.

All initial courses of study for majors include mathematics through calculus, and calculus is a prerequisite for much of the upper-division work in each major. A student interested in any of the physical sciences should continue mathematical training beyond these prerequisite courses. Furthermore, students interested in either physics or chemistry usually will include work in both of these subjects in their undergraduate careers.

Students in the physical sciences are urged to acquire a working knowledge of computer programming at an early stage of their University studies. This can be accomplished by taking Information and Computer Science 21, Chemistry 5, Engineering CEE10, MAE10, or Physics 53.

CAREER OPPORTUNITIES

The majority of graduates continue their education beyond the Bachelor's degree level. Many pursue advanced academic degrees in preparation for careers in scientific or medical research, engineering, or postsecondary education. Other students will complete a secondary education credential in order to prepare for careers teaching high school mathematics and science. Some students enter professional school in areas such as medicine, dentistry, law, or business administration. Students who choose not to continue their studies beyond the baccalaureate level most frequently find employment in private business or industry. In addition to technical areas directly related to their major fields of study, students often enter careers in less obviously related fields such as computing, systems analysis, engineering, journalism, marketing, or sales.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. See the Career Center section for additional information.

SPECIAL PROGRAMS

Preparation for Teaching Science and Mathematics

Students interested in teaching science and mathematics should consider the programs in science and mathematics education offered by the Departments of Chemistry, Mathematics, and

Physics and Astronomy. The concentration in Chemistry Education, the Mathematics specialization in High School Teaching, and the concentration in Physics Education each provide strong grounding in the fundamentals of one discipline. At the same time, these programs emphasize the breadth in natural sciences needed to satisfy the requirements for the secondary teaching credential during the mandatory year of study following award of the B.S. degree. Each department's curriculum includes specialized instruction in effective methods of science teaching and provides opportunities for practical fieldwork experiences in a secondary school classroom. Detailed requirements for each program are provided in the departmental sections.

Campuswide Honors Program

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. See the Center for International Education section for additional information.

Minor in Biomedical Engineering

The minor in Biomedical Engineering is an interdisciplinary curriculum that includes courses from the Schools of Engineering, Physical Sciences, and Biological Sciences. The minor is designed to provide a student in the physical sciences with the introductory skills needed in the quantitative biomedical arena. See The Henry Samueli School of Engineering section of the *Catalogue* for more information.

Minor in Conflict Resolution

The interdisciplinary minor in Conflict Resolution provides skills in conflict analysis and resolution and a useful understanding of integrative institutions at the local, regional, and international levels. See the School of Social Sciences section of the *Catalogue* for more information.

Minor in Global Sustainability

The interdisciplinary minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet. See the Interdisciplinary Studies section of the *Catalogue* for more information.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements: Refer to individual departments.

Graduate Programs

The School offers M.S. and Ph.D. degree programs in the Departments of Chemistry, Earth System Science, Mathematics, and Physics and Astronomy.

DEPARTMENT OF CHEMISTRY

518 Rowland Hall; (949) 824-6018
V. Ara Apkarian, **Department Chair**

Faculty

Nancy Allbritton, Ph.D. Massachusetts Institute of Technology, M.D. The Johns Hopkins University School of Medicine, *Professor of Physiology and Biophysics, Biological Sciences, Biomedical Engineering, and Chemistry* (analytical chemistry)

V. Ara Apkarian, Ph.D. Northwestern University, *Department Chair and Professor of Chemistry* (chemical physics)

Ramesh D. Arasasingham, Ph.D. University of California, Davis, *Lecturer with Security of Employment, Chemistry* (chemical education and inorganic chemistry)

Donald R. Blake, Ph.D. University of California, Irvine, *Department Vice Chair and Professor of Chemistry and Earth System Science* (atmospheric and analytical chemistry, and radiochemistry)

Vladimir E. Bondybey, Ph.D. University of California, Berkeley, *Adjunct Professor of Chemistry* (chemical physics)

David A. Brant, Ph.D. University of Wisconsin, *Chair of the Department of Education and Professor of Chemistry* (physical chemistry of biological macromolecules)

A. Richard Chamberlin, Ph.D. University of California, San Diego, *Professor of Chemistry* (organic synthesis and bioorganic chemistry)

Robert M. Corn, Ph.D. University of California, Berkeley, *Professor of Chemistry* (physical and analytical chemistry)

Robert J. Doedens, Ph.D. University of Wisconsin, *Associate Dean of the School of Physical Sciences and Professor of Chemistry* (structural inorganic chemistry)

William J. Evans, Ph.D. University of California, Los Angeles, *Professor of Chemistry* (synthetic inorganic and organometallic chemistry)

Patrick Farmer, Ph.D. Texas A & M University, *Associate Professor of Chemistry* (inorganic and analytical chemistry)

Barbara J. Finlayson-Pitts, Ph.D. University of California, Riverside, *Professor of Chemistry* (atmospheric, physical, and analytical chemistry)

Fillmore Freeman, Ph.D. Michigan State University, *Professor of Chemistry* (organic chemistry)

Nien-Hui Ge, Ph.D. University of California, Berkeley, *Assistant Professor of Chemistry* (physical/analytical chemistry)

R. Benny Gerber, Ph.D. Oxford University, *Professor of Chemistry* (theoretical chemistry and chemical physics)

Zhibin Guan, Ph.D. University of North Carolina at Chapel Hill, *Assistant Professor of Chemistry* (organic chemistry)

Stephen Hanessian, Ph.D. Ohio State University, *Adjunct Professor of Chemistry* (organic chemistry)

Warren J. Hehre, Ph.D. Carnegie-Mellon University, *Professor Emeritus of Chemistry* (theoretical chemistry)

John C. Hemminger, Ph.D. Harvard University, *Professor of Chemistry* (surface chemistry and physics, atmospheric and analytical chemistry)

Alan F. Heyduk, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Chemistry* (inorganic chemistry)

Wilson Ho, Ph.D. University of Pennsylvania, *Donald Bren Professor of Physics and Chemistry* (experimental condensed matter physics and chemistry)

Kenneth C. Janda, Ph.D. Harvard University, *Professor of Chemistry* (chemical physics, spectroscopy, and analytical chemistry)

Jhong K. Kim, Ph.D. University of California, Santa Cruz, *Senior Lecturer in Chemistry* (organic chemistry)

Susan M. King, Ph.D. Massachusetts Institute of Technology, *Lecturer in Chemistry* (organic chemistry)

Vladimir A. Mandelshtam, Ph.D. Institute of Spectroscopy, Academy of Sciences of the U.S.S.R., *Associate Professor of Chemistry* (theoretical and computational chemistry)

Craig C. Martens, Ph.D. Cornell University, *Professor of Chemistry* (theoretical chemistry)

Robert T. McIver, Jr., Ph.D. Stanford University, *Professor Emeritus of Chemistry* (physical and analytical chemistry)

George E. Miller, D. Phil. Oxford University, *Senior Lecturer with Security of Employment Emeritus and Reactor Supervisor* (radioanalytical and analytical chemistry, and chemical education)

Harold W. Moore, Ph.D. University of Illinois, *Edward A. Dickson Professor Emeritus of Chemistry* (organic chemistry and rational drug design)

Shaul Mukamel, Ph.D. Tel-Aviv University, *UCI Chancellor's Professor of Chemistry* (analytical/physical chemistry)
Serguei A. Nizkorodov, Ph.D. University of Basel, Switzerland, *Assistant Professor of Chemistry* (atmospheric/physical chemistry)
James S. Nowick, Ph.D. Massachusetts Institute of Technology, *Professor of Chemistry* (organic and bioorganic chemistry)
Larry E. Overman, Ph.D. University of Wisconsin, *UCI Distinguished Professor of Chemistry* (organic chemistry)
Reginald M. Penner, Ph.D. Texas A & M University, *Department Vice Chair and Professor of Chemistry* (analytical chemistry)
Thomas L. Poulos, Ph.D. University of California, San Diego, *Director of the Irvine Research Unit in Macromolecular Structure and UCI Chancellor's Professor of Molecular Biology and Biochemistry, Physiology and Biophysics, and Chemistry* (inorganic/organic chemistry)
Peter M. Rentzepis, Ph.D. Cambridge University, *Professor of Chemistry and of Electrical Engineering and Computer Science, and UC Presidential Chair* (physical chemistry and picosecond spectroscopy)
F. Sherwood Rowland, Ph.D. University of Chicago, *Donald Bren Research Professor of Chemistry and Earth System Science* (atmospheric and analytical chemistry, and radiochemistry)
Scott D. Rychnovsky, Ph.D. Columbia University, *Professor of Chemistry* (organic chemistry)
A. J. Shaka, Ph.D. Oxford University, *Professor of Chemistry* (physical and analytical chemistry)
Kenneth J. Shea, Ph.D. Pennsylvania State University, *Professor of Chemistry* (organic, polymer, and analytical chemistry)
Mare Taagepera, Ph.D. University of Pennsylvania, *Senior Lecturer with Security of Employment Emerita* (physical organic chemistry and chemical education)
Douglas J. Tobias, Ph.D. Carnegie Mellon University, *Associate Professor of Chemistry* (computational biophysical chemistry)
Shiou-Chuan (Sheryl) Tsai, Ph.D. University of California, Berkeley, *Assistant Professor of Molecular Biology and Biochemistry and of Chemistry* (organic chemistry)
David L. Van Vranken, Ph.D. Stanford University, *Department Vice Chair and Professor of Chemistry* (organic chemistry)
Gregory A. Weiss, Ph.D. Harvard University, *Assistant Professor of Chemistry and of Molecular Biology and Biochemistry* (organic chemistry)
Keith A. Woerpel, Ph.D. Harvard University, *Professor of Chemistry* (organic and organometallic chemistry)
Max Wolfsberg, Ph.D. Washington University, *Professor Emeritus of Chemistry* (theoretical chemistry)
Albert Yee, Ph.D. University of California, Berkeley, *Director and Chair of the UCI Division of the California Institute for Telecommunications and Information Technology (Calit2) and Professor of Chemical Engineering and Materials Science, Biomedical Engineering, and Chemistry*

Undergraduate Program

The major in Chemistry is elected by students planning careers in the chemical sciences and frequently also by those whose interests lie in biology, medicine, earth sciences, secondary education, business, and law. The curriculum of the Department is designed to satisfy the diverse needs of these students and others who may have occasion to study chemistry. The year course Chemistry 1A-B-C (or the Honors sequence Chemistry H2A-B-C) is prerequisite to all study in the Department at more advanced levels. The subject matter of this course serves also as a thorough introduction to the varied aspects of modern chemistry for students who do not wish to pursue their studies beyond the introductory level.

In order to enroll in Chemistry 1A, students must pass the Chemistry Placement Examination, which is given in late spring, summer, and during Orientation Week prior to the beginning of fall quarter. A preparatory course, Chemistry 1P, is offered in summer and fall for those who do not pass the Chemistry Placement Examination or who need additional preparation prior to entering Chemistry 1A. A grade of C or better in Chemistry 1P automatically qualifies the student for Chemistry 1A.

Completion of a one-year sequence in organic chemistry, either Chemistry 51A-B-C or H52A-B-C, is required for Chemistry majors and for students of the life sciences. Certain advanced courses required of Chemistry majors may also be of interest to others.

The undergraduate program of the Chemistry Department emphasizes close contact with research. Chemistry majors are urged to engage in research or independent study under the direction of a faculty member. A handout describing the procedures for arranging an undergraduate research opportunity is available from the Chemistry Undergraduate Program Office, 248/250 Rowland Hall.

Much of the important chemical literature is being and has been printed in foreign languages, principally German, Russian, Japanese, Chinese, and French. Reading competence in one or more of these languages is desirable, and Chemistry majors are encouraged to acquire this competence.

Chemistry majors who are interested in teaching chemistry at the secondary level are urged to consider completing the optional concentration in Chemistry Education. A two-year post-baccalaureate program for the M.S. in Chemistry and a California Secondary Teaching Credential is described in the Chemistry Graduate Program section. Chemistry majors who plan subsequent study in medical, dental, or other professional schools should request information concerning admission requirements directly from the schools which they seek to enter. Counseling about preparation for a career in the health sciences is provided by the health science advisors in the School of Biological Sciences. Those intending to pursue graduate studies in chemistry should discuss their plans with a faculty member no later than the fall quarter of their senior year.

Admission to the Major

Students may be admitted to the Chemistry major upon entering the University as freshmen, via change of major, and as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at http://www.due.uci.edu/Change_of_Major.html. For transfer student admission, preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: one year of general chemistry with laboratory and one year of approved calculus.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements

Basic Requirements: Mathematics 2A-B-D, Physics 7B-D-E and 7LB-LD, Chemistry 1A-B-C and 1LA-1LB-1LC (or H2A-B-C and H2LA-LB-LC), Chemistry 5, Chemistry 51A-B-C and 51LA-LB-LC (or H52A-B-C and H52LA-LB-LC), Chemistry 107 and 107L, Chemistry 131A-B-C (or 130A-B-C), Chemistry 151 and 151L.

Elective Requirements: At least four lecture courses selected from Chemistry 125, 127, 128, 135, 136, 137, 138; and Chemistry courses numbered 201–205, 213–249, 262, 271, and 272; Biological Sciences 98 (Biochemistry), 99 (Molecular Biology), M114 (Advanced Biochemistry), M116 (Advanced Molecular Biology); Earth System Science 122 (Atmospheric Dynamics), 130 (Physical Oceanography); Physics 111A-B (Classical Mechanics), 112A-B (Electromagnetic Theory); Engineering CBEMS110 (Reaction Kinetics and Reactor Design), CBEMS112 (Introduction to Biochemical Engineering), CBEMS120A (Momentum Transfer), CBEMS120B (Heat and Mass Transfer), CBEMS130 (Separation Processes), CBEMS135 (Chemical Process Control), CBEMS145 (Chemical Engineering Design), CEE162 (Introduction to Environmental Chemistry), CEE165 (Physical-Chemical Treatment Processes).

At least three laboratory courses chosen from Biological Sciences M114L (Biochemistry Laboratory), M116L (Molecular Biology

Laboratory), Chemistry 128L (Introduction to Chemical Biology Laboratory Techniques), 152 (Advanced Analytical Chemistry), 153 (Physical Chemistry Laboratory), 156 (Advanced Laboratory in Chemistry and Synthesis of Materials), 160 (Organic Synthesis Laboratory), 170 (Radioisotope Techniques), 180 (Undergraduate Research), Engineering CBEMS140A-B (Chemical Engineering Laboratory), Physics 120 (Electronics for Scientists), and 121 (Advanced Laboratory). (Chemistry 180 can be counted toward this requirement no more than once.)

At least four of the courses used to satisfy the Elective Requirement must be courses offered by the Chemistry Department.

Optional American Chemical Society Certification: For ACS Certification the program must include Biological Sciences 98 or Chemistry 128; Chemistry 127, 152, 153; and at least two courses beyond the degree requirement chosen from Mathematics 2E, 2J, 3A, and 3D.

Optional Concentration in Biochemistry: The program must include Biological Sciences 97, 98, 99; Chemistry 128, 128L; and three advanced biology electives chosen from: Biological Sciences D103, D104, D111L, D147, D151, D152, E109, E112L, M114, M114L, M116, M116L, M121, M121L, M122, M122L, M124, M124L, M128, M130, M133, M137, M138, M140, M144, N110, and N132.

Optional Concentration in Chemistry Education: The program must include Education 173 (or 176), Physical Sciences 114 (two quarters), and three science breadth electives offered by one department from the following list: Earth System Science 51, 53, 55, 122, 130, 164; Mathematics 2E, 2J, 3A, 3D, 7; Physics 20A, 51A, 51B. One quarter of Physical Sciences 114 can be replaced by one quarter of Chemistry 191 or 192. The Chemistry elective requirement is reduced for students in this concentration to three lecture courses and two laboratory courses. Of these, three must be courses offered by the Chemistry Department.

HONORS PROGRAM IN CHEMISTRY

The Honors Program in Chemistry is a research-based program offered to selected Chemistry majors during their final year. Applicants to the program must have completed their junior year with a grade point average of at least 3.3 overall and in their Chemistry courses. They must also have demonstrated the potential of carrying out research of honors quality, as judged by the Chemistry faculty member who will supervise their research. Students in this program enroll in Honors Research in Chemistry (Chemistry H180A-B-C) throughout their senior year and submit a formal thesis late in the spring quarter. They also enroll in the Honors Seminar in Chemistry (Chemistry H181), in which they receive instruction in scientific writing and present a formal research seminar. Successful completion of Chemistry H181 satisfies the UCI upper-division writing requirement.

Students who complete these requirements, whose grade point average remains above the 3.3 standard, and whose research is judged to be of honors quality will graduate with Departmental Honors in Chemistry.

The Department also offers an Honors General Chemistry sequence, H2A-B-C. This course in general chemistry is designed for members of the Campuswide Honors Program (CHP) and other highly qualified students. It covers the same material as Chemistry 1A-B-C, but in greater depth.

Additional information is available from the Chemistry Undergraduate Program Office.

PLANNING A PROGRAM OF STUDY

The departmental requirements leave the student a great deal of latitude in choice of courses; the student can choose to pursue interests ranging from biochemistry on the one hand to chemical physics on the other. Many of the basic requirements above coincide with those of the School of Biological Sciences. For this reason a double major in Chemistry and Biological Sciences is popular. The Department is approved by the American Chemical Society to offer an undergraduate degree certified by the Society as suitable background for a career in chemistry or for graduate study in chemistry. While it is not mandatory, it is desirable for students to pursue a course of study that the Department judges to merit a certified degree. Specifically, the following courses must be included in the program of study: Biological Sciences 98 or Chemistry 128; two courses from Mathematics 2E, 2J, 3A, 3D; Chemistry 127, 152, and 153. These courses must be taken for a letter grade.

Students should consult with their academic advisors on courses of study. A Chemistry major normally takes Chemistry 1A-B-C and 1LA-LB-LC (or H2A-B-C and H2LA-LB-LC), Mathematics 2A-B-D, and required writing courses during the freshman year. The sophomore year should include Chemistry 5, 51A-B-C, and 51LA-LB-LC (or H52A-B-C and H52LA-LB-LC); the Physics 7 sequence should be completed no later than the fall quarter of the junior year. The balance of the freshman and sophomore program can be chosen at the student's discretion with consideration given to progress toward completion of the UCI breadth requirement.

In the junior year all Chemistry majors should enroll in a year sequence of physical chemistry and in Chemistry 151/151L (fall), 107 (winter), and 107L (spring). Chemistry 130A-B-C and 131A-B-C are equivalent courses in physical chemistry. They have the same prerequisites and expect the same level of chemical and mathematical rigor. Both are acceptable to satisfy the physical chemistry requirement for the major. Chemistry 131A-B-C develops the topic beginning from a molecular or microscopic point of view and proceeds to the macroscopic description of matter; applications may address primarily gas phase systems. Chemistry 130A-B-C, on the other hand, commences with the macroscopic description; this approach may be of particular interest for applications of physical chemistry in biology, materials science, and engineering. Students should choose between the two courses on the basis of their interests. Because of significant differences in the sequence of topics, students starting in one series may not switch to the other in subsequent quarters.

During the junior and senior years the Chemistry Department electives requirement should be fulfilled, as should other University and departmental requirements.

Sample programs for Chemistry majors, American Chemical Society-certified Chemistry majors, the Biochemistry concentration, the Chemistry Education concentration, and Chemistry-Biological Sciences double majors are shown in the accompanying charts. Sample programs for Chemistry majors wishing to emphasize chemical physics, computational or theoretical chemistry, chemical synthesis and reactivity, or materials or polymer science in their undergraduate programs are available from the Chemistry Undergraduate Program Office, 248/250 Rowland Hall.

The faculty encourages Chemistry majors to enhance their education by studying abroad for one or more quarters, or during the summer. In most cases, the Chemistry EAP advisor can help students plan a program of study that will not extend the time it takes to graduate. Also, study abroad can enhance students' applications for admission to graduate and professional schools. For more information about opportunities to study abroad, see the Center for International Education section of this *Catalogue* or visit the Physical Sciences Student Affairs Office.

Sample Program — Chemistry Majors*
Items in parentheses are recommended choices or alternatives.

FALL	WINTER	SPRING
Freshman		
Chemistry 1A, 1LA (H2A, H2LA)	Chemistry 1B, 1LB (H2B, H2LB)	Chemistry 1C, 1LC (H2C, H2LC)
Mathematics 2A	Mathematics 2B	Mathematics 2D
Breadth (Freshman Writing)	Breadth (Freshman Writing)	Breadth
Breadth		
Sophomore		
Chem. 51A, 51LA (H52A, H52LA)	Chem. 51B, 51LB (H52B, H52LB)	Chem. 51C, 51LC (H52C, H52LC)
Chemistry 5	Physics 7B, 7LB	Physics 7D, 7LD
Physics 7A, 7LA	Breadth	Breadth
Junior		
Chem. 131A (130A)	Chem. 131B (130B)	Chem. 131C (130C)
Physics 7E	Chemistry 107	Chemistry 107L
Chemistry 151, 151L	Chemistry Elective	Chemistry Elective
	Breadth/Elective	Breadth/Elective
Senior		
Chemistry Elective	Chemistry Elective	Chemistry Elective
Chemistry Elective	Chemistry Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective

* For American Chemical Society certification include Biological Sciences 98 or Chemistry 128; Chemistry 127, 152, 153; two courses chosen from Mathematics 2E, 2J, 3A, and 3D.

Sample Program — Concentration in Chemistry Education
Items in parentheses are recommended choices or alternatives.

FALL	WINTER	SPRING
Freshman		
Chemistry 1A, 1LA (H2A, H2LA)	Chemistry 1B, 1LB (H2B, H2LB)	Chemistry 1C, 1LC (H2C, H2LC)
Mathematics 2A	Mathematics 2B	Mathematics 2D
Breadth (Freshman Writing)	Breadth (Freshman Writing)	Breadth
Breadth		
Sophomore		
Chem. 51A, 51LA (H52A, H52LA)	Chem. 51B, 51LB (H52B, H52LB)	Chem. 51C, 51LC (H52C, H52LC)
Chemistry 5	Physics 7B, 7LB	Physics 7D, 7LD
Physics 7A, 7LA	Breadth	Breadth
Breadth		
Junior		
Chem. 131A (130A)	Chem. 131B (130B)	Chem. 131C (130C)
Physics 7E	Chemistry 107	Chemistry 107L
Chemistry 151, 151L	Chemistry Elective	Chemistry Elective
	Breadth/Elective	Breadth/Elective
Senior		
Chemistry Elective	Chemistry Elective	Chemistry Elective
Education 173 (176)	Physical Sciences 114 (Chem. 191 or 192)	Physical Sciences 114 (Chem. 191 or 192)
Science Breadth Elective	Science Breadth Elective	Science Breadth Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective

Sample Program — Concentration in Biochemistry
Items in parentheses are recommended choices or alternatives.

FALL	WINTER	SPRING
Freshman		
Chemistry 1A, 1LA (H2A, H2LA)	Chemistry 1B, 1LB (H2B, H2LB)	Chemistry 1C, 1LC (H2C, H2LC)
Mathematics 2A	Mathematics 2B	Mathematics 2D
Breadth (Freshman Writing)	Breadth (Freshman Writing)	Breadth
Breadth		
Sophomore		
Chem. 51A, 51LA (H52A, H52LA)	Chem. 51B, 51LB (H52B, H52LB)	Chem. 51C, 51LC (H52C, H52LC)
Chemistry 5	Physics 7B, 7LB	Physics 7D, 7LD
Physics 7A, 7LA	Biological Sciences 98	Biological Sciences 99
Biological Sciences 97		
Junior		
Chem. 130A (131A)	Chemistry 130B (131B)	Chemistry 130C (131C)
Physics 7E	Chemistry 107	Chemistry 107L
Chemistry 151, 151L	Chemistry 128	Chemistry 128L
	Breadth/Elective	Breadth/Elective
Senior		
Chemistry Elective	Chemistry Elective	Chemistry Elective
Advanced Bio. Elective	Advanced Bio. Elective	Advanced Bio. Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective

Sample Program — Chemistry-Biological Sciences Double Majors
Items in parentheses are recommended choices or alternatives.

FALL	WINTER	SPRING
Freshman		
Chemistry 1A, 1LA (H2A, H2LA)	Chemistry 1B, 1LB (H2B, H2LB)	Chemistry 1C, 1LC (H2C, H2LC)
Mathematics 2A	Mathematics 2B	Mathematics 2D
Bio. Sci. 93	Bio. Sci. 94	Bio. Sci. 2B
Breadth (Freshman Writing	Breadth (Freshman Writing)	Breadth
Bio. Sci. 2A		
Sophomore		
Chem. 51A, 51LA (H52A, H52LA)	Chem. 51B, 51LB (H52B, H52LB)	Chem. 51C, 51LC (H52C, H52LC)
Bio. Sci. 194S	Physics 7B, 7LB	Physics 7D, 7LD
Physics 7A, 7LA	Bio. Sci. 98	Bio. Sci. 99
Bio. Sci. 97	Breadth/Elective	Chemistry 5
Junior		
Chem. 130A (131A)	Chem. 130B (131B)	Chem. 130C (131C)
Physics 7E	Chemistry 107	Chemistry 107L
Chemistry 151, 151L	Required Bio. Sci. major course	Required Bio. Sci. major course
Bio. Sci. 100L	Breadth/Elective	Breadth/Elective
Senior		
Chemistry Elective	Chemistry Elective	Chemistry Elective
Required Bio. Sci. major course	Bio. Sci. Elective	Chemistry Elective
Bio. Sci. Lab	Bio. Sci. Lab	Bio. Sci. Lab
Breadth/Elective	Breadth/Elective	Breadth/Elective

Graduate Program

The Department offers the M.S. and Ph.D. degrees in Chemistry. The Ph.D. degree is granted in recognition of breadth and depth of knowledge of the facts and theories of modern chemistry and an ability to carry out independent chemical research demonstrated through submission of an acceptable doctoral dissertation. The M.S. degree may be earned either through submission of an acceptable Master's thesis (Plan I) or through an approved program of graduate course work and a comprehensive oral examination (Plan II). A Master's degree is not a prerequisite for admission to the Ph.D. program.

Students in the Ph.D. and M.S. Plan I (Thesis) programs are required to complete a minimum of seven approved courses (or 28 units), including six graduate-level courses (or 24 units), in chemistry. The M.S. Plan II (Non-Thesis) program requires that the student complete 10 graduate-level chemistry courses (or 40 units) and a comprehensive oral examination. Graduate students are expected to attain grades of B or better to remain in good academic standing. The comprehensive oral examination assesses the competence of the candidate in the areas of chemistry covered by the chosen course work, with unanimous agreement among the three examination committee members required for satisfactory completion.

Progress toward the Ph.D. degree during the first year is assessed by a written examination administered after completion of the first year of study. This examination covers either research accomplishments during the first year or comprehensive knowledge acquired in course work. The time and content of the examination depends upon the student's specific area of interest.

Training in teaching is an integral part of each graduate program, and all graduate degree candidates are expected to participate in the teaching program for at least four quarters during their graduate career.

Participants in the Ph.D. program take an oral examination for formal Advancement to Candidacy. This examination normally comes in a student's second or third graduate year and consists of an oral defense before a faculty committee of the student's dissertation research project, and an original research proposition conceived, developed, and documented by the student. The committee may examine the student at this time on any subject it deems relevant to the independent pursuit of chemical research.

The most important component of the Ph.D. program is the doctoral dissertation, which must describe the results of original research performed by the student under the supervision of a faculty member of the Department. The criterion for acceptability of the dissertation is that its contents be of a quality suitable for publication in a scientific journal of high editorial standards. Each Ph.D. candidate is expected to present the work described in the completed dissertation in a seminar before the Department, following which the candidate will be examined on the contents of the dissertation by a committee of the faculty. A Master's thesis presented in partial fulfillment of the requirements for the M.S. under Plan I must also describe the results of a student's original research performed under the direction of a faculty member. However, no public oral defense of the Master's thesis is required.

Residency requirements specify a minimum of six quarters in residence at UCI for Ph.D. candidates and three quarters for M.S. candidates.

The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

CONCENTRATION IN PROTEIN ENGINEERING SCIENCE

Several faculty in the Department of Chemistry, in conjunction with faculty in the School of Biological Sciences and The Henry Samueli School of Engineering, participate in the joint graduate program in Protein Engineering. This interdisciplinary graduate program offers students the opportunity to work with faculty in any of the participating academic units; take course work in the areas of protein structure, function, and molecular biology; and earn the Ph.D. in Chemistry, Biological Sciences, or Engineering with a concentration in Protein Engineering Science. Additional information is available in the School of Biological Sciences section of the *Catalogue* and through the graduate program in Protein Engineering office in the Biological Sciences Administration Building.

MASTER OF SCIENCE IN CHEMISTRY WITH A TEACHING CREDENTIAL

In cooperation with the UCI Department of Education, the Chemistry Department sponsors a coordinated two-year program for the M.S. degree in Chemistry and the California Single Subject Teaching Credential. The M.S. degree may be obtained under either Plan I or Plan II described below. Prospective graduate students interested in this program should so indicate on their graduate application and should request a detailed description of the program from the Chemistry Department Graduate Affairs Office or the Department of Education.

The following lists specify requirements for each of the graduate programs offered by the Department of Chemistry.

MASTER OF SCIENCE IN CHEMISTRY PLAN I
(Thesis Plan)

Completion of a minimum of seven approved courses (or 28 units), including six graduate-level courses (or 24 units) in chemistry (as specified by the Department and excluding Chemistry 280, 290, 291, and 399) with maintenance of an average grade of B or better in all course work undertaken.

Completion of the teaching requirement.

Completion of three quarters in residence at UCI.

Submission of an acceptable Master's thesis.

MASTER OF SCIENCE IN CHEMISTRY PLAN II
(Non-Thesis Plan)

Completion of 10 graduate-level courses (or 40 units) in chemistry (excluding Chemistry 290, 291, and 399 and counting Chemistry 280 no more than once) with an average grade of B or better.

Maintenance of an average grade of B or better in all course work undertaken.

Completion of the teaching requirement.

Completion of three quarters in residence at UCI.

Satisfactory completion of a comprehensive oral examination.

DOCTOR OF PHILOSOPHY IN CHEMISTRY

Completion of a minimum of seven approved courses (or 28 units), including six graduate-level courses (or 24 units) in chemistry (as specified by the Department and excluding Chemistry 280, 290, 291, and 399) with maintenance of an average grade of B or better in all course work undertaken.

Completion of the second-year Examination requirement.

Completion of the Oral Examination requirement for Advancement to Candidacy.

Completion of the teaching requirement.

Completion of six quarters in residence at UCI.

Submission of an acceptable doctoral dissertation.

Area Requirements

Ph.D. students generally choose from one of seven areas of specialization in the Department which determines course work requirements. Generally, each area requires three or four core courses and a menu of additional courses from which to choose to reach the required total of seven courses.

Analytical Chemistry: Three core courses: Chemistry 243, 246, and 249; plus four additional courses from: Chemistry 213, 230, 231A, 232A, 233, 234, 247, 248, 271, and 272.

Atmospheric Chemistry: Four core courses: Earth System Science 208, Chemistry 213, either Chemistry 231A or 232A, and Chemistry 245; plus three additional courses from: Chemistry 230, 231A, 231B, 232A, 234, 241, 243.

Inorganic Chemistry: Three core courses: Chemistry 215, 216, and 217; plus four additional courses from: Chemistry 201, 202, 203, 204, 205, 220, 225, and 249; Molecular Biology and Biochemistry 203, 204, and 207; Biological Chemistry 210A and 212.

Organic Chemistry: Three core courses: Chemistry 201, 203, and 204 or 220; plus four additional courses from: Chemistry 202, 205, 215, 216, 217, 218, 220, and 225; Molecular Biology and Biochemistry 203, 204, and 207; Biological Chemistry 210A and 212; Physiology and Biophysics 204 and 242.

Physical Chemistry: Three core courses: Chemistry 213, 231A, and 232A; plus four additional courses from Chemistry 207, 227, 230, 231B, 231C, 232B, 232C, 234, 235, 236, 248, 249, and 266.

CONCENTRATION IN CHEMICAL AND MATERIALS PHYSICS

This is an interdisciplinary program between condensed matter physics and physical chemistry, which is designed to eliminate the barrier between these two disciplines. Students with B.S. degrees in Physics, Chemistry, or Materials Science and Engineering, are encouraged to apply to the program. The goal of the concentration in Chemical and Materials Physics (ChaMP) is to provide students with a broad interdisciplinary education in the applied physical sciences that emphasizes modern laboratory and computational skills. The program accepts students for both the M.S. and the Ph.D. degrees. Upon admission to the program, students are assigned two faculty advisors, one from the Department of Physics and Astronomy, and one from the Department of Chemistry, to provide guidance on curriculum and career planning.

The curriculum for the M.S. program includes a summer session to assimilate students with different undergraduate backgrounds; formal shop, laboratory, and computational courses; a sequence on current topics to bridge the gap between fundamental principles and applied technology; and a course to develop communication skills. The required courses include thirteen core courses and three electives (subject to advisor approval) as follows: **Core:** Chemistry 206, 208, 229A, 231A-B-C, 232A-B, 266; two courses from the following group: Chemistry 228, 230, Physics 211, 222; one course from each of the following two groups: Physics 133 or 238A or Chemistry 236; Physics 129 or 273 or Chemistry 139. **Electives:** Chemistry 213, 225, 226, 232C, 233, 243, 248, 249, Engineering EECS278, MSE201, MSE259A, Physics 134, 213C, 223, 224, 229B, 233A-B, 238A. In addition to the required courses, M.S. students complete a master's thesis. The M.S. program prepares students to compete for high-tech jobs or to begin research toward a Ph.D. degree.

Successful completion of the M.S. degree requirements qualifies students for the Ph.D. program. Ph.D. students must also pass a qualifying examination by the end of their second year of graduate study. A candidacy examination is expected to be completed within a year of starting the Ph.D. program. The examination is comprised of two parts: (a) a written report on a topic to be determined in consultation with the research advisor and (b) an oral report on research accomplished and plans for completion of the Ph.D. dissertation.

Courses in Chemistry

LOWER-DIVISION

NOTE: Enrollment in lower-division Chemistry courses may be subject to pre-testing or other limitations. See the *Catalogue's* Placement Testing section and the quarterly *WebSOC, Searchable Schedule of Classes* for information.

1A-B-C General Chemistry (4-4-4); 1A (F, W, Summer), 1B (W, S, Summer), 1C (S, Summer, F). Lecture, three hours; discussion, one hour. Stoichiometry, properties of gases, liquids, solids, and solutions; chemical equilibrium, chemical thermodynamics; atomic and molecular structure; chemical kinetics, periodic properties and descriptive chemistry of the elements. Corequisite: concurrent enrollment in the corresponding laboratory courses. Prerequisite for Chemistry 1A: high school chemistry and one of the following: a passing score on the UCI Chemistry Placement Examination or a grade of C or better in Chemistry 1P; for Chemistry 1B and 1C, a grade of C- or better in all previous courses in the sequence. Chemistry 1A-B-C and Chemistry H2A-B-C may not both be taken for credit. **(II)** NOTE: The Chemistry Placement Examination, which is to be taken prior to enrollment in Chemistry 1A, assesses the student's preparation for General Chemistry. Students enrolled in the W-S-Summer/F sequence of Chemistry 1A-B-C must complete Chemistry 1C in the Summer Session to be eligible to enroll in Chemistry 51A or H52A in the subsequent fall quarter.

1LA General Chemistry Laboratory for Chemistry and Engineering Majors (1) F, W. Laboratory, three hours. Training and experience in basic laboratory techniques through experiments related to lecture topics in Chemistry 1A. Open to Chemistry and Engineering majors only. Prerequisite: concurrent enrollment or successful completion of Chemistry 1A. NOTE: Chemistry 1LA is open to Chemistry and Engineering majors only. Chemistry 1LA and Chemistry H2LA may not both be taken for credit. **(II)**.

1LB-LC General Chemistry Laboratory (2-2); 1LB (W, S), 1LC (S, Summer, F). Discussion, one hour; laboratory, four hours. Training and experience in basic laboratory techniques. Chemical practice and principles illustrated through experiments related to lecture topics in Chemistry 1A-B-C. Corequisite for Chemistry 1LB and 1LC: concurrent enrollment in the corresponding segment of Chemistry 1. Prerequisite for Chemistry 1LB: a grade of C- or better in Chemistry 1A or Chemistry 1A and 1LA. Prerequisite for Chemistry 1LC: a grade of C- or better in Chemistry 1B and 1LB. Chemistry 1LB-LC and H2LB-LC may not both be taken for credit. **(II)**

1P Preparation for General Chemistry (4) F, Summer. Lecture, three hours; quiz, two hours. Units of measurement, dimensional analysis, significant figures; elementary concepts of volume, mass, force, pressure, energy, density, temperature, heat, work; fundamentals of atomic and molecular structure; the mole concept; stoichiometry; properties of the states of matter; gas laws; solutions, concentrations.
NOTE: Chemistry 1P satisfies no requirements other than contribution to the 180 units required for graduation. Designed for students who need additional help prior to enrollment in General Chemistry.

H2A-B-C Honors General Chemistry (4-4-4) F, W, S. Lecture, three hours; discussion, one hour. Covers the same material as Chemistry 1A-B-C but in greater depth. Additional topics included as time permits. Corequisite: concurrent enrollment in the corresponding quarter of Chemistry H2LA-LB-LC. Prerequisite for H2A: membership in the Campuswide Honors Program, or a score of 4 or 5 on the Chemistry Advanced Placement Examination, or a score of 700 or better on the SAT II in Chemistry, or a qualifying score on the UCI Chemistry Placement Examination, or consent of instructor. Prerequisite for H2B-H2C: grade of B or better in preceding course in series. Chemistry H2A-B-C satisfies the same requirements and prerequisites as Chemistry 1A-B-C; corresponding segments may not both be taken for credit. **(II)**

H2LA-LB-LC Honors General Chemistry Laboratory (2-2-2) F, W, S. Laboratory, three hours (H2LA), four hours (H2LB-LC). Training and experience in basic laboratory techniques through experiments related to lecture topics in Chemistry H2A-B-C. Corequisite: concurrent enrollment in the corresponding segment of Chemistry H2A-B-C. Prerequisites: membership in the Campuswide Honors Program, or a score of 4 or 5 on the Chemistry Advanced Placement Examination, or a score of 700 or better on the SAT II in Chemistry, or a qualifying score on the UCI Chemistry Placement Examination, or consent of instructor. Chemistry H2LA-LB-LC and Chemistry 1LA-LB-LC may not both be taken for credit.

5 Scientific Computing Skills (4) F, S, Summer. Lecture, three hours; discussion, one hour; laboratory, two hours. Introduces students to the personal computing software used by chemists for managing and processing of data sets, plotting of graphs, symbolic and numerical manipulation of mathematical equations, and representing chemical reactions and chemical formulas. Corequisites: Chemistry 1C and Mathematics 2D. Prerequisites: Chemistry 1A-B and Mathematics 2A-B.

51A-B-C Organic Chemistry (4-4-4); 51A (F, W, Summer), 51B (W, S, Summer), 51C (S, Summer, F). Lecture, three hours; discussion, one hour. Fundamental concepts relating to carbon compounds with emphasis on structural theory and the nature of chemical bonding, stereochemistry, reaction mechanisms, and spectroscopic, physical, and chemical properties of the principal classes of carbon compounds. Corequisite for 51A-B: concurrent enrollment in the corresponding segment of Chemistry 51L. Prerequisites for 51A: Chemistry 1A-B-C and 1LB-1LC. Prerequisites for 51B and 51C: a grade of C- or better in previous quarter of sequence. Chemistry 51A-B-C and Chemistry H52A-B-C may not both be taken for credit.
NOTE: Priority for enrollment in the Chemistry 51A-B-C sequence offered in W-S-Summer/F is given to students who successfully complete Chemistry 1C in the preceding fall quarter.

51LA-LB-LC Organic Chemistry Laboratory (2-2-2); 51LA (F, W, Summer), 51LB (W, S, Summer), 51LC (S, Summer, F). Discussion, one hour; laboratory, four hours. Modern techniques of organic chemistry, using selected experiments to illustrate topics introduced in Chemistry 51A-B-C. Corequisite for 51LA-LB-LC: concurrent enrollment in the corresponding segment of Chemistry 51. Prerequisites for 51LB: a grade of C- or better in Chemistry 51A and 51LA. Prerequisites for 51LC: a grade of C- or better in Chemistry 51B and 51LB.

NOTE: Chemistry H52A-B-C, H52LA-LB-LC satisfy the same requirements and prerequisites as Chemistry 51A-B-C, 51LA-LB-LC; corresponding segments may not both be taken for credit.

H52A-B-C Honors Organic Chemistry (4-4-4) F, W, S. Lecture, three hours; discussion, one hour. Fundamental concepts of the chemistry of carbon compounds. Structural, physical, and chemical properties of the principal classes of carbon compounds. Corequisite: concurrent enrollment in the corresponding segment of Chemistry H52L. Prerequisites for H52A: a B average in Chemistry 1A-B-C or H2A-B-C or consent of instructor. Prerequisites for H52B and H52C: a grade of C or better in previous quarter of sequence. Chemistry H52A-B-C and Chemistry 51A-B-C may not both be taken for credit.

H52LA-LB-LC Honors Organic Chemistry Laboratory (2-2-2) F, W, S. Laboratory, five hours. Fundamental techniques of modern experimental organic chemistry. Corequisite: concurrent enrollment in the corresponding segment of Chemistry H52. Prerequisite for H52LB and H52LC: a grade of C or better in previous quarter of sequence.

H90 The Idiom and Practice of Science (4). Lecture, three hours; discussion, two hours. A series of fundamental and applied scientific problems are addressed, illustrating the pervasive role of mathematical analysis. Topics may include thermodynamics, chemical equilibria, acid-base chemistry, kinetics, states of matter, electronic structure of atoms and the periodic table, chemical bonding, spectroscopy, and topics from organic, atmospheric, and biochemistry. Open only to members of the Campuswide Honors Program or consent of instructor. **(II)**

UPPER-DIVISION

107 Inorganic Chemistry I (4) W. Lecture, three hours; discussion, one hour. Introduction to modern inorganic chemistry. Principles of structure, bonding, and chemical reactivity with application to compounds of the main group and transition elements, including organometallic chemistry. Prerequisites: Chemistry 1A-B-C; 51A-B-C or H52A-B-C.

107L Inorganic Chemistry Laboratory (3) S. Laboratory, seven hours; discussion, one hour. Modern techniques of inorganic and organometallic chemistry including experience with glove box, Schlenk line, and vacuum line methods. Prerequisite: Chemistry 107.

125 Advanced Organic Chemistry (4) F. Lecture, three hours; discussion, one hour. Rapid-paced comprehensive treatment of organic chemistry, reinforcing the fundamental concepts introduced in Chemistry 51A-B-C and H52A-B-C. Focuses on molecular structure, reactivity, stability, scope and mechanisms of organic reactions. Topics include: structure and bonding; theoretical organic chemistry; acidity and basicity; reactive intermediates; pericyclic reactions; stereochemistry; organic synthesis; natural products; organic photochemistry. Prerequisites: Chemistry 51A-B-C or H52A-B-C.

127 Inorganic Chemistry II (4) S. Lecture, three hours; discussion, one hour. Advanced treatment of selected fundamental topics in inorganic chemistry, building on material presented in Chemistry 107. Molecular symmetry with applications to electronic structure and spectroscopy. Reaction kinetics and mechanisms; inorganic synthesis and catalysis; bioinorganic chemistry. Prerequisite: Chemistry 107.

128 Introduction to Chemical Biology (4) W. Lecture, three hours; discussion, one hour. Introduction to the basic principles of chemical biology: structures and reactivity; chemical mechanisms of enzyme catalysis; chemistry of signaling, biosynthesis, and metabolic pathways. Prerequisites: Chemistry 1A-B-C; Chemistry 51A-B-C or H52A-B-C.

128L Introduction to Chemical Biology Laboratory Techniques (4) S. Discussion, one hour; laboratory, six hours. Introduction to the basic laboratory techniques of chemical biology: electrophoresis, plasmid preparation, PCR, protein expression, isolation, and kinetics. Prerequisite: Chemistry 128.

NOTE: Chemistry 130A-B-C and 131A-B-C are parallel courses in physical chemistry; both are acceptable to satisfy the physical chemistry requirements for the major. Because of significant differences in course content, students starting in one series may not switch to the other in subsequent quarters.

130A-B-C Physical Chemistry: Biological and Materials Applications. Lecture, three hours; discussion, one hour.

130A Chemical Thermodynamics (4) F. Principles of chemical and heterogeneous equilibrium. Multiple chemical equilibrium, electrochemical equilibria, and equilibria at phase boundaries. Corequisite: Physics 7E or Engineering CBEMS40A. Prerequisites: Chemistry 1C and 5; Mathematics 2D; Physics 7D.

130B Quantum Chemistry, Spectroscopy, and Bonding (4) W. Fundamentals of molecular quantum mechanics. Development of the principles of rotational, vibrational, electronic, and magnetic resonance spectroscopy. Chemical bonding. Applications to biological and condensed phase systems. Prerequisite: Chemistry 130A; Physics 7E or Engineering CBEMS40A.

130C Structure, Statistical Mechanics, and Chemical Dynamics (4) S. Kinetic theory and statistical mechanics with applications to gases, macromolecules, and condensed phases. Transport phenomena. Chemical kinetics. Prerequisite: Chemistry 130B.

131A-B-C Physical Chemistry: A Molecular Approach. Lecture, three hours; discussion, one hour.

131A Quantum Principles (4) F. Principles of quantum chemistry with applications to nuclear motions and the electronic structure of the hydrogen atom. Corequisite: Physics 7E or Engineering CBEMS40A. Prerequisites: Chemistry 1C and 5; Mathematics 2D; Physics 7D.

131B Molecular Structure and Elementary Statistical Mechanics (4) W. Principles of quantum mechanics with application to the elements of atomic structure and energy levels, diatomic molecular spectroscopy and structure determination, and chemical bonding in simple molecules. Prerequisites: Chemistry 131A; Physics 7E or Engineering CBEMS40A.

131C Thermodynamics and Chemical Dynamics (4) S. Energy, entropy, and the thermodynamic potentials. Chemical equilibrium. Chemical kinetics. Prerequisite: Chemistry 131B.

135 Methods of Molecular Structure Determination (4) F. Lecture, three hours; discussion, one hour. Prerequisites: Chemistry 130A-B-C or 131A-B-C. Determination of molecular structure using spectroscopic, diffraction, and scattering techniques.

136 The Molecular Structure and Properties of Materials (4) F. Lecture, three hours; discussion, one hour. Development of the molecular basis for the properties of solid materials. Discussion of the interrelationship between molecular structure and properties such as optical behavior, conductivity, superconductivity, and magnetism. The properties of surfaces of materials are contrasted to bulk properties. Prerequisites: Chemistry 130A-B-C or 131A-B-C.

137 Computational Chemistry (4) S. Lecture, three hours; discussion, one hour; laboratory, three hours. Short introduction to programming languages and to representative algorithms employed in chemical research. Students have the opportunity to devise and employ their own codes and also to employ codes which are widely used in various fields of chemistry. Corequisite: Chemistry 130B or 131B. Prerequisites: Chemistry 51A-B-C or H52A-B-C and 130A or 131A.

138 Introduction to Computational Organic Chemistry (4). Lecture, three hours; discussion, one hour; laboratory, three hours. An introduction to the use of computational chemistry to investigate reaction mechanisms, to calculate structures, and to predict properties of molecules. Students have the opportunity to perform calculations employing computational methods which are widely used in various fields of chemistry. Prerequisites: Chemistry 51A-B-C or H52A-B-C.

139 Technical Writing and Communication Skills (4) F, W, S. Lecture, three hours. Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement. Prerequisites: upper-division standing; satisfaction of the lower-division writing requirement. Open to Chemistry majors only. Same as Mathematics 190 and Physics 129.

151 Quantitative Analytical Chemistry (4) F, Summer. Lecture, three hours; discussion, one hour. Theoretical aspects of methods in analytical chemistry. Topics include statistical treatment of data and the fundamental chemistry which underlies methods of chemical analysis. Corequisite: Chemistry 151L. Prerequisites: Chemistry 1A-B-C, 1LB-LC; 5; 51A-B-C and 51LA-LB-LC or H52A-B-C and H52LA-LB-LC.

151L Quantitative Analytical Chemistry Laboratory (2) F, Summer. Discussion, one hour; laboratory, six hours. Practical aspects of important methods in analytical chemistry. Laboratory analysis of standard samples. Laboratory experiments include methods of gravimetry, titrimetry, chromatography and other separation methods, spectrochemical and electrochemical measurements. The use of computer programs for the reduction of data from laboratory experiments is encouraged. Corequisite: Chemistry 151. Prerequisites: Chemistry 1A-B-C, 1LB-LC; 5; 51A-B-C and 51LA-LB-LC or H52A-B-C and H52LA-LB-LC.

152 Advanced Analytical Chemistry (5) W. Lecture, three hours; discussion, one hour; laboratory, seven hours. In-depth treatment of most modern instrumental methods for quantitative analysis of real samples and basic principles of instrument design. Laboratory experiments in the use of electronic test equipment, microprocessor programming; interfacing and use of techniques such as absorption, emission, and luminescence spectrophotometry, polarography, gas and liquid chromatography, magnetic resonance, neutron activation analysis, and mass spectrometry. Prerequisite: Chemistry 151 and 151L.

153 Physical Chemistry Laboratory (4) S. Prelaboratory lecture, three hours; laboratory, nine hours. Laboratory exercises emphasize quantitative characterization of chemical substances and chemical processes. Experiments in chemical thermodynamics, atomic and molecular spectroscopy, chemical kinetics, and various methods of molecular structure determination. Corequisite: Chemistry 130C or 131C. Prerequisites: Chemistry 151, 151L, and Chemistry 130A-B or 131A-B.

156 Advanced Laboratory in Chemistry and Synthesis of Materials (4) S. Lecture, two hours; laboratory, eight hours. Synthesis and characterization of organic and inorganic materials including polymers, oxides, metal alloys, electronic materials. Techniques include electron microscopy, solid-state NMR, gel permeation chromatography, photolithography, x-ray diffraction, porosity, and thermal analysis. Prerequisite: Chemistry 130A-B or 131A-B or Engineering ENGR54. Same as Engineering CBEMS160.

160 Organic Synthesis Laboratory (4) W. Lecture, two hours; discussion, one hour; laboratory, eight hours. Modern experimental techniques in organic synthesis including experience with thin-layer chromatography, liquid chromatography, and gas chromatography. Modern methods of structure elucidation including FT NMR are employed in the characterization of products. Prerequisite: Chemistry 125.

170 Radioisotope Techniques (4) W. Lecture, three hours; laboratory, four to six hours. Basic theory and practice of production, separation, safe handling, counting, applications of radioactive isotopes with emphasis on applications in chemistry, biology, and medicine. Prerequisite: Chemistry 151, 151L.

180 Undergraduate Research (4-4-4) F, W, S. The student wishing to engage in research for credit should arrange with a member of the faculty to sponsor and supervise such work. A student time commitment of 10 to 15 hours per week is expected, and a written research report is required at the end of each quarter of enrollment. Prerequisite: consent of a faculty sponsor.

H180A-B-C Honors Research in Chemistry (4-4-4) F, W, S. Undergraduate honors research in Chemistry. A student time commitment of 10–15 hours per week is required. Corequisite for H180C: Chemistry H181. Prerequisites: consent of instructor; open to participants in the Chemistry Honors program and to Chemistry majors participating in the Campuswide Honors Program.

H181 Honors Seminar in Chemistry (2) S. Students receive guidance in the preparation of oral and written research presentations. A written thesis is prepared and a formal research seminar is presented. Corequisite: Chemistry H180C. Prerequisites: successful completion of Chemistry H180A-B; satisfactory completion of the lower-division writing requirement. Open only to students in the Chemistry Honors Program and Chemistry majors who are participating in the Campuswide Honors Program.

191 Chemistry Outreach Program (2) F, W, S. Field work, six to eight hours; discussion, one hour. Involves intensive participation in the UCI Chemistry Outreach Program, which performs Chemistry demonstrations at local high schools. Pass/Not Pass only. May be taken for credit six times.

192 Tutoring in Chemistry (2) F, W, S. Enrollment limited to participants in the Chemistry Peer Tutoring Program. Prerequisite: consent of instructor. May be taken for a total of 18 units of which the first eight may be taken for a letter grade. The remaining 10 units must be taken Pass/Not Pass only. NOTE: No more than eight units may be counted toward the 180 units required for graduation. Satisfies no degree requirement other than contribution to the 180-unit total.

199 Independent Study in Chemistry (1 to 4 per quarter). The student wishing to engage in independent study for credit should arrange with a member of the faculty to sponsor and supervise such work. A student time commitment of three to four hours per week per unit is expected, and a written report on the independent study is required at the end of each quarter of enrollment. Prerequisite: consent of instructor.

GRADUATE

201 Organic Reaction Mechanisms I (4). Lecture, three hours; discussion, one hour. Advanced treatment of basic mechanistic principles of modern organic chemistry. Topics include molecular orbital theory, orbital symmetry control of organic reactions, aromaticity, carbonium ion chemistry, free radical chemistry, the chemistry of carbenes and carbanions, photochemistry, electrophilic substitutions, aromatic chemistry. Prerequisite: Chemistry 130A-B-C or 131A-B-C or equivalent.

202 Organic Reaction Mechanisms II (4). Lecture, three hours; discussion, one hour. Topics include more in-depth treatment of mechanistic concepts, kinetics, conformational analysis, computational methods, stereoelectronics, and both solution and enzymatic catalysis. Prerequisite: Chemistry 201.

203 Organic Spectroscopy (4). Lecture, three hours; discussion, one hour. Modern methods used in structure determination of organic molecules. Topics include mass spectrometry; ultraviolet, chiroptical, infrared, and nuclear magnetic resonance spectroscopy. Prerequisite: Chemistry 51A-B-C or H52A-B-C.

204 Organic Synthesis I (4). Lecture, three hours; discussion, one hour. Fundamentals of modern synthetic organic chemistry will be developed. Major emphasis is on carbon-carbon bond forming methodology. Topics include carbonyl annelations, cycloadditions, sigmatropic rearrangements, and organometallic methods. Corequisite: concurrent enrollment in Chemistry 202.

205 Organic Synthesis II (4). Lecture, three hours; discussion, one hour. Fundamentals of modern synthetic organic chemistry will be developed. Major emphasis this quarter is on natural product total synthesis and retrosynthetic (antithetic) analysis. Prerequisite: Chemistry 204.

206 Laboratory Skills (4 to 6). Lecture, three hours; laboratory, six to ten hours. Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Prerequisite: consent of instructor. Same as Physics 206. Concurrent with Physics 106.

207 Chemistry for Physicists (4). Lecture, three hours; discussion, one hour. Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules. Same as Physics 207.

208 Mathematics for Chemists (4), Lecture, three hours; discussion, one hour. Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations. Same as Physics 208.

213 Chemical Kinetics (4) S. Lecture, three hours; discussion, one hour. Surveys gas phase and organic reaction mechanisms and their relationship to kinetic rate laws; treats the basic theory of elementary reaction rates. A brief presentation of modern cross-sectional kinetics is included. Prerequisites: Chemistry 130A-B-C or 131A-B-C or equivalent.

215 Inorganic Chemistry I (4). Lecture, three hours; discussion, one hour. Principles of modern inorganic chemistry with applications to chemical systems of current interest. Inorganic phenomena are organized into general patterns which rationalize observed structures, stabilities, and physical properties. Prerequisites: Chemistry 107 and 130A-B-C or 131A-B-C or equivalent.

216 Organometallic Chemistry (4). Lecture, three hours; discussion, one hour. Synthesis and reactivity of organometallic complexes with an emphasis on mechanisms. Topics include bonding and fluxional properties; metal-carbon single and multiple bonds; metal š-complexes. Applications to homogenous catalysis and organic synthesis are incorporated throughout the course. Prerequisite: Chemistry 107 or 215.

217 Physical Inorganic Chemistry (4). Lecture, three hours; discussion, one hour. General principles of the spectroscopy and magnetism of inorganic compounds. Characterization of inorganic complexes by infrared, near-infrared, visible, ultraviolet, NMR, EPR, EXAFS, and Mossbauer spectroscopies. Some necessary group theory developed. Prerequisite: Chemistry 215 or consent of instructor.

218 Metallobiochemistry (4). Lecture, three hours; discussion, one hour. A review of the biochemistry of metallic elements emphasizing: methods for studying metals in biological systems; the chemical basis for nature's exploitation of specific elements; structures of active sites; mechanisms; solid-state structures and devices; metals in medicine. Prerequisite: Chemistry 130A-B-C or equivalent.

219 Chemical Biology (4). Lecture, three hours; discussion, one hour. A survey of the organic chemistry underlying biological function. Introduction to chemical genetics, receptor-ligand interactions, small molecule agonists and antagonists, combinatorial synthesis, high throughput assays, molecular evolution, protein and small molecule design. Prerequisite: graduate standing or consent of instructor.

220 Bioorganic Chemistry (4). Lecture, three hours; discussion, one hour. Structure and function of biologically important macromolecules. Introduction to nucleic acids, protein structure, principles of molecular recognition, enzyme function, modeling, and engineering. Prerequisite: Chemistry 51A-B-C or H52A-B-C or equivalent.

222 Natural Products (4) F. Lecture, three hours; discussion, one hour. Fundamentals of natural products chemistry are surveyed. Topics include classification schemes, biosynthesis, isolation and characterization, drug development from natural products, and chemical synthesis.

225 Polymer Chemistry: Synthesis and Characterization of Polymers (4). Lecture, three hours; discussion, one hour. Structure of synthetic and natural polymers. Survey of modern polymer synthetic methods. Molecular weight and molecular weight distribution. Chain conformation and stereochemistry. Introduction to polymer characterization, chain models, and solution behavior. Prerequisite: undergraduate courses in organic and physical chemistry; or consent of instructor.

226 Polymer Materials: Polymer Structure-Property Relationships (4). Lecture, three hours; discussion, one hour. Chain length and copolymer sequence distributions. Polymer chain models and configurational statistics. Melting and glass transitions in crystalline and amorphous polymers. Network theory. Elasticity and viscoelasticity. Solution theory and phase equilibria. Mechanical and materials properties. Prerequisite: undergraduate courses in organic and physical chemistry; or consent of instructor.

227 Molecular Modeling (4). Laboratory, four hours. Concepts of molecular mechanics and electronic structure theory, and applications to practical chemical questions. Topics include prediction of conformational preference, reactivity, and selectivity. A hands-on course with numerous worked problems and examples using graphics workstations. Prerequisite: consent of instructor.

228 Electromagnetism (4). Lecture, three hours; discussion, one hour. Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation. Prerequisite: consent of instructor. Same as Physics 228.

229A-B Computational Methods (4-4). Lecture, three hours; laboratory, six hours. Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science. Prerequisite: consent of instructor. Same as Physics 229A-B.

230 Classical Mechanics and Electromagnetic Theory (4). Lecture, three hours; discussion, one hour. The fundamentals of classical mechanics and electromagnetic theory are developed with specific application to molecular systems. Newtonian, Lagrangian, and Hamiltonian mechanics are developed. Boundary value problems in electrostatics are investigated. Multipole expansion and macroscopic media are discussed from a molecular viewpoint. Prerequisite: Chemistry 131A-B-C or equivalent.

231A-B-C Quantum Mechanics and Spectroscopy. Lecture, three hours; discussion, one hour.

231A Fundamentals of Quantum Mechanics (4) F. The postulates of quantum mechanics are discussed and applied to a variety of model problems. Prerequisites: Chemistry 131A-B-C or equivalent.

231B Applications of Quantum Mechanics (4) W. Approximate methods for solving atomic and molecular structure problems are developed, and the application of quantum mechanics to spectroscopy is introduced. Prerequisite: Chemistry 231A or consent of instructor.

231C Molecular Spectroscopy (4) S. Theory and techniques of spectroscopy as used for the study of molecular and condensed phase properties. Coherent time domain spectroscopies are covered. Prerequisite: Chemistry 231B or consent of instructor.

***232A Thermodynamics and Introduction to Statistical Mechanics* (4) W.** Lecture, three hours; discussion, one hour. A detailed discussion from an advanced point of view of the principles of classical thermodynamics. The fundamentals of statistical mechanics. Topics include an introduction to ensemble theory, Boltzmann statistics, classical statistical mechanics, and the statistical mechanics of ideal gas systems. Prerequisite: Chemistry 130A-B-C or 131A-B-C or equivalent.

232B Advanced Topics in Statistical Mechanics (4) S. Continued discussion of the principles of statistical mechanics. Applications to topics of chemical interest including imperfect gases, liquids, solutions, and crystals. Modern techniques such as the use of autocorrelation function methods. Prerequisite: Chemistry 232A or equivalent.

232C Non-Equilibrium Statistical Mechanics (4) F. Lecture, three hours; discussion, one hour. Phenomenology of material processes, including: kinetic theories of transport and continuum, linear response theory, critical phenomena of phase transition, self-assembly, and nucleation. Prerequisite: consent of instructor.

233 Nuclear and Radiochemistry (4). Lecture, three hours. Advanced treatment (beyond that in Chemistry 170) of nuclear structure, nuclear reactions, and radioactive-decay processes. Introduction to nuclear activation analysis, isotope effects, radiation chemistry, hot-atom chemistry, nuclear age-dating methods, nuclear reactors, and nuclear power. Prerequisite: Chemistry 170 or equivalent or consent of the instructor.

234 Advanced Chemical Kinetics (4). Topics and format vary. Prerequisite: Chemistry 213 or consent of the instructor.

235 Molecular Quantum Mechanics (4) W. Lecture, three hours; discussion, one hour. Application of quantum mechanics to calculation of molecular properties. Electronic structure of molecules. Prerequisite: Chemistry 231A or equivalent.

241 Current Issues Related to Tropospheric and Stratospheric Processes (4) S. Lecture, three hours. Examination of current issues related to the atmosphere, including energy usage; toxicology; effects on humans, forest, plants, and ecosystems; particulate matter (PM10); combustion; modeling and meteorology; airborne toxic chemicals and risk assessment; application of science to development of public policies. Prerequisite: One course selected from Chemistry 245, Earth System Science 202, Engineering MAE164, Engineering MAE261, or consent of instructor. Same as Engineering MAE 260.

242 Applied Optics (4) W. Lecture, four hours; discussion, one hour. Focuses on how to design and construct optical instruments. Topics include geometrical optics, polarizing optics, opt-electronic devices; laser theory, non-linear optics and laser design; ray-tracing and other optical design software; fiber optics; spectroscopic instruments and techniques. Prerequisite: consent of instructor.

243 Advanced Instrumental Analysis (4) W. Lecture, three hours. Theory and applications of modern advanced instrumental methods of analysis. Includes data acquisition, storage, retrieval and analysis; Fourier transform methods; vacuum technologies, magnetic sector, quadrupole, and ion trap mass spectrometry; surface science spectroscopic methods; lasers and optics. Prerequisites: Chemistry 152 and Chemistry 130A-B-C or 131A-B-C.

245 Atmospheric Chemistry of the Natural and Polluted Troposphere (4) F. Lecture, three hours; discussion, one hour. Kinetics, mechanisms, and photochemistry of tropospheric reactions in the gas, liquid, and solid phases, and methods of analysis. Chemistry of photochemical oxidant formation and acid deposition, and applications to control strategies. Chemistry of toxic chemicals and indoor air pollution. Prerequisites: Chemistry 130A-B-C or 131A-B-C and Chemistry 151 and 151L or equivalent.

246 Separations and Chromatography (4). Lecture, three hours; discussion, one hour. Introduction to modern separation techniques such as gas chromatography, high-performance liquid chromatography, supercritical fluid chromatography, capillary electrophoresis, and field flow fractionation. Applications of these separation strategies are discussed.

247 Current Problems in Analytical Chemistry (4). Lecture, three hours; discussion, one hour. Surveys current research challenges in analytical chemistry. Topics include electrochemistry, chromatography, spectroscopy, and mass spectrometry.

248 Electrochemistry (4). Lecture, three hours; discussion, one hour. Fundamentals of electrochemistry including thermodynamics and the electrochemical potential, charge transfer kinetics, and mass transfer. Methods based on controlled potential and controlled current are described; the effects of slow heterogeneous kinetics and the perturbation caused by homogeneous chemistry are discussed.

249 Analytical Spectroscopy (4). Lecture, three hours; discussion, one hour. Advanced treatment of spectroscopic techniques and instrumentation. Atomic and molecular absorption, emission, and scattering processes and their application to quantitative chemical analysis are outlined. Puts different spectroscopic techniques in perspective and demonstrates most appropriate applications to analytical problems.

251 Special Topics in Organic Chemistry (1 to 4). Advanced topics in organic chemistry. Prerequisite: consent of the instructor.

252 Special Topics in Physical Chemistry (1 to 4). Advanced topics in physical chemistry. Prerequisite: consent of the instructor.

253 Special Topics in Inorganic Chemistry (1 to 4). Advanced topics in inorganic chemistry. Prerequisite: Chemistry 215 or consent of the instructor.

266 Current Topics in Chemical and Materials Physics (4). Lecture, three hours; discussion, one hour. The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology. Prerequisite: consent of instructor. Same as Physics 266.

271 Structural X-ray Crystallography (4). Lecture, three hours; discussion, one hour. The principles and practice of the determination of structures by single crystal x-ray diffraction techniques. Crystal symmetry, diffraction, structure solution and refinement. Opportunities for hands-on experience in structure determination. Prerequisite: Chemistry 130A-B-C or Chemistry 131A-B-C or equivalent.

272 Industrial Chemistry (4). Lecture, three hours; discussion, one hour. Scientific, economic, and environmental aspects of the top 50 industrially produced chemicals, including how they are obtained and used, present and future sources of energy and raw materials, and the effects of chemical manufacturing on the price structure of our economy. Prerequisite: consent of instructor.

280 Research (2 to 12) F, W, S. Supervised original research toward the preparation of a Ph.D. dissertation or M.S. thesis. Prerequisite: consent of the instructor.

290 Seminar (1) F, W, S. Weekly seminars and discussions on general and varied topics of current interest in chemistry. Prerequisite: graduate standing. May be repeated for credit.

291 Research Seminar (4). Detailed discussion of research problems of current interest in the Department. Format, content, and frequency of the course are variable. Prerequisite: consent of instructor.

292 Graduate Symposium (2) F. Students present public seminars on literature-based research topics in contemporary chemistry. Topics to be chosen by student and approved by instructor. May be repeated for credit as topics vary.

299 Independent Study (1 to 4) F, W, S. Prerequisite: consent of instructor.

399 University Teaching (1 to 4) F, W, S. Required of and limited to Teaching Assistants.

DEPARTMENT OF EARTH SYSTEM SCIENCE

220 Rowland Hall; (949) 824-8794
Eric S. Saltzman, **Chair**

Faculty

Ralph J. Cicerone, Ph.D. University of Illinois, *Chancellor Emeritus and Professor Emeritus of Earth System Science* (atmospheric and analytical chemistry)

Ellen R. M. Druffel, Ph.D. University of California, San Diego, *Professor of Earth System Science and National Science Foundation "ADVANCE" Chair* (biogeochemistry and oceanography)

James S. Famiglietti, Ph.D. Princeton University, *Associate Professor of Earth System Science and of Civil and Environmental Engineering* (hydrology and climate)

Michael L. Goulden, Ph.D. Stanford University, *Associate Professor of Earth System Science and of Ecology and Evolutionary Biology* (biosphere-atmosphere exchange, physiological ecology)

Gudrun Magnusdottir, Ph.D. Colorado State University, *Associate Professor of Earth System Science* (atmospheric dynamics)

J. Keith Moore, Ph.D. Oregon State University, *Assistant Professor of Earth System Science* (ocean ecosystem dynamics and biogeochemistry)

Diane E. Pataki, Ph.D. Duke University, *Assistant Professor of Earth System Science and of Ecology and Evolutionary Biology* (global change biology)

Michael Prather, Ph.D. Yale University, *Professor of Earth System Science and Fred Kavli Chair in Earth System Science* (mathematical modeling of atmospheric chemistry, and climate)

Francois W. Primeau, Ph.D. Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, *Assistant Professor of Earth System Science* (physical oceanography and climate dynamics)

James T. Randerson, Ph.D. Stanford University, *Assistant Professor of Earth System Science* (global biogeochemical cycles, biosphere-atmosphere trace gas exchange)

William S. Reeburgh, Ph.D. The Johns Hopkins University, *Professor of Earth System Science* (geochemistry and biogeochemistry)

Eric S. Saltzman, Ph.D. University of Miami, *Department Chair and Professor of Earth System Science* (marine and atmospheric chemistry)

Kathleen K. Treseder, Ph.D. Stanford University, *Assistant Professor of Earth System Science and of Ecology and Evolutionary Biology* (microbial biogeochemistry)

Susan E. Trumbore, Ph.D. Columbia University, *Professor of Earth System Science* (geochemistry and biogeochemistry)

Laurel L. Wilkening, Ph.D. University of California, San Diego, *Chancellor Emerita and Professor Emerita of Earth System Science* (planetary science)

Jin-Yi Yu, Ph.D. University of Washington, *Associate Professor of Earth System Science* (atmospheric sciences and climate dynamics)

Charles S. Zender, Ph.D. University of Colorado, *Assistant Professor of Earth System Science* (atmospheric physics, aersols, and climate)

Affiliated Faculty

Donald R. Blake, Ph.D. University of California, Irvine, *Professor of Chemistry and Earth System Science* (atmospheric and analytical chemistry, and radiochemistry)
Carl A. Friehe, Ph.D. Stanford University, *Professor of Mechanical and Aerospace Engineering and of Earth System Science* (fluid mechanics, turbulence, micrometeorology, instrumentation)
F. Sherwood Rowland, Ph.D. University of Chicago, *Donald Bren Research Professor of Chemistry and Earth System Science* (atmospheric and analytical chemistry, and radiochemistry)
Soroosh Sorooshian, Ph.D. University of California, Los Angeles, *Director of the Center for Hydrometeorology and Remote Sensing (CHRS) and UCI Distinguished Professor of Civil and Environmental Engineering and of Earth System Science* (hydrometeorology, remote sensing, water resources)

The goal of the Department of Earth System Science is to increase the scientific understanding of the Earth as a coupled system of atmosphere, ocean, and land. Earth System Science is inherently interdisciplinary in scope, linking the fields of oceanography, atmospheric and terrestrial sciences, climatology, hydrology, biology, physics, and chemistry to understand the climate system and global biogeochemical cycles. These fields have traditionally been taught in different departments, which has hindered students who want to learn about all of the disciplines that interact to control the global environment. At the undergraduate level, courses are designed to educate both science and non-science majors in the basic processes driving the Earth system, including elemental cycling, Earth's climate, and global environmental problems. Undergraduates can pursue a major in Earth and Environmental Sciences or a minor in Earth and Atmospheric Sciences. The Department also offers a group of lower-division breadth courses appropriate for non-science majors. At the graduate level, the Department offers the M.S. and Ph.D. degrees in Earth System Science. Graduate study emphasizes laboratory, field, and modeling studies of global change in the environment through study of physical, chemical, and biological processes within and between the atmosphere, oceans, and terrestrial systems.

Undergraduate Program

The objective of the major is to prepare students to understand the rapidly evolving field of Earth System Science. Students work with faculty and graduate students to obtain a quantitative understanding of the Earth system. Both the major and the minor consist of a set of required core courses and a group of elective courses drawn from offerings in Physical Sciences, Biological Sciences, Engineering, and Social Ecology. The core courses provide a broad scientific foundation of the physical, chemical, and biological principles needed to understand the complex interactions of the atmosphere, ocean, and land that drive the Earth's climate and biogeochemical cycles. Majors develop the analytical and quantitative skills needed to understand sensitive environmental issues.

In their junior and senior years, ESS students are encouraged to focus on a particular area within Earth System Science and to choose electives within ESS and campuswide that build a coherent core of knowledge. Focus areas include but are not limited to climatology, biogeochemical cycles, oceanography, hydrology, terrestrial sciences, atmospheric sciences, environmental policy and planning, and resource management. Alternatively, the focus could be on chemical, physical, or biological processes across these disciplines. This flexible program is designed to accommodate the particular interests of each student. Majors are encouraged to become directly involved in scientific research working with a faculty member by taking Earth System Science 199 for several quarters, typically in the senior year. The UCI upper-division writing requirement may be fulfilled by taking Earth System Science 199 and 198 in the senior year.

Many ESS students go on to graduate school programs and careers as research scientists in academic, public, or private institutions. Students are prepared to enter the workforce directly as scientists in a diverse array of fields including environmental policy and planning, environmental consulting, air quality monitoring and assessment, laboratory analysis, scientific research, science education, natural resource management, wildlife management, conservation and environmental protection, and water resource management.

The minor is open to all students (except Earth and Environmental Sciences majors), but it is primarily designed for students in the natural sciences and engineering who wish to explore interdisciplinary problems and broaden their studies to include the application of their fields to understanding the Earth system.

Admission to the Earth and Environmental Sciences Major

Students may be admitted to the Earth and Environmental Sciences major upon entering the University as freshmen, via change of major, and as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at http://www.due.uci.edu/Change_of_Major.html. For transfer student admission, preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: one year of calculus and one year of *either* general chemistry (with laboratory) or calculus-based physics (with laboratory).

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements

A. Earth System Science 25*, 51, 53, 55, 114, 116, 191; Mathematics 2A-B-J; Chemistry 1LB-LC, and either 1A-B-C or H2A-B-C; Physics 3A-B-C, 3LB-LC, or 7A-B-E, 7LA-LB;

* Other approved courses may be substituted for Earth System Science 25 by petition.

B. Seven electives from the following (at least four must be Earth System Science courses): Earth System Science 112, 124, 126, 130, 132, 138, 142, 144, 164, 166, 168, 190C, 199 (may be counted once toward degree); Chemistry 51A and 51LA, 51B and 51LB, 51C, H52A and H52LA, H52B and H52LB, H52C, 130A, 130B, 130C,131A, 131B, 131C; Physics 51A, 51B, 115A, 120, 134A, 134B, 137, 144, 145; Mathematics 3A or 6C, 2D, 3D, 105A, 112A, 131A, 131B, 131C; Mechanical and Aerospace Engineering (MAE) 91, 130A, 164, 180, 185; Civil and Environmental Engineering (CEE) 132, 162, 171, 172, 174, 176, 178; Biological Sciences 93, 94, 98, D105, D134, E106, E167, E178, E179, E179L, E181, E186, E189, M133; Environmental Analysis and Design E105U, E110, E132U, E145U, E155U, E160, E160L, E161, E165L, E168, E173; Criminology, Law and Society C148; Computing Skills (one of the following may be counted toward degree): Information and Computer Science 21, Engineering EECS10, Engineering MAE 10, Physics 53, or other approved programming course.

MINOR IN EARTH AND ATMOSPHERIC SCIENCES

NOTE: All of these courses have prerequisites. Students pursuing the minor should plan to fulfill all prerequisites prior to enrolling in these courses.

Requirements for the Minor

Earth System Science 51, 53, 55, plus four electives chosen from the above approved elective list for majors, at least two of which must be Earth System Science courses.

Sample Program — Earth and Environmental Sciences		
FALL	**WINTER**	**SPRING**
Freshman		
Mathematics 2A*	Mathematics 2B*	Mathematics 2J*
Chemistry 1A*	Chemistry 1B*, 1LB*	Chemistry 1C*, 1LC*
ESS 25*	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Sophomore		
ESS 51*	ESS 53*	ESS 55*
Physics 3A*	Physics 3B*, 3LB*	Physics 3C*, 3LC*
Breadth Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Junior		
ESS 116*	ESS Elective*	ESS 114*
ESS 191*	Approved Elective*	ESS Elective*
Breadth/Elective	Breadth/Elective	Elective
Elective	Elective	Elective
Senior		
ESS Elective*	ESS Elective*	ESS Elective*
Approved Elective*	Elective	Elective
Elective	Elective	Elective
Elective	Elective	Elective

* Fulfills major requirement.

Some students (particularly transfer students) take Earth System Science 51, 53, and 55 in the junior year.

Graduate Program

Applicants to the Earth System Science Ph.D. program should have a broad quantitative scientific background, with an undergraduate degree in natural science or related fields such as applied mathematics and engineering. Undergraduate preparation should involve mathematics including differential equations, a year-long sequence of physics and of chemistry, and courses in general biology, ecology, or geology. Entering graduate students plan their courses and research with the help of the Earth System Science Advisory Committee of academic and research faculty. Students are admitted to the Ph.D. program only; the Master's degree is awarded upon progress to the Ph.D.

To complete the course requirements for the Ph.D. program, a minimum of 10 approved graduate-level courses, including the core curriculum, must be completed with an average grade of B or better. All courses must be approved by the student's Advisory Committee. The core curriculum consists of Earth System Science 200, 202, 204, 206, 208, 210, 212, 218, and 298. These courses are described below. Students are also expected to participate in the Earth System Science seminar. Additionally, Ph.D. students are required to complete a teaching assistant training program and to have a minimum of two quarters of experience as a teaching assistant, provided opportunities are available.

Academic Senate regulations specify a minimum period of residence of six quarters for Ph.D. candidates. Enrollment in a minimum of 12 units of graduate/upper-division course work per quarter is required. Registration in every regular academic session is necessary until all requirements for the degree have been completed, unless a formal Leave of Absence is granted by the Office of Graduate Studies. All Ph.D. requirements must be completed within 15 quarters in residence (five years), excluding summer quarters. Exceptions must be put to a vote of the Earth System Science faculty. The maximum time permitted is seven years.

A single departmental Qualifying Examination for all eligible Earth System Science students is administered during the fall quarter. This examination determines the student's readiness to begin research for the dissertation and should be taken following completion of the core course work and summer research, during the fall quarter of the second year. The Qualifying Examination consists of both written and oral parts. The written portion of the examination emphasizes breadth, general knowledge, and the ability to integrate and use information covered in the core curriculum and other course work. The oral examination provides an opportunity to clarify questions arising from the student's performance on the written examination.

Following completion of the Qualifying Examination, those students who receive a recommendation to continue Ph.D. work will pursue research on a potential dissertation topic and then take the Advancement to Candidacy Examination. This oral examination is given by a faculty committee, including extra-departmental faculty. Concurrent with this examination, the Ph.D. candidates present a research seminar to the entire Earth System Science Department outlining their proposed dissertation work. The normal time for advancement to candidacy is three years.

A dissertation based on original research and demonstrating critical judgment, intellectual synthesis, creativity, and clarity in written communication is required for the Ph.D. degree. The dissertation must summarize the results of original research performed by the student under the supervision of a faculty member of the Department. The criterion of acceptability of a dissertation is that its contents be judged by the committee as suitable for publication in a peer-reviewed scientific journal of high editorial standards. The dissertation may be a compilation of published papers or manuscripts accepted for publication, so long as a major proportion of the material has been produced independently by the candidate. The format and content are approved by the Dissertation Committee, and University requirements for style, format, and appearance are met.

The Master's degree is awarded only to students admitted to the Ph.D. program who have completed a total of 10 courses, met the three-quarter residency requirement, and completed the Qualifying Examination.

A summary of the requirements follows.

DOCTOR OF PHILOSOPHY IN EARTH SYSTEM SCIENCE

1. Completion of course work (10 courses, including core courses)
2. Six quarters in residence at UCI
3. Completion of the teaching and seminar requirements
4. Completion of the Qualifying Examination, with recommendation to continue for the Ph.D.
5. Pass the Advancement to Candidacy Examination
6. Presentation of an open research seminar
7. Submission of an acceptable doctoral dissertation and formal defense

MASTER OF SCIENCE IN EARTH SYSTEM SCIENCE

1. Completion of course work (10 courses, including core courses)
2. Three quarters in residence at UCI
3. Completion of the teaching and seminar requirements
4. Completion of the Qualifying Examination

Courses in Earth System Science

Lower-division undergraduate course offerings emphasize an understanding of the basic science involved in global change of the Earth's atmosphere, oceans, and biosphere and soils. Any three courses selected from Earth System Science 1, 3, 5, 7, 11, 15, Physics 15, 16, 17, 18, 19, 20A, 20B, 20C, 20D, 21, and Engineering E5 will satisfy the natural sciences breadth requirement. Lower-division Earth System Science courses also are core or elective courses in the interdisciplinary minor in Global Sustainability;

see the Interdisciplinary Studies section of this *Catalogue* for information.

Upper-division courses are particularly appropriate as electives for students majoring in the physical or biological sciences, or engineering, with an interest in applying physics, chemistry, and biology to study the Earth's atmosphere, oceans, biosphere, and climate.

LOWER-DIVISION

1 The Physical Environment (4) F. Covers the origin and evolution of the Earth, its atmosphere, and oceans, from the perspective of biogeochemical cycles, energy use, and human impacts on the Earth system. **(II)**

3 Oceanography (4) S. Examines circulation of the world oceans and ocean chemistry as it relates to river, hydrothermal vent, and atmospheric inputs. Geological features, the wide variety of biological organisms, and global climate changes, such as greenhouse warming, are also studied. **(II)**

5 The Atmosphere (4) W. The composition and circulation of the atmosphere with a focus on explaining the fundamentals of weather and climate. Topics include solar and terrestrial radiation, clouds, and weather patterns. **(II)**

7 Geology (4) W. Basic geologic principles; teaches students how to interpret earth history from landforms and the rock record, understand volcano and earthquake risks, and recognize the distribution of resources. The geologic time scale, fossil record, and major events in earth history are explored. **(II)**

9 The Biosphere (4) W. An introduction to the role of biological processes in the Earth system. Topics span the functioning of cells, organisms, ecosystems, and the global biosphere, including an introduction to evolution, terrestrial and marine organismal biology, and principles of ecology and biogeochemistry. Same as Biological Sciences 9M. **(II)**

11 Climate Change and Policy (4). Develops an understanding of the physical basis behind global climate change; examines how human activities cause it, looks to future rates and impacts of global warming, and reviews the international conventions, protocols, and scientific assessments of climate change. **(II)**

13 Global-Change Biology (4) W. Addresses ways in which humans are altering the global environment, with consequences for the ecology of animals, plants, and microbes. Discussion on how these biologically oriented questions relate to human society, politics, and the economy. Same as Biological Sciences 9K. **(II)**

15 Atmospheric Pollution, Ozone, and Climate (4) S. Air pollution occurs on global, continental, and urban scales. We pollute the atmosphere in different ways. Its consequences on the quality of the air we breathe, health of our ecosystems, ozone layer depletion, and changes in our climate are studied. **(II)**

25 Introduction to Earth and Environmental Sciences (4) F. Covers the origin and evolution of the Earth, its atmosphere, and oceans, from the perspective of biogeochemical cycles, and human impacts. Corequisite: Mathematics 2A or consent of instructor. Open only to Physical Sciences, Biological Sciences, and Engineering majors.

51 Land Interactions (4) F. The role of terrestrial processes in the Earth system. Provides an introduction to ecosystem processes that regulate the cycling of energy, water, carbon, and nutrients. Analysis of the impact of human activities. Corequisites: Mathematics 2B and Physics 3A or 7A. Prerequisite: Chemistry 1C.

53 Ocean Biogeochemistry (4) W. Overview of oceanography for those interested in Earth system science. Focus is on physical, chemical, and biological processes that drive biogeochemical cycling in the oceans. Coastal systems also reviewed, with emphasis on California waters. Corequisite: Mathematics 2B; Physics 3B or 7B.

55 Earth's Atmosphere (4) S. Composition, physics, and circulation of Earth's atmosphere with an emphasis on explaining the role of atmospheric processes in shaping the climate system. Topics include: atmospheric composition, the global energy balance, radiative transfer and climate, atmospheric circulation and climate sensitivity. Corequisite: Mathematics 2B; Physics 3B or 7B.

H90 The Idiom and Practice of Science (4). A series of fundamental and applied scientific problems are addressed, illustrating the pervasive role of mathematical analysis. Topics may include energy utilization, the climate system, the "greenhouse effect," ozone depletion and air pollution, ecological consequences of water pollution, nutrient cycles. Open only to members of the Campuswide Honors Program or consent of instructor. **(II)**

UPPER-DIVISION

112 Global Climate Change and Impacts (4) F. Observations over the twentieth century show extensive changes in atmospheric composition, climate and weather, and biological systems that have paralleled industrial growth. Evidence of globally driven changes in these biogeochemical systems is studied, including projected impacts over the twenty-first century. Prerequisites: Earth System Science 51, 53, and 55.

114 Earth System Science Laboratory and Field Methods (4) S. Introduction to methods used to measure exchange of gases and energy between the atmosphere and terrestrial ecosystems. Laboratories include data acquisition and isotopic and chromatographic analysis. Field measurements at UCI's Marsh Reserve include microclimate, hydrology, trace-gas exchange, and plant growth.

116 Data Analysis for Climate Sciences (4) F. Analysis and interpretation of geophysical data, including functional fitting, probability density functions, and multidimensional time-series methods, with applications in atmospheric, oceanic, and biogeochemical sciences.

122 Atmospheric Dynamics (4) W. Fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean. Most important are interactions between the density stratification and the Coriolis force associated with Earth's rotation. Topics include circulation, vorticity, planetary waves and their role in climate. Prerequisites: Mathematics 2D, Physics 7A-B-E, or consent of instructor.

124 Weather and Meteorology (4) W. Provides an overview of weather systems in midlatitudes and tropics. The fundamental dynamics possible for these weather systems are described. Elementary weather analysis and forecasting techniques are introduced. Prerequisite: Earth System Science 55.

126 Engineering Meteorology (4) W. Fundamentals and aspects of atmospheric sciences important to engineering and environmental problems. Basic physics and thermodynamics of the atmosphere; dispersion of pollutants. A design problem is included. Prerequisites: Engineering MAE91 or CBEMS40B; MAE130A or CEE170 or CBEMS120A or consent of instructor. Same as Engineering MAE162.

130 Physical Oceanography (4) W. Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics. Prerequisites: Mathematics 2D and Physics 7A-B-E, or consent of instructor. Concurrent with Earth System Science 230.

132 Terrestrial Hydrology (4) S. Comprehensive treatment of modern conceptual and methodological approaches to hydrological science. Combines qualitative understanding of hydrological processes with quantitative representation, approaches to measurement, and treatment of uncertainty. Major components of the hydrological cycle and their linkages within the coupled Earth system. Prerequisites: Mathematics 2D and Physics 7A-D-E or equivalent or consent of instructor. Concurrent with Earth System Science 232.

138 Satellite Remote Sensing for Earth System Science (4) S. Satellite remote sensing data are increasingly used to study the Earth system. Provides an overview of the principles behind remote sensing, and the types of satellite data available for study of the oceans, land, and atmosphere. Prerequisite: Earth System Science 51, 53, or 55; or consent of instructor.

142 Atmospheric Chemistry (4) S. Chemistry of the troposphere and stratosphere. Topics include: processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system. Prerequisites: Chemistry 1A-B-C.

144 Marine Geochemistry and Biogeochemistry (4) S. Processes controlling the major and minor element composition of seawater and element distributions in the ocean. Gas exchange, carbon dioxide system, stable isotopes, radionuclides as tracers and chronometers, particle fluxes, organic geochemistry, sediment geochemistry, global cycles of biogeochemically important elements.

164 Terrestrial Ecosystems (4) F, W, S. A mechanistic perspective of the structure and functioning of terrestrial ecosystems. Includes the mechanisms that control plant growth, hydrology and nutrient cycling, and the roles terrestrial ecosystems play in local and global biogeochemistry. Prerequisite: Biological Sciences E106 or consent of instructor. Same as Biological Sciences E118 and Environmental Analysis and Design E167.

166 The Earth Surface Processes (4) S. Physical character of land surfaces. Land surface processes and global change. Tectonic deformation, gravity, fluid flow, climate, and insolation. Landforms, deformation, watershed evolution, weathering, sediment production, transport, deposition, and coastal zone evolution. Includes field expeditions. Prerequisite: Mathematics 2B or consent of instructor.

168 Physiological Plant Ecology (4) F. An examination of the interactions between plants and their environment. Emphasis on the underlying physiological mechanisms of plant function, adaptations and responses to stress, and the basis of the distribution of plants and plant assemblages across the landscape. Prerequisite: Biological Sciences E106 or consent of instructor. Same as Biological Sciences E127.

190A-B Senior Seminar on Global Sustainability I, II (2-2) F, W. Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. **A:** Prepare bibliography. **B:** Prepare research proposal. In-progress grading for 190A-B, grade for sequence given upon completion of 190C. Prerequisites: senior standing, Biological Sciences 65, Environmental Analysis and Design E20, and Earth System Science 10. Same as Biological Sciences 191A-B and Social Ecology 186A-B.

190C Writing/Senior Seminar on Global Sustainability III (4) S. Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations and to prepare senior research paper. Prepare/write research paper under the direction of a faculty member. Prerequisites: Earth System Science 190A-B and satisfaction of the lower-division writing requirement. Same as Biological Sciences 191C and Social Ecology 186C.

191 Introduction to Research in Earth System Science (1) F. A series of weekly presentations by Earth System Science faculty describing ongoing research in their laboratories. The goals are to introduce students to the range of research topics and methods in Earth System Science and to the research opportunities available within the Department. Prerequisite: upper-division standing or consent of instructor; limited to majors in Earth and Environmental Sciences or minors in Earth and Atmospheric Sciences.

198 Senior Thesis in Earth System Science (2) S. Students receive guidance on the effective oral and written communication of research results. Students prepare and present a seminar, a poster, and a written thesis describing their research in Earth System Science. Prerequisites: successful completion of two quarters of Earth System Science 199 or comparable research experience with consent of instructor; successful completion of the lower-division writing requirement. Intended for seniors majoring in Earth and Environmental Sciences.

199 Undergraduate Research (2 to 4) F, W, S. For junior and senior undergraduates, preferably with majors in science or engineering. Interested students should arrange with a member of the Earth System Science faculty to supervise and support a research project. A written summary is required at the end of each quarter. Prerequisite: consent of instructor.

GRADUATE

200 Earth System Climatology and Physics (4) F. Introduction to Earth System Science. Includes evolution of Earth, atmosphere/ocean circulation, and land and ocean geography. Physical processes which mediate the transformation of energy and momentum in the climate system. Topics include hydrostatics, radiation, and climate forcing and feedbacks. Prerequisites: Mathematics 2D; Physics 3C or 7E or equivalent; or consent of instructor.

202 Terrestrial and Ocean Biogeochemistry (4) F. Biogeochemical processes which mediate the transformation of carbon, nitrogen, and other biogeochemically important elements on land and in the ocean. Topics include chemistry of soils and seawater, nutrient limitation, cycling of dissolved and particulate organic matter, and isotopes.

204 Global Hydrology and the Planetary Boundary Layer (4) F. Global hydrologic cycle and its interactions within the Earth's climate system. Precipitation, clouds and radiation, water vapor, sea surface fluxes, terrestrial hydrology. Planetary boundary layer. Surface energy and radiation budgets; temperature, humidity, and wind profiles; turbulence, neutral boundary layers, similarity theory.

206 Atmospheric and Oceanic Dynamics (4) W. Introduces the student to atmospheric and oceanic fluid dynamics. Equations of motion for a rotating stratified fluid. Scaling analysis, potential vorticity dynamics, linear waves, energetics and instability theory with applications to the mean circulation and variability.

208 Atmospheric Chemistry and Global Biogeochemical Cycles (4) W. Chemistry of the atmosphere and global biogeochemical cycling of the elements. Topics include: tropospheric photochemistry; the tropospheric ozone budget; stratospheric chemistry and the ozone hole; global cycling of carbon, nitrogen, oxygen, and sulfur; impact of human activities on biogeochemical processes. Earth System Science 208 and 242 may not both be taken for credit.

210 Geoscience Data Analysis and Modeling (4) F. Teaches basic numerical and statistical techniques needed to solve or analyze Earth system models/data, computational approaches and accuracy, plus hands-on experience with computers. Focuses on probabilistic time-series models and deterministic models based on linear and non-linear differential equations.

212 Earth System Change (4) S. Explores past, present, and projected changes in the Earth system: atmospheric composition, ocean circulation, climate and weather, and the biosphere. Begins with paleo-record, lessons from past climate change. Ends with currently observed global warming, related changes, projections of our future.

218 Terrestrial and Marine Ecology (4) S. A mechanistic perspective of the structure and functioning of terrestrial and marine ecosystems. Includes the processes that control plant growth and community structure, nutrient cycling, and role of ecosystem dynamics in local and global biogeochemical cycling.

222 Atmospheric Dynamics (4) W. Fluid dynamical processes that determine the large-scale flow of the atmosphere and ocean. Most important are interactions between the density stratification and the Coriolis force associated with Earth's rotation. Topics include circulation, vorticity, planetary waves and their role in climate. Formerly Earth System Science 212.

230 Physical Oceanography (4) S. Physical processes that determine the distribution of water properties such as salt and temperature. Fluid-dynamical underpinnings of physical oceanography. Wave motions. The wind-driven and thermohaline circulation. Similarities and differences between ocean and atmosphere dynamics. Prerequisites: Mathematics 2D and Physics 7A-B-E, or consent of instructor. Concurrent with Earth System Science 130.

232 Terrestrial Hydrology (4) S. Comprehensive treatment of modern conceptual and methodological approaches to hydrological science. Combines qualitative understanding of hydrological processes with quantitative representation, approaches to measurement, and treatment of uncertainty. Major components of the hydrological cycle and their linkages within the coupled Earth system. Prerequisites: Mathematics 2D and Physics 7A-D-E or equivalent or consent of instructor. Concurrent with Earth System Science 132.

236 Radiative Processes and Remote Sensing (4) F. Solar and terrestrial radiation and Earth system interaction. Radiative transfer theory. Principles, applications of remote sensing of environment. Planck's law, radiative transfer equation, radiative properties of trace gasses and aerosols, remote sensing techniques, global trends in radiative forcing. Prerequisites: Mathematics 2D and Physics 7A-B-D, or equivalent.

238 Analysis of Hydrologic Systems (3) F. Application of systems theory in hydrologic, land surface, and biogeochemical modeling. Design, identification, and calibration of conceptual models. Principles of dynamic systems and modeling approaches, theory of linear systems and mathematical concepts of differential calculus, theoretical concepts of parameter estimation and optimization theory. Same as Civil and Environmental Engineering CEE289.

242 Atmospheric Chemistry (4) S. Chemistry of the troposphere and stratosphere. Topics include: processes controlling the lifetime and reaction pathways of chemicals in the atmosphere, the role of the atmosphere in biogeochemical cycles, and interactions between atmospheric chemistry and the physical climate system. Prerequisites: Chemistry 1A-B-C. Formerly Earth System Science 202. Earth System Science 242 and 208 may not both be taken for credit.

246 Isotope Geochemistry (4) S. Principles of isotope geochemistry with an emphasis on applications in biogeochemistry. Covers basic theory and experimental investigations of natural variations in stable and radioactive isotopes and isotope fractionation by kinetic processes, isotope exchange reactions, and diffusional processes.

260 Global Biological Change (4) F. Lecture, two hours; field work, one hour. An investigation of the mechanisms that underlie responses of organisms to human-caused environmental changes. Activities include field trips, literature discussions, and lectures. Focuses on issues of interest in Southern California, including nitrogen deposition, invasions, and habitat fragmentation. Same as Ecology and Evolutionary Biology 225.

282A-B-C Topics in Climate (4-4-4). Each quarter is devoted to in-depth analysis of an important and rapidly developing area in the field of climate dynamics. May be repeated for credit as topics vary. Formerly Earth System Science 233A-B-C.

286A-B-C Topics in Biogeochemistry (4-4-4). Each quarter is devoted to in-depth analysis of a subarea in biogeochemistry which is undergoing rapid development. May be repeated for credit as topics vary. Formerly Earth System Science 231A-B-C.

290 Seminar (1) F, W, S. Weekly seminars and discussions on topics of general and current interest in Earth System Science. Satisfactory/Unsatisfactory only. Prerequisite: graduate standing. May be repeated for credit as topics vary.

291 Research Seminar (1 to 4) F, W, S. Detailed discussions of ongoing research in Earth System Science. Format, content, and frequency of the course are variable. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

298 Practicum in Earth System Science (4) W. For first-year graduates. Students explore research opportunities and develop a proposal for a summer research project under the direction of a faculty member. Prerequisite: consent of instructor.

299 Research (2 to 12) F, W, S. Supervised original research in areas of Earth System Science. Prerequisite: consent of instructor. May be repeated for credit. Formerly Earth System Science 280.

399 University Teaching (1 to 4) F, W, S. Required of and limited to teaching assistants. Satisfactory/Unsatisfactory grading only. May be repeated for credit.

DEPARTMENT OF MATHEMATICS

103 Multipurpose Science and Technology Building; (949) 824-5503
John S. Lowengrub, **Department Chair**

Faculty

Takeo Akasaki, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (ring theory)

Vladimir Baranovsky, Ph.D. University of Chicago, *Assistant Professor of Mathematics* (algebraic geometry)

Frank B. Cannonito, Ph.D. Adelphi University, *Professor Emeritus of Mathematics* (group theory)

Larry Chrystal, M.A. University of California, Santa Barbara, *Lecturer in Mathematics*

Michael C. Cranston, Ph.D. University of Minnesota, *Department Vice Chair for Graduate Studies and Professor of Mathematics* (probability)

Vittorio Cristini, Ph.D. Yale University, *Assistant Professor of Biomedical Engineering and Mathematics*

Donald Darling, Ph.D. California Institute of Technology, *Professor Emeritus of Mathematics*

Rui J. P. de Figueiredo, Ph.D. Harvard University, *Professor of Electrical Engineering and Computer Science, Biomedical Engineering, and Mathematics*

Lawrence Man Hou Ein, Ph.D. University of California, Berkeley, *Professor of Mathematics* (algebraic geometry)

Paul C. Eklof, Ph.D. Cornell University, *Department Vice Chair for Undergraduate Studies and Professor of Mathematics* (logic and algebra)

Aleksandr Figotin, Ph.D. Tashkent University, *Professor of Mathematics* (applied mathematics, electromagnetic waves in inhomogeneous media, photonic crystals)

Mark Finkelstein, Ph.D. Stanford University, *Associate Professor of Mathematics* (analysis)

Matthew D. Foreman, Ph.D. University of California, Berkeley, *Professor of Mathematics and Philosophy* (logic)

Michael D. Fried, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (arithmetic geometry, complex variables)

Patrick Guidotti, Ph.D. University of Zürich, *Assistant Professor of Mathematics* (applied mathematics)

Svetlana Jitomirskaya, Ph.D. Moscow State University, *Professor of Mathematics* (mathematical physics)

Richard K. Juberg, Ph.D. University of Minnesota, *Professor Emeritus of Mathematics* (analysis, differential equations)

Ludmil Katzarkov, Ph.D. University of Pennsylvania, *Professor of Mathematics* (algebraic geometry, representation theory)

Abel Klein, Ph.D. Massachusetts Institute of Technology, *Professor of Mathematics* (mathematical physics)

Natalia L. Komarova, Ph.D. University of Arizona, *Assistant Professor of Mathematics and of Ecology and Evolutionary Biology* (applied mathematics)

Rachel Lehman, Ph.D. University of California, Irvine, *Lecturer in Mathematics*

Peter Li, Ph.D. University of California, Berkeley, *UCI Chancellor's Professor of Mathematics* (differential geometry)

Song-Ying Li, Ph.D. University of Pittsburgh, *Professor of Mathematics* (harmonic analysis, several complex variables)

John S. Lowengrub, Ph.D. New York University, *Department Chair and Professor of Mathematics* (computational mathematics)

Zhiqin Lu, Ph.D. New York University, *Associate Professor of Mathematics* (differential geometry)

Penelope Maddy, Ph.D. Princeton University, *UCI Chancellor's Professor of Logic and Philosophy of Science and of Mathematics* (logic, philosophy, and foundations of mathematics)

Caryl Margulies, Ph.D. University of California, Irvine, *Lecturer in Mathematics*

Qing Nie, Ph.D. Ohio State University, *Associate Professor of Mathematics and Biomedical Engineering* (computational applied mathematics)

Timur Oikhberg, Ph.D. Texas A&M University, *Assistant Professor of Mathematics* (analysis)

Richard S. Palais, Ph.D. Harvard University, *Adjunct Professor of Mathematics* (differential geometry)

David L. Rector, Ph.D. Massachusetts Institute of Technology, *Professor Emeritus of Mathematics* (algebraic topology, computer algebra)

Robert C. Reilly, Ph.D. University of California, Berkeley, *Associate Professor of Mathematics* (differential geometry)

Karl C. Rubin, Ph.D. Harvard University, *Professor of Mathematics, and Edward and Vivian Thorp Chair in Mathematics* (number theory)

Bernard Russo, Ph.D. University of California, Los Angeles, *Professor of Mathematics* (functional analysis)

Donald G. Saari, Ph.D. Purdue University, *Director of the Institute for Mathematical Behavioral Sciences and UCI Distinguished Professor of Economics and Mathematics* (dynamical systems and mathematical economics)

Martin Schechter, Ph.D. New York University, *Professor of Mathematics* (partial differential equations, functional analysis)

Stephen Scheinberg, Ph.D. Princeton University; M.D. University of California, Irvine, *Professor Emeritus of Mathematics* (analysis)

Alice Silverberg, Ph.D. Princeton University, *Professor of Mathematics and Computer Science* (number theory and arithmetic algebraic geometry)

William H. Smoke, Ph.D. University of California, Berkeley, *Professor Emeritus of Mathematics* (homological algebra)

Knut Solna, Ph.D. Stanford University, *Associate Professor of Mathematics* (applied mathematics)

Ronald J. Stern, Ph.D University of California, Los Angeles, *Dean of the School of Physical Sciences and Professor of Mathematics* (geometry and topology)

Chuu-Lian Terng, Ph.D. Brandeis University, *Professor of Mathematics and National Science Foundation "ADVANCE" Chair* (differential geometry)

Edriss S. Titi, Ph.D. Indiana University, *Professor of Mathematics and of Mechanical and Aerospace Engineering* (partial differential equations, nonlinear analysis)

Howard G. Tucker, Ph.D. University of California, Berkeley, *Professor of Mathematics* (probability and statistics)

Daqing Wan, Ph.D. University of Washington, *Professor of Mathematics* (number theory, algebraic geometry)

Frederic Yui-Ming Wan, Ph.D. Massachusetts Institute of Technology, *Professor of Mathematics and of Mechanical and Aerospace Engineering* (applied mathematics)

Robert W. West, Ph.D. University of Michigan, *Professor Emeritus of Mathematics* (algebraic topology)

Joel J. Westman, Ph.D. University of California, Los Angeles, *Professor Emeritus of Mathematics* (analysis)

Robert J. Whitley, Ph.D. New Mexico State University, *Professor of Mathematics* (analysis)

Janet L. Williams, Ph.D. Brandeis University, *Professor Emerita of Mathematics* (probability and statistics)
Jack Xin, Ph.D. New York University, *Professor of Mathematics* (applied mathematics)
James J. Yeh, Ph.D. University of Minnesota, *Professor of Mathematics* (real and stochastic analysis)
Martin Zeman, Ph.D. Humboldt University (Berlin), *Assistant Professor of Mathematics* (logic and combinatorics)
Hong-Kai Zhao, Ph.D. University of California, Los Angeles, *Associate Professor of Mathematics and Computer Science* (computational applied mathematics)
Weian Zheng, Ph.D. Université de Strasbourg, *Professor of Mathematics* (probability)

The Department of Mathematics is engaged in teaching and fundamental research in a wide variety of basic mathematical disciplines, and offers undergraduate and graduate students the opportunity to fashion a thorough program of study leading to professional competence in mathematical research, or in an area of application.

The curriculum in mathematics includes opportunities for supervised individual study and research, and is augmented by seminars and colloquia. It is designed to be compatible with curricular structures at other collegiate institutions in California in order to enable students transferring to UCI to continue their programs of mathematics study.

Undergraduate Program

The Department offers a B.S. degree in Mathematics. Within this program there are five tracks; besides the standard track, there are four specializations or concentrations (in Mathematics for Economics, Applied and Computational Mathematics, Statistics, and Mathematics for High School Teaching.) In addition, the Department offers a minor in Mathematics.

Undergraduate mathematics courses are of several kinds: courses preparatory to advanced work in mathematics, the exact sciences, and engineering; courses for students of the social and biological sciences; and courses for liberal arts students and those planning to enter the teaching field.

Admission to the Major

Students may be admitted to the Mathematics major upon entering the University as freshmen, via change of major, and as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at http://www.due.uci.edu/Change_of_Major.html. For transfer student admission, preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the required course work of one year of approved calculus.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements

Lower-Division Requirements (for all Mathematics majors except those in the Teaching specialization):

A. Mathematics 2A-B, 2D (or H2D), 2E (or H2E), 2J, 3A, 3D.

B. Computing skills attained through either Information and Computer Science 21, Engineering E10, Engineering CEE10, Engineering EECS10, Engineering MAE10, or Physics 53.

C. One three-quarter lecture course sequence selected from Chemistry 1A-B-C; Physics 7A-B-D, 7A-B-E, or 7B-D-E. (This also satisfies UCI breadth requirement category II if taken with the accompanying laboratories.)

Upper-Division Requirements (for Mathematics majors except those in the Economics concentration, Applied and Computational specialization, or Teaching specialization): Most of the upper-division Mathematics courses are organized into a series of Core Areas. The Core Areas are: Numerical Analysis (courses numbered 100–109); Applied Mathematics (110–119); Algebra (120–129); Probability and Statistics (130–139); Analysis (140–149); Logic (150–159); and Geometry/Topology (160–169). There are also non-Core-Area courses (170–189). Students are required to complete 15 upper-division one-quarter lecture courses in Mathematics (with associated laboratories when applicable) as follows. (Mathematics Honors Program students follow modified requirements, as explained in a later section.)

A. Mathematics 120A, 121A
B. Mathematics 140A-B
C. A third lecture course from the Algebra Core Area (120–129)
D. A third lecture course from the Analysis Core Area (140–149)
E. One additional lecture course from either the Algebra or the Analysis Core Area
F. Two lecture courses from a third Core Area
G. One lecture course from a fourth Core Area
H. Five additional lecture courses in Mathematics chosen from the Core Areas or from courses numbered 170–189

The Department offers one concentration and three specializations. Note that all require the completion of an application and an interview with an advisor. Mathematics 13 is only required for the specialization in Mathematics for High School Teaching but is strongly recommended for all Mathematics majors, as preparation for upper-division courses.

Concentration in Mathematics for Economics

Admission to this concentration requires approval in advance by the Mathematics Department. The admissions process begins with completing a form at the Department office, and includes an interview with the Department's advisor for the concentration. This approval should be applied for after the student has completed Economics 20A-B-C, but no later than the end of the junior year.

Upper-division requirements:

A. Twelve upper-division Mathematics lecture courses (plus any associated laboratories) including:

1. Nine courses: Mathematics 120A, 121A-B, 140A-B-C, 131A-B-C (same as Statistics 120A-B-C).

2. Three elective lecture courses chosen from Mathematics 105A-B (plus 105LA-LB), 107 (plus 107L), 112A-B-C, 118A-B-C, 130B-C, 171A-B, 176.

B. Nine Economics courses: Economics 20A-B-C, 100A-B-C, 123A-B-C.

Specialization in Applied and Computational Mathematics

Admission to this specialization requires approval in advance by the Mathematics Department. The admissions process begins with completing a form at the Department office, and includes an interview with the Department's advisor for the specialization. This approval should be applied for no later than the end of the junior year.

Upper-division requirements:

A. Thirteen upper-division Mathematics lecture courses (plus any associated laboratories) including:

1. Ten required lecture courses: Mathematics 105A-B, 107 (plus 105LA-LB, 107L), 112A-B-C, 115, 121A, 140A-B.

2. A two-quarter sequence chosen from: Mathematics 114A-B, 118A-B, 120A-B, 130A-B, 131A-B, 140C-D, 162A-B.

3. One additional Mathematics course numbered 100–189.

B. Two approved courses in an area of application outside of Mathematics. Approval must be obtained in advance from the advisor for this specialization. The student is responsible for satisfying any prerequisites for these courses.

Specialization in Statistics

Admission to this specialization requires approval in advance by the Mathematics Department. The admissions process begins with completing a form at the Department office, and includes an interview with the Department's advisor for the specialization.

All the requirements for the Mathematics major must be satisfied; in fulfilling requirements F and H, students must include the following courses: Mathematics 131A-B-C (or Statistics 120A-B-C), either 130B-C or 132B-C, and two additional courses approved in advance by the advisor for this specialization.

Departmental Requirements for the Mathematics Major with a Specialization in Mathematics for High School Teaching

Admission to this specialization requires approval in advance by the Mathematics Department. The admission process begins with completing a form at the Department office, and includes an interview with the Department's Undergraduate Advisor and its Tutor Supervisor. This approval should be applied for no later than the end of the junior year.

This specialization helps to prepare students for teaching mathematics. Students wishing to go on and teach at the intermediate and high school levels should also consult with an academic advisor in the Department of Education.

Lower-Division Requirements:

A. Mathematics 2A-B, 2D (or H2D), 2J, 3A, 3D, 6A, 13.

B. Computing skills attained through either Information and Computer Science 21, Engineering E10, Engineering CEE10, Engineering EECS10, Engineering MAE10, or Physics 53.

C. One three-quarter lecture course sequence (plus the indicated laboratories) selected from Chemistry 1A-B-C (plus 1LB-LC); Physics 7A-B-D (plus 7LA-LB-LD), 7A-B-E (plus 7LA-LB), or Physics 7B-D-E (plus 7LB-LD).

D. In addition, students must satisfy an extra science requirement by taking at least three additional approved science lecture courses, including any accompanying laboratories. The following courses are approved:

1. Chemistry 51A-B and 51LA-LB, plus one quarter of Earth System Science 1, 3, 5, 7, or 15 (for students taking Chemistry 1A-B-C).
2. Physics 7E, 51A-B, plus one quarter of Physics 20A, 20B, 20C, or 20D (for students taking Physics 7A-B-D).
3. Physics 7D (plus 7LD) and 51A-B, plus one quarter of Physics 20A, 20B, 20C, or 20D (for students taking Physics 7A-B-E).
4. Physics 51A-B, plus two quarters of Physics 20A, 20B, 20C, or 20D (for students taking Physics 7B-D-E but testing out of Physics 7A).

Although course groupings 1–4 above are the "preferred" ways to satisfy the extra science requirement for this specialization, a student can request approval to substitute other suitable science courses, including certain upper-division Mathematics courses. Such approval is not automatic and should be obtained from the Mathematics Department Undergraduate Advisor *before* a student takes the courses.

Upper-Division Requirements:

A. Twelve Mathematics lecture courses, numbered 100–189, plus any accompanying laboratories, including: Mathematics 120A-B, 121A, either 121B or 124, 140A-B, 131A, 150, 161, 180, 184.

B. One quarter of Education 100 and two quarters of Mathematics 192.

HONORS PROGRAM IN MATHEMATICS

The Honors Program in Mathematics is open to all junior and senior Mathematics majors who meet the minimum academic qualifications of a 3.5 GPA in Mathematics courses and a 3.2 GPA overall. In addition to satisfying the requirements for the major in Mathematics (in any one of its tracks), participants must complete at least one of the two series Mathematics 205A-B-C (Introduction to Graduate Analysis) or 206A-B-C (Introduction to Graduate Algebra) with a grade of C or better. If Mathematics 205A-B-C is not taken, then 140A-B-C-D must all be completed. If Mathematics 206A-B-C is not taken, then 120A-B and 121A-B must all be completed.

In terms of satisfaction of the Mathematics major requirements, Mathematics 205A-B-C counts as the equivalent of four upper-division courses, specifically 140A-B-C-D; and 206A-B-C counts as the equivalent of four upper-division courses, specifically, 120A-B and 121A-B. The graduate sequences may be taken in place of or in addition to the undergraduate courses named.

Students must apply for the Honors Program no later than the fall quarter of their senior year. Those who are accepted enroll in the Honors Seminar (Mathematics H195A-B) during the winter and spring quarter of their senior year. At the end of the spring quarter students submit an Honors thesis, which is designed and completed under the supervision of the Honors Seminar faculty. (Mathematics H195B may be counted toward the major requirements as one of the five additional courses in area H.) Upon approval of the thesis by the Department's Honors Committee and completion of all other requirements, students graduate with Honors in Mathematics, and this distinction is noted on their transcript.

Requirements for the Minor

One course selected from Mathematics 13, 120A, or 140A, plus six additional upper-division lecture courses in Mathematics (plus the associated laboratories, where applicable) numbered 100–188. NOTE: Nearly all upper-division courses in Mathematics have Mathematics 2A-B-J as prerequisites, and many courses have additional prerequisites such as Mathematics 2D, 2E, 3A, and/or 3D.

PLANNING A PROGRAM OF STUDY

The application process for the specializations and concentrations is designed to make sure the student gets suitable advising in planning a program of study. For all Mathematics majors, or prospective majors, assistance in planning a program of study is available from the Mathematics Department Undergraduate Advisor and the advisors for the various tracks, as well as from the academic counselors for the School of Physical Sciences. The following sample programs are only examples.

Majors should consider taking Mathematics H2D in place of 2D and H2E in place of 2E. Those in the specialization for High School Teaching should note that Mathematics 124, 161, 180, and 184 may not be offered more than once every other year and thus should be taken when offered.

Sample Program — Mathematics Major Interested in Pure Mathematics or Preparing for Graduate Study in Mathematics

FALL	WINTER	SPRING
Freshman		
Math. 2B	Math. H2D	Math. H2E
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Sophomore		
Math. 2J	Math. 3A	Math. 3D
Math. 13	ICS 21	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Junior		
Math. 120A	Math. 120B	Math. 121B
Math. 140A	Math. 121A	Math. 140C
Breadth/Elective	Math. 140B	Math. 141
Breadth/Elective	Breadth/Elective	Breadth/Elective
Senior		
Math. 150	Math. 151	Math. 152
Math. 205A (or 206A)	Math. 162A	Math. 162B
Breadth/Elective	Math. 205B (or 206B)	Math. 205C (or 206C)
Breadth/Elective	Breadth/Elective	Breadth/Elective

Sample Program — Mathematics Major Specializing in Applied and Computational Mathematics

FALL	WINTER	SPRING
Freshman		
Math. 2A	Math. 2B	Math. 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Sophomore		
Math. 2J	Math. 2E	Math. 3D
ICS 21	Math. 3A	Math. 13
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Junior		
Math. 112A	Math. 112B	Math. 112C
Math. 140A	Math. 140B	Math. 115
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Senior		
Math. 105A, LA	Math. 105B, LB	Math. 107, 107L
Math. 114A	Math. 114B	Math. 121A
Technical Elective	Technical Elective	Math. 146
Breadth/Elective	Breadth/Elective	Breadth/Elective

Sample Program — Mathematics Major Concentrating in Mathematics for Economics

FALL	WINTER	SPRING
Freshman		
Math. 2A	Math. 2B	Math. 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Sophomore		
Math. 2E	Math. 3A	Math. 3D
Math. 2J	ICS 21	Math. 13
Economics 20A	Economics 20B	Economics 20C
Breadth/Elective	Breadth/Elective	Breadth/Elective
Junior		
Math. 131A	Math. 131B	Math. 131C
Math. 140A	Math. 140B	Math. 140C
Economics 100A	Economics 100B	Economics 100C
Breadth/Elective	Math. 176	Breadth/Elective
Senior		
Math. 120A	Math. 121A	Math. 121B
Math. 105A, LA	Math. 105B, LB	Breadth/Elective
Economics 123A	Economics 123B	Economics 123C
Breadth/Elective	Breadth/Elective	Breadth/Elective

Sample Program — Mathematics Major Specializing in Statistics

FALL	WINTER	SPRING
Freshman		
Math. 2A	Math. 2B	Math. 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Sophomore		
Math. 2E	Math. 3A	Math. 3D
Math. 2J	ICS 21	Math. 13
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Junior		
Math. 120A	Math. 121A	Math. 121B
Math. 131A	Math. 131B	Math. 131C
Math. 140A	Math. 140B	Math. 140C
Breadth/Elective	Breadth/Elective	Breadth/Elective
Senior		
Math. 105A, 105LA	Math. 105B, 105LB	Math. 130C
Breadth/Elective	Math. 130B	Math. 146
Breadth/Elective	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective

Sample Program — Mathematics Major Specializing in Mathematics for High School Teaching

FALL	WINTER	SPRING
Freshman		
Math. 2A	Math. 2B	Math. 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Physics 20A	Breadth/Elective	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective
Sophomore		
Math. 2J	Math. 3A	Math. 3D
Math. 6A	Physics 51A	Math. 13
Physics 7E	ICS 21	Physics 51B
Breadth/Elective	Breadth/Elective	Breadth/Elective
Junior		
Math. 120A	Math. 120B	Math. 121A
Math. 140A	Math. 140B	Math. 124
Breadth/Elective	Breadth/Elective	Math. 184
Breadth/Elective	Breadth/Elective	Breadth/Elective
Senior		
Math. 131A	Math. 151 or 131B	Math. 180
Math. 150	Math. 161	Math. 192
Education 100	Math. 192	Breadth/Elective
Breadth/Elective	Breadth/Elective	Breadth/Elective

Graduate Program

Graduate courses are designed to meet the needs of students doing graduate work in mathematics and in those disciplines that require graduate-level mathematics for their study. Among the fields covered are analysis, algebra, applied and computational mathematics, mathematical biology, functional analysis, geometry and topology, probability, ordinary and partial differential equations, and mathematical logic.

In addition to formal courses, there are seminars for advanced study toward the Ph.D. in various fields of mathematics. Topics will vary from year to year. Each seminar is conducted by a faculty member specializing in the subject studied. Enrollment will be subject to the approval of the instructor in charge.

MASTER OF SCIENCE IN MATHEMATICS

The Master's program serves a dual purpose. For some students it will be a terminal program of mathematics education; for others it will lead to study and research at the doctoral level. To earn the Master of Science degree, the student must satisfy course and residency requirements, and pass Comprehensive Examinations administered by the Graduate Studies Committee of the Department.

The total number of required courses for the M.S. degree is 12 courses, completed with satisfactory performance. Students are required to complete at least one series of the following courses: Mathematics 210A-B-C, 220A-B-C, or 230A-B-C. At most one undergraduate course may count as an elective course, provided it is sponsored by rank faculty and approved by the Graduate Advisor. At most one elective course (of at least three units) is allowed outside the Department.

Students will take Advisory Examinations in Algebra and Analysis upon entrance to the graduate program. The Advisory Examination in Algebra is based on the courses Mathematics 120A and 121A-B plus some advanced topics in group theory and linear algebra; students who do not pass this examination will be asked to take the Mathematics 206A-B-C sequence. The Advisory Examination in Analysis is based on the courses Mathematics 140A-B-C-D; students who do not pass this examination will be asked to take the Mathematics 205A-B-C sequence.

Students must pass two Comprehensive Examinations, one in Algebra and one in Analysis, before the beginning of their second year in the graduate program and will be given, at most, two chances to pass each examination. Students who have passed the Advisory Examination will be exempted from taking the corresponding Comprehensive Examination.

Mathematics 199, 297, 298, 299, and 399 may not be used to fulfill course requirements.

The residency requirement ordinarily is satisfied by full-time enrollment for three quarters immediately preceding the award of the M.S. degree. When appropriate, a leave of absence may be granted between matriculation and the final quarters of study.

MASTER OF SCIENCE IN MATHEMATICS WITH A TEACHING CREDENTIAL

In cooperation with the UCI Department of Education, the Department of Mathematics sponsors a coordinated two-year program for the M.S. degree in Mathematics and the California Single Subject Teaching Credential. This option requires 12 courses, at least eight of which must be graduate courses. Three thesis courses (Mathematics 299) *may* be used as part of the course work for this option. The Advisory and Comprehensive Examination requirements are the same as for the regular Master's degree. Prospective graduate students interested in this program should so indicate on their applications and can request a detailed description of the program from the Department of Mathematics or the Department of Education.

DOCTOR OF PHILOSOPHY IN MATHEMATICS

When accepted into the doctoral program, the student embarks on a program of formal courses, seminars, and individual study courses to prepare for the Ph.D. Qualifying Examinations, Advancement to Candidacy Examination, and dissertation.

All students will take Advisory Examinations in Algebra and Analysis upon entrance to the graduate program. The Advisory Examination in Algebra is based on the courses Mathematics 120A and 121A-B, plus some advanced topics in group theory and linear algebra; students who do not pass this examination will be asked to take the Mathematics 206A-B-C sequence. The Advisory Examination in Analysis is based on material covered in Mathematics 140A-B-C-D; students who do not pass this examination will be asked to take the Mathematics 205A-B-C sequence. All students who take Mathematics 205A-B-C (Analysis) and 206A-B-C (Algebra) must pass, at the beginning of their second year in the graduate program, the corresponding Comprehensive Examination, which covers the material of the Advisory Examination plus Mathematics 205 or 206, respectively.

Each student must choose at least two series of the following three series of courses—Mathematics 210A-B-C (Real Analysis), 220A-B-C (Complex Analysis), or 230A-B-C (Algebra)—and pass two written Qualifying Examinations from these courses before the end of their third year. Each examination may be taken twice. A student who passes the examination prior to taking the corresponding course will be exempted from taking the course. The Department will offer the Qualifying Examinations twice each year, during orientation week before the fall quarter and at the end of spring quarter.

By the end of their second year, students must declare a major specialization from the following areas: Algebra, Analysis, Applied and Computational Mathematics, Geometry and Topology, Logic, or Probability. Students are required to take two series of courses from their chosen area. (Students who later decide to change their area must also take two series of courses from the new area.) Additionally, all students must take two series of course outside their declared major area of specialization. Special topics courses within certain areas of specialization and courses counted toward the

M.S. degree, other than Mathematics 205A-B-C and 206A-B-C, will count toward the fulfillment of the major specialization requirement.

By the beginning of their third year, students must have an advisor specialist in their major area. With the advisor's aid, the student forms a committee for the Advancement to Candidacy oral examination. This committee will be approved by the Department on behalf of the Dean of Graduate Studies and the Graduate Council and will have five faculty members. At least one, and at most two, of the members must be faculty from outside the Department. Before the end of the third year, students must have a written proposal, approved by their committee, for the Advancement to Candidacy examination. The proposal should explain the role of at least two series of courses from the student's major area of specialization and of additional research reading material, and should have a plan for investigating specific topics under the direction of the student's adviser(s). The courses Mathematics 210A-B-C, 220A-B-C, and 230A-B-C cannot count for both Qualifying and Advancement to Candidacy Examinations. After the student meets the requirements, the Graduate Studies Committee recommends to the Dean of Graduate Studies the advancement to candidacy for the Ph.D. degree. Students should advance to candidacy by the beginning of their fourth year.

Teaching experience and training is an integral part of the Ph.D. program. All doctoral students are expected to participate in the Department's teaching program.

The candidate must demonstrate independent, creative research in Mathematics by writing and defending a dissertation that makes a new and valuable contribution to mathematics in the candidate's area of concentration. Upon advancement to candidacy a student must form a Thesis Committee, ideally a subcommittee of the Advancement Examination Committee, consisting of at least three faculty members and chaired by the student's advisor. The committee guides and supervises the candidate's research, study, and writing of the dissertation; conducts an oral defense of the dissertation; and recommends that the Ph.D. be conferred upon approval of the doctoral dissertation. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Courses in Mathematics

LOWER-DIVISION

1A-B Pre-Calculus. Lecture, three hours; discussion, two hours.

1A (0) F. Basic equations and inequalities, linear and quadratic functions, and systems of simultaneous equations. Four units of workload credit only.

1B (4) F, W, Summer. Preparation for calculus and other mathematics courses. Exponentials, logarithms, trigonometry, polynomials, and rational functions. Satisfies no requirements other than contribution to the 180 units required for graduation. Prerequisite: Mathematics 1A, satisfactory performance on the algebra or pre-calculus placement examinations offered periodically by the Mathematics Department, or consent of instructor.

2A-B Single-Variable Calculus (4-4) F, W, S, Summer. Lecture, three hours; discussion, two hours. **2A:** Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Antiderivatives. Prerequisite: pass the UCI Precalculus test no more than one year before the start of the quarter in which Mathematics 2A will be taken, or get a grade of C (2.0) or better in Mathematics 1B at UCI. **2B:** Definite integrals; the Fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Logarithmic and exponential functions. Polar coordinates. Prerequisite for Mathematics 2B: 2A. **(V)**

2D-E Multivariable Calculus. Lecture, three hours; discussion, two hours.

2D (4) F, W, S, Summer. Differential and integral calculus of real-valued functions of several real variables, including applications. Prerequisites: Mathematics 2A-B. Mathematics 2D and H2D may not both be taken for credit. **(V)**

2E (4) F, W, S, Summer. The differential and integral calculus of vector-valued functions. Implicit and inverse function theorems. Line and surface integrals, divergence and curl, theorems of Green, Gauss, and Stokes. Prerequisite: 2D. Mathematics 2E and H2E may not both be taken for credit.

H2D-E Honors Multivariable Calculus (4-4) W, S. Lecture, three hours; discussion, two hours. Covers the same material as Mathematics 2D-E, but with a greater emphasis on the theoretical structure of the subject matter. Especially recommended for prospective Mathematics majors and others with a particular interest in mathematics. Satisfies the same requirements and prerequisites as 2D-E. Prerequisites for H2D: a grade of B (3.0) or better in Mathematics 2B or a score of 4 or 5 on the Advanced Placement Calculus BC examination; for H2E: a grade of C (2.0) or better in Mathematics H2D. Mathematics 2D-E and H2D-E may not both be taken for credit. (H2D: **V**)

2J Infinite Series and Basic Linear Algebra (4) F, W, S, Summer. Lecture, three hours; discussion, two hours. Systems of linear equations: matrix operations; determinants; eigenvalues, and eigenvectors. Infinite sequences and series. Complex numbers. Prerequisites: Mathematics 2A-B. **(V)**

3A Introduction to Linear Algebra (4) F, W, S. Lecture, three hours; discussion, two hours. Vectors, matrices, linear transformations, dot products, determinants, systems of linear equations, vector spaces, subspaces, dimension. Prerequisites: Mathematics 2J. Mathematics 3A and Mathematics 6C may not both be taken for credit.

3D Elementary Differential Equations (4) F, W, S, Summer. Lecture, three hours; discussion, two hours. Linear differential equations, variation of parameters, constant coefficient cookbook, systems of equations, Laplace transforms, series solutions. Further topics as time permits. Prerequisite: Mathematics 2J.

4 Mathematics for Economists (4) F, S. Lecture, three hours; discussion, two hours. Topics in linear algebra and multivariable differential calculus suitable for economic applications. Prerequisites: Mathematics 2A-B. No credit for Mathematics 4 if taken after both Mathematics 2J and 2D. **(V)**

6A Discrete Mathematics for Computer Science (4) F, S, Summer. Lecture, three hours; discussion, two hours. Covers essential tools from discrete mathematics used in computer science with an emphasis on the process of abstracting computational problems and analyzing them mathematically. Topics include: combinatorics, mathematical induction, elementary probability, and asymptotic analysis. Prerequisite: high school mathematics through trigonometry. Same as Information and Computer Science 6A. **(V)**

6B Discrete Mathematics: Boolean Algebra and Logic (4) W, S, Summer. Lecture, three hours; discussion, two hours. Relations and their properties; Boolean algebras, formal languages; finite automata. Prerequisite: Mathematics 6A or Information and Computer Science 6A. **(V)**

6C Linear Algebra (4) F, W, S, Summer. Lecture, three hours; discussion, two hours. Linear equations, vector spaces and subspaces, linear functions and matrices, linear codes, determinants, scalar products. Prerequisite: high school mathematics through trigonometry. Mathematics 6C and Mathematics 3A may not both be taken for credit. NOTE: Mathematics majors must take 3A. **(V)**

7 Basic Statistics (4) F, W, S, Summer. Lecture, three hours; discussion, one to two hours. Introduces basic inferential statistics including confidence intervals and hypothesis testing on means and proportions, t-distribution, Chi Square, regression and correlation. F-distribution and nonparametric statistics included if time permits. Same as Statistics 7. Mathematics 7/Statistics 7 and Biological Sciences 7 may not both be taken for credit. No credit for Mathematics 7/Statistics 7 if taken after Mathematics 67/Statistics 67. **(V)** *F, W offered for seniors only.*

13 Introduction to Abstract Mathematics (4) F, W, S. Lecture, three hours; discussion, two hours. The style of precise definition and rigorous proof which is characteristic of modern mathematics. Topics include set theory, equivalence relations, proof by mathematical induction, and number theory. Students construct original proofs to statements. Strongly recommended for freshman and sophomore Mathematics majors as preparation for upper-division courses such as Mathematics 120 and 140.

67 Introduction to Probability and Statistics for Computer Science (4) S. Lecture, three hours; discussion, two hours. Introduction to the basic concepts of probability and statistics with discussion of applications to computer science. Prerequisites: Mathematics 2B, 6A, and 6C or 3A. No credit for Mathematics 7/Statistics 7 or Biological Sciences 7 if taken after Mathematics 67/Statistics 67. Same as Statistics 67.

UPPER-DIVISION

NOTE: Some of the upper-division courses listed below have one or two hours of discussion weekly in addition to the lectures. Not all courses are offered every year.

105A-B Numerical Analysis (4-4) F, W. Lecture, three hours. Introduction to the theory and practice of numerical computation. **105A:** Floating point arithmetic, roundoff; solving transcendental equations; quadrature; linear systems, eigenvalues, power method. Corequisite: Mathematics 105LA if offered. Prerequisites: Mathematics 2A-B-J; some acquaintance with computer programming. Only one course from Mathematics 105A, Engineering CEE185, and Engineering MAE185 may be taken for credit. **105B:** Lagrange interpolation, finite differences, splines, Padé approximations; Gaussian quadrature; Fourier series and transforms. Corequisite: Mathematics 105LB if offered. Prerequisite: Mathematics 105A.

105LA-LB Numerical Analysis Laboratory (1-1) F, W. Laboratory, two hours. Provides practical experience to complement the theory developed in Mathematics 105A-B. Corequisite: concurrent enrollment in Mathematics 105A-B.

107 Numerical Differential Equations (4) S. Lecture, three hours. Theory and applications of numerical methods to initial and boundary-value problems for ordinary and partial differential equations. Corequisite: concurrent enrollment in Mathematics 107L if offered. Prerequisites: Mathematics 3D and 105A-B.

107L Numerical Differential Equations Laboratory (1) S. Laboratory, two hours. Provides practical experience to complement the theory developed in Mathematics 107. Corequisite: concurrent enrollment in Mathematics 107.

112A-B-C Introduction to Partial Differential Equations and Applications (4-4-4). Lecture, three hours. Introduction to ordinary and partial differential equations and their applications in engineering and science. Basic methods for classical PDEs (potential, heat, and wave equations). **112A:** Classification of PDEs, separation of variables and series expansions, special functions, eigenvalue problems. **112B:** Green functions and integral representations, method of characteristics. **112C:** Galerkin method and other discretization techniques. Prerequisites for 112A: Mathematics 2D, 3D; for 112B: 2E and 112A.

114A-B Applied Complex Analysis (4-4) F, W. Lecture, three hours. Introduction to complex functions and their applications to engineering and science. **114A:** Complex numbers, elementary functions; analytic functions; complex integration; power series; residue theory; conformal maps; applications. **114B:** Applications to potential theory, flows; heat; Laplace transforms; asymptotic expansions. Prerequisites: for 114A: Mathematics 2D, 2J. Mathematics 2E and 3D recommended. For 114B: Mathematics 114A. Mathematics 114A and Engineering EECS145 may not both be taken for credit.

115 Mathematical Modeling (4). Lecture, three hours. Mathematical modeling and analysis of phenomena that arise in engineering physical sciences, biology, economics, or social sciences. Corequisite or prerequisite: Mathematics 112A or Engineering MAE140. Prerequisites: Mathematics 2D; 3A or 6C; 3D.

118A-B-C The Theory of Differential Equations (4-4-4). Lecture, three hours; discussion, one hour. Introductory theoretical course in ordinary and/or partial differential equations. Existence and uniqueness of solutions, methods of solution, the geometry of solutions. Students are expected to follow and understand proofs. Prerequisites: Mathematics 3A, 3D; 140A-B or consent of instructor.

120A Introduction to Abstract Algebra: Groups (4) F, W. Lecture, three hours; discussion, two hours. Axioms for group theory; permutation groups, matrix groups. Isomorphisms, homomorphisms, quotient groups. Advanced topics as time permits. Special emphasis on doing proofs. Prerequisite: Mathematics 3A or 6C; Mathematics 13 is strongly recommended.

120B Introduction to Abstract Algebra: Rings and Fields (4) W, S. Lecture, three hours; discussion, two hours. Basic properties of rings; ideals, quotient rings; polynomial and matrix rings. Elements of field theory. Prerequisite: Mathematics 120A.

121A-B Linear Algebra (4-4). Lecture, three hours; discussion, two hours. Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. **121A:** Vector spaces, linear independence, bases, dimension. Linear transformations and their matrix representations. Theory of determinants. **121B:** Canonical forms; inner products; similarity of matrices. Prerequisite for 121A: Mathematics 3A or 6C.

124 Algebra and Some Famous Impossibilities (4). Lecture, three hours. Proof of the impossibility of certain ruler-and-compass constructions (squaring the circle; trisecting angles); nonexistence of analogs to the "quadratic formula" for polynomial equations of degree 5 or higher. The necessary algebra introduced as needed. Prerequisites: Mathematics 3A or 6C; Mathematics 120A. Previous or concurrent enrollment in Mathematics 120B and 121A recommended. *Not offered every year.*

NOTE: Only one course from Mathematics 130A, 131A, and 132A may be taken for credit. In the future, only Mathematics 131A (or Statistics 120A) will be offered. Any one of these courses, or Mathematics 67, will satisfy the prerequisite for Mathematics 130B, 131B, and 132B.

130B-C Probability and Stochastic Processes (4-4). Lecture, three hours. Introductory course emphasizing applications. **130B:** Conditional probability and conditional expectations; Markov chains. **130C:** Exponential distribution and Poisson process; Brownian motion; additional topics, such as option pricing, as time permits. Prerequisites: for 130B: Mathematics 2A-B; either 67, 130A, 131A (same as Statistics 120A), or 132A; for 130C: Mathematics 130B.

131A-B-C Introduction to Probability and Statistics (4-4-4). Lecture, three hours; discussion, one to two hours. Introductory course covering basic principles of probability and statistical inference. **131A:** Axiomatic definition of probability, random variables, probability distributions, expectation. **131B:** Point estimation, interval estimating, and testing hypotheses, Bayesian approaches to inference. **131C:** Linear regression, analysis of variance, model checking. Prerequisites: for 131A-B: Mathematics 2A-B; 2D-2J or 4; for 131C: Mathematics 131A-B; 3A or 6C. Same as Statistics 120A-B-C.

132B-C Discrete Probability and Mathematical Theory of Sample Surveys (4-4). Lecture, three hours. Sample selection, stratification, cluster sampling, double-sampling procedures, optimal allocation, probability-proportional-to-size sampling. Applications to problems in economics, business, public health, agriculture, and the social sciences. Prerequisites: for 132B: Mathematics 67 or 131A; for 132C: Mathematics 132B.

140A-B Elementary Analysis (4-4). Lecture, three hours; discussion, two hours. Introduction to real analysis including: the real number system, convergence of sequences, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs. Prerequisites: Mathematics 2D, 2J; Mathematics 13 is strongly recommended.

140C-D Analysis in Several Variables (4-4). Lecture, three hours; discussion, two hours. **140C:** Rigorous treatment of multivariable differential calculus. Jacobians, Inverse and Implicit Function theorems. Prerequisites: some background in linear algebra (Mathematics 3A, 6C, or 2J), and 140B. **140D:** Rigorous treatment of multivariable integral calculus. Multiple integrals in $\mathbf{R}^n$; iterated integrals and Fubini's theorem; change-of-variables theorem; differential forms and Stokes' theorem. Prerequisite: Mathematics 2E and 140C.

140T Topics in Analysis (4). Lecture, three hours; discussion, two hours. Additional topics in analysis. Varies from year to year. Prerequisites: Mathematics 140A-B and consent of instructor. May be repeated for credit as topics vary. *Not offered every year.*

141 Introduction to Topology (4) S. Lecture, three hours. The elements of naive set theory and the basic properties of metric spaces. Introduction to topological properties. Prerequisite: Mathematics 140A. Formerly Mathematics 141A.

146 Fourier Analysis (4) S. Lecture, three hours. Rigorous introduction to the theory of Fourier series and orthogonal expansions. Fourier transform. Prerequisites: Mathematics 3D and 140A-B. Mathematics 112A recommended.

150 Introduction to Mathematical Logic (4) F. Lecture, three hours. First-order logic through the Completeness Theorem for predicate logic. Prerequisite: consent of instructor. Only one course from Mathematics 150, Philosophy 105B, and Logic and Philosophy of Science 105B may be taken for credit.

151 Set Theory (4) W. Lecture, three hours. Axiomatic development; infinite sets; cardinal and ordinal numbers. Prerequisite: Mathematics 150. Only one course from Mathematics 151, Philosophy 105A, and Logic and Philosophy of Science 105A may be taken for credit.

152 Computability (4) S. Lecture, three hours. Computable functions; undecidability; Gödel's Incompleteness Theorem. Prerequisite: Mathematics 150. Only one course from Mathematics 152, Philosophy 105C, and Logic and Philosophy of Science 105C may be taken for credit.

161 Modern Geometry (4). Lecture, three hours. Euclidean geometry; Hilbert's axioms; absolute geometry; hyperbolic geometry; the Poincare models; geometric transformations. Prerequisites: Mathematics 2D, 3A, 120A. Formerly Mathematics 182.

162A-B Introduction to Differential Geometry (4-4) W, S. Lecture, three hours. Applications of advanced calculus and linear algebra to the geometry of curves and surfaces in space. Prerequisites: Mathematics 2D-E, 2J.

171A, B-C Mathematical Methods in Operations Research. Lecture, three hours. *Offered summer only.*

171A Linear Programming (4). Simplex algorithm, duality, optimization in networks. Prerequisite: Mathematics 3A or 6C.

171B Nonlinear Programming (4). Conditions for optimality, quadratic and convex programming, search methods, geometric programming. Prerequisites: Mathematics 2D and either 3A or 6C.

171C Integer and Dynamic Programming (4). Multistage decision models, applications. Prerequisite: Mathematics 171A or 171B.

173A-B Introduction to Cryptology (4-4). Lecture, three hours. Introduction to some of the mathematics used in the making and breaking of codes, with applications to classical ciphers and public key systems. The mathematics which is covered includes topics from number theory, probability, and abstract algebra. Prerequisites: Mathematics 2A-B; 3A or 6C.

176 Mathematics of Finance (4). Lecture, three hours. Introduces the mathematics of finance with an emphasis on financial derivatives. After a review of certain tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, and the design of portfolios are discussed. Prerequisites: Mathematics 2A-B-J. Same as Economics 135.

180 Introduction to Number Theory (4). Lecture, three hours. The ring of integers. Divisibility. Prime numbers and factorization. Number-theoretic functions such as the Moebius function and the Euler function. Congruences, Moebius inversion, perfect numbers, diophantine equations, quadratic residues. Other topics as time permits. Prerequisite: Mathematics 2J.

184 History of Mathematics (4). Lecture, three hours. Topics vary from year to year. Some possible topics: mathematics in ancient times; the development of modern analysis; the evolution of geometric ideas. Students are assigned individual topics for term papers. Prerequisite: Mathematics 2D, 2J, 3A or 6C, 3D, 120A, 140A. *Not offered every year.*

189 Special Topics in Mathematics (4). Lecture, three hours. Offered from time to time, but not on a regular basis. Content and prerequisites vary with the instructor. May be repeated for credit as topics vary.

190 Technical Writing and Communication Skills (4) F, W, S. Lecture, three hours. Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement. Prerequisites: upper-division standing; satisfaction of the lower-division writing requirement. Open to Mathematics majors only. Same as Chemistry 139 and Physics 129.

192 Tutoring in Mathematics (2). Enrollment limited to upper-division Mathematics majors participating in the Department's Tutoring Program. Admission requires approval of Department Tutor Supervisor. For students *not* in the Department's specialization in Mathematics for High School Teaching, this course satisfies no requirements other than contribution to the 180 units required for graduation. Pass/Not Pass only. Prerequisites: Mathematics 2D; 2J; 3D; 13 or 120A or 140A. May be taken twice for credit.

194 Problem-Solving Seminar (2). Develops ability in analytical thinking and problem solving, using problems of the type found in the Mathematics Olympiad and the Putnam Mathematical Competition. Students taking the course in fall will prepare for and take the Putnam examination in December. Pass/Not Pass only. NOTE: satisfies no requirement other than contribution to the 180 units required for graduation. Recommended for prospective teachers. May be taken twice for credit.

H195A-B Honors Seminar (4-4) W, S. A focused study of a topic which will vary from year to year, culminating in the writing of an Honors thesis. Prerequisite: enrollment in the Mathematics Honors Program or consent of instructor.

199A-B-C Special Studies in Mathematics (4-4-4) F, W, S. Supervised reading. For outstanding undergraduate mathematics majors in supervised but independent reading or research of mathematical topics. Prerequisite: consent of Department. NOTE: Cannot normally be used to satisfy departmental requirements.

GRADUATE

205A-B-C Introduction to Graduate Analysis (5-5-5) F, W, S. Lecture, four hours. Construction of the real number system, topology of the real line, concepts of continuity, differential and integral calculus, sequences and series of functions, equicontinuity, metric spaces, multivariable differential and integral calculus, implicit functions, curves and surfaces. Prerequisites: Mathematics 2A-B, 2J, 2D, 2E, 3A; or equivalent or consent of instructor.

206A-B-C Introduction to Graduate Algebra (5-5-5). Lecture, four hours. Introduction to abstract linear algebra, including bases, linear transformation, eigenvectors, canonical forms, inner products, symmetric operators. Introduction to groups, rings, and fields including examples of groups, group actions, Sylow theorems, modules over principal ideal domains, polynomials and Galois groups. Prerequisite: Mathematics 3A or equivalent or consent of instructor.

210A-B-C Real Analysis (4-4-4) F, W, S. Lecture, three hours. Measure theory, Lebesgue integral, signed measures, Radon-Nikodym theorem, functions of bounded variation and absolutely continuous functions, classical Banach spaces, Lp spaces, integration on locally compact spaces and the Riesz-Markov theorem, measure and outer measure, product measure spaces. Prerequisites: Mathematics 140A-B-C or consent of instructor.

211A-B Topics in Real Analysis (4-4). Lecture, three hours. A continuation of Mathematics 210A-B-C; topics selected by instructor.

218A-B-C Introduction to Manifolds and Geometry (4-4-4) F, W, S. Lecture, three hours. General topology and fundamental groups, covering space; Stokes theorem on manifolds, selected topics on abstract manifold theory. Prerequisites: Mathematics 205A-B-C or consent of instructor.

220A-B-C Analytic Function Theory (4-4-4) F, W, S. Lecture, three hours. Standard theorems about analytic functions. Harmonic functions. Normal families. Conformal mapping. Prerequisites: Mathematics 140A-B-C or equivalent or consent of instructor.

221A-B Several Complex Variables (4-4). Lecture, three hours. Introduction to the study of holomorphic functions in several complex variables. Topics include: Automorphism group of a domain, Bergman kernel function, boundary behavior of Poisson integrals, pluriharmonic functions, Hardy and Bergman spaces, Mobius invariant function spaces, subharmonicity, convexity. Prerequisites: Mathematics 210, 220, and 260.

225A-B-C Introduction to Numerical Analysis and Scientific Computing (4-4-4). Lecture, three hours. Introduction to fundamentals of numerical analysis from an advanced viewpoint. **225A:** Error analysis, approximation of functions, nonlinear equations. **225B-C:** Numerical linear algebra, numerical solutions of differential equations; stability. Corequisite: Mathematics 225LA-LB-LC (if offered). Prerequisites: Mathematics 3D; 105A-B or 140A-B; 121A; and Mathematics 112A or Engineering MAE140.

225LA-LB-LC Laboratory for Numerical Analysis and Scientific Computing (2-1-1). Laboratory, two hours for 225LA; one hour for 225LB and 225LC. Provides practical experience to complement the theory in Mathematics 225A-B-C. Corequisite: Mathematics 225A-B-C.

226A-B-C Computational Differential Equations (4-4-4). Lecture, three hours. Finite difference and finite element methods. Quick treatment of functional and nonlinear analysis background: weak solution, Lp spaces, Sobolev spaces. Approximation theory. Fourier and Petrov-Galerkin methods; mesh generation. Elliptic, parabolic, hyperbolic cases in 226A-B-C, respectively. Corequisite: Mathematics 226LA-LB-LC (if offered). Prerequisites: basic differential equations, such as in Mathematics 3D and either Mathematics 112A or Engineering MAE140; plus either abstract analysis (e.g., Mathematics 140A-B) or numerical analysis (Mathematics 105A-B or equivalent).

226LA-LB-LC Laboratory for Computational Differential Equations (2-1-1). Laboratory, two hours for 226LA; one hour for 226LB and 226LC. Provides practical experience to complement the theory in Mathematics 226A-B-C. Corequisite: Mathematics 226A-B-C.

230A-B-C Algebra (4-4-4) F, W, S. Lecture, three hours. Elements of the theories of groups, rings, fields, modules. Galois theory. Modules over principal ideal domains. Artinian, Noetherian, and semisimple rings and modules. Prerequisites: Mathematics 120A and 121A-B or equivalent, or consent of instructor.

232A-B-C Algebraic Number Theory (4-4-4) F, W, S. Lecture, three hours. Prime number theorem, quadratic reciprocity, Gauss sums, diophantine equations, zeta functions over finite fields. Algebraic integers, prime ideals, class groups, Dirichlet unit theorem, localization, completion, Galois extensions, Chebatarev density theorem. Representations of finite groups, L-functions, Hecke L-functions. Introduction to class field theory. Prerequisites: Mathematics 206A-B-C or consent of instructor.

233A-B-C Algebraic Geometry (4-4-4). Lecture, three hours. Basic commutative algebra and classical algebraic geometry. Algebraic varieties, morphisms, rational maps, blow ups. Theory of schemes, sheaves, divisors, cohomology. Algebraic curves and surfaces, Riemann-Roch theorem, Jocobian classification of curves and surfaces.

234A-B-C Topics in Algebra (4-4-4). Lecture, three hours. Group theory, homological algebra, and other selected topics. Prerequisites: Mathematics 230A-B-C or consent of instructor.

237A-B Homological Algebra (4-4). Lecture, three hours. Categories and functors, including the category of modules over a (possibly noncommutative) ring; direct sums and products, direct and projective limits, tensor products and Hom; image, kernal, complexes, homology and exact sequences. Applications. Prerequisites: Mathematics 230A-B-C or consent of instructor.

240A-B-C Differential Geometry (4-4-4). Lecture, three hours. Riemannian manifolds, connections, curvature and torsion. Submanifolds, mean curvature, Gauss curvature equation. Geodesics, minimal submanifolds, first and second fundamental forms, variational formulas. Comparison theorems and their geometric applications. Hodge theory applications to geometry and topology. Prerequisites: Mathematics 141A-B or consent of instructor.

245A-B-C Topics in Differential Geometry (4-4-4). Lecture, three hours. Continuation of Mathematics 240A-B-C. Topics to be determined by the instructor. Prerequisites: Mathematics 240A-B-C or consent of instructor. May be repeated for credit as topics vary.

250A-B-C Algebraic Topology (4-4-4). Lecture, three hours. Provides fundamental materials in algebraic topology: fundamental group and covering space, homology and cohomology theory, and homotopy group. Prerequisites: Mathematics 230A and 141A-B, or equivalent, or consent of instructor.

260A-B-C Functional Analysis (4-4-4). Lecture, three hours. Normed linear spaces, Hilbert spaces, Banach spaces, Stone-Weierstrass Theorem, locally convex spaces, bounded operators on Banach and Hilbert spaces, the Gelfand-Neumark Theorem for commutative C*-algebras, the spectral theorem for bounded self-adjoint operators, unbounded operators on Hilbert spaces. Prerequisites: Mathematics 210A-B-C and 220A-B-C or consent of instructor.

270A-B-C Probability (4-4-4). Lecture, three hours. Probability spaces, distribution and characteristic functions. Strong limit theorems. Limit distributions for sums of independent random variables. Conditional expectation and martingale theory. Stochastic processes. Prerequisites: Mathematics 130A-B-C and 210A-B-C or consent of instructor.

271A-B-C Stochastic Processes (4-4-4). Lecture, three hours. Processes with independent increments, Wiener and Gaussian processes, function space integrals, stationary processes, Markov processes. Prerequisites: Mathematics 210A-B-C or consent of instructor.

274 Topics in Probability (4-4-4). Lecture, three hours. Selected topics, such as theory of stochastic processes, martingale theory, stochastic integrals, stochastic differential equations. Prerequisites: Mathematics 270A-B-C or consent of instructor. May be repeated for credit as topics vary.

277A-B-C Topics in Mathematical Physics (4-4-4). Lecture, three hours. Topics to be determined by the instructor. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

280A-B-C Mathematical Logic (4-4-4). Lecture, three hours. Basic set theory; models, compactness, and completeness; basic model theory; Incompleteness and Gödel's Theorems; basic recursion theory; constructible sets. Prerequisite: consent of instructor.

281A-B-C Set Theory (4-4-4). Lecture, three hours. Ordinals, cardinals, cardinal arithmetic, combinatorial set theory, models of set theory, Gödel's constructible universe, forcing, large cardinals, iterate forcing, inner model theory, fine structure. Prerequisites: Mathematics 280A-B-C or consent of instructor.

282A-B-C Model Theory (4-4-4). Lecture, three hours. Languages, structures, compactness and completeness. Model-theoretic constructions. Omitting types theorems. Morley's theorem. Ranks, forking. Model completeness. O-minimality. Applications to algebra. Prerequisites: Mathematics 280A-B-C.

285A-B-C Topics in Mathematical Logic (4-4-4). Lecture, three hours. Continuation of Mathematics 280A-B-C. Topics to be conducted by the instructor. Prerequisite: Mathematics 280A-B-C or consent of instructor. May be repeated for credit as topics vary.

290A-B-C Methods in Applied Mathematics (4-4-4). Lecture, three hours. Introduction to ODEs and dynamical systems: existence and uniqueness. Equilibria and periodic solutions. Bifurcation theory. Perturbation methods: approximate solution of differential equations. Multiple scales and WKB. Matched asymptotic. Calculus of variations: direct methods, Euler-Lagrange equation. Second variation and Legendre condition.

291A-B-C Topics in Applied and Computational Mathematics (4-4-4) F, W, S. Lecture, three hours. Topics to be determined by instructor. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

295A-B-C Partial Differential Equations (4-4-4). Lecture, three hours. Theory and techniques for linear and nonlinear partial differential equations. Local and global theory of partial differential equations: analytic, geometric, and functional analytic methods. Prerequisites: Mathematics 112A-B-C, 210A-B-C or equivalent, or consent of instructor.

296 Topics in Partial Differential Equations (4). Lecture, three hours. Continuation of Mathematics 295A-B-C. Topics to be determined by the instructor. Prerequisites: Mathematics 295A-B-C or consent of instructor. May be repeated for credit as topics vary.

297 Mathematics Colloquium (1). Weekly colloquia on topics of current interest in mathematics. Satisfactory/Unsatisfactory Only. May be repeated for credit.

298A-B-C Seminar (1 to 3) F, W, S. Seminars organized for detailed discussion of research problems of current interest in the Department. The format, content, frequency, and course value are variable. Prerequisite: consent of the Department. May be repeated for credit.

299A-B-C Supervised Reading and Research (2 to 12) F, W, S. May be repeated for credit.

399 University Teaching (1 to 4) F, W, S. Limited to Teaching Assistants. Does not satisfy any requirements for the Master's degree. Satisfactory/Unsatisfactory Only. May be repeated for credit.

COURSE IN PHYSICAL SCIENCES

114 Science Education Teacher Apprentice Field Experience (4) F, W, S. Students assist public school classroom teachers in laboratory demonstrations and experiments, tutoring individuals or small groups. Prerequisite: consent of instructor. Same as Education 114. May be taken for credit twice.

DEPARTMENT OF PHYSICS AND ASTRONOMY

4129 Frederick Reines Hall; (949) 824-6911
Andrew J. Lankford, **Department Chair**

Faculty

Myron Bander, Ph.D. Columbia University, *Professor of Physics* (elementary particle theory)
Aaron Barth, Ph.D. University of California, Berkeley, *Assistant Professor of Physics* (observational astrophysics)
Elizabeth Barton, Ph.D. Harvard University, *Assistant Professor of Physics* (observational astrophysics)
Steven Barwick, Ph.D. University of California, Berkeley, *Professor of Physics* (experimental high-energy particle astrophysics)
Gregory A. Benford, Ph.D. University of California, San Diego, *Professor of Physics* (plasma physics and astrophysics)
James Bullock, Ph.D. University of California, Santa Cruz, *Assistant Professor of Physics* (theoretical astrophysics and cosmology)
David A. Buote, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Physics* (observational astrophysics)
David Casper, Ph.D. University of Michigan, *Assistant Professor of Physics* (experimental particle physics)
Gary A. Chanan, Ph.D. University of California, Berkeley, *Professor of Physics* (observational astrophysics)
Liu Chen, Ph.D. University of California, Berkeley, *Professor of Physics* (plasma theory)
Alexander (Sasha) Chernyshev, Ph.D. Russian Academy of Sciences (Russia), *Assistant Professor of Physics* (condensed matter theory)
Philip G. Collins, Ph.D. University of California, Berkeley, *Assistant Professor of Physics* (experimental condensed matter physics)
Asantha Cooray, Ph.D. University of Chicago, *Assistant Professor of Physics* (theoretical astrophysics and cosmology)
Michael B. Dennin, Ph.D. University of California, Santa Barbara, *Associate Professor of Physics* (experimental condensed matter physics)
Igor Dzyaloshinskii, Ph.D. Institute for Physical Problems (U.S.S.R.), *Professor Emeritus of Physics* (condensed matter theory)
Jonathan Lee Feng, Ph.D. Stanford University, *Associate Professor of Physics* (elementary particle theory)
Steven Gross, Ph.D. University of Texas, Austin, *Assistant Professor of Developmental and Cell Biology, Biomedical Engineering, and Physics* (experimental biophysics)
Herbert W. Hamber, Ph.D. University of California, Santa Barbara, *Professor of Physics* (elementary particle theory)
William W. Heidbrink, Ph.D. Princeton University, *Professor of Physics* (experimental plasma physics)
Wilson Ho, Ph.D. University of Pennsylvania, *Donald Bren Professor of Physics and Chemistry* (experimental condensed matter, physics and chemistry)
Herbert Hopster, Ph.D. University of Aachen (Federal Republic of Germany), *Professor of Physics* (experimental condensed matter physics)
Manoj Kaplinghat, Ph.D. Ohio State University, *Assistant Professor of Physics* (theoretical cosmology)
David P. Kirkby, Ph.D. California Institute of Technology, *Associate Professor of Physics* (experimental particle physics)
Andrew J. Lankford, Ph.D. Yale University, *Department Chair and Professor of Physics* (experimental particle physics)
Jon M. Lawrence, Ph.D. University of Rochester, *Professor of Physics* (experimental condensed matter physics)
Zhihong Lin, Ph.D. Princeton University, *Assistant Professor of Physics* (plasma theory)
Mark A. Mandelkern, Ph.D. University of California, Berkeley; M.D. University of Miami, *Professor of Physics* (experimental particle physics and medical physics)
Alexei A. Maradudin, Ph.D. University of Bristol (England), *Professor Emeritus of Physics* (condensed matter theory)
Meinhard E. Mayer, Ph.D. Parhon University (Romania), *Professor Emeritus of Physics* (mathematical physics)
Roger D. McWilliams, Ph.D. Princeton University, *Professor of Physics* (experimental plasma physics)
Douglas L. Mills, Ph.D. University of California, Berkeley, *Professor of Physics* (condensed matter theory)
William R. Molzon, Ph.D. University of Chicago, *Professor of Physics* (experimental particle physics)
Orhan Nalcioglu, Ph.D. University of Oregon, *Professor of Radiological Sciences, Medicine, Electrical and Computer Engineering, and Physics* (medical physics)
Riley Newman, Ph.D. University of California, Berkeley, *Professor of Physics* (experimental particle physics and gravitational physics)
William H. Parker, Ph.D. University of Pennsylvania, *Vice Chancellor for Research and Dean of Graduate Studies, and Professor of Physics* (experimental condensed matter physics)
Arvind Rajaraman, Ph.D. Stanford University, *Assistant Professor of Physics* (elementary particle theory)
Thorsten Ritz, Ph.D. University of Ulm (Germany), *Assistant Professor of Physics* (theoretical biophysics)
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James E. Rutledge, Ph.D. University of Illinois, *Professor of Physics* (experimental condensed matter physics)
Nathan Rynn, Ph.D. Stanford University, *Professor Emeritus of Physics* (experimental plasma physics)
Jonas Schultz, Ph.D. Columbia University, *Professor Emeritus of Physics* (experimental particle physics)
Gordon L. Shaw, Ph.D. Cornell University, *Professor Emeritus of Physics* (elementary particle theory and biophysics)
Anthony L. Shoup, Ph.D. University of Cincinnati, *Adjunct Professor of Physics* (experimental particle astrophysics)
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Zuzanna Siwy, Ph.D. Silesian University of Technology, Assistant Professor of Physics (experimental biophysics)
Tammy Smecker-Hane, Ph.D. The Johns Hopkins University, *Associate Professor of Physics* (observational astrophysics)
Henry W. Sobel, Ph.D. Case Institute of Technology, *Professor of Physics* (experimental particle physics)
Min-Ying (Lydia) Su, Ph.D. University of California, Irvine, *Assistant Professor of Radiological Sciences and Physics in Residence* (medical physics)
Peter Taborek, Ph.D. California Institute of Technology, *Professor of Physics* (experimental condensed matter physics)
Virginia L. Trimble, Ph.D. California Institute of Technology, *Professor of Physics* (theoretical astronomy)
Gerard Van Hoven, Ph.D. Stanford University, *Professor Emeritus of Physics* (plasma physics and astrophysics)
Richard F. Wallis, Ph.D. Catholic University of America, *Professor Emeritus of Physics* (condensed matter theory)
Steven White, Ph.D. Cornell University, *Professor of Physics* (condensed matter theory)
Ruqian Wu, Ph.D. Institute of Physics (China), *Professor of Physics* (condensed matter theory)
Gaurang B. Yodh, Ph.D. University of Chicago, *Professor of Physics* (experimental particle astrophysics)
Clare Yu, Ph.D. Princeton University, *Professor of Physics* (condensed matter theory and theoretical biophysics)

Physics is that branch of science concerned with the study of natural phenomena at the fundamental level. Physicists study the smallest particles of matter (quarks and leptons), nuclei, and atoms; the fundamental forces; the properties of solids, liquids, gases, and plasmas; the behavior of matter on the grand scale in stars and galaxies; and even the origin and fate of the universe. Other disciplines such as chemistry, biology, medicine, and engineering often build upon the foundations laid by physics.

The Department of Physics and Astronomy offers courses for students of various interests, from those in the humanities and social sciences, to those in biological sciences, and to those in physics, engineering, and other sciences. Faculty members are conducting active research in several forefront areas of physical research, and there is student access to specialized research areas such as astrophysics, cosmology, elementary particle, plasma, condensed matter, biological, and medical physics at both advanced and undergraduate course levels. The Department offers several interdisciplinary concentrations and tracks which include courses taught by faculty in Biological Sciences, Chemistry, Engineering, and Medicine. The faculty is vigorous, innovative, and engaged in everything from the traditional activities of research, education, and university service to community action, literature, and national policy making, to mention a few examples. The Department encourages student-faculty interaction.

Undergraduate Program

The goal of the undergraduate major in Physics is to develop expert problem solvers with a broad understanding of physical principles. The program is flexible and prepares students for careers in industrial research, applications programming, education, law, or business, as well as for graduate study in astronomy, biomedical physics, engineering, or physics. Annual mandatory meetings with faculty advisors assist students in selecting a program that matches their aptitudes and interests. In addition to the core Physics courses, students complete either a standard track (such as the track for future Ph.D. physicists), or one of the formal concentrations or specializations (in Applied Physics, Biomedical Physics, Computational Physics, Philosophy of Physics, Physics Education, or Astrophysics). In addition, Physics majors may find the minor in Earth and Atmospheric Sciences, offered by the Department of Earth System Science, to be of interest.

The three lower-division sequences in physics are distinguished by their intended audience, their mathematical prerequisites, and the extent to which they offer preparation for more advanced courses. These aspects of the beginning courses are summarized as follows:

Physics 3: *Intended audience:* Premedical students, Biological Sciences majors. *Prerequisites:* algebra and trigonometry; concurrent enrollment in Mathematics 2A. *Preparation for advanced courses:* Physics 7D with permission.

Physics 7: *Intended audience:* Physical Sciences and Engineering majors. *Prerequisite:* concurrent enrollment in Mathematics 2. *Preparation for advanced courses:* Physics 51A.

Physics 14–21: *Intended audience:* Nonscience majors. *Prerequisites:* none. *Preparation for Advanced courses:* none.

Admission to the Major

Students may be admitted to the Physics major upon entering the University as freshmen, via change of major, and as transfer students from other colleges and universities. Information about change of major policies is available in the Physical Sciences Student Affairs Office and at http://www.due.uci.edu/Change_of_Major.html. For transfer student admission, preference will be given to junior-level applicants with the highest grades overall, and who have satisfactorily completed the following required courses: one year of approved calculus and one year of calculus-based physics with laboratory for engineering and physics majors.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: None.

Departmental Requirements

Physics 7A-B-D-E with laboratory courses 7LA-LB-LD; Mathematics 2A-B, 2D-E, 2J, 3D; Physics 50; Physics 51A-B; Physics 52A-B-C; Physics 53 (or another programming course); Physics 111A-B, 112A-B, 113A, 115A, 121, and 125A; Physics 196C or H196C or 197; and six additional coherently related four-unit courses. (The six coherently related courses are normally satisfied by concentrations, specializations, and tracks.)

Concentration in Applied Physics

Requirements: The six additional coherently related courses required for the major must be in engineering and be approved by the Department of Physics and Astronomy.

Concentration in Biomedical Physics

Requirements: Biological Sciences 97, 98, and 99; Chemistry 1A-B-C, 1LB-LC, 51A-B, (or 52A-B).

Concentration in Computational Physics

Requirements: Three courses in computer science (Information and Computer Science 21, 22, 23), two courses in numerical analysis plus the accompanying laboratories (Mathematics 105A-B, 105LA-LB), and one advanced computational course (Mathematics 107, 107L or Physics 131). Mathematics 6A is also recommended as a prerequisite.

Concentration in Philosophy of Physics

Requirements: One course selected from Philosophy or Logic and Philosophy of Science 30, 104, 105A-B-C, or Mathematics 150, 151, 152; Philosophy or LPS 31; Philosophy or LPS 140; one course from History 60, 135A, 135B, 135C, or an approved alternative elective; Physics 113B; three courses selected from Philosophy or LPS 102, 121, 141A, 141B, 141C, 141D.

Concentration in Physics Education

Requirements: Education 173; two quarters of Physical Sciences 114 and/or Physics 191; five courses selected from Biological Sciences 1A-B, Chemistry 1A-B-C, Earth System Science 3, 7, 51, Physics 20A-B.

Specialization in Astrophysics

Requirements: Physics 139; three astrophysics courses selected from Physics 137, 138, 144, or 145; and any two upper-division Physics electives.

Honors Program in Physics

The Honors Program in Physics provides an opportunity for selected students majoring in Physics to pursue advanced work in one of the research areas of the Department. Admission to the program is based on an application normally submitted by the sixth week of the spring quarter of the junior year. Applicants must have an overall grade point average of at least 3.4 and a grade point average in physics courses of 3.5 or better. (Exceptions to these procedures and standards may be granted in unusual circumstances.) In selecting students for the program, the Department considers evidence of ability and interest in research.

Students admitted to the program participate in a year-long course, Physics H196A-B-C, which includes two quarters of research and a final quarter in which a written thesis is submitted. If this work and the student's final GPA are deemed of honors quality by the program advisor, the student then graduates with Departmental Honors in Physics.

PLANNING A PROGRAM OF STUDY

Physics 3 is a one-year course suitable for premedical students, students majoring in Biological Sciences, and nonscience majors. It surveys most of the important branches of physics. Laboratory work accompanies the course. Nonscience majors with some mathematical skill may wish to consider Physics 3 as an alternative to Physics 14 through 21.

A student who decides to major in Physics after completing Physics 3 should meet with the Department Undergraduate Advisor for placement information.

Physics 7 is an intensive four-quarter course for students in Physical Sciences and Engineering who are interested in a careful quantitative approach to macroscopic physics. Laboratory work accompanies the course. Students with an advanced background in physics may begin the sequence with 7B upon satisfactory completion of the Physics Placement Examination.

Physics courses numbered between 14 and 21 are general education courses intended for nonscience majors. The content and format of Physics 21 may vary from year to year.

The introduction to mathematical methods (Mathematics 2E, 2J, 3D, and Physics 50), microscopic physics (Physics 51A-B), and experimental physics (Physics 52A-B-C) are normally taken in the sophomore year.

Courses numbered 111 and above are for Physics majors and other qualified students. Courses numbered between 111 and 115 emphasize the mathematical and theoretical structures that have unified our understanding of nature. It should be noted that multi-quarter courses such as 111A-B must be taken and passed in sequential order. Any student who is so inclined may take more than the minimum one quarter of advanced laboratory work. Courses numbered between 132 and 149 introduce active subdisciplines in current research. Independent research (195, 196) is strongly encouraged. Physics 196C, H196C, and 197 stress the written and verbal communication of research findings.

Transfer students are specifically advised to seek individual consultation with the Department Undergraduate Advisor before deciding on a program of courses.

All Physics majors must complete the core courses listed below. By the end of the junior year, each student must also select a concentration or track.

Note that alternatives to Physics major requirements can be approved upon petition to the Department and the Office of the Associate Dean. Furthermore, exceptionally prepared students are allowed to enroll in graduate-level courses; to do so requires the approval of the Department Undergraduate Advisor.

Sample Program — Physics Core Curriculum

FALL	WINTER	SPRING
Freshman		
Mathematics 2A	Mathematics 2B	Mathematics 2D
Physics 7A, 7LA	Physics 7B, 7LB	Physics 7D, 7LD
Sophomore		
Mathematics 2E	Mathematics 3D	Physics 50
Mathematics 2J	Physics 51A	Physics 51B
Physics 7E	Physics 52B	Physics 52C
Physics 52A		
Junior		
Physics 111A	Physics 111B	Physics 53
Physics 112A	Physics 112B	Physics 113A
		Physics 115A
Senior		
Physics 125A	Physics 121	Physics 197

For a student planning graduate study in physics, additional courses in advanced physics are strongly recommended.

Sample Program — Physics Graduate School Track

FALL	WINTER	SPRING
Senior		
Physics 113B	Physics 113C	Physics 115B
Physics Elective	Physics 125B	Physics Elective

Students preparing for graduate school in atmospheric science or physical oceanography should complete the minor in Earth and Atmospheric Sciences.

The **Applied Physics concentration** is designed to provide appropriate education to students who anticipate a career in industrial or technological research. It combines the fundamental knowledge of physical processes obtained from physics courses with the technical knowledge obtained from engineering courses. A student is required to complete six courses in the School of Engineering approved by the Physics and Astronomy Department. Examples of appropriate courses include Engineering EECS70, EECS170 and 170LA, EECS170B and 170LB, EECS170C and 170LC, EECS174, EECS188, MAE120, MAE135, and MAE147. Upon completion of the Applied Physics concentration, the student will receive a B.S. degree in Physics.

Sample Program — Applied Physics Concentration

FALL	WINTER	SPRING
Junior		
	Engr. EECS70A	Engr. EECS70B, 70LB
Senior		
Engr. ECE113A, LA	Engr. EECS113B, LB Engr. EECS178	Physics 206

The **Biomedical Physics concentration** is designed for the student who anticipates a career in physics applied to biology and medicine, such as health physics or radiological physics, or who intends to work in a scholarly field which deals with the physical aspects of biology or medicine, such as molecular biology or physiology. Completion of requirements for the Physics major is required as are nine quarters of basic courses in biology and chemistry. Students who wish to follow the Biomedical Physics concentration are advised to seek guidance early in their college careers. The requirements are such that coordination of a program in the second year is essential.

Sample Program — Biomedical Physics Concentration

FALL	WINTER	SPRING
Freshman		
Chemistry 1A	Chemistry 1B, 1LB	Chemistry 1C, 1LC
Sophomore		
Chemistry 51A	Chemistry 51B	
Junior		
Bio. Sci. 97	Bio. Sci. 98	Bio. Sci. 99

The **Computational Physics concentration** provides training for positions in software development in a wide variety of high-technology fields. For example, consider medical imaging software for magnetic resonance imaging. To write a first-rate program, one must understand the apparatus and analysis techniques (physics), use appropriate numerical techniques (numerical analysis), and employ a convenient object-oriented interface (computer science). The concentration develops this unique set of skills: physical and mathematical insight through the Physics curriculum, knowledge of modern computer programming techniques, and knowledge of numerical analysis.

Sample Program — Computational Physics Concentration

FALL	WINTER	SPRING
Junior		
ICS 21	ICS 22	ICS 23
Senior		
Math. 105A, 105LA	Math. 105B, 105LB	Math. 107, 107L

The **Philosophy of Physics concentration** is concerned with the study of the conceptual history of physics, the method of inquiry that has led to our best physical theories, and the structure and interpretation of the theories themselves. Students take courses in deductive and inductive logic, the philosophy and history of physics, and quantum mechanics. The emphasis on careful argument makes this concentration useful for anyone who wishes to pursue a graduate degree in philosophy or law, or for other careers that employ both verbal and quantitative analysis.

The **Physics Education concentration** is for students who plan a career in secondary education. An Education course, five general science courses, and two quarters of classroom experience complete the requirements for the concentration.

The **Astrophysics specialization** is primarily taken by two types of students, those planning on going on to graduate school in astronomy or astrophysics and those planning to work in aeronautics or astrophysics-related industries or government research laboratories after receiving their bachelor's degree. It also is an excellent focus for students who anticipate careers in science journalism, teaching, science administration, or public relations. The course work includes one upper-division astrophysics laboratory (139), three of four courses in astrophysics (137, 138, 144, 145), and two or more upper-division Physics courses. Of the Physics electives, students bound for graduate school are strongly advised to include Physics 113B, 115B, and 125B. Other recommended electives include Physics 131, 132, 134A-B, 135, and 136.

Sample Program — Astrophysics Specialization

FALL	WINTER	SPRING
Junior		
	Physics 137	Physics 144 or 145
Senior		
Physics 113B	Physics 125B	Physics 115B
Physics 139	Physics 138	Physics 144 or 145

Graduate Program

The Department offers the M.S. and Ph.D. degrees in Physics. These degrees are awarded in recognition of demonstrated knowledge of the basic facts and theories of physics and of a demonstrated capacity for independent research. Active programs of research are underway in high-energy physics, condensed matter physics, low-temperature physics, plasma physics, gravitational physics, and astrophysics.

In general, graduate study in the physics Ph.D. program is expected to be a full-time activity. Other proposed arrangements should be approved by the Graduate Committee. The normal time for completion of the Ph.D. is six years of full-time study, and the maximum time permitted is seven years. Students may pursue the M.S. degree on either a full-time or part-time basis.

Complementing the formal courses, the Department offers regular colloquia and informal seminars. Graduate students are members of an intellectual community and are expected to participate fully in departmental activities. Attendance at colloquia is considered an essential part of graduate study. In addition, there are regular weekly research seminars in condensed matter, high-energy, and plasma physics, and astrophysics.

Sources of support available to graduate students include teaching assistantships, research assistantships, and fellowships. Students planning to pursue graduate work in Physics should obtain a copy of the Department's graduate brochure.

Students admitted into the graduate program in Physics and Astronomy may elect to pursue the M.S. or Ph.D. degree with a concentration in Chemical and Materials Physics, as described in a later section.

MASTER OF SCIENCE IN PHYSICS

The requirements for the M.S. degree are (1) at least three quarters of residence; (2) mastery of graduate course material, which must be demonstrated by passing, with a grade of B or better, a minimum of eight quarter courses including: Physics 211, 213A-B, 215A, 223, at least one other course numbered between 200 and 259, and two other courses approved by the graduate advisor; and (3) either Option A, a research project and written thesis, or Option B, a comprehensive written examination.

A typical program of study for the M.S. degree consists of the following nine courses: Physics 211 (Classical Mechanics), 213A-B (Electromagnetic Theory), 215A (Quantum Mechanics), 223 (Numerical Methods), 224 (Discoveries and Inventions of Modern Physics), 206 (Laboratory Skills) for experimentalists or 212 (Mathematical Physics) for theorists, plus two electives chosen from Physics 215B or undergraduate upper-division courses in related areas. Students following Option B should take Physics 214A.

(The requirements for the M.S. degree with a concentration in Chemical and Materials Physics differ from these.)

DOCTOR OF PHILOSOPHY IN PHYSICS

The principal requirements for the Ph.D. degree are a minimum of six quarters of residence, passage of a written and an oral examination, and successful completion and defense of a dissertation reporting results of original research. In addition, the Ph.D. candidate must complete certain graduate course requirements. There is no foreign language requirement.

Course Requirements. Students are required to exhibit mastery of the basic sequences—Classical Mechanics, Electromagnetic Theory, Quantum Mechanics, Mathematical Physics, and Statistical Physics. A minimum of 12 quarter courses including 211, 212A, 213A-B, 214A, 215A-B, 223, at least two other courses numbered between 200 and 259, and two other courses approved by the graduate advisor, must be passed with a grade of B or better. Students are strongly encouraged to take Physics 211, 212A, 213A-B, 214A, 215A-B, 223, and 206 (for experimentalists) in their first year of study. It is expected that students, having selected a research specialty, will ordinarily take the core courses in that subject in their second year of study. Students pursuing research in elementary particle physics ordinarily complete Physics 215C during their first year and Physics 234A-B-C and 235A-B during their second year. Students pursuing research in plasma physics ordinarily complete Physics 239A during their first year and Physics 239B-C-D their second year; Physics 249 is also recommended. Students pursuing research in condensed-matter physics ordinarily take Physics 238A-B-C during their second year. Students pursuing research in astrophysics/cosmology ordinarily complete Physics 240A during spring of their first year; 240B, C in their second year; and one or more of Physics 241A, B, C, D in their second or subsequent years.

(The requirements for the Ph.D. degree with a concentration in Chemical and Materials Physics differ from these, as outlined on the next page.)

Comprehensive Examination. Progress toward the degree is assessed by a written comprehensive examination covering a broad range of fundamentals of physics at the graduate and advanced undergraduate levels. It is offered twice a year, and a student is allowed a maximum of three attempts. The first attempt must occur before the end of the fall quarter of the student's second year, and the examination must be passed by the end of spring quarter of the student's second year.

Advancement to Ph.D. Candidacy. For advancement to Ph.D. candidacy, a student must pass an oral advancement examination. It is typically taken within one year of successful completion of the comprehensive examination. To satisfy normal progress toward the degree, it must be taken by the end of the student's third year. The candidacy committee that administers this examination will contain one or two faculty members from outside the Department. This oral examination will cover material principally related to the broad and general features of the student's dissertation area.

Teaching Program. Experience in teaching is an integral part of the graduate program, and all Ph.D. students are required to participate in the teaching program for at least three quarters during their graduate careers. All new teaching assistants are required to enroll in Physics 269. Students who are not citizens from countries where English is either the primary or dominant language as approved by the UCI Graduate Council must pass either the Test of Spoken English (TSE) or the UCI SPEAK (Speaking Proficiency English Assessment Kit) examination. One of these tests must be passed before such a student can qualify for a teaching assistantship in order to fulfill the Department's teaching requirement. The Department expects one of these tests to be passed by the end of the student's second year at UCI.

Dissertation. A dissertation summarizing the results of original research performed by the student under the supervision of a doctoral committee, appointed by the Department Chair on behalf of the Dean of Graduate Studies and the Graduate Council, will be required for the Ph.D. degree. A criterion for the acceptability of a dissertation by the Department is that it be suitable for publication in a scientific journal. The dissertation must not have been submitted to any other institution prior to its submission to the UCI Physics and Astronomy Department.

Defense of Dissertation. Upon completion of the dissertation, the student will take an oral examination, open to the public, before the doctoral committee.

CONCENTRATION IN CHEMICAL AND MATERIALS PHYSICS

This is an interdisciplinary program between condensed matter physics and physical chemistry, which is designed to eliminate the barrier between these two disciplines. Students with B.S. degrees in Physics, Chemistry, or Materials Science and Engineering, are encouraged to apply to the program. The goal of the concentration in Chemical and Materials Physics (ChaMP) is to provide students with a broad interdisciplinary education in the applied physical sciences that emphasizes modern laboratory and computational skills. The program accepts students for both the M.S. and the Ph.D. degrees. Upon admission to the program, students are assigned two faculty advisors, one from the Department of Physics and Astronomy, and one from the Department of Chemistry, to provide guidance on curriculum and career planning.

The curriculum for the M.S. program includes a summer session to assimilate students with different undergraduate backgrounds; formal shop, laboratory, and computational courses; a sequence on current topics to bridge the gap between fundamental principles and applied technology; and a course to develop communication skills. The required courses include thirteen core courses and three electives (subject to advisor approval) as follows: **Core:** Physics 206, 207, 228, 229A, 266; Chemistry 231A-B or Physics 215A-B, Chemistry 231C, 232A-B; one course from each of the following three groups: Physics 211 or 222; Physics 133 or 238A or Chemistry 236; Physics 129 or 273 or Chemistry 139. **Electives:** Physics 134, 213C, 223, 224, 229B, 233A, 233B, 238A, Chemistry 213, 225, 226, 232C, 233, 243, 248, 249, Engineering EECS278, MSE201, MSE259A. In addition to the required courses, M.S. students complete a master's thesis. The M.S. program prepares students to compete for high-tech jobs or to begin research toward a Ph.D. degree.

Successful completion of the M.S. degree requirements qualifies students for the Ph.D. program. Ph.D. students must also pass a comprehensive examination by the end of their second year of graduate study. A candidacy examination is expected to be completed within a year of starting the Ph.D. program. The examination is comprised of two parts: (a) a written report on a topic to be determined in consultation with the research advisor and (b) an oral report on research accomplished and plans for completion of the Ph.D. dissertation.

Courses in Physics

LOWER-DIVISION

NOTE: The Department of Physics and Astronomy strictly enforces all course prerequisites. Courses with sequential designations (for example, 1A-B-C) indicate multiple-quarter courses; *each course in a sequence is prerequisite to the one following.*

3A-B-C Basic Physics (4-4-4) F, W, S, Summer. Lecture, three hours; discussion, one hour. **3A:** Vectors; motion, force, and energy. **3B:** Fluids; heat; electricity and magnetism. **3C:** Waves and sound; optics; quantum ideas; atomic and nuclear physics; relativity. Prerequisite or corequisite: Mathematics 2A-B. **(II)**

3LB Basic Physics Laboratory (1.5) W, S, Summer. Laboratory, three hours. Practical applications of electronics and classical physics to biology. Goals include skill to use oscilloscope and other basic instrumentation. **(II)**

3LC Basic Physics Laboratory (1.5) S, Summer, F. Laboratory, three hours. Practical applications of physics to medical imaging. Topics include optics, radioactivity, and acoustics. Prerequisite: Physics 3LB. **(II)**

7A-B-D Classical Physics (4-4-4) F, W, S; W, S, Summer. Lecture, three hours; discussion, one hour. **7A:** Units; vectors; motion; momentum; force. **7B:** Energy; rotation and gravity. **7D:** Electricity and magnetism. Corequisites for 7A-B-D: corresponding quarters of Physics 7LA-LB-LD; Mathematics 2A-B and 2C or 2D. Physics 7A and Physics 1 may not both be taken for credit. **(II)**

7LA-LB-LD Classical Physics Laboratory (1-1-1) F, W, S; W, S, Summer. Laboratory, two hours. Experiments related to lecture topics in Physics 7A-B-D. Corequisite: corresponding quarter of Physics 7A-B-D. **(II)**

7E Classical Physics (4) F, Summer. Lecture, three hours; discussion one hour. Fluids; oscillations; waves; and optics. Prerequisites: Physics 7B, Mathematics 2B. **(II)**

COURSES FOR NON-MAJORS

Course numbers between 14 and 21 are assigned to courses especially designed for students majoring in programs other than the physical sciences.

14 Physics of Energy and the Environment (4). Lecture, three hours. The physics of society's energy production and consumption, and of their influences on the environment. Topics include fossil and renewable energy resources; nuclear power; prospects for a hydrogen economy; efficient and environmentally benign transportation; efficient home and commercial energy usage. **(II)**

15 Physics of Music (4). Lecture, three hours. Introduces basic physical principles underlying generation and properties of music, including basic properties of sound waves, musical scales and temperament, musical instruments, and acoustics of music halls. No mathematics background required, but high school algebra is recommended. **(II)**

16 Physics of Weapons and Their Control (4). Lecture, three hours. Introduction to physics related to issues of peace and conflict. Topics include: nuclear and non-nuclear weapons, delivery systems, missile defense systems, satellite surveillance systems, technology for homeland security, and arms control. **(II)**

17 Physics of Athletics (4). Lecture, three hours. Introduces basic physical principles behind motion. Examples are drawn from a range of athletic endeavors (such as ice skating, baseball, diving, and dance). No mathematics background required, but high school algebra is recommended. **(II)**

18 How Things Work (4) S. Lecture, three hours. Survey of the physical basis of modern technology, with an emphasis on electronics and materials. Topics include power generation and distribution, communication (radio, TV, telephone, computers, tape recorders, CD players), imaging (optics, x-rays, MRI), and modern materials (alloys, semiconductors, superconductors, polymers, ceramics, liquid crystals). **(II)**

19 Great Ideas of Physics (4). Lecture, three hours. Introduces nonscience majors to physics, examining important breakthroughs and controversies. Potential topics: Einstein's Relativity; Heisenberg's Uncertainty Principle; black holes; extra-dimensions; antimatter. Case studies illustrate the essential nature of scientific review and independent confirmation of results. No mathematics background required. **(II)**

20 Physical Science of the Earth and Cosmos. Introduction to the physical environment. The formation, structure, and evolution of the Earth, planets, stars, galaxies, and the universe as a whole.

20A Introduction to Astronomy (4) F, S. History of astronomy. Underlying physics. Objects in the solar system and how they are studied. Properties of stars: their formation, structure, and evolution. Pulsars and black holes. Galaxies and quasars. **(II)**

20B Cosmology: Man's Place in the Universe (4) W. "Cook's Tour" of the universe. Ancient world models. Evidence for universal expansion; the size and age of the universe and how it all began. The long-range future and how to decide the right model. Anthropic principle. **(II)**

20C Observational Astronomy (4). Lecture, three hours; discussion, one hour. Fundamental observational techniques used in astronomy, including the analysis and interpretation of images and spectra that allow students to determine orbits of planets and moon, time evolution of supernovae, ages of star clusters, Hubble's Law. Naked-eye observations of the night sky. Observations of stars and galaxies with the UCI 24-inch telescope. Current events in observational astronomy. Prerequisites: Physics 20A, 20B. **(II)**

20D Space Science (4) S. Motions of planets, satellites, and rockets. Propulsion mechanisms and space flight. The solar radiation field and its influence on planets. The interplanetary medium, solar wind, and solar-terrestrial relations. **(II)**

21 Special Topics in Physics (4). Lecture, three hours. Topics vary. Past topics have included physics and music, Newton, planetary science. Lectures on areas of special interest in physics are used to introduce students to scientific method, fundamental laws of science, qualitative and quantitative analysis of data. May be repeated for credit as topics vary. **(II)**

ADVANCED LOWER-DIVISION

50 Mathematical Methods for Physical Science (4) S. Lecture, three hours; discussion, one hour. Mathematica and its applications to linear algebra, differential equations, and complex functions. Fourier series and Fourier transforms. Other topics in integral transforms. Corequisite: Mathematics 2E. Prerequisites: Mathematics 2J and 3D.

51A-B Modern Physics (4-4) W, S. Lecture, three hours; discussion, one hour. **51A:** Wave-particle duality; quantum mechanics; special relativity; statistical mechanics. Prerequisites: Physics 7E and Mathematics 2D. **51B:** Atoms; molecules; solids, nuclei; elementary particles.

52A-B-C Fundamentals of Experimental Physics (2-2-2) F, W, S. Laboratory, four hours. **52A:** Optics: lenses, mirrors, polarization, lasers, optical fibers, interference, spectra. Corequisite: Physics 7E. **52B:** Circuits: oscilloscope, meters, DC and AC circuits. Corequisite: Mathematics 2J. Prerequisite: Physics 7D. **52C:** Data analysis: random and systematic errors, curve fitting; nuclear counting; quantum experiments. Prerequisite: Physics 51A.

53 Introduction to C and Numerical Analysis (4) S. Introduction to structured programming; in-depth training in C. Elementary numerical methods applied to physics problems. Prerequisites: Mathematics 2J and 3D.

H90 The Idiom and Practice of Science (4) W. Lecture, three hours; discussion, two hours. A series of fundamental and applied scientific problems of social relevance. Possible topics include Newton's Laws, calculus, earthquake physics, and radiation. Open only to members of the Campuswide Honors Program. Formerly Physics H90A. **(II)**

99 General Physics Seminar (1) F, W, S. Designed to introduce undergraduate students to current topics in physics. Focus is discussion of selected readings on current research issues. May be repeated for credit.

UPPER-DIVISION

100 Computational Methods (4) F, W, S. Lecture, three hours; laboratory, six hours. Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science. Prerequisite: consent of instructor. Concurrent with Physics 229A.

106 Laboratory Skills (4 to 6) F, W, S. Lecture, three hours; laboratory, six to ten hours. Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Prerequisite: consent of instructor. Concurrent with Physics 206 and Chemistry 206.

111A-B Classical Mechanics (4-4) F, W. Lecture, three hours; discussion, one hour. One dimensional motion and oscillations; three-dimensional motion, non-inertial coordinates, conservation laws, and Lagrangian and Hamiltonian dynamics; rigid body motion and relativity. Corequisite: Physics 50. Prerequisites: Physics 7E; Mathematics 2J and 3D.

112A-B Electromagnetic Theory (4-4) F, W. Lecture, three hours; discussion, one hour. Electric, magnetic, and gravitational fields and potentials; electrodynamics; mechanical and electromagnetic waves and radiation. Corequisite: Physics 50. Prerequisites: Physics 7D; Mathematics 2E.

113A-B-C Quantum Physics (4-4-4) S, F, W. Lecture, three hours; discussion, one hour. Inadequacy of classical physics; time independent and time dependent Schrodinger equation; systems in one, two, and three dimensions; matrices; Hermitian operators; symmetries; angular momentum; perturbation theory; scattering theory; applications to atomic structure; emphasis on phenomenology. Prerequisites: Physics 111B and 112B.

115A Statistical Physics (4) S. Lecture, three hours. Microscopic theory of temperature, heat, and entropy; kinetic theory; multicomponent systems; quantum statistics. Prerequisite: Physics 111A.

115B Thermodynamics (4) S. Lecture, three hours. Macroscopic theory of temperature, heat, and entropy; mathematical relationships of thermodynamics; heat engines; phase transitions. Prerequisite: Physics 115A.

120 Electronics for Scientists (4) F. Lecture, two hours; laboratory, four hours. Applications of modern semiconductor devices to physical instrumentation. Characteristics of semiconductor devices, integrated circuits, analog and digital circuits. Prerequisite: Physics 52B or consent of instructor.

121 Advanced Laboratory (4) W, S. Lecture, one hour; laboratory, eight hours. Experiments in atomic, condensed matter, nuclear, particle, and plasma physics. Introduction to instrumentation and a first experience in the research laboratory. Prerequisites: Physics 51B and 52C. May be taken for credit three times.

125A-B Mathematical Physics (4-4) F. Lecture, three hours; discussion, one hour. Complex variables; Legendre and Bessel functions; complete sets of orthogonal functions; partial differential equations; integral equations; calculus of variations; coordinate transformations; special functions and series. Prerequisite: Physics 113A.

129 Technical Writing and Communication Skills (4) F, W, S. Lecture, four hours. Workshop in writing technical reports, journal articles, proposals. Oral presentations. Communicating with the public. May not be used in satisfaction of any School or departmental requirement. Prerequisite: upper-division standing; satisfaction of the lower-division writing requirement. Open to Physics majors only. Same as Chemistry 139 and Mathematics 190.

131 Special Topics in Computational Physics (4). Lecture, three hours. Modern symbolic and numerical techniques on state-of-the-art computers for solving problems in classical and quantum mechanics, fluids, electromagnetism, and mathematical physics. Prerequisites: Physics 53, 113A, and 115A. May be repeated for credit as topic varies. Concurrent with Physics 231.

CAPSTONE SEMINARS

NOTE: Some of the upper-division courses listed below have one or two hours of discussion weekly in addition to the lectures. Students should refer to the quarterly *WebSOC, Searchable Schedule of Classes* for specific information.

132 Introduction to Nuclear Physics (4). Lecture, three hours. Nucleons and nuclear structure, radioactivity, neutron-proton scattering, the deuteron, nuclear reactions. Prerequisite: Physics 113A.

133 Introduction to Condensed Matter Physics (4) S. Lecture, three hours. Phenomena of solids and their interpretation in terms of quantum theory. Prerequisites: Physics 113B and 115A.

134A Optics (4) F of even years. Lecture, three hours; discussion, one hour. Fundamentals of geometrical and physical optics. Lenses and mirrors, interference and diffraction, the eye and vision, instrumentation for astronomy and medicine. Corequisite: Physics 112B. Prerequisite: Physics 112A.

134B Modern Optics (4) W of odd years. Lecture, three hours. Interaction of radiation with matter; lasers; nonlinear optics; optical properties of solids; absorption and scattering of light; modern spectroscopic techniques. Corequisite: Physics 112B. Prerequisite: Physics 112A. Formerly Physics 134.

135 Introduction to Plasma Physics (4) F. Lecture, three hours. Ionization and discharge mechanisms; microscopic motions and kinetic equations; macroscopic fluid theories; electrodynamics of plasma; waves and instabilities; examples of laboratory and cosmic phenomena. Prerequisite: Physics 112B.

136 Introduction to Particle Physics (4) S. Lecture, three hours. Experimental techniques and theoretical concepts of high-energy phenomena: accelerators and detectors; classification of particles and interactions; particle properties; symmetries and mass multiplets; production and decay mechanisms. Prerequisite: Physics 113B.

137 Introduction to Cosmology (4) W. Lecture, three hours; discussion, one hour. Solution of the differential equations governing the expansion of the Universe. Observational determinations of the parameters governing the expansion. Big Bang inflation, primordial nucleosynthesis, and cosmic microwave background. Dark matter, dark energy, and large-scale structure of the Universe. Prerequisites: Physics 111A, Mathematics 3D.

138 Extragalactic Astrophysics (4) W. Lecture, three hours; discussion, one hour. Introduction to the solar neighborhood, Milky Way, and other galaxies. Interstellar medium. Star formation. Stellar populations. Evolution of spiral, elliptical, and irregular galaxies. Supermassive black holes, quasars, and active galaxies. Galaxies as probes of the expansion rate of the Universe. Prerequisites: Physics 111A-B.

139 Observational Astrophysics (4) F. Lecture, one hour; laboratory, eight hours. Telescopes and astronomical observations, imaging with CCD detectors and image processing techniques. Photometry and spectroscopy of stars, galaxies, and quasars. Advanced imaging techniques such as deconvolution, adaptive optics, and interferometry. Prerequisites: Physics 52A-B-C; Physics 53 or equivalent computing experience.

144 Stellar Astrophysics (4) S of odd years. Lecture, three hours. Stars: their structure and evolution; physical state of the interior; the Hertzprung-Russell diagram, stellar classification, and physical principles responsible for the classification; star formation; nuclear burning; giant and dwarf stars; neutron stars and black holes. Prerequisites: Physics 51B, 111A, and 112A.

145 High-Energy Astrophysics (4) S of even years. Lecture, three hours. Production of radiation by high-energy particles, white dwarfs, neutron stars, and black holes. Evolution of galactic nuclei, radio galaxies, quasars, and pulsars. Cosmic rays and the cosmic background radiation. Prerequisites: Physics 51B, 111A, and 112A.

146A-B Biophysics of Molecules and Molecular Machines (4-4) F, W. Lecture, three hours. Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision. Prerequisite: Physics 115A or consent of instructor. Concurrent with Physics 230A-B.

147A-B Physics Principles in Biology and Medicine. (4-4). Physical principles in biology and medicine with examples from physiology and medical diagnostics and therapeutics. **147A:** Principles of imaging. **147B:** Ionizing radiation, radiology and nuclear medicine, magnetism and MRI, acoustics and ultrasound. Prerequisite for 147A: Physics 5E or 51B or equivalent; for 147B: Physics 147A.

EDUCATION

191 Field Experience in Physics Education (1 to 4) F, W, S. Students develop and perform physics assemblies at neighboring public schools. Prerequisites: Physics 7B-D-E or equivalent. Pass/Not Pass only. May be taken for a total of eight units.

192 Tutoring in Physics (1 to 2). Enrollment limited to students participating in the Society of Physics Students (SPS) tutoring program. This course satisfies no requirements other than contribution to the 180 units required for graduation. No more than 12 units may be counted toward the 180 units required. Prerequisite: Physics 7E or consent of instructor.

RESEARCH

195 Undergraduate Research (4). Open to seniors and occasionally to juniors with consent of the Department. Pass/Not Pass Only.

196A-B-C Thesis in Physics (4-4-4) F, W, S. Independent research conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted. Prerequisites: Physics 113A and consent of instructor; prerequisite for 196C: satisfactory completion of the lower-division writing requirement. Physics 196A-B-C and H196A-B-C may not both be taken for credit. Physics 196C and 197 may not both be taken for credit.

H196A-B-C Honors Thesis in Physics (4-4-4) F, W, S. Independent research conducted under the guidance of a faculty member. Students' research results are discussed in oral presentations, and a written proposal, progress report, and thesis are submitted. Prerequisite for H196C: satisfactory completion of the lower-division writing requirement. Open only to participants in the Honors Program in Physics and to Physics majors participating in the Campuswide Honors Program. Physics H196A-B-C and 196A-B-C may not both be taken for credit. Physics H196C and 197 may not both be taken for credit. Formerly Physics H195, H196.

197 Research Writing for Physics Majors (4) S. Students perform a research project under the guidance of a faculty member. Written and oral proposals, a progress report, and written and oral final reports are completed. Prerequisites: Physics 111A-B, 112A-B, 113A, 115A, and satisfactory completion of the lower-division writing requirement. Only one course from Physics 197, 196C, and H196C may be taken for credit.

199 Readings on Special Topics (1 to 4). Prerequisite: consent of the Department. Pass/Not Pass Only. May be repeated for credit.

GRADUATE

206 Laboratory Skills (4 to 6). Lecture, three hours; laboratory, six to ten hours. Introduces students to a variety of practical laboratory techniques, including lock-in, boxcar, coincidence counting, noise filtering, PID control, properties of common transducers, computer interfacing to instruments, vacuum technology, laboratory safety, basic mechanical design, and shop skills. Prerequisite: consent of instructor. Same as Chemistry 206. Concurrent with Physics 106.

207 Chemistry for Physicists (4). Lecture, three hours; discussion, one hour. Introduction to fundamental concepts in molecular structure and reactivity: theory of bonding, valence and molecular orbitals; structure and reactivity in inorganic chemistry; elements in molecular group theory; nomenclature in organic chemistry; and survey of macromolecules. Same as Chemistry 207.

208 Mathematics for Chemists (4). Lecture, three hours; discussion, one hour. Applications of mathematics to physical and chemical problems. Calculus of special functions, complex variables and vectors; linear vector spaces and eigenvalue problems. Differential equations. Same as Chemistry 208.

211 Classical Mechanics (4) F. Lecture, three hours. Variational principles, Lagrange's equations; applications to two body problems, small oscillation theory, and other phenomena. Hamilton's equations. Hamilton-Jacobi theory. Canonical transformations.

212A-B Mathematical Physics (4-4) F, S. Lecture, three hours. **212A:** Complex variables and integration; ordinary and partial differential equations; the eigenvalue problem. **212B:** Integral transforms; integral equations; probability and statistics; tensor analysis.

213A-B Electromagnetic Theory (4-4) W, S. Lecture, three hours. Electrostatics; magnetostatics; relativity; classical electron theory; fields in vacuum and matter; retardation; radiation and absorption; dispersion; propagation of light; diffraction; geometric optics; theories of the electric and magnetic properties of materials; scattering.

213C Modern Optics (4). Lecture, three hours. Modern optics, linear and non-linear. Waves in dispersive media, weak non-linearities, higher order interactions, light scattering, strong non-linearities, laser radiation. Prerequisites: Physics 213A-B.

214A-B Statistical Physics (4-4) S, F. Lecture, three hours. **214A:** Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac statistics; ideal and imperfect gases; thermodynamic properties of solids; transport theory. **214B:** Phase transitions; critical phenomena; cooperative phenomena; fluctuations.

214C Many Body Theory (4). Application of field theory methods, perturbative and non-perturbative, to many particle systems; second quantization, Feynman diagrams, linear response theory, and functional integral methods applied to the ground state and at finite temperature. Prerequisites: Physics 214A and 215A-B.

215A-B-C Quantum Mechanics (4-4-4) F, W, S. Lecture, three hours. **215A:** Foundations; Dirac notation; basic operators and their eigenstates; perturbation theory; spin. **215B:** Atomic physics; scattering theory, formal collision theory; semi-classical radiation theory; many body systems. **215C:** Quantization of the electromagnetic field; relativistic quantum mechanics; second quantization.

222 Hydrodynamics (4). Lecture, three hours. Hydrodynamics of a perfect fluid; two-dimensional problems, motion of an incompressible viscous fluid; Navier-Stokes equations; viscous fluids in rotation; motion in three dimensions; introduction to motion of a compressible fluid.

223 Numerical Methods (4). Lecture, three hours; laboratory, one hour. Introduction to theory and practice of modern numerical methods. Techniques are drawn from topics such as solution of differential equations, Monte Carlo methods, Fast Fourier transforms, and evaluation of special functions.

224 Discoveries and Inventions of Modern Physics (4). Lecture, three hours; discussion, one hour. Introduction to physical phenomenology intended to complement the more formal traditional physics curriculum, with topics drawn from atomic and nuclear physics, condensed matter, particle physics, plasma physics, and astrophysics.

228 Electromagnetism (4). Lecture, three hours; discussion, one hour. Maxwell's equations, electrodynamics, electromagnetic waves and radiation, wave propagation in media, interference and quantum optics, coherent and incoherent radiation, with practical applications in interferometry, lasers, waveguides, and optical instrumentation. Prerequisite: consent of instructor. Same as Chemistry 228.

229A-B Computational Methods (4-4). Lecture, three hours; laboratory, six hours. Mathematical and numerical analysis using Mathematica and C programming, as applied to problems in physical science. Prerequisite: consent of instructor. Same as Chemistry 229A-B. Physics 229A is concurrent with Physics 100.

230A-B Biophysics of Molecules and Molecular Machines (4-4) F, W. Lecture, three hours. Physical concepts and experimental and computational techniques used to study the structure and function of biological molecules and molecular machines with examples from enzyme action, protein folding, molecular motors, photobiology, chemotaxis, and vision. Concurrent with Physics 146A-B.

231 Special Topics in Computational Physics (4). Lecture, three hours. Modern symbolic and numerical techniques on state-of-the-art computers for solving problems in classical and quantum mechanics, fluids, electromagnetism, and mathematical physics. Concurrent with Physics 131. May be repeated for credit as topic varies. Formerly Physics 231A.

233A-B Fundamentals of Biomedical Imaging Systems (4-4) F, W. Lecture, three hours. Physical principles and methods of biomedical imaging systems. Linear systems, random processes, projection imaging, computed tomography, x-rays, nuclear medicine, ultrasound, optical imaging, NMR, EEG, MEG imaging and impedance tomography. Same as Engineering EECS202A-B.

234A Elementary Particle Physics (4) F. Lecture, three hours. Overview of Standard Model theory and phenomenology. Electromagnetic, strong and weak forces, quark model, interactions with matter, particle detectors and accelerators. Prerequisite: Physics 215C or consent of instructor.

234B-C Advanced Elementary Particle Physics (4-4) W, S. Lecture, three hours. SU(3)xSU(2)xU(1) model of strong, weak, and electromagnetic interactions. K-meson system and CP violation, neutrino masses and mixing, grand-unified theories, supersymmetry, introduction to cosmology and its connection to particle physics. Prerequisites: Physics 234A and 235A.

235A Quantum Field Theory (4) F. Lecture, three hours. Canonical quantization, scalar field theory, Feynman diagrams, tree-level quantum electrodynamics. Prerequisites: Physics 215C and completion of first-year graduate courses.

235B Advanced Quantum Field Theory (4) W. Lecture, three hours. Path-integral techniques, loop diagrams, regularization and renormalization, anomalies. Prerequisites: Physics 235A and completion of first-year graduate courses.

238A-B-C Condensed Matter Physics (4-4-4) F, W, S. Lecture, three hours. Bonding in solids; crystal symmetry and group theory, elastic properties of crystals; lattice vibrations, interaction of radiation with matter; cohesion of solids; the electron gas; electron energy bands in solids; ferromagnetism; transport theory; semiconductors and superconductors; many-body perturbation theory. Prerequisites: Physics 214A, 215B, either 228 or 213B, or consent of instructor.

239A-B-C-D Plasma Physics (4-4-4-4) S, F, W, S. Lecture, three hours. **239A:** Basic concepts, orbits, kinetic and fluid equations, Coulomb collisions, fluctuations, scattering, radiation. **239B:** Magnetic confinement, MHD equilibrium and stability, collisional transport. **239C:** Linear waves and instabilities, uniform un-magnetized and magnetized plasmas, non-uniform plasmas. **239D:** Nonlinear plasma physics, quasilinear theory, large-amplitude coherent waves, resonance broadening, strong turbulence.

240A Galactic Astrophysics (4) S. Lecture, three hours. The morphology, kinematics, and evolution of our Milky Way and other galaxies. Topics include stellar formation and stellar evolution, end states of stars (supernovae, neutron stars), the distribution of stars, interstellar gas and mass in galaxies. The Local Group.

240B Cosmology (4) F. Lecture, three hours. An introduction to modern cosmology set within the context of general relativity. Topics include the expansion history of the Universe, inflation, the cosmic microwave background, density fluctuations, structure formation, dark matter, dark energy, and gravitational lensing.

240C Radiative Processes in Astrophysics (4) W. Lecture, three hours. Exploration of radiation mechanisms (electron scattering, synchrotron emission, collisional excitation, and more) and radiative transfer through matter including absorption and emission. Includes such observational astrophysics topics as spectroscopic study of atoms and nuclei, X-rays, and cosmic rays.

241A Solar System and Extrasolar Planets (4) F. Lecture, three hours. Observational and theoretical study of the Solar System, present-day dynamical state of the Solar System (asteroids, Kuiper Belt objects, Oort cloud), planetary formation, detection of extrasolar planets and their physical properties. Prerequisites: Physics 211; 240A and 240C are highly recommended.

241B Stellar Astrophysics (4) W. Lecture, three hours. Physics of stellar interiors and equations of stellar structure. Stellar atmospheres and absorption processes. Introduction to stellar winds. Thermonuclear reactions, nucleosynthesis, and solar neutrinos. Binary stars and mass accretion. White dwarfs, supernovae, neutron stars, and black holes. Prerequisites: Physics 211, 240A.

241C Extragalactic Astrophysics (4) W. Lecture, three hours. The physics and phenomenology of galaxies; star formation, interstellar medium, and intergalactic medium. Galaxy structure and dynamics. Galaxy evolution, stellar populations, and scaling relations; the relationship between galaxy properties and environment. Galaxy clusters and active galactic nuclei. Prerequisites: Physics 211, 240A.

241D Early Universe Physics (4) S. Lecture, three hours. Includes a thorough quantum treatment of the generation of perturbations during inflation and various topics related to kinetic theory in an expanding Universe. Other topics include the astrophysics and cosmology of weakly interacting particles. Prerequisites: Physics 234A, and either 240B or 255.

245 Special Topics in Biological Physics (4) F, W, S. Lecture, three hours. Outlines and emphasizes a subarea of biological physics that is undergoing rapid development. May be repeated for credit.

246 Special Topics in Astrophysics (4) F, W, S. Lecture, three hours. Outlines and emphasizes a subarea of astrophysics that is undergoing rapid development. Prerequisites: Physics 236A-B-C or consent of instructor. May be repeated for credit.

247 Special Topics in High-Energy Physics (4) F, W, S. Lecture, three hours. Current topics in high-energy physics. Includes topics from accelerator and non-accelerator-based research fields. May be repeated for credit.

248 Special Topics in Condensed Matter Physics (4) F, W, S. Lecture, three hours. Outlines and emphasizes a subarea of condensed matter physics that is undergoing rapid development. May be repeated for credit.

249 Special Topics in Plasma Physics (4) F, W, S. Lecture, three hours. Outlines and emphasizes a subarea of plasma physics that is undergoing rapid development. Satisfactory/Unsatisfactory only. Prerequisites: Physics 239A-B. May be repeated for credit.

255 General Relativity (4). Lecture, three hours. An introduction to Einstein's theory of gravitation. Tensor analysis, Einstein's field equations, astronomical tests of Einstein's theory, gravitational waves.

260-299: SEMINARS AND RESEARCH

These courses are designed to acquaint students with the basic concepts and methods underlying current research activity in selected branches of physics.

260A-B-C Seminar in Condensed Matter Physics (1-1-1) F, W, S. Seminar designed to acquaint students with recent advances in solid state physics. Lecturers from the Department of Physics and Astronomy (both faculty and graduate students), other UCI departments, and other institutions. Satisfactory/Unsatisfactory only. Prerequisite: consent of instructor. May be repeated for credit.

261A-B-C Seminar in Plasma Physics (1-1-1) F, W, S. Advanced topics in plasma physics: wave propagation, nonlinear effects, kinetic theory and turbulence, stability problems, transport coefficients, containment, and diagnostics. Applications to controlled fusion and astrophysics. Satisfactory/Unsatisfactory only. Prerequisites: Physics 239A-B-C-D or equivalent.

263A-B-C Seminar in High-Energy Physics (1-1-1) F, W, S. Discussion of advanced topics and reports of current research results in theoretical and experimental high-energy physics and cosmic rays. Satisfactory/Unsatisfactory only. Prerequisite: consent of instructor. May be repeated for credit.

265A-B-C Seminar in Astrophysics (1-1-1) F, W, S. Acquaints students with current research in astrophysics. Lecturers from the Department of Physics and Astronomy and from other institutions. Satisfactory/Unsatisfactory only. May be repeated for credit.

266 Current Topics in Chemical and Materials Physics (4). Lecture, three hours; discussion, one hour. The subjects covered vary from year to year. Connection between fundamental principles and implementations in practice in science, industry, and technology. Prerequisite: consent of instructor. Same as Chemistry 266.

267A-B-C Current Problems in High-Energy Physics (4-4-4) F, W, S. Lecture, three hours. Presentation and discussion of current research and theory in high energy physics. Lectures given by staff and students. May be repeated for credit.

269 Seminar in Teaching Physics (1) F. Lecture techniques; teaching problem-solving skills; group learning; practicum. Required of all new Teaching Assistants.

273 Technical Communication Skills (2). Lecture, one hour; discussion, three hours. Development of effective communication skills, oral and written presentations, through examples and practice. Satisfactory/Unsatisfactory only. Prerequisite: consent of instructor.

295 Experimental Research (4 to 12). With the approval of a faculty member, a student may pursue a research program in experimental physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

296 Theoretical Research (4 to 12). With approval of a faculty member, a student may pursue a research program in theoretical physics. Typical areas include astrophysics, condensed matter physics, elementary particle physics, and plasma physics.

298 Physics Colloquium (1). Seminar held each week, in which a current research topic is explored. Frequently, off-campus researchers are invited to present the seminar, and on occasion a faculty member or researcher from the Department will speak. Satisfactory/Unsatisfactory only. May be repeated for credit.

299 Reading of Special Topic (4 to 12). With special consent from a faculty member who will agree to supervise the program, a student may receive course credit for individual study of some area of physics.

395 Laboratory Teaching (1) F, W, S, Summer. Lecture, two hours. Required of and limited to teaching assistants of undergraduate laboratory courses. Designed to teach the necessary skills required of teaching assistants for these courses. Satisfactory/Unsatisfactory only. May be repeated for credit.

399 University Teaching (1 to 4) F, W, S. Required of and limited to Teaching Assistants.

SCHOOL OF SOCIAL ECOLOGY

C. Ronald Huff, **Dean**

300 Social Ecology I
Undergraduate Counseling: (949) 824-6861
Graduate Counseling: (949) 824-5918
World Wide Web: http://www.seweb.uci.edu/

Faculty

Phyllis F. Agran, M.D. University of California, Irvine, M.P.H. Harvard University, *Chief of Pediatric Gastroenterology and Professor of Pediatrics and Social Ecology*

Hoda Anton-Culver, Ph.D. St. Andrews University (Scotland), *Director of the Center for Cancer Genetics Research and Prevention, Chief of Epidemiology, and Professor of Medicine (Epidemiology and Preventive Medicine) and Social Ecology*

Dean Bradford Baker, M.D. University of California, San Diego; M.P.H. University of California, Berkeley, *Director of the UCI Center for Occupational and Environmental Health and Professor of Clinical Medicine, Community and Environmental Medicine, and Social Ecology*

M. Victoria Basolo, Ph.D. University of North Carolina, Chapel Hill, *Associate Professor of Social Ecology* (housing and community development policy within the context of governmental relations)

Victoria A. Beard, Ph.D. University of British Columbia, *Assistant Professor of Social Ecology* (planning in developing countries, community-based planning, poverty reduction, planning theory and population studies)

Arnold Binder, Ph.D. Stanford University, *Professor Emeritus of Social Ecology* (research methodology, juvenile delinquency, police organization and methods)

Marlon G. Boarnet, Ph.D. Princeton University, *Chair of the Department of Planning, Policy, and Design and Professor of Social Ecology and Economics* (urban economics, urban planning, urban economic development)

Scott A. Bollens, Ph.D. University of North Carolina, *Professor of Social Ecology* (ethnicity and urban planning, urban growth policy, metropolitan governance, intergovernmental approaches to planning)

Thomas C. Buchmueller, Ph.D. University of Wisconsin, Madison, *Associate Professor of Management, Economics, and Social Ecology* (health policy and promotion)

Michael L. Burton, Ph.D. Stanford University, *Department Chair and Professor of Anthropology and Professor of Social Ecology* (economic, ecological, and psychological anthropology)

Lawrence F. Cahill, Ph.D. University of California, Irvine, *Associate Professor of Neurobiology and Behavior and of Social Ecology*

Kitty C. Calavita, Ph.D. University of Delaware, *Professor of Social Ecology and Sociology* (sociology of law, criminology, social deviance, immigration, and inequality)

Elizabeth E. Cauffman, Ph.D. Temple University, *Assistant Professor of Social Ecology* (adolescent development, mental health, juvenile justice, legal and social policy)

Susan Charles, Ph.D. University of Southern California, *Assistant Professor of Social Ecology* (life-span development, emotion and cognition, emotion and health)

Chuansheng Chen, Ph.D. University of Michigan, *Associate Professor of Social Ecology* (cross-cultural psychology, socialization of achievement, adolescent development)

Kenneth S. Chew, Ph.D. University of California, Berkeley, *Associate Professor of Social Ecology and Sociology* (social demography, epidemiology and public health)

K. Alison Clarke-Stewart, Ph.D. Yale University, *Associate Dean of Research, School of Social Ecology, and Professor of Social Ecology* (development in early childhood and the effects of variation in the social environment)

Peter Clecak, Ph.D. Stanford University, *Professor Emeritus of Social Ecology*

Simon A. Cole, Ph.D. Cornell University, *Assistant Professor of Social Ecology* (science, technology, law, and criminal justice)

Ross F. Conner, Ph.D. Northwestern University, *Associate Professor of Social Ecology* (evaluation research and social psychology, health promotion)

Susan Bibler Coutin, Ph.D. Stanford University, *Associate Professor of Social Ecology* (anthropology of law, law and society, immigration, political activism, human rights, Central America)

Thomas J. Crawford, Ph.D. Harvard University, *Senior Lecturer with Security of Employment Emeritus, Social Ecology* (attitude theory and social problems research)

Elliott Currie, Ph.D. University of California, Berkeley, *Professor of Social Ecology* (criminal justice policy in the United States and other countries; causes of violent crime; social context of delinquency and youth violence; etiology of drug abuse and the assessment of drug policy; race and criminal justice; the social and personal impact of poverty and unemployment)

Kristen Day, Ph.D. University of Wisconsin, Milwaukee, *Associate Professor of Social Ecology* (urban issues in environment-behavior studies)

Ralph Delfino, M.D. University of Chicago, Ph.D. McGill University (Canada), *Associate Professor of Medicine (Epidemiology), Pediatrics, and Social Ecology in Residence*

Sally S. Dickerson, Ph.D. University of California, Los Angeles, *Assistant Professor of Social Ecology* (health psychology, stress physiology, effects of social and emotional processes on physiology and health)

Joseph F. DiMento, Ph.D., J.D. University of Michigan, *Professor of Social Ecology and Management* (planning, land use and environmental law, use of social science in policy making, legal control of corporate behavior)

Peter Ditto, Ph.D. Princeton University, *Professor of Social Ecology* (psychological reactions to medical diagnoses, end-of-life medical decision making, the role of motivation and emotion in information processing)

John D. Dombrink, Ph.D. University of California, Berkeley, *Professor of Social Ecology and Sociology* (crime and criminal justice, deviance and social control)

C. David Dooley, Ph.D. University of California, Los Angeles, *Professor of Social Ecology* (community psychology, epidemiology, economic change)

Rufus Edwards, Ph.D. University of Medicine and Dentistry of New Jersey and Rutgers, the State University of New Jersey, *Assistant Professor of Social Ecology* (particulate and VOC air pollution, European urban environments for the EXPOLIS project, improvements in the health of rural solid fuel using communities in the developing world, cross-cutting issues of health and climate change in developing nations)

Jonathon E. Ericson, Ph.D. University of California, Los Angeles, *Chair of the Department of Environmental Health, Science, and Policy and Professor of Social Ecology and of Community and Environmental Medicine* (environmental health science; archaeological chemistry)

Ilona S. Federenko, Ph.D. University of Trier (Germany), *Assistant Professor of Social Ecology* (psychobiology of stress, developmental psychobiology, behavior genetics)

Martha Feldman, Ph.D. Stanford University, *Professor of Social Ecology, Management, Sociology, and Political Science, and Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management* (organization theory and behavior, stability and change in organizations, decision making and information processing)

Paul J. Feldstein, Ph.D. University of Chicago, *Professor of Management, Economics, and Social Ecology, and Robert Gumbiner Chair in Health Care Management* (economics of health care)

Ajay Garde, Ph.D. University of Southern California, *Assistant Professor of Social Ecology* (urban design, urban form, sustainable growth)

Chad P. Garner, Ph.D. Oxford University, *Assistant Professor of Social Ecology and Medicine (Epidemiology)* (development of statistical genetic methods for human complex disease and in population genetics theory, focusing on the analysis of genetic variation)

Gilbert L. Geis, Ph.D. University of Wisconsin, *Professor Emeritus of Social Ecology* (crime and criminal justice)

David Theo Goldberg, Ph.D. City University of New York Graduate School and Center, *Director of the UC Humanities Research Institute and Professor of African American Studies and Social Ecology* (race, racism, race and the law, political theory, South Africa)

Wendy A. Goldberg, Ph.D. University of Michigan, *Associate Professor of Social Ecology* (developmental psychology, children and their families, transition to parenthood, social policy)

Michael R. Gottfredson, Ph.D. State University of New York, Albany, *Executive Vice Chancellor and Professor of Social Ecology and Sociology* (criminology, theory, crime and policy)

Lisa Grant, Ph.D. California Institute of Technology, *Assistant Professor of Social Ecology* (earthquake geology, paleoseismology, environmental geology, seismic hazard)

Ellen Greenberger, Ph.D. Harvard University, *Professor of Social Ecology* (developmental psychology, adolescence and social institutions, work and the family, social policy)

Jutta Heckhausen, Ph.D. University of Strathclyde, *Professor of Social Ecology* (life-span development, primary and secondary control, cultural universals and differences)

F. Allan Hubbell, M.D., M.S.P.H. Baylor University College of Medicine, *Chief of Primary Care, Department Chair of Medicine, Professor of Medicine (General Internal Medicine and Primary Care) and Social Ecology, and Director of the Irvine Research Unit in Health Policy and Research*

C. Ronald Huff, Ph.D. Ohio State University, *Dean of the School of Social Ecology and Professor of Social Ecology and Sociology* (criminology and public policy)

Helen Ingram, Ph.D. Columbia University, *Professor of Social Ecology and Political Science, and Drew, Chace, and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation* (public policy, U.S.–Mexico relations, environmental resource management)

Mireille Jacobson, Ph.D. Harvard University, *Assistant Professor of Social Ecology and Economics* (labor economics, health economics, economics of crime and drug policy)

Larry Jamner, Ph.D. State University of New York at Stony Brook, *Professor of Social Ecology and Pharmacology* (health psychology, psychophysiology, algology)

Valerie Jenness, Ph.D. University of California, Santa Barbara, *Chair of the Department of Criminology, Law and Society and Professor of Social Ecology and Sociology* (links between divorce and social control, especially law, gender, and social change and social movements)

Paul D. Jesilow, Ph.D. University of California, Irvine, *Associate Professor of Social Ecology* (crime and criminal justice)

Chenyang (Sunny) Jiang, Ph.D. University of South Florida, *Associate Professor of Social Ecology and of Community and Environmental Medicine* (marine science, microbial ecology in marine environments)

Bryan Kemp, Ph.D. University of Southern California, *Clinical Professor of Medicine and Social Ecology*

Michael T. Kleinman, Ph.D. New York University, *Adjunct Professor of Community and Environmental Medicine and of Social Ecology*

Raul Perez Lejano, Ph.D. University of California, Los Angeles, *Assistant Professor of Social Ecology* (collaborative planning, environmental decision making, planning theories)

Richard Leo, Ph.D., J.D., University of California, Berkeley, *Associate Professor of Social Ecology* (sociology and history of American police interrogation practices, social psychology of false confessions to police, causes and consequences of miscarriage of justice in American criminal justice system)

Linda J. Levine, Ph.D. University of Chicago, *Associate Professor of Social Ecology* (relations between cognitive and emotional development, how emotions influence attention and memory, the development of children's strategies for coping with negative emotions)

Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Social Ecology and Cognitive Sciences* (cognitive psychology, human memory, psychology and law)

Salvatore R. Maddi, Ph.D. Harvard University, *Professor of Social Ecology* (personality, psychopathology, health psychology, creativity)

Richard Matthew, Ph.D. Princeton University, *Associate Professor of Social Ecology and Political Science* (international relations, environmental policy, ethics)

Cheryl Maxson, Ph.D. University of Southern California, *Associate Professor of Social Ecology* (crime and delinquency, youth violence, juvenile justice system and policing street gangs)

Sanjoy Mazumdar, Ph.D. Massachusetts Institute of Technology, *Professor of Social Ecology* (environmental studies and design, organizational analysis, management and planning, and social and behavioral aspects of architecture)

Richard McCleary, Ph.D. Northwestern University, *Professor of Social Ecology* (criminal justice, research methodology, statistics)

Michael G. McNally, Ph.D. University of California, Irvine, *Director of the Graduate Program in Transportation Science and Associate Professor of Civil and Environmental Engineering and of Social Ecology* (travel behavior, transportation systems analysis)

James W. Meeker, Ph.D., J.D. State University of New York, Buffalo, *Associate Dean of Student Affairs, School of Social Ecology, and Professor of Social Ecology and Sociology* (sociology of law, criminal justice, research methodology, statistics)

David S. Meyer, Ph.D. Boston University, *Professor of Sociology and Social Ecology*

Calvin Morrill, Ph.D. Harvard University, *Department Chair and Professor of Sociology and Professor of Social Ecology* (anthropology of law, sociology of culture, qualitative field methods)

Raymond W. Novaco, Ph.D. Indiana University, *Professor of Social Ecology* (human stress, aggression, community psychology)

Oladele Ogunseitan, Ph.D. University of Tennessee, *Professor of Social Ecology* (environmental health, microbiology, molecular ecology, environmental biotechnology, applied microbiology)

Betty H. Olson, Ph.D. University of California, Berkeley, *Professor of Social Ecology and of Community and Environmental Medicine* (aquatic microbiology, environmental health and molecular biology, water resources)

Cornelia Pechmann, Ph.D. Vanderbilt University, *Professor of Management and Social Ecology* (consumer behavior, advertising strategy, health care marketing, evaluation research)

Joan Petersilia, Ph.D. University of California, Irvine, *Professor of Social Ecology* (program evaluation, public policy, juvenile justice)

Mark P. Petracca, Ph.D. University of Chicago, *Department Chair and Associate Professor of Political Science and Associate Professor of Social Ecology*

Henry N. Pontell, Ph.D. State University of New York, Stony Brook, *Professor of Social Ecology and Sociology* (criminal justice, sociology of law, medical sociology)

JoAnn Prause, Ph.D. University of California, Irvine, *Lecturer with Security of Employment, Social Ecology* (statistics, quantitative epidemiology, employment typology)

Jodi Quas, Ph.D. University of California, Davis, *Assistant Professor of Social Ecology* (memory development, children's involvement in the legal system)

Karen S. Rook, Ph.D. University of California, Los Angeles, *Chair of the Department of Psychology and Social Behavior and Professor of Social Ecology* (gerontology, social support systems, subjective well-being and health)

Judy B. Rosener, Ph.D. Claremont Graduate School, *Senior Lecturer with Security of Employment, Management and Social Ecology* (business and government, cultural diversity, gender and management)

Michael D. Rugg, Ph.D. University of Leicester, *Director of the Center for the Neurobiology of Learning and Memory, and Professor of Neurobiology and Behavior, Cognitive Sciences, and Social Ecology*

Jean-Daniel M. Saphores, Ph.D. Cornell University, *Assistant Professor of Social Ecology, Civil and Environmental Engineering, and Economics* (environmental and natural resource economics and policy, transportation economics, planning and policy, quantitative methods)

Roxane Cohen Silver, Ph.D. Northwestern University, *Professor of Social Ecology and Medicine* (stress and coping, social psychology, health psychology)

Jennifer Skeem, Ph.D., University of Utah, *Assistant Professor of Social Ecology* (psychopathology and violence, mandated psychiatric treatment, psychology and law)

Kenneth A. Small, Ph.D. University of California, Berkeley, *Professor of Economics and Social Ecology*

David A. Smith, Ph.D. University of North Carolina, Chapel Hill, *Professor of Sociology and Social Ecology* (urbanization, comparative historical sociology, political sociology, world-system analysis)

Sharon Stern, Ph.D. University of Utah, *Lecturer with Security of Employment, Social Ecology* (water pollution and treatment, environmental pollution remediation, conservation biology, health and policy)

Daniel Stokols, Ph.D. University of North Carolina, *Professor of Social Ecology* (health impacts of environmental stressors, environmental design and social behavior)

Luis Suarez-Villa, Ph.D. Cornell University, *Professor of Social Ecology* (innovation and technology, economic and social development, regional analysis)

Eunkook Mark Suh, Ph.D. University of Illinois, *Associate Professor of Social Ecology* (health and well-being in social and ecological contexts)

William C. Thompson, Ph.D. Stanford University, J.D. University of California, Berkeley, *Professor of Social Ecology* (psychology and law, criminal justice, human judgment and decision making, use of social science in appellate litigation)

George E. Tita, Ph.D. Carnegie-Mellon University, *Assistant Professor of Social Ecology* (criminology, community context of violence, urban youth gangs, homicide studies)

Rudolpho D. Torres, Ph.D. Claremont Graduate University, *Associate Professor of Social Ecology, Chicano/Latino Studies, and Political Science* (urban political economy, Latino politics)

Elaine Vaughan, Ph.D. Stanford University, *Associate Professor of Social Ecology* (environmental assessment, risk perceptions, research methodology, social psychology)

James Diego Vigil, Ph.D. University of California, Los Angeles, *Professor of Social Ecology* (urban research, urban poverty, culture change, socialization and education, psychological anthropology, street gangs in cross-cultural perspective, Mexico and U.S. southwestern ethnohistory, and comparative ethnicity)

Pathik Wadwha, Ph.D. University of California, Irvine, *Assistant Professor of Psychiatry and Human Behavior and of Social Ecology* (biobehavioral processes in human pregnancy and life-span development, biobehavioral processes in breast cancer)

Carol K. Whalen, Ph.D. University of California, Los Angeles, *Professor of Social Ecology* (developmental psychopathology, childhood behavior disorders, child therapies, health psychology)

John M. Whiteley, Ed.D. Harvard University, *Professor of Social Ecology* (moral development, late adolescent to early adult development, social ecology of peace)

Argyrios Ziogas, Ph.D. University of Southern California, *Associate Adjunct Professor of Medicine (Epidemiology) and Social Ecology* (epidemiology of diseases with substantial environmental risk factors)

OVERVIEW

The School of Social Ecology is a unique interdisciplinary academic unit spanning the environmental, social, behavioral, and health sciences, as well as the relationship between law and society. The School is comprised of the Departments of Criminology, Law and Society; Environmental Health, Science, and Policy; Psychology and Social Behavior; and Planning, Policy, and Design. It has approximately 70 full-time faculty members, 2,560 undergraduate majors, and 240 graduate students. Social ecology applies scientific methods to the study of a wide range of recurring social and environmental problems. Among issues of long-standing interest in the School are crime and justice in society, social influences on human development over the life cycle, and effects of the physical environment on health and behavior. In summary, while ecology is the science of the relationship between organisms and their environments, *social ecology* is the science of the relationships between human populations and their environments.

The faculty is *multidisciplinary.* It includes psychologists with a variety of specialties (e.g., developmental, clinical, social, and environmental); sociologists; program evaluators; criminologists; lawyers; urban and regional planners; environmental health scientists; and environmental design specialists. Faculty members conduct research and teach courses that integrate concepts and perspectives of the several disciplines. This focus arises from commitment to the view that societal problems are so complex that their analysis requires *interdisciplinary* efforts (i.e., the joining of talents by people with different intellectual backgrounds). A number of faculty members are involved in interventions directed toward improving the way groups of individuals, institutions, and communities function. A number of others are involved in interventions aimed at improving the quality and control of the environment.

Research Facilities

Social Ecology I and II and the nearby Multipurpose Academic and Administrative (MPAA) Building house the School's research centers and feature many facilities for experimental research, such as wet laboratories for research and teaching in the environmental health sciences and behavioral assessment laboratories for research in human development, social relations, and legal studies. Wet laboratories are used for studying air and water pollution. Behavioral assessment laboratories are used for studying social phenomena such as parent-child interaction, cooperation among children, memory functions, hyperactivity, social support processes, and mock jury discussions.

The School also offers students up-to-date computing facilities and assistance to ensure that their skills prepare them for either advanced (graduate) work or for the changing needs of today's workplace, which increasingly demands skills in computing and information technology.

Degrees

Applied Ecology*	B.S.
Criminology, Law and Society	B.A., M.A.S., Ph.D.
Environmental Analysis and Design	B.A.
Environmental Health Science and Policy	M.S., Ph.D.
Planning, Policy, and Design	Ph.D.
Psychology and Social Behavior	B.A., Ph.D.
Social Ecology	B.A., M.A., Ph.D.
Urban and Regional Planning	M.U.R.P.

*Offered jointly with the School of Biological Sciences

Honors

Honors at graduation will be awarded to about 12 percent of the graduating seniors. Eligibility for such honors will be on the basis of grade point average (GPA). A minimum overall GPA of 3.5 is required. A general criterion is that students must have completed at least 72 units in residence at a University of California campus by the end of the winter quarter of the academic year in which they graduate. Final decisions concerning the awards of *summa cum laude, magna cum laude,* and *cum laude* are the responsibility of a committee chaired by the Associate Dean for Students. Other important factors are also considered (see page 52).

Undergraduate Program

The School of Social Ecology offers either a general interdisciplinary degree in Social Ecology or a more focused experience through degree programs in Applied Ecology; Criminology, Law and Society; Environmental Analysis and Design; and Psychology and Social Behavior.

Change of Major. Students who wish to change their major to one offered by the School should contact the Social Ecology Undergraduate Counseling Office for information about change-of-major requirements, procedures, and policies. Information is also available at http://www.due.uci.edu/Change_of_Major.html.

HONORS PROGRAM IN SOCIAL ECOLOGY

The Social Ecology Honors Program provides the opportunity for selected School of Social Ecology students to pursue advanced independent study. Admission to the program is based on formal invitation and application in the spring quarter of the junior year. In order to be considered, a student must have satisfied the following requirements: completion of all lower-division Social Ecology courses required for the major; completion of at least five upper-division Social Ecology courses with a grade point average of at least 3.5 in these courses; and achievement of an overall grade point average at UCI of at least 3.2. Acceptance into the program is based upon evidence of the student's ability, interest in research, and proposed thesis project. Successful completion of the program requires two quarters of supervised, independent work on a thesis research project (Social Ecology H190A-B) and written and oral presentation of an honors thesis (Social Ecology H190W).

CAREER OPPORTUNITIES

Graduates of the School of Social Ecology bring a distinctive cross-disciplinary perspective to the job market. The School provides a solid foundation for those students who seek jobs in planning departments, mental health settings, educational institutions, and a variety of community and governmental agencies. Many Social Ecology students find that their interdisciplinary training is also useful for careers in management.

The School also provides sound preparation for students who wish to apply to graduate and professional schools of law, administration, public health, social welfare, psychology, sociology, criminology, and urban planning.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. Additional information is available in the Career Center section.

FIELD STUDY

An important aspect of the undergraduate program is its field study requirement for majors. Field study is designed to provide students with an opportunity to examine social-environmental problems as they occur in community settings; to evaluate the merit of ideas presented in the classroom; and to conduct naturalistic observations and investigations at field sites. Under the supervision of a Social Ecology faculty sponsor, students have the opportunity to test their skills in the community, to evaluate procedures and problem-solving strategies used in the work place, and to observe the links between community practices and academic ideas and issues.

The settings provided for field study include a wide range of problem-oriented institutions and agencies in both the private and the public sector (e.g., Orange County Public Defender's Office; Irvine Medical Center; California Coastal Commission; American Red Cross; primary and secondary schools; Fairview Development Center; planning, legal, and design corporations). Students must select a placement site from those listed and approved by the School of Social Ecology. Unlisted or inappropriate placements, as well as those that could give the appearance of nepotism or preferential treatment, will not be approved. Departmental approval for field study will be determined by the Field Study Coordinator.

Field study is open *only* to upper-division School of Social Ecology students who are in good academic standing and have completed all prerequisite course work. All field studies are taken on a Pass/Not Pass grading basis. Further information, including field study sign-up procedures and prerequisites, must be obtained from the Social Ecology Undergraduate Counseling Office.

Planning a Program of Study

Because there are many alternative ways to plan a program, some of which may require careful attention to specific major requirements, students should consult with the Undergraduate Counseling Office, 102 Social Ecology I, to design an appropriate program of study.

Students who elect one of the majors in the School of Social Ecology in their freshman year might begin by taking the introductory courses required by their major. It is a good idea to take these courses early because they include fundamental concepts that are widely applicable in more advanced courses. In addition, the lower-division writing requirement of the breadth requirement (category I) should be completed during the first year. In the sophomore year, the student might complete three courses toward the breadth requirement, four courses in their major, and four electives. Students who are planning to go on to graduate school can use their freshman and sophomore years to advantage by taking courses in theory, research methods, statistics, and other areas important to graduate study. In the junior and senior years, the student should take courses in the major area and should create an individualized program of study through a combination of courses and course modules which fall in an area of interest. Particular attention should be paid to planning a program of study that will ensure that major requirements are met prior to graduation.

Requirements for the Bachelor's Degree

University Requirements: See pages 56–60.

School Requirements

Criminology, Law and Society C7, Environmental Analysis and Design E8, Psychology and Social Behavior P9, Social Ecology 10, 13, 194, 195 (four units), and one additional upper-division course (four units) chosen from any department in the School of Social Ecology *or* an additional four units of Social Ecology 195. (Social Ecology 198 and 199 may not be used to fulfill this requirement.)

Breadth Requirement Limitation: With the exception of categories I, V, and VII, a student in any School of Social Ecology major may count toward breadth no more than three courses offered by the School of Social Ecology.

Departmental Requirements: Refer to individual departments.

Grade Requirement

A minimum grade average of at least C (2.0) is required: (1) overall, (2) in all courses required for the major program, including the School requirements, and (3) in the upper-division courses required for the major.

Double Majors

In order to double major within the School of Social Ecology, major requirements must be met for both majors without any overlap of upper-division courses.

Additional Curricular Options

Students in the School of Social Ecology may combine their course work with the following University programs and should consult an academic counselor for further information.

CAMPUSWIDE HONORS PROGRAM

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

EDUCATION

Students who plan to obtain a teaching credential or a higher degree in the field of education should consult with counselors in the UCI Department of Education early in their college career. Students completing a degree program in the School of Social Ecology may qualify for a waiver of the Single Subject Credential Examination. For additional information about teaching credentials, refer to the Department of Education section.

THE 3-2 PROGRAM WITH THE PAUL MERAGE SCHOOL OF BUSINESS

Outstanding students in the School of Social Ecology who are interested in a career in management may wish to apply for entry into The Paul Merage School of Business' 3-2 Program. Students normally apply for this program early in their junior year. See The Paul Merage School of Business section for additional information.

EDUCATION ABROAD PROGRAM

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with host universities and colleges in countries throughout the world. Additional information is available in the Center for International Education section.

INTERDISCIPLINARY MINORS

These minors are available to all UCI students.

The **minor in Conflict Resolution** provides skills in conflict analysis and resolution and a useful understanding of integrative institutions at the local, regional, and international levels. See the School of Social Sciences section for information.

The **minor in Global Sustainability** trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet. See the Interdisciplinary Studies section for information.

The **minor in Native American Studies** is an interdisciplinary, interschool program which focuses on history, culture, religion, and the environment. See the Interdisciplinary Studies section for information.

Undergraduate Major in Social Ecology

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN SOCIAL ECOLOGY

University Requirements: See pages 56–60.

School Requirements: See page 396.

Requirements for the Major

Ten upper-division courses (numbered 100–193), selected from the Departments of Criminology, Law and Society; Environmental Health, Science, and Policy; and Psychology and Social Behavior.

Course prerequisites established by the individual departments must be satisfied. Students may, by petition, count one Social Ecology 199 course and graduate courses (numbered 200–290) toward the upper-division requirement.

Courses in Social Ecology

LOWER-DIVISION

10 Research Design (4). Lecture, three hours. An introduction to the logic behind and methods of designing research studies and experiments in Social Ecology. Statistical reasoning discussed to the extent necessary for relevant data analyses.

13 Statistical Analysis in Social Ecology (4). Lecture, three hours. Introduction to the techniques of statistical analysis in Social Ecology. Topics include probability, statistical inference, significance testing, univariate descriptive statistics, and multivariate analysis from an interdisciplinary perspective. Prerequisite: Social Ecology 10; may be taken concurrently. Restricted to majors only. Only one course from Social Ecology 13, Social Science 9A-B-C, and Social Science 10A-B-C may be taken for credit.

H20A-B-C Honors: Critical Issues in the Social Sciences (6-6-6). Lecture, three hours; seminar, two hours. Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly small seminars emphasizing the development of the skills of critical thinking and quantitative analysis through regular written work are integral to the course. Prerequisite: restricted to members of the Campuswide Honors Program. Same as Social Sciences H1E-F-G. **(III)**

UPPER-DIVISION

111 Advanced Research Methods (4). Lecture, three hours. For students planning to conduct senior research projects or apply to graduate school in social research fields. Topics include reviewing literature, preparing a research proposal, protecting human subjects, citing scholarly work, selecting or building measures, estimating sample size, interview and presentation skills. Prerequisites: Social Ecology 10 and 13 or equivalent.

120 Health Education for University Life (4). Lecture, three hours. A survey of health issues that present a potential for high-risk behavior in the student community. Students acquire knowledge of risk and wellness factors in sexual health, stress management, fitness and nutrition, alcohol and other drug use, and health relationships. Formerly Environmental Analysis and Design E181U.

121A Peer Community Health Training (4). Lecture, three hours. Focuses on the study of health behavior theory, change models, and environmental analysis skills as applied to college student health risk issues. Students design an intervention for the UCI student community which addresses individual, environmental, or policy change in health risk behavior. Pass/Not Pass only. Prerequisite: one course from Social Ecology 120, Environmental Analysis and Design E168, Psychology and Social Behavior P139H, or consent of instructor.

121B Peer Community Health Practicum I (4). Lecture, three hours. Training sessions (one meeting per week) prepare students to serve as undergraduate teaching assistants and run a weekly discussion group for the Social Ecology 120 course. Practicum meetings (one per week) provide supervision of teaching assistant responsibilities and the student's delivery of the intervention they designed in 121A course. Pass/Not Pass only. Prerequisite: Social Ecology 121A.

121C Peer Community Health Practicum II (4). Lecture, three hours. Students receive training and supervision in the role of undergraduate teaching assistant in the Social Ecology 120 course and in the delivery of health-risk intervention in the student community. New topics of study include social marketing and health promotion in the media. Pass/Not Pass only. Prerequisite: Social Ecology 121B.

131 Social Ecology of Health Promotion (4). Lecture, three hours. Core themes of Social Ecology are examined as they apply to major areas of health promotion research and practice. Students attend lectures and work collaboratively on team projects conducted in university and community settings. Prerequisite: consent of instructor.

166A-B-C Foundations of Applied Statistics I, II, III (4-4-4). Lecture, four hours; laboratory, three hours. **166A-B:** Descriptive statistical concepts and techniques most widely used in social science research. Weekly laboratories employ computer graphics to investigate concepts. 166A: Pass/Not Pass only. **166C:** Classical statistical inference, limited to simple random sampling or simple randomization designs. Characteristics of sampling distributions; bias, standard error, mathematical models, estimation, hypothesis testing. Same as Social Sciences 100A-B-C and Statistics 100A-B-C. **(V)**

166E Introduction to Statistical Computing with SAS (4) W. Lecture, two hours; laboratory, two hours. Data definition, data acquisition, and data management using SAS procedures and commands. Statistical procedures available from the SAS Statistical Software Package. SAS/GRAPH procedures for producing statistical graphics. Prerequisite: completion of one year of statistics or concurrent enrollment in Social Ecology 166C, or consent of instructor. Pass/Not Pass only. Same as Social Science 101E and Statistics 101.

181 Mentors in Higher Education (4). Seminar, three hours. Discussion of roles and functions of mentors in higher education. Specific mentoring issues include: personal skills, training, the sociocultural role of mentoring in higher education, student affirmative action, history and politics in higher education. Prerequisite: consent of instructor.

183A International Studies Forum (2). A faculty-student forum featuring lecturers from a variety of institutions with discussion issues related to international studies. Pass/Not Pass only. May be taken for credit four times. Same as Humanities 183A and Social Science 183A.

183B Senior Seminar in Conflict Resolution (4). Designed for seniors (juniors may also enroll) who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas. Same as Humanities 183B and Social Science 183B. **(VII-B)**

183C Senior Seminar in Conflict Resolution (4). Continuation of Social Ecology 183B. Students write a senior research paper. Prerequisite: Social Ecology 183B and satisfactory completion of the lower-division writing requirement. Same as Humanities 183C and Social Science 183C.

186A-B Senior Seminar on Global Sustainability I, II (2-2) F, W. Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations. **A:** Prepare bibliography. **B:** Prepare research proposal. In-progress grading for 186A-B, grade for sequence given upon completion of 186C. Prerequisites: senior standing, Biological Sciences 65, Environmental Analysis and Design E20, and Earth System Science 10. Same as Biological Sciences 191A-B and Earth System Science 190A-B.

186C Writing/Senior Seminar on Global Sustainability III (4) S. Students attend weekly seminar to discuss current issues in global sustainability. Weekly attendance at Global Sustainability Forum also is required. Seminar utilized to analyze forum presentations and to prepare senior research paper. Prepare/write research paper under the direction of a faculty member. Prerequisites: Social Ecology 186A-B and satisfaction of the lower-division writing requirement. Same as Biological Sciences 191C and Earth System Science 190C.

187 Ideology and Contemporary Social Problems (4). Examines the concept of ideology from the Enlightenment to the present, tracing it from Marx to such contemporary thinkers as R. Williams and D. Bell. The concept and "social criticism" discourse are illustrated through discussions of socialism, communism, fascism, liberalism, conservatism, capitalism.

188 Global Issues and International Perspectives (2). Primarily for students planning to study abroad. Weekly guest lectures, giving global perspectives on culture, politics, economics, women's roles, environmental issues, language, and history. In discussion sections participants study the particular area to which they are going, and learn how to conduct themselves while there. Pass/Not Pass only. Same as Social Sciences 188.

H190A-B Honors Research (4-4). Seminar, three hours. Independent work on an individual research project in addition to participation in a mini proseminar in which faculty discuss their ongoing research. Students prepare a written proposal for a research project. **H190A:** Letter grade and Pass/Not Pass. **H190B:** Pass/Not Pass only. Prerequisites: acceptance into the Honors Program; junior or senior standing.

H190W Honors Seminar and Thesis (4). Seminar, three hours. Students write up their honors research project (H190A-B) and prepare an oral report which is presented at the honors seminar. Prerequisites: acceptance into the honors program; junior or senior standing.

194 Naturalistic Field Research (4). Lecture, three hours. Introduction to alternative models of experiential learning and to various methods of observation, assessment, and evaluation. Introduction to the nature of organizations and ethical issues that emerge from research and intervention in natural settings. Must be taken prior to Social Ecology 195. Enrollment in discussion section is required. Prerequisite: Social Ecology 10; satisfactory completion of the lower-division writing requirement; restricted to Social Ecology majors.

195 Field Study (2 to 4) F, W, S. Prerequisites: Social Ecology 194; junior standing; restricted to Social Ecology majors. Pass/Not Pass only. May be repeated for credit.

198 Directed Studies (1 to 4) F, W, S. Prerequisite: consent of instructor. Pass/Not Pass only. May be repeated for credit.

199 Special Studies (1 to 4) F, W, S. Prerequisites: consent of instructor and junior or senior status. May be repeated for credit.

Undergraduate Major in Applied Ecology

102 Social Ecology I; (949) 824-6861
101 Biological Sciences Administration; (949) 824-5318

The Department of Environmental Health, Science, and Policy in the School of Social Ecology and the School of Biological Sciences offer a B.S. degree program in Applied Ecology. The interdisciplinary curriculum furnishes a strong undergraduate foundation in human-environment interactions, and develops skills in resource quality and management, molecular and genetic methodology for environmental protection, and field sampling techniques for data collection.

An Applied Ecology major receives the basic science training of a Biological Sciences major and utilizes these skills in a core of environmentally based courses taught in Social Ecology. Social Ecology brings to this major a unique combination of courses in Environmental Quality and Health, Planning and Public Policy, and Law and Society. This combination, together with a strong biology background contributed by the School of Biological Sciences and a general science background contributed by the School of Physical Sciences, enables students selecting this major to pursue interdisciplinary learning experiences which are difficult to achieve within traditional disciplines. The first three years of the major are very structured, leaving the last year open for students to specialize in an area of their choice.

Transfer Applicants: See page 41.

PLANNING A PROGRAM OF STUDY

It is important that students take the required science courses early, in order that the science background may be utilized in the Social Ecology courses. There are many required courses, and the student must plan carefully. For initial academic advising, students should consult the Social Ecology Counseling Office or the Biological Sciences Student Affairs Office. Faculty academic advisors may be either Social Ecology or Biological Sciences faculty members.

CAREERS IN APPLIED ECOLOGY

Careers in the fields of environmental and resource management and planning are particularly suited to an Applied Ecology background. Many graduates hold technical or administrative positions in, for example, the United States Environmental Protection Agency; or in California's Regional Water Quality Control Board, Air Resources Board, Department of Fish and Game, and Department of Health and Human Services; or in various county and city agencies. A variety of firms in the private sector employ Applied Ecology graduates to prepare environmental impact reports, laboratory analyses, and planning studies. The Applied Ecology major also provides a strong academic foundation for graduate or professional study in areas such as conservation and natural resources, environmental health science, microbiology, public health, law, medicine, dentistry, planning, and administration.

The Applied Ecology major provides students with a comprehensive treatment of basic ecological principles and their relevance to human needs. As an alternate pathway, students with related interests should explore other environmental program options within The Henry Samueli School of Engineering, the School of Physical Sciences, and the School of Biological Sciences.

REQUIREMENTS FOR THE BACHELOR'S DEGREE IN APPLIED ECOLOGY

University Requirements: See pages 56–60.

Requirements for the Major

General: Economics 1; Information and Computer Science 10A, 10B, or 10C; Mathematics 2A, 2B, and either 2D, 2J, 7, or Biological Sciences 7; Chemistry 1A-B-C, 1LB-LC, 51A-B-C, and 51LA-LB; Physics 3A-B-C, 3LB-LC; Biological Sciences 93, 94, 97, 98, 99, 100L, E106, 194S, and one from D103, D104, D105, or E109; Environmental Analysis and Design E5; three courses from E103, E110, E160, E168, and Biological Sciences E179; Environmental Analysis and Design E180 and E180L.

Laboratory Courses: Two courses from the following: Biological Sciences D111L, D129L, E112L, E179L, M114L, M116L, M122L, M124L, N113L; Environmental Analysis and Design E160L, E164L, E165L, E166L.

Research or Field Study: Either eight units of Biological Sciences 199, Environmental Analysis and Design E196, or Social Ecology 199 (research), *or* Social Ecology 194 plus four units of Social Ecology 195 (field study).

Applied Ecology Elective Areas: A minimum of three courses selected from the following list. At least two of the three courses must be from the same category. Students should note that some courses have prerequisites. Environmental Analysis and Design E103, E110, E160, E168, and Biological Sciences E179 may be used to fulfill the General Requirement *or* the Applied Ecology Elective Area but may not be used to fulfill both requirements.

Environmental Biotechnology: Biological Sciences D129, E189, M122, M123, M124, M137, M138; Environmental Analysis and Design E105U, E112, E117, E160.

Environmental Health Science: Biological Sciences D143, M122; Environmental Analysis and Design E111U, E112, E117, E160, E161, E164, E169A, E169B, E172, E173, E175, E176, E177A, E177B, E178, E179, E186, E187, E188.

Environmental Law, Planning, and Public Policy: Environmental Analysis and Design E101, E105U, E107U, E108U, E109U, E111U, E112, E131U, E137U, E141U, E143U, E148U, E155U, E156U, E157U, E162, E169A, E169B, E179U, E189U.

Resource Management-Terrestrial Environments: Biological Sciences E174, E175, E181, E186; Environmental Analysis and Design E103, E105U, E110, E117, E129, E154U, E164, E167, E169A, E169B.

Water Pollution Control and Management: Biological Sciences E178, E179, E189, M122; Environmental Analysis and Design E103, E105U, E117, E137U, E155U, E160, E164, E169A, E169B, E178, E191A, E191B, E191C.

NOTE: Students may not major in both Applied Ecology and any of the School of Biological Sciences majors.

DEPARTMENT OF CRIMINOLOGY, LAW AND SOCIETY

Valerie Jenness, **Department Chair**

The Department of Criminology, Law and Society focuses, first, on the manifestations of criminal behavior and the methods for controlling that behavior, and second, on the relationships and interactions between social processes and legal systems. Basic courses present overviews of American legal systems with particular emphasis on criminal and juvenile justice, the forms of criminal behavior, the role of law in understanding social and psychological phenomena, and the applications of sociological theory in understanding law and legal systems. Subsequent course work provides understanding of the theoretical structures used to explain criminal behavior, the effects of crimes from the perspectives of victims, the operations of systems of justice and their underlying institutions, the goals of governmental regulation and the methods used to achieve those goals, and more advanced issues in the interactions of law and such fields as psychology, sociology, and planning. In addition, substantive areas of law, such as criminal, environmental, and family law, are introduced. The Department offers a B.A. degree program in Criminology, Law and Society.

Students are provided with opportunities to become acquainted with the varieties of behavior that society chooses to control or regulate, the methods and institutions used to achieve that control or regulation, and the approaches aimed specifically at altering unacceptable behavior. In addition, there is provision for students to use their increasing knowledge of the law, its procedures, and institutions to enhance their understanding of the social sciences.

The course of study provides excellent preparation for law school and for graduate study in sociology, criminology, and criminal justice. Careers for students who terminate their University education at the baccalaureate level may be developed through placements in criminal justice and regulatory agencies, in organizations determining public policy, and in programs that deliver services to people who have difficulties with some aspect of the legal system.

Students are strongly encouraged to select electives in a variety of departments. Courses in areas such as Psychology, Sociology, Economics, and Political Science can provide a further context for the understanding of crime, law, and criminal justice, while courses in areas such as art history, theater, and music can enhance the quality of the student's entire life.

Field study placements are available in police departments, public defenders' offices, probation and parole agencies, the Orange County District Attorney's Office, the State juvenile detention system, the Orange County Victim/Witness Assistance Program, juvenile shelters, legislative offices, and in private legal firms.

Information on the graduate program begins on page 412.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 396.

Departmental Requirements

Ten courses (40 units) as specified below:

A. Three upper-division required courses (12 units); students must select one course from each of the following three groups: Criminology, Law and Society (1) C101, C102, C103, C104, C105; (2) C106, C107, C108, C109, C110; (3) C111, C112, C113, C114, C115.

B. Seven upper-division elective courses (28 units) numbered C100–C191, selected in any combination from the three areas of study within the major: (1) The Legal System, Law and Society, (2) Crime and Criminology, and (3) Formal Institutions of Social Control. (Courses taken to satisfy requirement A may not also be used to satisfy requirement B.)

Criminology, Law and Society Minor Requirements

Nine courses (36 units): Criminology, Law and Society C7, Environmental Analysis and Design E8, Psychology and Social Behavior P9, and six upper-division Criminology, Law and Society courses selected from C100–C191.

NOTE: Students pursuing a major in the School of Social Ecology may not use upper-division course work for both school, major, or minor requirements. No overlap is permitted. Social Ecology 198 and 199 may not be applied toward the minor.

Courses in Criminology, Law and Society

LOWER-DIVISION

C7 Introduction to Criminology, Law and Society (4). Lecture, three hours. Examines the major biological, sociological, and psychological explanations for crime and links them historically with prevailing systems of punishment. From classical criminology to positivism, investigates the evolution of criminological theories, their cultural and historical contexts, and their strengths and weaknesses. Formerly Criminology, Law and Society J7. **(III)**

UPPER-DIVISION

C100 Special Topics in Criminology, Law and Society (4). Lecture, three hours. Special topics courses are offered from time to time. Course content varies with interest of the instructor. Prerequisites: Criminology, Law and Society C7 and, in some cases, consent of instructor. May be repeated for credit as topics vary. Formerly Criminology, Law and Society J100.

C101 Civil Legal System (4). Lecture, three hours. Provides an overview of the American civil legal system and of certain fundamental legal concepts as well as an introduction to legal research. Reading, briefing and debating judicial opinions, legal research, and writing an appellate legal brief. Prerequisite: Criminology, Law and Society C7. Formerly Criminology, Law and Society J101.

C102 Introduction to the Comparative Study of Legal Cultures (4). Lecture, three hours. Traces the anthropological and comparative cultural study of law from the nineteenth century to the present; briefly surveys the diversity of recorded legal cultures and critically examines key concepts which have been used to describe and classify them. Formerly Criminology, Law and Society J106.

C103 American Socio-Legal Theory (4). Lecture, three hours. Evolution of American legal theory from nineteenth century to present in historical context of other human sciences; emphasizes shifting relation between legitimacy of legal decisions and legal system's relative autonomy; social science research use within legal system. Formerly Criminology, Law and Society J103.

C104 Sociology of Law (4). Lecture, three hours. Examines law creation and law enforcement in their social and political context. Discusses the major theories of law and the modern state, and presents case studies in order to evaluate the strengths and weaknesses of these theoretical perspectives. Formerly Criminology, Law and Society J104.

C105 Psychology and the Law (4). Lecture, three hours. Psychological assumptions of American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eye-witness identification. Use of police, courts, correctional institutions in prevention of behavior disorder. Prerequisite: Criminology, Law and Society C7 or C101. Same as Psychology and Social Behavior P164S. Formerly Criminology, Law and Society J105.

C106 Crime and Public Policy (4). Lecture, three hours. Increase students' understanding of crime, violence, and the criminal justice system; assess students' state of knowledge on current key policy issues, examine/discuss policy-making and the use of empirical information in current U.S. policy debates. Prerequisite: Criminology, Law and Society C7. Formerly Criminology, Law and Society J125.

C107 Deviance (4). Lecture, three hours. Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior. Same as Sociology 156 and Psychology 177D. Formerly Criminology, Law and Society J107.

C108 Criminological Theory (4). Lecture, three hours. Explores the question of crime causation from a number of theoretical perspectives in the social sciences. Schools of thought examined include utilitarianism, positivism, human ecology, social structural approaches, social process (learning) theories, labeling, and radical-critical (political) perspectives. Prerequisite: Criminology, Law and Society C7. Formerly Criminology, Law and Society J108.

C109 Juvenile Delinquency (4). Lecture, three hours. Patterns of delinquent behavior, theories that explain behavior, current research aimed at enhancing exploratory power. Attempts to prevent and control delinquency are put in historical perspective. Development of the current juvenile justice system and evolution of modern juvenile law. Prerequisite: Criminology, Law and Society C7. Formerly Criminology, Law and Society J132.

C110 Community Context of Crime (4). Lecture, three hours. Examines the social context of high-crime communities, with special emphasis on the problems of poverty, joblessness, economic inequality, and racial discrimination. Assesses debates on the causes of these problems, and on the most effective policies to combat them. Formerly Criminology, Law and Society J155.

C111 Theories of Punishment (4). Lecture, three hours. Survey of the various schools of thought regarding formal punishment theory. The purposes of legal sanctions are examined, including those of deterrence, rehabilitation, retribution, and incapacitation. Considers problems in realizing formal goals of punishment in practice. Formerly Criminology, Law and Society J143.

C112 Legal Sanctions and Social Control (4). Lecture, three hours. Examination of criminal sanctions as mechanisms of social control. Includes the nature, function, and organization of courts as sanction generating institutions, and problems associated with punishing white-collar and corporate illegalities. Formerly Criminology, Law and Society J109.

C113 Gender and Social Control (4). Lecture, three hours. Investigates how gender and social control interface such that each determines and reflects the other. Examines how the social world is organized around sex, sexuality, masculinities, femininities. Processes that regulate and channel social life, desire, conduct, differential allocation of social status. Formerly Criminology, Law and Society J116.

C114 Miscarriages of Justice (4). Lecture, three hours. Systematically describes, explains, and analyzes the causes and consequences of the wrongful accusation, prosecution, incarceration, and sometimes even execution, of the innocent in the American criminal justice system. Formerly Criminology, Law and Society J151.

C115 Prisons, Punishment, and Corrections (4). Lecture, three hours. A review of how the U.S. punishes and rehabilitates convicted law violators. The conflicts among the major purposes of sentencing—rehabilitation, deterrence, incapacitation—are discussed, as well as the effects of different sanctions on public safety, offender rehabilitation, and justice system costs. Formerly Criminology, Law and Society J140.

C120 Law and Inequality (4). Lecture, three hours. Various aspects of the law as related to three specific areas of inequality: immigration and immigrants, race, and gender. The role of law as a tool of social reform and limitations of the legal system historically in resolving inequality issues. Formerly Criminology, Law and Society J120.

C121 Science and Law (4). Lecture, three hours. Explores how the law accommodates scientific knowledge and new technologies. Among the topics are ownership of biological materials, intellectual property in the digital age, and toxic torts. Formerly Criminology, Law and Society J112.

C122 Constitutional Law (4). Lecture, three hours. Addresses the areas of freedom of speech, freedom of religion, the right to privacy, and discrimination. Specific issues include racial and gender bias, abortion, symbolic speech, freedom of the media, defamation, advocacy of violence, and obscenity. Prerequisite: Criminology, Law and Society C7. Criminology, Law and Society C122 and Political Science 171D may not both be taken for credit. Formerly Criminology, Law and Society J102.

C123 Family Law (4). Lecture, three hours. Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues. Prerequisite: Criminology, Law and Society C7 or C101. Same as Psychology and Social Behavior P169P. Formerly Criminology, Law and Society J123.

C125 Child Development, the Law, and Social Policy (4). Lecture, three hours. Examines how psychology research and practice can inform areas of law and social policy affecting children and adolescents. Topics include education, mental health, reproductive rights, and delinquency. Goals are to evaluate research as well as identify the costs/benefits of current policies. Prerequisites: Psychology and Social Behavior P9 or equivalent; P113D or P114D recommended. Same as Psychology and Social Behavior P165S.

C126 Drugs, Crime, and Social Control (4). Lecture, three hours. Drug abuse in the U.S.; the psychopharmacology of various drugs; biological, psychological, and sociological explanations for drug abuse. Policy issues are discussed; students will develop and defend a set of strategies for limiting harm done by drugs and drug laws. Formerly Criminology, Law and Society J126.

C127 Hate Crimes (4). Lecture, three hours. Examines the causes, manifestations, and consequences of hate crimes and the larger social context within which they occur. The politics and dynamics of intergroup violence born of bigotry and manifested as discrimination; social policy designed to control bias-motivated violence. Formerly Criminology, Law and Society J127.

C128 Environmental Law (4). Lecture, three hours. Environmental law as combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality. Federal and state laws utilized. Prerequisite: Environmental Analysis and Design E8. Same as Environmental Analysis and Design E105U. Formerly Criminology, Law and Society J128.

C129 International Environmental Management (4). Lecture, three hours. Network of intergovernmental organizations (the United Nations, in particular) and international nongovernmental organizations in the field of environmental management. Analysis of key international projects and sources of information. Lessons for the integration of international research expertise. Prerequisite: Criminology, Law and Society C7. Same as Environmental Analysis and Design E137U and International Studies 123. Formerly Criminology, Law and Society J129.

C130 Seminar on Gangs (4). Seminar, three hours. An overview of gangs, including the nature and definition of gangs; types of gangs; diversity of membership; theoretical explanations; criminal behavior; drug use and sales; law enforcement responses; gangs in correctional institutions; intervention and prevention strategies; and public policy issues. Formerly Criminology, Law and Society J130.

C131 Organized Crime and American Society (4). Lecture, three hours. Examination of the phenomenon of American organized crime from a sociological perspective. Explanation of methods by which organized crime is tolerated at various levels of society. Emphasis on ways in which "underworld" interests interact with legitimate economic and political institutions. Formerly Criminology, Law and Society J114.

C132 Forensic Science, Law, and Society (4). Lecture, three hours. Examines the use of "forensic science" to resolve issues arising in criminal cases including crime scene analysis, DNA testing, fingerprints, trace evidence comparisons, profiling, lie detectors, other forensic techniques; evaluation, statistical characterization, and legal admissibility of evidence; regulation of forensic laboratories.

C133 Homicide and Suicide (4). Lecture, three hours. Examines similarities and differences among homicide and suicide, two major causes of death. Formerly Criminology, Law and Society J113.

C134 Victimless Crimes (4). Lecture, three hours. Examines major theoretical, empirical, and policy-oriented research related to the design, implementation, and analysis of government intervention, through the criminal sanction, in the spheres of vice and morality. Formerly Criminology, Law and Society J134.

C135 Homicide (4). Lecture, three hours. Examines homicide from several different perspectives including: how the social, cultural, and economic environment impacts homicide levels; the measuring and categorizing of homicide to aid in the design and implementation of violence-reduction interventions, and the investigation of homicide events by law enforcement. Formerly Criminology, Law and Society J135.

C136 Forensic Psychology (4). Lecture, three hours. Presents theoretical and empirical basis for a psychological perspective of criminal behavior, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment, treatment, and rehabilitation; mental health services within forensic institutions. Prerequisites: Psychology and Social Behavior P9 or equivalent, Psychology and Social Behavior P105, P175P or Criminology, Law and Society C149, or consent of instructor. Same as Psychology and Social Behavior P145C and Psychology 177F.

C137 Criminal Procedure (4). Lecture, three hours. Examines the law governing arrests (with and without a warrant); police detention; search and seizure; interrogation; use of informers, eavesdropping, wiretapping; examination and identification of suspects. Pretrial motions such as speedy trial and discovery of evidence may be covered. Formerly Criminology, Law and Society J137.

C138 Victims of Crime (4). Lecture, three hours. Examines the impact of crime upon a variety of victims, e.g., victims of child and spousal abuse, burglary, arson, robbery, and rape. Considers such topics as victim compensation, victim-offender relationships, and the secondary victimization process. Formerly Criminology, Law and Society J138.

C139 Police and Change (4). Lecture, three hours. Organizational efforts to modify police conduct are addressed by focusing on the history of policing in the United States including training, education, and the contributions of women. Formerly Criminology, Law and Society J139.

C140 Surveillance and Society (4). Lecture, three hours. Explores the development and deployment of surveillance technologies in contemporary society. The social and legal impact of surveillance technologies in such areas as crime control, privacy, trust, community, democracy, and the war on terror.

C141 Seminar in Criminology, Law and Society (4). Seminar, three hours. Selected topics in the field of criminal justice. Issues vary with the interests of the instructor and students, and include such topics as violent crime, political crimes, police discretion, and civil rights of prison inmates. Formerly Criminology, Law and Society J141.

C142 White-Collar Crime (4). Lecture, three hours. Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms. Same as Sociology 142. Formerly Criminology, Law and Society J142.

C143 Media, Intellectual Property, and Cyberlaw (4). Lecture, three hours. Explores the personal and intellectual property rights and obligations in media and on the Internet. Critically evaluates the challenge of interpreting constitutional rights in the digital world. Topics include Internet regulation, free speech, privacy, crime, biopatents, and artificial intelligence.

C144 Criminal Law (4). Lecture, three hours. Deals specifically with the substantive nature of criminal law and its historical development. Focuses on understanding the development of fundamental doctrinal principles upon which criminal law is based, including mens rea, actus reus, homicide, causation, group criminality, and exculpation. Formerly Criminology, Law and Society J144.

C145 Government Crime (4). Lecture, three hours. Examines the legal, organizational, and political issues involved in the generation and control of government lawlessness. Readings present historical and theoretical perspectives in the abuse of government authority and the ability of the legal system to control such behavior. Formerly Criminology, Law and Society J145.

C146 Social Control of Violence (4). Lecture, three hours. Studies the police as controllers of violence, as users of violence, and as victims of violence. Prerequisite: Criminology, Law and Society C7. Formerly Criminology, Law and Society J146.

C147 Law and Social Change (4). Lecture, three hours. Explores the relationship of law to its social setting by considering both law as a product of social change and law as a source or medium of change. Formerly Criminology, Law and Society J147.

C148 Geographic Information Systems (4). Lecture, two hours; laboratory, one and one half hours. Basic geographic, cartographic, and GIS concepts including computer representation of physical, political, statistical, and social aspects of space using vector and grid-based maps. Experience with extensive geographic base map files and databases through use of GIS software (ArcView 3.x). Formerly Criminology, Law and Society J148.

C149 Violence in Society (4). Lecture, three hours. Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed. Prerequisite: Psychology and Social Behavior P9 or equivalent. Same as Psychology and Social Behavior P175P. Formerly Criminology, Law and Society J149.

C150 The Legal Profession (4). Lecture, three hours. Role of the legal profession in modern society, the diverse professional roles lawyers play, the American legal profession compared with that of other societies. "Litigation explosion," ethical problems, interactions between lawyers and other professionals, training and socialization of new lawyers. Formerly Criminology, Law and Society J150.

C151 Cybercrimes, Investigation, Forensics, and Prosecution (4). Lecture, three hours. Examines crimes committed against persons, property, society, and the government in which a computer is used. How these computer crimes are committed, investigated, and ultimately prosecuted.

C152 Interrogation, Confession, and the Law (4). Lecture, three hours. In-depth examination of the social psychology of police interrogation in America, the evolution of American interrogation practices from the nineteenth century to the present, impact of law on police behavior and ideology, causes and consequences of false confessions, possibilities of reform. Same as Psychology and Social Behavior P156S. Formerly Criminology, Law and Society J152.

C153 Rights, Justice, and the Law (4). Lecture, three hours. Examines various ways of justifying system of rights and looks at interrelations and conflicts between various elements. Focuses on four distinct categories of rights: civil rights, property rights, welfare rights, and human rights. Formerly Criminology, Law and Society J153.

C154 Social Theory and the Law (4). Lecture, three hours. Provides theoretical tools to understand the relationship between law and society. Focuses on the connections between law and discourse, power, space and geography, economic markets, gender, race, class, democratic legitimacy, and the indeterminacy of language. Formerly Criminology, Law and Society J154.

C155 Influence, Memory, and the Law (4). Lecture, three hours. Examines the intersection of influence and memory on law with a theoretical discussion of the social psychology of influence, suggestion, and decision making. Phenomenon of coercive persuasion, social origins and perpetuation of moral panic, how it can lead to wrongful prosecution.

C156 Cross-Cultural Research on Urban Gangs (4). Lecture, three hours. Taking an urban policy approach, examines the background and contemporary traditions of gangs in several ethnic groups including African-, Asian-, and Mexican-Americans. Cross-cultural exploration of the varied facets of gang life. The major social-control institutions affecting them. Same as Chicano/Latino Studies 153. Formerly Criminology, Law and Society J156.

C164 Social Control of Delinquency (4). Lecture, three hours. Assumes familiarity with theories of juvenile delinquency, the juvenile justice system, the elements of juvenile law. Using that knowledge, students explore current research in primary and secondary prevention of delinquency, and relevant case law. Requires an original research project. Prerequisites: Social Ecology 10 and Criminology, Law and Society C109. Formerly Criminology, Law and Society J164.

C165 The Death Penalty (4). Lecture, three hours. Examines why the U.S. continues to have a death penalty when so many other countries have abandoned it. Arguments for and against the death penalty are covered.

C170 Federal Law Enforcement (4). Lecture, three hours. The peculiar legal, organizational concerns of the federal system of law enforcement and some of the crimes it is uniquely designed to address—white-collar crime, drug trafficking, racketeering, public corruption. Roles, responsibilities of the FBI, DEA, Customs, other policing agencies. Prerequisites: Criminology, Law and Society C7. Formerly Criminology, Law and Society J115.

C171 Latinos and the Law (4). Lecture, three hours; discussion, one hour. Examines a range of theoretical, empirical, and policy approaches to legal issues affecting the Latino population, with emphasis on California. Discusses topics concerning the purpose of law, the creation of law, and the enforcement of law. Same as Chicano/Latino Studies 142. Formerly Criminology, Law and Society J111.

C172 Culture Change and the Mexican People (4). Reviews culture contact and colonization, innovation diffusion, acculturation, assimilation, culture conflict and marginality, modernization, urbanization, legal transformations. Mexico and the Southwestern U.S. are reviewed through several centuries to better appreciate the indigenous base of the Mexican people. Same as Chicano/Latino Studies 155. **(VII-A)**

C177 Eyewitness Testimony (4). Lecture, three hours. Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues. Prerequisites: Social Ecology 10 and senior standing. Same as Psychology and Social Behavior P177P.

C181 Contemporary Legal Issues (4). Lecture, three hours. An in-depth analysis of current legal issues viewed from their political and constitutional perspectives. Issues studied are determined by instructor and student interest. Prerequisite: consent of instructor. Formerly Criminology, Law and Society J181.

C185 Criminal Justice System Capacity (4). Lecture, three hours. Examination of "system capacity" in criminological and criminal justice related research and how it can be used to explain and describe current problems and practices in the American legal system. Limitations of sanctioning criminals due to political, physical space, and resource constraints. Prerequisite: Criminology, Law and Society C7. Formerly Criminology, Law and Society J185.

C191 Law and Modernity (4). The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of "liberty, equality, fraternity"; contradictions of liberal law, its understandings of "primitive" and "civilized"; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive. Same as Anthropology 127A. Formerly Criminology, Law and Society J191. **(VII-B)**

C196 Research Seminar in Criminology, Law and Society (4). Seminar, three hours. Special topics research seminar. Content varies with interest of instructor. Capstone research opportunity with Criminology, Law and Society faculty members. Prerequisites: upper-division standing and consent of instructor. May be repeated for credit as topics vary. Formerly Criminology, Law and Society J196.

DEPARTMENT OF ENVIRONMENTAL HEALTH, SCIENCE, AND POLICY

Jonathon E. Ericson, **Department Chair**

The Department of Environmental Health, Science, and Policy is concerned with the interactions between the physical and social environment and human health and behavior. The Department offers a B.A. degree program in Environmental Analysis and Design. This major is offered jointly with faculty in the Department of Planning, Policy, and Design. The faculty also cosponsors the B.S. degree in Applied Ecology with the School of Biological Sciences; see page 398.

Students in the Environmental Analysis and Design degree program begin with basic courses in human ecology, environmental quality, epidemiology, environmental health sciences, and environmental public policy. Subsequent work moves toward problem-oriented courses in these areas, enriched by ongoing faculty and student research on such topics as the effects of environmental pollution; the biology and politics of water pollution; potential impacts of natural disasters; compliance with environmental regulations; the way in which changes in the community affect health and well-being of its residents; environmental stressors (e.g., crowding, smog, noise); the effects of stress on health; causes and consequences of urbanization and population change; and risk assessment.

In addition to providing basic knowledge for students in other areas, courses are relevant to professional careers in the areas of administration, environmental quality, environmental health science, environmental impact assessment, urban and regional planning, and community environmental education. Graduate and professional opportunities related to environmental analysis include urban and regional planning, architecture, environmental psychology, ecology, and public health. Special emphasis is placed upon the roles of individual citizens and community organizations, both governmental and private, in maintaining and enhancing the quality of the human environment. Field study is done in city planning departments, private consulting firms, environmental information centers, pollution control agencies, and health agencies.

Information on the graduate program begins on page 412.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 396.

Departmental Requirements

Ten courses (40 units) as specified below:

A. Four upper-division core courses (16 units) selected from Environmental Analysis and Design E101–E120.

B. Six upper-division specialty courses (24 units) numbered E100, E100U, E121–E193, selected in any combination from the areas of Socio-Environmental Studies, Planning and Policy Studies, Ecology and Environmental Health Science, and Public Health.

Environmental Analysis and Design Minor Requirements

Nine courses (36 units): Criminology, Law and Society C7, Environmental Analysis and Design E8, Psychology and Social Behavior P9, and six upper-division Environmental Analysis and Design courses, of which a minimum of two are selected from E101–E120U and the remainder are selected from E100, E121–E193.

NOTE: Students pursuing a major in the School of Social Ecology may not use upper-division course work for both school, major, or minor requirements. No overlap is permitted. Social Ecology 198 and 199 may not be applied toward the minor.

Environmental Design Minor Requirements

Eight courses (32 units): Environmental Analysis and Design E102U, E108U, E136U, and five additional courses selected from E104U, E105U, E132, E133, E134, E135U, E138U, E139A-B-C, E160U, E191U.

NOTE: A maximum of three courses may be counted toward both the minor in Environmental Design and the majors in Environmental Analysis and Design or Social Ecology.

Epidemiology and Public Health Minor Requirements

Nine courses (36 units): Environmental Analysis and Design E5, E8, E177A, and six additional courses selected from E45U, E101, E111U, E173, E175, E176, E177B, E178, E186, E187, Psychology and Social Behavior P134H, Social Ecology 120, 130, Biological Sciences 143.

NOTE: A maximum of three courses may be applied toward both the minor in Epidemiology and Public Health and the majors in Applied Ecology, Environmental Analysis and Design, or Social Ecology. (Environmental Analysis and Design E8 is by necessity one of the three.)

Urban and Regional Planning Minor Requirements

Nine courses (36 units): Environmental Analysis and Design E8, E107U, and seven additional upper-division Environmental Analysis and Design courses selected from E100U, E102U, E104U, E105U, E106U, E108U, E109U, E111U, E123U, E124U, E128U, E131U, E132U, E135U, E136U, E137U, E138U, E140U, E141U, E142U, E143U, E144U, E145U, E148U, E151U, E154U, E155U, E156U, E157U, E158U, E159U, E160U, E179U, E189U, E190C, E190U, E191U.

NOTE: A maximum of three courses may be counted toward both the minor in Urban and Regional Planning and the majors in Environmental Analysis and Design or Social Ecology. (Environmental Analysis and Design E8 is by necessity one of the three.)

Courses in Environmental Analysis and Design

LOWER-DIVISION

E1 Natural Disasters (4) F. Lecture, three hours. Examines the natural processes and impacts of natural disasters. The responses of our society are examined and compared with available prehistoric case studies. Basic understanding of natural processes is gained in this course. **(II)**

E3 Human Environments (4) W. Lecture, three hours. Study of natural and physical components of earth's environmental problems due to human activities. Topics include global air, water, soil, biodiversity, rainforests, energy, demographics, agriculture, and urbanization. Theme is sustainability. Integrated into the science are social, legal, and economic considerations. **(II)**

E5 Introduction to Environmental Quality and Health (4). Lecture, three hours. A preliminary survey of how pollution of the natural and physical environment affects human health. Topics include toxicology, epidemiology, risk assessment, water, food, air, noise, radiation, solid and hazardous waste. Included are elements of environmental administration, environmental education, consumer protection. **(II)**

E7 Principles of Public Health (4) W. Lecture, three hours. Introduces the major concepts and principles of public health and the determinants of health status in communities. Emphasizes the ecological model that focuses on the linkages and relationships among multiple natural and social determinants affecting health.

E8 Introduction to Environmental Analysis and Design (4) F, W, S. Lecture, three hours. Overview of general concepts, theoretical principles, and analytical techniques for investigating environmental systems. Integrates tools from both natural and social sciences to analyze contemporary environmental challenges such as pollution, resource acquisition, facility and ecosystem design, impact assessments, the formulation of environmental policy. **(III)**

E9 Case Studies in Public Health Practice (4) W. Lecture, three hours. Presents case studies in various themes of public health practice to demonstrate how the principles of public health were established and continue to evolve.

E15 Native American Religions and the Environmental Ethic (4) S. Examines Native American religions and their perspectives on the human relationship to the natural environment. Topics include the rise and fall of pre-Columbian state theocracies, the ceremony of the Sacred Pipe, revitalization movements, and sacredness and ritual in contemporary life. **(VII-A)**

E20 People, Cultures, and Environmental Sustainability (4). An anthropological consideration of global environmental sustainability from the perspective of human cultures and communities. Causes and consequences of population growth, natural resource management, environmental law, environmental ethics. Case studies emphasize tropical rain forests, arid lands of Africa and North America. Same as Anthropology 20A.

E45U AIDS Fundamentals (4). Considers the biological and sociological bases of the AIDS epidemic. Topics include the history of AIDS, current medical knowledge, transmission, risk reduction, and how the community can respond. Same as Biological Sciences 45. **(II)**

UPPER-DIVISION

E100 Special Topics in Environmental Analysis (4). Lecture, three hours. Special topics courses are offered from time to time. Course content varies with interest of the instructor. Prerequisites: Environmental Analysis and Design E8 and, in some cases, consent of instructor.

E100U Special Topics in Urban and Regional Planning (4). Lecture, three hours. Special topics courses are offered from time to time. Course content varies with interest of the instructor. Prerequisite: in some cases, consent of instructor. May be repeated for credit as topics vary.

E101 Environmental and Public Health Policy (4). Lecture, three hours. Examines factors involved in shaping public health and environmental policy. Topics include the role of science in public health policy, the function of governmental regulatory agencies, citizen participation, and economic and sociopolitical aspects of controlling infectious diseases and regulating carcinogens. Same as Psychology and Social Behavior P182P.

E102U Cultural Ecology and Environmental Design (4). Lecture, three hours. Introduction to cultural ecology and environmental and architectural design. With a view to understanding people's relationships with their built environments, the basic elements of architecture, architectural analysis, and cultural analysis are covered. Examines values in design and design for multicultural societies. Prerequisite: Environmental Analysis and Design E8.

E103 Environmental Pollution and Remediation (4). Lecture, three hours. The study of pollution—its identification, risks, and remediation. Analysis of sources of natural and anthropogenic environmental pollutants using ecological concepts, chemical fate and transport, engineering technologies, economics, and policy to provide understanding and solutions to these problems. Prerequisite: upper-division standing or consent of instructor.

E104U Urban Sociology (4). Lecture, three hours. Overview of theoretical, substantive, and policy issues in urban sociology. History of urbanization, the school of human ecology, and recent trends regarding urbanism. Time is devoted to understanding the causes and possible solutions to urban problems. Prerequisite: Environmental Analysis and Design E8.

E105U Environmental Law (4). Lecture, three hours. Environmental law as combination of traditional legal principles and newly created statutes, rules, and decisions applied to environmental protection. Investigates roles of courts, legislature, executive branch and administrative agencies, and private citizens attempting to regulate environmental quality. Federal and state laws utilized. Prerequisite: Environmental Analysis and Design E8. Same as Criminology, Law and Society C128.

E106U Human Ecology (4). Lecture, three hours. Will population growth doom the human race? Examines the influence of Malthus' *First Essay on Population* (1798) on current models of population-environment interactions and the implications of these models for action. Prerequisite: Environmental Analysis and Design E8. Formerly Environmental Analysis and Design E106.

E107U Urban and Regional Planning (4). Lecture, three hours. Important substantive areas, concepts, tools in the field of urban and regional planning. Topics include: forces that have historically guided and are currently guiding U.S. urbanization; land use, economic development, housing and community development, environmental planning; legal, environmental, governmental contexts. Prerequisite: Environmental Analysis and Design E8.

E108U Environmental Psychology (4). Lecture, three hours. Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; and (c) methodological approaches to the study of environmental issues. Prerequisites: Social Ecology 10 and Environmental Analysis and Design E8. Same as Psychology and Social Behavior P109.

E109U Urban Public Policy (4). Lecture, three hours. Examines why and how urban policies are enacted and carried out in contemporary U.S. cities and regions. Topics include: evolution and organization of city governments and policymaking over the past century; who has the power to direct public policy and control how cities develop. Prerequisites: Social Ecology 10 and Environmental Analysis and Design E8.

E110 Environmental Geology (4). Introduction to geologic principles and applications to environmental problems. Topics include: tectonic processes, earth materials, soils, river processes, groundwater, the coastal environment, slope failures, seismic hazards, mineral resources, and land-use evaluation based on geologic conditions. Examples from case studies. Prerequisite: Environmental Analysis and Design E1, E3, or E8.

E111U Dynamics of Human Populations (4). Lecture, three hours. Survey of measurement and theory in social demography, with applications to social and economic issues at local, regional, and global levels.

E112 Public Issues in Biotechnology (4). Lecture, three hours. Examines developments in biotechnology potentially affecting various facets of human society or warranting significant public debate. The implications for public health, environmental science, agriculture, legislation, ethics in science, public policy, economics, and technological background in genetics and ecology.

E113 Social Ecology of Peace (4). Lecture, three hours. Examination of differing definitions of the problem of achieving peace and the special problems of seeking peace in the nuclear age. Same as International Studies 121. **(VII-B)**

E115 Environmental Health Science (4). Lecture, three hours. Focuses on processes of exposure to environmental toxins/agents and their impact to human health and the environment. Media transport, exposure assessment, susceptibility, behavior, and health effect of several toxins are discussed.

E117 Environmental Biotechnology (4). Lecture, three hours. A comprehensive yet concise description of the field of environmental biotechnology as it relates to human environments and the global ecosystem. Students become conversant in the natural history of environmental, biotechnical developments, and the applications of biotechnology. Prerequisite: a course in biology, chemistry, ecology, or environmental science.

SOCIO-ENVIRONMENTAL STUDIES

E121 Human Stress (4). Lecture, three hours. Stress as a multidisciplinary topic. Biological, psychological, and sociological approaches to adaptation-related disorders. Effects of acute and chronic stress on emotions, physiology, and behavior. Methods of stress assessment, stress reduction, and intervention. Prerequisite: Psychology and Social Behavior P9 or equivalent. Same as Psychology and Social Behavior P127H.

E122 Social Ecology of Peace II (4). Lecture, three hours. Examination of the relationship to achieving peace, of strivings for national security and arms control, and of the basic formative and stabilizing institutions of society including government, religion, business, education, and the family.

E123U California's Population (4). Lecture, three hours. Surveys California's human population (past, present, and future) and its interactions with trends in society, government, the economy, and the environment.

E124U Leadership (4). Lecture, three hours. Examines current theory and research about the origins, aspects, and consequences of leadership. Discussions with recognized community leaders and experiential assignments designed to focus on student's own leadership potential and skills. Prerequisite: Social Ecology 10 recommended. Same as Psychology and Social Behavior P159S.

E125 Ecological Anthropology (4). Lecture, three hours. Studies relationships between human communities and their natural environments. The role of environment in shaping culture; effects of extreme environments on human biology and social organization; anthropologist's role in studying global environmental problems, e.g., African famine, destruction of tropical rain forests. Prerequisite: Anthropology 2A, 2B, or 2C. Same as Anthropology 125B. **(VII-B)**

E126 The Family (4). Lecture, three hours. Examination of Western family life from population and life course perspectives. Links between large-scale trends and changes in individual's family and household options. Same as Psychology and Social Behavior P168P.

E127 Nuclear Environments (4). Lecture, three hours. Understanding the impact of the nuclear age on the environment and human health through the interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia. Same as International Studies 122. **(VII-B)**

E128U Race, Ethnicity, and Cities (4). Lecture, three hours. Examines racial and ethnic inequality and the influence that urbanization has in affecting race relations. Explores how race/ethnicity, urban space, housing, economic development, public education, and land policy intersect in cities, both historically and today.

PLANNING AND POLICY STUDIES

E129 Environmental Impact Analysis (4). Lecture, three hours. Examines the environmental impact assessment process. Topics include impacts associated with biophysical and socioeconomic environmental effects, whether direct, indirect, or cumulative. Analysis of project alternatives, mitigation of impacts, methodologies for measuring impacts. Legislation and case law. Examples from case studies. Prerequisite: Environmental Analysis and Design E8 or consent of instructor.

E131U Diversity and Environments (4). Lecture, three hours. Explores human diversity and power in built environments. Examines contributions of underrepresented groups to design and planning professions, and how race, class, gender affect use and perception of environments. Investigates ways to make environments and environmental professions more responsive to diversity. **(VII-A)**

E132U Global Environmental Issues (4). Lecture, three hours. While many agree that environmental problems threaten humankind, there is much disagreement over the nature of these threats and how to address them. This course examines global environmental issues from various perspectives in order to provide answers to these questions. Same as International Studies 120 and Political Science 143D.

E133 Advanced Environmental Psychology: Facilities Design for the Workplace (4). Lecture, three hours. Survey of major topics in the field of facilities design and management including methods of environmental programming and postoccupancy evaluation, design criteria for office automation, and facility-based strategies for promoting employee health, productivity, and improved quality of worklife. Prerequisites: Environmental Analysis and Design E8 and E108. Same as Psychology and Social Behavior P184P.

E134 Environmental Design Research Methods (4). Lecture, four hours. In-depth treatment of theoretical and empirical work relevant to selected topics in environmental psychology, followed by field work with architectural consultants. Students develop environmental evaluation instruments, collect data, and report findings to the consultants for review. Prerequisites: Social Ecology 10; Environmental Analysis and Design E8 and E108. Same as Psychology and Social Behavior P188P.

E135U Elements of Environmental Design (4). Lecture, three hours. Basic elements of environmental design such as scale, proportion, rhythm, color, sound, lighting, surfaces, texture, architectural definition of spaces, volumes, massing volumetric analysis, solids and voids, and cultural aspects of design. Excitement and creativity in design, imageability. Prerequisite: Environmental Analysis and Design E8; E102U or consent of instructor.

E136U Environmental Programming (4). Lecture, three hours. Various styles and methods of programming for buildings and building interiors. Examines information designers need; methods for acquiring, sorting, and processing information; making information more scientific, systematic, and reliable; how it can be represented; value judgments involved. Prerequisites: Environmental Analysis and Design E8; E135U or consent of instructor.

E137U International Environmental Management (4). Lecture, three hours. Network of intergovernmental organizations (the United Nations, in particular) and international nongovernmental organizations in the field of environmental management. Prerequisite: Criminology, Law and Society C7. Same as Criminology, Law and Society C129 and International Studies 123.

E138U Design and Behavior (4). Lecture, three hours. Introduces students to United States urban design and the significance of design for human well-being. Focuses on Southern California urban developments. Prerequisites: Environmental Analysis and Design E8 and E136U.

E139A-B-C Research in Environmental Design I, II, III (4-4-4). Participating in a research project selected by the professor, students learn to frame research questions, design a research project, collect data, analyze data, and write research reports. Focus is on "qualitative research methods." Prerequisite: Social Ecology 10 or consent of instructor. Only one quarter of E139A-B-C may be used toward upper-division requirements.

E140U Survey Analysis of Urban Residents (4). Lecture, three hours. Hypotheses concerning the nature and problems of metropolitan areas are tested using Orange County data. A resident survey and the 1980 census are used to study urban social and economic issues. Empirical research projects are assigned. Prerequisites: Environmental Analysis and Design E8; Social Ecology 10 and 166A-B-C.

E141U Urban and Regional Analysis (4). Lecture, three hours. Concepts and methods in regional science with applications to planning, public policy, and environmental analysis. Spatial interaction, location, multiplier, basic activity, and input-output models and their relation to ongoing urban and regional phenomena. Prerequisites: Social Ecology 10 and 13.

E142U Technology and Economic Development (4). Lecture, three hours. Covers importance of technology for urban economic and social development. Concepts of technological innovation and diffusion, and their relevance for cities and metropolitan areas. Principles of networks and their importance for diffusion. Relationship of technology with urban infrastructure and metropolitan form. Prerequisites: Social Ecology 10 and 13 or equivalent.

E143U Social Ecology of the Borderlands (4). Lecture, three hours. An introduction to the most important socioeconomic issues affecting the urban-regional context of the U.S.–Mexico border area. Borderlands regional development, urbanization, migration, industrialization, labor market, and environmental issues are considered. Prerequisite: Environmental Analysis and Design E8. Same as Chicano/Latino Studies 162. **(VII-B)**

E144U Urbanization and Social Change (4). Lecture, three hours. Examines interactions between social structure and physical space: (1) the contemporary evolution of cities and their hinterlands in the U.S.; (2) patterns of urbanization in the Third World; and, as background for understanding these developments, (3) the re-emergence of cities in Medieval Europe. Prerequisite: Environmental Analysis and Design E8.

E145U Environmental Politics and Policy (4). Lecture, three hours. Provides a multifaceted foundation for the development of environmental problem-solving and policy-making skills. Examines "nature" from a range of historical and cultural perspectives. Links socio-ecological stress theories to a range of landscapes and contemporary debates. Current air, water, and land policies. Same as Political Science 141A.

E146U Public Policy and Management (4). Lecture, three hours. Exposes students to the best management practices that assure effective planning and implementation of policies and programs in government, business, and nonprofit sectors. Includes guest lecturers who are proven leaders in the four principal institutions of a community: business, education, government, and nonprofit.

E148U Cities and Transportation (4). Lecture, three hours. The relationship between urban areas and transportation systems. Economic analysis of cities, transportation and urban form, highway congestion, environmental impacts of transportation, public transit, land use and transportation, and political influences on transportation planning.

E151U Housing and Urban Development Policy (4). Lecture, three hours. Surveys public policy issues and develops analytic techniques in the areas of housing and urban development. Examines a range of policy topics including housing assistance to low- and moderate-income families, housing finance system, incentives for economic development and neighborhood preservation. Recommended: previous course work in economics.

E154U Ethics and Public and Private Life: Advanced Seminar (4). Examines ethical issues in public and private life by considering traditional moral theory in light of specific moral dilemmas, such as environmental policy, genocide, abortion, euthanasia, social welfare, and aid to other countries. Prerequisite: satisfactory completion of the upper-division writing requirement or consent of instructor. Same as Political Science 138B.

E155U Water Resource Policy (4). Lecture, three hours. Examination of contemporary water problems worldwide, with particular attention to the competing demands for water in the western U.S., and water demand by the poor in developing countries. History and analysis of U.S. water policies at local, state, and federal levels.

E156U Public Health Cost-Effectiveness Analysis (4). Students learn how to calculate the cost-effectiveness of life-and-death public health interventions by measuring health-related quality of life, survival, and cost, and how to use cost-effectiveness information to make wise public health investment decisions in the face of limited resources.

E157U Public Policy Analysis (4). Examines different approaches to the analysis of public policy with differing notions of what constitutes good policy, the role of government, and how citizens participate in policy-making. Suggests a policy-design perspective which builds upon other frameworks but concentrates on goals, implementation structures, tools, and rationales. Prerequisites: Environmental Analysis and Design E8 and E109U. Same as Political Science 121E.

E158U Economic Analysis of Government Behavior II (4) W. The study of government using the tools of economics. The effects of various taxation and expenditure policies, such as social security, are examined. Prerequisites: Economics 100A-B or consent of instructor. Same as Economics 141B and Political Science 127B.

E159U Urban Economic Development Policy (4). Theoretical and practical perspectives on local economic development policy. Integrates economic, planning, political perspectives. Overview of economic role of cities and metropolitan areas. Specific development issues include link between taxes, regulation, job growth; redevelopment planning; evaluating economic development policy.

ECOLOGY AND ENVIRONMENTAL HEALTH SCIENCE

E160 Environmental Health Microbiology of Water and Waste Water (4). Lecture, three hours. Examines microorganisms and their functions in the aquatic environment, specifically microorganisms' role in the biogeochemical cycles of nitrogen, sulfur, and mercury, and how our activities are affecting these cycles. How and why indicator organisms are used in the determination of water quality for public health. Prerequisites: Environmental Analysis and Design E5 or a general course in biology.

E160L Environmental Health Microbiology of Water and Waste Water Laboratory (4). Laboratory, three hours. Enumeration and identification of microorganisms from various aquatic environments. Examines microbial mediation of the sulfur, nitrogen, and mercury cycles and the public health aspects of water quality. Prerequisites: Environmental Analysis and Design E8 or a general course in the Biological Sciences Core curriculum; and completion of or concurrent enrollment in E160.

E160U Urban Design Principles (4). Lecture, three hours. Introduction to principles of urban design and its applications. Study of contemporary and traditional theories of urban design formulated to improve physical characteristics of built environment to facilitate an enhanced quality of life. A variety of case studies are discussed.

E161 Environmental Hydrology (4). Lecture, three hours. Provides an overview of the occurrence, distribution, and movement of water in the environment. Qualitative understanding emphasized. Quantitative methods for analyzing hydrologic processes. Human impacts on water distribution and quality. Lectures, weekly assignments, problem sets, a project, and a field trip. Prerequisites: precalculus-level mathematics and previous introductory course work in environmental geology, earth science, or chemistry helpful.

E162 Brownfields: Law and Policy (4). Lecture, three hours. Examines the legal structure and policy issues of redeveloping contaminated properties know as Brownfields. Federal and state Brownfield programs, liability and risk management, cleanup and future land use, institutional controls, community economic revitalization, legislation and policies to encourage Brownfield redevelopment. Prerequisite: Environmental Analysis and Design E8 or consent of instructor.

E163 Issues in Potable Water Reuse (4). Lecture, three hours. Provides an in-depth study of the treatment and subsequent reuse of wastewater for drinking. Analyzes existing regulations for both drinking water and reuse situations, microbial and chemical contaminants, health concerns and risk assessment. Prerequisite: Environmental Analysis and Design E8.

E164 Toxins in the Environment (4). Lecture, three hours. Uses and impact of heavy-metal toxins in the environment traced from ore bodies, product manufacture, consumption, and waste management. Routes of exposure; medical and societal impacts of these exposures. Prerequisites: Environmental Analysis and Design E8; junior standing and consent of instructor.

E164L Toxins in the Environment Laboratory (4). Laboratory, three hours. Involves planning, sampling, gathering, and analyzing data. Direct first-hand experience in carrying out a scientific research project from inception through final technical report. Prerequisite or corequisite: Environmental Analysis and Design E164. Prerequisites: E8 and either E115 or consent of instructor.

E165L Environmental Geology: Field and Laboratory (4). Provides weekly lecture, laboratory experiments, and demonstration of techniques in the environmental sciences. Three to five Saturday field trips as well as a four-day field trip to study specific environmental problems. Prerequisite or corequisite: Environmental Analysis and Design E110. Formerly Environmental Analysis and Design E185L.

E166L Chronological Dating Techniques Laboratory (4). Examines the potential and limitations of chronological dating techniques in the study of both near-term and long-term environmental processes and anthropogenic events. Case studies reflect consistency of the class. Weekly laboratory demonstrations and exercises. Prerequisite: Environmental Analysis and Design E8.

E167 Terrestrial Ecosystems (4). A mechanistic perspective of the structure and functioning of terrestrial ecosystems. Includes the mechanisms that control plant growth, hydrology and nutrient cycling, and the roles terrestrial ecosystems play in local and global biogeochemistry. Prerequisite: Biological Sciences E106 or consent of instructor. Same as Biological Sciences E118 and Earth System Science 164.

E168 Coastal Ecosystem Health (4). Examines the causes of coastal ecosystem degradation and strategies to restore the ecosystem balance or prevent further coastal ecosystem health degradation. Prerequisite: Environmental Analysis and Design E8.

E168L Laboratory for Exposure Assessment (4). Laboratory, three hours. Focuses on sampling strategies, collection techniques, and instrumental analysis of environmental samples from different media to determine exposure of the population. Laboratory exercises, data analysis, and report writing. Prerequisite: E115.

E169A-B Applied Ecology Seminar (3-3). Seminar, two hours. Introduces Applied Ecology majors to a variety of research occurring in industry and universities concerned with subjects addressed in the major. Selected topics include environmental health issues, water quality, hazardous waste management, biotechnology, and economic concerns in management of pollution problems. Prerequisites: Environmental Analysis and Design E8; upper-division Applied Ecology majors.

PUBLIC HEALTH

E172 Introduction to Complementary and Alternative Medicine (4). Examines health and disease in contemporary American culture and society with definitions, models, and practices of what has come to be known as "orthodox" or "conventional" medicine. Selected "alternative" or "complementary" modes of promoting health and well-being including homeopathy, herbology, and chiropractic.

E173 Health and Global Environmental Change (4). Lecture, three hours. Overview of scientific underpinnings of global environmental change and human health consequences. Provides students with an understanding of the fundamental dependency of human health on global environmental integrity. Encourages disciplinary cross-fertilization through interaction of students in environmental, health, and policy sciences. Prerequisite: at least one upper-division course in environmental science, public health, environmental policy, and/or environmental management, or consent of instructor.

E175 Strategies of Health Promotion (4). Lecture, three hours. Examination of strategies for promoting physical and mental health at community, organizational, and individual levels. Interventions designed to promote healthier lifestyles, organizational structures, and environmental conditions. Criteria for monitoring cost-effectiveness of these programs. Prerequisite: Environmental Analysis and Design E8. Same as Psychology and Social Behavior P138H.

E176 Environmental and Occupational Health (4). Lecture, three hours. Occupational health, theory, practice, and regulations: recognition, evaluation, and control of workplace and community health hazards. Emphasizes complexities of personal and ambient environment and the view that health is an individual's response to a diverse and dynamic world. Same as Psychology and Social Behavior P142H.

E177A Epidemiology I (4). Lecture, three hours. The distribution of disease and injury across time, space, and populations. Covers basic concepts and methods of descriptive epidemiology including the natural history of disease, demography, public health interventions, models, measurement, sources of data, and indices of health. Prerequisites: Social Ecology 10 and 13. Same as Psychology and Social Behavior P128H. Formerly Environmental Analysis and Design E116.

E177B Epidemiology II (4). Lecture, three hours. Covers basic concepts of analytic epidemiology and applications, including experimental and observational designs, prevention, screening, treatment and rehabilitation, infectious disease, and injury prevention. Prerequisite: Environmental Analysis and Design E177A. Same as Psychology and Social Behavior P129H. Formerly Environmental Analysis and Design E177.

E178 Community Health: An Epidemiological Approach (4). Lecture, three hours. An examination of the distribution and dynamics of human health problems on the community level and exploration of scientific investigations used to determine circumstances under which diseases occur or health prevails. Includes environmental, genetic, and nutritional factors, and examines social ramifications. Prerequisites: Environmental Analysis and Design E8 and consent of instructor. Same as Psychology and Social Behavior P139H.

E179U Foundations of Community Health (4). Lecture, three hours. A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies also are discussed. Prerequisite: Environmental Analysis and Design E8. Same as Psychology and Social Behavior P126H.

E180 Field Methods for Applied Ecologists (4). Uses descriptive format to introduce environmental analysis, methodology, and writing skills necessary to conduct research and produce written papers in scientific journal format. Corequisite: Environmental Analysis and Design E180L. Open only to senior Applied Ecology majors.

E180L Field Methods Laboratory (3). Active participation in acquisition and analysis of data. Introduction to field sampling techniques, data collection and laboratory analysis, and the production of written papers in scientific journal format. Habitats include terrestrial, aquatic, and the built environment, both natural and polluted conditions. Corequisite: Environmental Analysis and Design E180.

E186 Impacts on Human Health and Disease (4). Lecture, three hours. Examines mechanisms by which diseases are maintained and spread through human populations. Impact of disease is given historical and global perspective. Topics include infectious and genetic disease, evolution, weaponization, modernization, and public health policy.

E187 Introduction to Genetic Epidemiology (4). Lecture, three hours. Examines the methodological approaches for studying the importance of genetic factors and gene-environment interactions in human diseases. Topics include: genetic and epidemiological concepts, population studies, family studies, and applications in medicine and public health. Prerequisite: Environmental Analysis and Design E177A.

E188 Social Epidemiology (4). Lecture, three hours. Overviews evidence linking environmental factors to mental and physical disorders including such variables as socioeconomic status, income inequality, work stress, job loss, social capital, location, and other demographic characteristics. Considers measurement and research design issues of both the individual and aggregate levels. Prerequisites: Psychology and Social Behavior P9 or equivalent; Social Ecology 10; Social Ecology 13 or equivalent. Same as Psychology and Social Behavior P163S.

E189U Health Policy (4). Lecture, three hours. Considers social and economic aspects of health and disease in the United States. What are the proper roles of the individual, community, and government in improving health and health care? International comparisons will be made wherever possible.

E190B Community Response to Terrorism (4). Lecture, three hours. Examines risk perceptions and behaviors of individuals and societies in response to terrorism. Topics: unconventional and emerging threats, psychology of terror, coping and resilience, risk communication, media effects on psychological responses, public health preparedness for mass-casualty terrorism. Prerequisite: Psychology and Social Behavior P9 or equivalent. Same as Psychology and Social Behavior P191P.

E190C Ethics and International Relations (4). Lecture, three hours. Introduces students to the dynamic field of ethics and international relations. A variety of traditional and emerging perspectives are examined, skeptical views are discussed in detail, and arguments are illustrated with current cases. Same as Political Science 146A. **(VII-B)**

E190U Latino Metropolis (4). Lecture, three hours. Explores the processes of Latino urbanization in the United States and the spatialization of Latino identities, particularly in the context of Southern California with selected comparisons drawing from other cities. Same as Chicano/Latino Studies 154. **(VII-A)**

E191A Seminar in Environmental Health, Science, and Policy (4). Current topics relevant to the field of environmental health, science, and policy are covered in-depth in a seminar format. Possible subjects include hazardous and biological pollutants in soil, water, air; remediation technologies; water conflicts; regulations pertaining to contaminants. Prerequisite: upper-division standing or consent of instructor. May be taken twice for credit as topics vary.

E191B Bioindicators of Environmental Pollution (4). Focuses on bioindicators of environmental pollution in the soil, air, and water studies at the ecosystem, organism, and gene/molecule level. Includes economic, policy, and social implications of these sentinels. Prerequisite: upper-division standing or consent of instructor.

E191C Air Pollution, Climate, and Health (4). Introduction to how air pollutants are emitted into the atmosphere, physical and meteorological processes that affect transport, and the influence of air pollutants on global warming. How people are most exposed to air pollutants and differences in developed and developing areas. Prerequisite: Environmental Analysis and Design E3, E5, E8, or consent of instructor.

E191U Urban Design and Graphics Studio (4). Lecture, three hours. Introductory course organized around a variety of assignments to encourage learning by design in a studio setting. Students work on design projects and graphic representation assignments to learn practical aspects of urban design.

E192U Technology Analysis (4). Lecture, three hours. Covers concepts of interest for policy-making and technology analysis, dealing with invention, innovation, and the socioeconomic impacts of new technologies. Comparative assessments of new technologies and their national and regional impacts on organizations, sectors, and activities. Prerequisites: Social Ecology 10 and 13.

E193U Decisions, Games, and Other Public Policy Analytics (4). Lecture, three hours. A number of alternative approaches to policy analysis are taken up, beginning with the rational model and leading into postpositivist approaches, including studying institutional coherence, interpretive analysis, and others.

E194U Institutional Analysis: Studying Programs and Practices (4). Lecture, three hours. Study of the methods of examining institutions from macro, intermediate, and micro scales of analysis. Provides a wide range of skills for program analysis ranging from standard program evaluation to interpretive analytics. Prerequisites: upper-division standing and consent of instructor.

E196A-B Applied Ecology Research (4-4). Basic introduction to research and laboratory research techniques: experimental design, laboratory skills, biostatistics, library research. Students undertake a two-quarter project focusing on environmental health of humans or of flora and fauna associated with environments that are impacted by human activities. Corequisite: first year of Biological Sciences Core. Prerequisites: general chemistry; Biological Sciences 100L or Environmental Analysis and Design E103, or consent of instructor. In-progress grading.

DEPARTMENT OF PSYCHOLOGY AND SOCIAL BEHAVIOR

Karen S. Rook, **Department Chair**

The Department of Psychology and Social Behavior is concerned with human behavior in social contexts. A major objective is to investigate how different social environments (e.g., the family, school, workplace, culture) affect health and human behavior across the life span. The Department's faculty share a strong commitment to interdisciplinary scholarship and research that has the potential for application to important societal problems. Students begin with basic course work in developmental psychology, health and preclinical (abnormal) psychology, and social and environmental psychology. Subsequent courses cover such topics as social, emotional, and cognitive development in children, adolescents, adults, and the elderly; behavior disorders and developmental psychopathology; cultural, social, and personality influences on behavior; attitude formation and change; health psychology; cognition and emotion; stress and coping; psychology and the law; and counseling and therapy. Opportunities are available to work with faculty members on research in these and other areas. Obtaining research experience as an undergraduate also provides a valuable background for entry into many graduate programs. The Department offers a B.A. degree program in Psychology and Social Behavior.

Students are given a foundation that will enable them to pursue graduate work in psychology, public health, health services, social work, counseling, or education, or to work after graduation from UCI in both the private and public sectors. Field study opportunities include hospital settings, social service agencies, educational institutions, and community health clinics and counseling centers, among others.

Students should be aware that psychology courses are offered in several different departments and programs at UCI. Students interested in developmental, clinical, social, emotional, health, cross-cultural, or environmental psychology, or in psychology and the law, are advised to consult the course listings here in the Department of Psychology and Social Behavior section. These courses offer students a solid foundation in general psychology. Students interested in language, perception, sensorimotor integration, memory, learning, mathematical psychology, and neuroscience are advised to consult the course listings in the Department of Cognitive Sciences and the School of Biological Sciences sections of the *Catalogue*.

Information on the graduate program begins on page 412.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 396.

Departmental Requirements

Ten courses (40 units) as specified below:

A. Three upper-division Psychology and Social Behavior core courses (12 units), one from each of these areas:
   1. Lifespan Developmental Psychology (P106)
   2. Health and Pre-Clinical Psychology (P103, P105, P107)
   3. Social and Environmental Psychology (P108, P109).

B. Three upper-division specialty courses (12 units), one from each of these areas:
   1. Developmental Psychology (P113D–P117D)
   2. Health and Pre-Clinical Psychology (P125H–P143H and P144C–P155C)

3. Social and Environmental Psychology (P156S–P167S and P168P–P193P).

C. Four additional courses (16 units) selected from the specialty areas in requirement B above or from those courses numbered P119D–P124D and P192A–Z (a maximum of two courses from P192A–Z may be counted toward the major). NOTE: P100 may be used as a specialty course but not as a core course, and P196 and Social Ecology H190A may be counted as upper-division specialty courses upon petition.

Psychology and Social Behavior Minor Requirements

Nine courses (36 units): Criminology, Law and Society C7, Environmental Analysis and Design E8, Psychology and Social Behavior P9, and six upper-division Psychology and Social Behavior courses selected from P100–P193.

NOTE: Students pursuing a major in the School of Social Ecology may not use upper-division course work for both school, major, or minor requirements. No overlap is permitted. Social Ecology 198 and 199 may not be applied toward the minor.

Excellence in Research in Psychology and Social Behavior

High-achieving students majoring in Psychology and Social Behavior can earn Excellence in Research in Psychology and Social Behavior by participating in a two-component program consisting of faculty-supervised research and courses in methodology and statistics. Students apply to the program coordinator at the end of their junior year. To be eligible for the program, students must have earned an overall 3.5 GPA at UC, with grades of B or above in the required methodology and statistics courses (Social Ecology 10, 13, 111, and Psychology and Social Behavior P190). Applicants should also submit a three-page statement of their research interest and a letter of recommendation from a Psychology and Social Behavior faculty member who has worked with the student during at least two quarters of the junior year in P196 or Social Ecology 198 or 199 and judges the student prepared to embark on a senior research project. Successful completion of the program requires faculty-mentored research (P196 or Social Ecology H190A-B-W) and completion of a senior research thesis or a report at a research conference.

Courses in Psychology and Social Behavior

LOWER-DIVISION

P9 Introduction to Human Behavior (4). Lecture, three hours. Introduction to models of human development and mental health, and the application of scientific methods to the study of social behavior. Differences among individual, group, and societal levels of analysis and intervention emphasized. **(III)**

UPPER-DIVISION

P100 Special Topics in Social Behavior (4). Lecture, three hours. Special topics courses are offered from time to time. Course content varies with interest of instructor. Prerequisites: Psychology and Social Behavior P9 or equivalent, and consent of instructor. May be repeated for credit as topics vary.

P103 Health Psychology (4). Lecture, three hours. Theory and research are considered as they contribute to an understanding of the role of psychological processes in health and illness. The distinction between prevention and treatment of illness is established, and a variety of psychosocial interventions are elaborated. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P105 Abnormal Behavior (4). Lecture, three hours. Survey of disorders organized by the diagnostic categories of the American Psychiatric Association. Interdisciplinary orientation combines environmental, psychological, and organic perspectives on etiology and treatment. Prerequisite: Psychology and Social Behavior P9 or equivalent; Social Ecology 10. Psychology and Social Behavior P105 and Psychology 120A may not both be taken for credit.

P106 Life Span Developmental Psychology (4). Lecture, three hours. Addresses the major issues, concepts, and methods of life span developmental psychology. The fundamental theories, distinctive methods, and the physical, perceptual, cognitive, social, motivational, and emotional development for each developmental phase of the life course are considered. Prerequisite: Psychology and Social Behavior P9 or equivalent. Psychology and Social Behavior P106 and Psychology 120D may not both be taken for credit.

P107 Clinical Child Psychology (4). Lecture, three hours. Examines research and theory concerning childhood psychopathology and behavior disorders. Diagnosis and assessment, early identification of high-risk children, fear and phobias, antisocial behavior, childhood psychoses, autism, depression, hyperactivity and attention deficit disorders, ethical and policy implications of identifying children who are different. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 127C.

P108 The Social Animal (4). Lecture, three hours. Theories and research exploring social behavior and social influences on behavior. Topics include methods of social research, attitude formation and change, social perception, the social self, stereotypes and prejudice, conformity, obedience, altruism, aggression, interpersonal relationships and love, and group behavior. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P109 Environmental Psychology (4). Lecture, three hours. Impact of the physical environment on individual and group behavior. Three basic concerns examined: (a) environmental determinants of behavior at the individual and interpersonal level; (b) social planning and urban design; and (c) methodological approaches to the study of environmental issues. Prerequisites: Social Ecology 10 and Environmental Analysis and Design E8. Same as Environmental Analysis and Design E108U.

DEVELOPMENTAL PSYCHOLOGY

P113D Child Development (4). Lecture, three hours. Examines social, emotional, and intellectual growth and development between the ages of 2 and 12 years. Prerequisite: Psychology and Social Behavior P9 or equivalent. Psychology and Social Behavior P113D and Psychology 120D may not both be taken for credit.

P114D Adolescent Development (4). Lecture, three hours. Examines current research on the biological, social, and cultural contexts of adolescent development. Topics include the impacts of puberty, adolescents' decision-making competencies, changes in family and peer relationships, identity development, and psychosocial problems such as depression and problem behavior. Prerequisite: Psychology and Social Behavior P9 or Psychology 7A or equivalent. Psychology and Social Behavior P114D and Psychology 21A may not both be taken for credit.

P115D Infant Development (4). Lecture, three hours. Study of human development from conception through the first two years of life, covering processes and events in the domains of physical, social, and cognitive development. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 127I.

P116D Adult Development (4). Lecture, three hours. Examines why and how we change (with attention to gains as well as losses) from ages 25–65 and the nature and sources of continuity over time. Topics include physical and intellectual functioning, personality, coping strategies, and social roles and relationships. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 127A.

P117D Gerontology (4). Lecture, three hours. Examines stereotypes and myths associated with aging; physiological and psychological changes that accompany old age; distinguishes behavior changes due to aging *per se* from those due to historical and socioeconomic factors; political, social aspects of old age in contemporary society. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 127G.

P119D Cognition and Emotion (4). Lecture, three hours. Examines relations between cognition and emotion. How have the relations between cognition and emotion been construed historically? How closely related are cognitive and emotional development? How do emotions influence reasoning and memory? How similar is emotional experience across cultures? Prerequisite: Psychology and Social Behavior P9 or equivalent.

P120D Cognitive Development (4). Examines theories on nature of cognitive development. Discusses behaviorist theories on role of the environment including those of Vygotsky and Piaget, and recent evidence from cognitive psychologists stressing the importance of knowledge and skills within specific domains. Prerequisite: Psychology and Social Behavior P9 or equivalent. Psychology and Social Behavior P120D and Psychology 141D may not both be taken for credit.

P121D Human Sexuality (4). Lecture, three hours. A broad survey of human sexuality encompassing genetic factors, physiological and anatomical development, customary and atypical forms of behavior, reproductive processes, and cultural determinants. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P122D Development of Gender Differences (4). Lecture, three hours. Examination of research on how sexes differ in physiology, cognitive functioning, personality, and social behavior. Sex-differentiated development from the prenatal period through adulthood. Explanations for male-female differences are sought, focusing on biological (genetic, hormonal), and social (familial, cultural) mechanisms. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 127D.

P123D Perspectives on Child Rearing (4). Lecture, three hours. Impact of different child rearing practices on the development of personality and character. Effects on development of variations in structure and dynamics of the family and school; consequences of group care, working mothers, and the one-parent family. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P124D Human Development in Cross-Cultural Perspective (4). Lecture, three hours. Human development in diverse cultures (e.g., Asian, American, and African). Special emphasis on East-West contrasts and when East meets West (i.e., Asian-American experiences). Topics include parenting, family relations, language and cognition, schooling and academic achievement, and morality. Prerequisites: Psychology and Social Behavior P9 or equivalent; Social Ecology 10.

HEALTH AND PRE-CLINICAL PSYCHOLOGY

P125H The Hardiness Approach to Stress Management (4). Lecture, three hours. Hardiness is a new development within psychology involving a combination of motivations and skills that extensive research has shown enhances performance, conduct, morale, stamina, and health. Combines study of hardiness research with strategies for improvement of personal hardiness through a series of exercises.

P126H Foundations of Community Health (4). Lecture, three hours. A social ecological framework for understanding community health is presented. Measures of individual and community health are compared, and the influence of personal and environmental factors on individual, group, and population health is examined. Community health promotion strategies also are discussed. Prerequisite: Environmental Analysis and Design E8. Same as Environmental Analysis and Design E179U.

P127H Human Stress (4). Lecture, three hours. Stress as a multidisciplinary topic. Biological, psychological, and sociological approaches to adaptation-related disorders. Effects of acute and chronic stress on emotions, physiology, and behavior. Methods of stress assessment, stress reduction, and intervention. Prerequisite: Psychology and Social Behavior P9 or equivalent. Same as Environmental Analysis and Design E121.

P128H Epidemiology I (4). Lecture, three hours. The distribution of disease and injury across time, space, and populations. Covers basic concepts and methods of descriptive epidemiology including the natural history of disease, demography, public health interventions, models, measurement, sources of data, and indices of health. Prerequisites: Social Ecology 10 and 13. Same as Environmental Analysis and Design E177A.

P129H Epidemiology II (4). Lecture, three hours. Covers basic concepts of analytic epidemiology and applications, including experimental and observational designs, prevention, screening, treatment and rehabilitation, infectious disease, and injury prevention. Prerequisite: Psychology and Social Behavior P128H. Same as Environmental Analysis and Design E177B.

P130H Psychoneuroimmunology (4). Lecture, three hours. Examines the interactive relationships of behavioral-neural-hormonal-immune systems and how these relationships contribute to the maintenance of health and to the development of disease. Topics include: psychosocial factors, stress, disease and immunity; behavioral dispositions toward immune-related disorders. Prerequisites: Psychology and Social Behavior P9 or equivalent, P127H or consent of instructor.

P131H Child Health Psychology (4). Lecture, three hours. Exploration of psychological antecedents, concomitants, and consequences of medical illnesses in children. Children's beliefs about health, illness, and medication; the role of stress; coronary-prone behavior; therapeutic adherence and physician-patient interaction; coping with chronic illness; effects of a child's illness on family. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent; Social Ecology 10 recommended. Same as Psychology 127H.

P132H The Human Pain Experience (4). Lecture, three hours. Examines the physiological and sociocultural correlates of human pain perception. Emphasis on laboratory and clinical methods of measuring acute and chronic pain; social influences on the experience and communication of pain; biopsychosocial approaches to pain control. Prerequisites: Psychology and Social Behavior P9 or equivalent and any upper-division course from the Health or Pre-Clinical Psychology areas.

P134H Behavioral Medicine (4). Lecture, three hours. Examines biobehavioral aspects of health and illness, focusing on how stress contributes to or exacerbates disease processes. Background information on psychosomatic medicine and stress models and detailed examination of specific organ systems emphasizing the reactivity of these systems to stress. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P135H Sports Psychology (4). Lecture, three hours. Psychological components of athletic performance with regard to scientific and practical issues. Roles of cognitive processes, physiological arousal, and emotion. Various personality factors related to performance, competition, and coaching. Strategies for improving athletic performance for individual and team competition. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P138H Strategies of Health Promotion (4). Lecture, three hours. Examination of strategies for promoting physical and mental health at community, organizational, and individual levels. Interventions designed to promote healthier lifestyles, organizational structures, and environmental conditions. Criteria for monitoring cost-effectiveness of these programs. Prerequisite: Environmental Analysis and Design E8. Same as Environmental Analysis and Design E175.

P139H Community Health: An Epidemiological Approach (4). Lecture, three hours. An examination of the distribution and dynamics of human health problems on the community level and exploration of scientific investigations used to determine circumstances under which diseases occur or health prevails. Includes environmental, genetic, and nutritional factors, and examines social ramifications. Prerequisites: Environmental Analysis and Design E8 and consent of instructor. Same as Environmental Analysis and Design E178.

P140H Beliefs, Attitudes, and Health Behaviors (4). Lecture, three hours. Examines health-relevant beliefs, attitudes, and behaviors from a social psychological perspective. Topics include: self-control; obesity; sexual behavior; medication errors, stress, perceived control and social support; happiness and well-being; changing health attitudes and behaviors; self-disclosure and health. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P141H Clinical Health Psychology (4). Lecture, three hours. Role of behavior in etiology, treatment, and prevention of certain diseases. Behavioral intervention including biofeedback, stress-, pain-management, health habit counseling, and other skills to assist patients make cognitive, emotional, and behavioral changes needed to cope with disease or achieve better health. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P142H Environmental and Occupational Health (4). Lecture, three hours. Occupational health, theory, practice, and regulations: recognition, evaluation, and control of workplace and community health hazards. Emphasizes complexities of personal and ambient environment and the view that health is an individual's response to a diverse and dynamic world. Same as Environmental Analysis and Design E176.

P143H Psychology and Emotion (4). Lecture, three hours. General theories of emotion and research regarding cognitive, behavioral, physiological, and subjective experience of emotion. Specific topics include emotion regulation, emotion and health, emotional intelligence, and emotional development. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 127E.

P144C Personality (4). Lecture, three hours. Comparison of the major theories of personality. Provides a frame of reference for understanding lifestyles, development, maturity, and psychopathology. Emerging research themes are used to identify promising lines of personality theorizing. Prerequisite: Psychology and Social Behavior P9 or equivalent. Psychology and Social Behavior P144C and Psychology 120P may not both be taken for credit.

P145C Forensic Psychology (4). Lecture, three hours. Presents theoretical and empirical basis for a psychological perspective of criminal behavior, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment, treatment, and rehabilitation; mental health services within forensic institutions. Prerequisites: Psychology and Social Behavior P9 or equivalent, Psychology and Social Behavior P105, P175P or Criminology, Law and Society C149, or consent of instructor. Same as Criminology, Law and Society C136 and Psychology 177F.

P146C Clinical Psychology (4). Lecture, three hours. Overview of theories, assessment techniques, research methodologies and intervention approaches in clinical psychology. Psychodynamic, behavioral, humanistic, and cognitive perspectives are examined along with ethical and professional issues. Prerequisites: Psychology and Social Behavior P9 or equivalent; Social Ecology 10; Psychology and Social Behavior P105. Formerly Psychology and Social Behavior P106.

P147C Psychological Testing and Assessment (4). Lecture, three hours. Laboratory-seminar exploration of diverse methods of assessing, analyzing, and recording behavior. Includes methods of direct behavioral observation, structured (analog) assessments, rating scales, interviewing, and self-monitoring. Development of assessment skills and their application in intervention and research programs. Prerequisite: Psychology and Social Behavior P9 or equivalent; P105 or P146C. Social Ecology 10 recommended.

P149C Behavior Modification (4). Lecture, three hours. Principles and methods of behavior modification derived from psychological theories of learning. Considers applications of behavior techniques to treat childhood disorders, school problems, juvenile delinquency, marital and sexual problems, alcoholism, and eating disorders. Behavioral interventions in community and industrial settings. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent; Psychology 122C or consent of instructor. Same as Psychology 127B.

P150C Cognitive Behavior Therapy (4). Lecture, three hours. Presentation of principles and procedures of therapeutic interventions based on cognitive-behavior methods. Cognitive factors in learning, emotional arousal, psychological disorder, and psychotherapy reviewed. Introduces the application of cognitive behavioral methods to problems of depression, anxiety, anger, pain, and impulsivity. Prerequisites: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent; Psychology 122C or consent of instructor. Same as Psychology 147C.

P151C Child Therapies (4). Lecture, three hours. Examines research methodologies, empirical data, and implications of diverse intervention strategies. Primary topics include psychotherapy process and outcome, family therapies, behavioral intervention, cognitive behavior modification, pediatric psychopharmacology, and ethical and social policy implications of intervening in other people's lives. Prerequisites: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent; Psychology 122C or consent of instructor. Social Ecology 10 recommended. Same as Psychology 127T.

P152C Developmental Psychopathology (4). Lecture, three hours. Research and theory of origins, course, and outcomes of disordered behavior. Continuity and change in patterns of behavior; environmental challenges and buffers; stress and competence in children; vulnerable and invincible children; children of mentally ill parents; families at risk; childhood antecedents of adult disorders. Prerequisites: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent; Psychology 120A or consent of instructor; Social Ecology 10 recommended. Same as Psychology 177P.

P153C Existential Psychology (4). Lecture, three hours. Overall emphasis on life's meaning and direction as an unfolding expression of the pattern of decisions engaged in by each person. Topics include relevant personality and developmental theory, research, and philosophy, as well as applied consideration of diagnostic testing and psychotherapy. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P154C Peer Counseling I (4). Lecture, three hours. Focuses on the development of basic counseling skills and knowledge of specific issues related to the student population. Students are required to provide supervised coaching and counseling services to the campus community. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P155C Peer Counseling II (4). Second quarter of two-quarter course which focuses on the development of basic counseling skills and knowledge in specific issues related to the student population. Prerequisites: Psychology and Social Behavior P9 or equivalent, P154C, and consent of instructor.

SOCIAL AND ENVIRONMENTAL PSYCHOLOGY

P156S Interrogation, Confession, and the Law (4). Lecture, three hours. In-depth examination of the social psychology of police interrogation in America, the evolution of American interrogation practices from the nineteenth century to the present, impact of law on police behavior and ideology, causes and consequences of false confessions, possibilities of reform. Same as Criminology, Law and Society C152.

P157S Attitudes and Behavior (4). Lecture, three hours. Intended for students interested in theory and research on how attitudes influence, and are influenced by, behavior. Topics include: voting behavior, Fishbein and Ajzen's theories of reasoned action and planned behavior, attitude accessibility, prejudice and discrimination, and cognitive dissonance theory. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 127S.

P158S Social Relationships (4). Lecture, three hours. Examines major issues, concepts, and methods in the scientific study of social relationships. Topics include relationship formation and dissolution, friendships and love relationships, loneliness, bereavement, societal influences on close relationships, significance of close relationships for health and well-being. Prerequisites: Psychology and Social Behavior P9 or equivalent; Social Ecology 10.

P159S Leadership (4). Lecture, three hours. Examines current theory and research about the origins, aspects, and consequences of leadership. Discussions with recognized community leaders and experiential assignments designed to focus on student's own leadership potential and skills. Social Ecology 10 recommended. Same as Environmental Analysis and Design E124U.

P161S Psychology of Subjective Well-Being (4). Lecture, three hours. Introduces recent empirical developments in subjective well-being, an emerging field of psychology devoted to the study of happiness and life satisfaction. The antecedents and consequences of psychological well-being are discussed in relation to various demographic, personality, cross-cultural, developmental, and cognitive factors. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P162S Error and Bias in Social Judgment (4). Lecture, three hours. Examines how people encode, reason about, and remember social information and explores how biases and shortcomings in social perception, judgment, and memory are central to understanding both effective social functioning and many forms of maladaptive behavior and social conflict. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P163S Social Epidemiology (4). Lecture, three hours. Overviews evidence linking environmental factors to mental and physical disorders including such variables as socioeconomic status, income inequality, work stress, job loss, social capital, location, and other demographic characteristics. Considers measurement and research design issues of both the individual and aggregate levels. Prerequisites: Psychology and Social Behavior P9 or equivalent; Social Ecology 10; Social Ecology 13 or equivalent. Same as Environmental Analysis and Design E188.

P164S Psychology and the Law (4). Lecture, three hours. Psychological assumptions of American legal system and mental health aspects of provision of criminal justice services. Civil commitment, insanity defense, competence to stand trial, jury selection, eye-witness identification. Use of police, courts, correctional institutions in prevention of behavior disorders. Prerequisite: Criminology, Law and Society C7 or C101. Same as Criminology, Law and Society C105.

P165S Child Development, the Law, and Social Policy (4). Lecture, three hours. Examines how psychology research and practice can inform areas of law and social policy affecting children and adolescents. Topics include education, mental health, reproductive rights, and delinquency. Goals are to evaluate research as well as identify the costs/benefits of current policies. Prerequisites: Psychology and Social Behavior P9 or equivalent; P113D or P114D recommended. Same as Criminology, Law and Society C125.

P166S Family, Society, and Education (4). Lecture, three hours. Examines the development of children's academic and cognitive competence in social context. Effects of parental beliefs, home environment, school environment, peer norms, community norms, cultural values. Effects of selected demographic factors such as ethnicity, parental SES, maternal employment, birth order. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P168P The Family (4). Lecture, three hours. Examination of Western family life from population and life course perspectives. Links between large-scale trends and changes in individual's family and household options. Same as Environmental Analysis and Design E126.

P169P Family Law (4). Lecture, three hours. Examines legal issues surrounding marriage, cohabitation, divorce, child custody and support, adoption, and the rights of parents and children in the family context. The findings of social science research are used to illuminate the legal issues. Prerequisite: Criminology, Law and Society C7 or C101. Same as Criminology, Law and Society C123.

P170P Work and Family (4). Lecture, three hours. Effects of employment and unemployment on mental health and marital quality; effects of work on parenting and child development; corporate and social policies for "families that work"; young adults' decision-making about work and family. Prerequisite: Psychology and Social Behavior P9 or equivalent.

P171P Impacts of Divorce (4). Lecture, three hours. Examines divorce in historical, economic, and, primarily, psychological contexts, emphasizing recent research pertaining to the impacts of divorce on children, families, and society. Prerequisite: Psychology and Social Behavior P9, or Psychology 9A-B-C, or equivalent. Same as Psychology 177I.

P175P Violence in Society (4). Lecture, three hours. Current theory and research on aggression; anger and violence as problems in individual and social functioning. Process and functions of anger examined with regard to normal behavior and psychopathology. The determinants, prevalence, and implications of violence in society are analyzed. Prerequisite: Psychology and Social Behavior P9 or equivalent. Same as Criminology, Law and Society C149.

P176P Violence and Ideas Concerning the Social Order (4). Seminar, three hours. Historical and philosophical perspectives of violence as a way to enhance social science views. Violence as a problem of the social order. The state of nature, the social contract, and human destructiveness explored in conjunction with overviews of violence and warfare. Prerequisite: Psychology and Social Behavior P9 or equivalent and consent of instructor.

P177P Eyewitness Testimony (4). Lecture, three hours. Faulty eyewitness testimony is a major cause of wrongful convictions. Covers the fast-growing topic of eyewitness testimony and memory for real-world events, both how psychologists study eyewitness capacity, and how the legal system has dealt with eyewitness issues. Prerequisites: Social Ecology 10 and senior standing. Same as Criminology, Law and Society C177.

P182P Environmental and Public Health Policy (4). Lecture, three hours. Examines factors involved in shaping public health and environmental policy. Topics include the role of science in public health policy, the function of governmental regulatory agencies, citizen participation, and economic and sociopolitical aspects of controlling infectious diseases and regulating carcinogens. Same as Environmental Analysis and Design E101.

P184P Advanced Environmental Psychology: Facilities Design for the Workplace (4). Lecture, three hours. Survey of major topics in the field of facilities design and management including methods of environmental programming and postoccupancy evaluation, design criteria for office automation, and facility-based strategies for promoting employee health, productivity, and improved quality of worklife. Prerequisites: Environmental Analysis and Design E8 and E108U. Same as Environmental Analysis and Design E133.

P188P Environmental Design Research Methods (4). Lecture, four hours. In-depth treatment of theoretical and empirical work relevant to selected topics in environmental psychology, followed by field work with architectural consultants. Students develop environmental evaluation instruments, collect data, and report findings to the consultants for review. Prerequisites: Social Ecology 10; Environmental Analysis and Design E8 and E108. Same as Environmental Analysis and Design E134.

P190 Applied Statistics in Psychological Research (4). Lecture, three hours; discussion, one hour; laboratory, one hour. Covers statistical techniques used to describe and make generalizations about phenomena represented by data. Hands-on experience in data analysis and interpretation using statistical software (SPSS, STATA) is emphasized. Topics include data visualization, ANOVA, multiple regression, and categorical data analyses. Prerequisite: Social Ecology 13 or equivalent.

P191A Child in the Family, School, and Community (4). Lecture, three hours. The ecological study of contexts in which the child develops and is socialized: the family, school, peer group, media, and community. Examines the impact of societal influences, such as culture, religion, economics, politics, and technology. Prerequisite: Psychology and Social Behavior P9 or equivalent. Formerly P112D.

P191D Motivation (4). History, major theories, methods, and applications of motivational psychology, with emphasis on European approaches. Origins of the field in personality, learning, cognition, and activation research. Recent innovations in motivational and volitional self-recognition. Current approaches, major debates, empirical research programs. Prerequisites: Psychology and Social Behavior P9 or equivalent, and P106; and P108 or Environmental Analysis and Design E108U. Psychology and Social Behavior P191D and Psychology 121M may not both be taken for credit.

P191P Community Response to Terrorism (4). Lecture, three hours. Examines risk perceptions and behaviors of individuals and societies in response to terrorism. Topics: unconventional and emerging threats, psychology of terror, coping and resilience, risk communication, media effects on psychological responses, public health preparedness for mass-casualty terrorism. Prerequisite: Psychology and Social Behavior P9 or equivalent. Same as Environmental Analysis and Design E190B.

P192A History of Psychology (4). A history of the development of various schools and systems of psychological thought. Prerequisite: Psychology and Social Behavior P9 or equivalent, or Psychology 7A or 9A-B-C, or consent of instructor. Same as Psychology 120H.

P192B Organizational/Industrial Psychology (4). Introduction to applied psychology in organizations, including personnel testing, selection, training and evaluation, job and classification analysis, job satisfaction and motivation, organizational development, leadership, market research and consumer psychology. Potential ethical problems are discussed. Prerequisite: Psychology and Social Behavior P9 or equivalent, or consent of instructor. Same as Psychology 122I.

P192E Perception and Sensory Processes (4). A general introduction to the scientific study of sensory processes and perceptual phenomena, with special emphasis on the visual system. Prerequisite: Psychology and Social Behavior P9, or Psychology 7A or 9A-B, or equivalent, or consent of instructor. Psychology and Social Behavior P192E or Psychology 130A may not be taken for credit if taken after Psychology 131A or 131B. Same as Psychology 130A.

P192F Human Attention (4). Reviews and discusses methods of research, current data, and current theories in the field of human attention. Prerequisite: Psychology and Social Behavior P9, or Psychology 7A or 9A-B-C, or equivalent. Same as Psychology 134A.

P192G Cognitive Science (4). Introduction to investigations of the structure and function of the mind, from viewpoints of computation, neuroscience, philosophy, and cognitive psychology. Topics include: perception, attention, knowledge representations, learning and memory, action, reasoning, and language. Prerequisite: Psychology and Social Behavior P9, or Psychology 7A or 9B, or equivalent. Same as Psychology 140C.

P192I Principles of Learning Theory (4). Investigation of the learning and memory processes of humans and animals. Basic experimental approaches to learning and memory, empirical results, and theoretical interpretations of the evidence are discussed. Prerequisite: Psychology and Social Behavior P9, or Psychology 7A or 9A, or equivalent. Same as Psychology 140L.

P192J Human Memory (4). Developments in the area of memory; history of memory research; theories of the nature of memory. Visual memory, recognition memory, high-speed scanning, free recall, short-term memory, mnemonics, retrieval, relationship of memory to thinking. Selected theoretical formulations for memory. Prerequisite: Psychology and Social Behavior P9, or Psychology 7A or 9B, or equivalent. Psychology 46A may not be taken for credit after Psychology and Social Behavior P192J or Psychology 140M. Same as Psychology 140M.

P192K Human Problem Solving (4). Modern developments in the psychology of human problem solving. Topics include: concept identification, arithmetic, sets, logic puzzles, story problems, group problem solving, and theorem proving. Prerequisite: Psychology and Social Behavior P9, or Psychology 7A or 9A-B-C, or equivalent. Same as Psychology 143P.

P192L-M-N Cognitive Neuroscience I, II, III (4-4-4). Explores the neural basis of human perceptual, motor, and cognitive abilities. **P192L:** Introduction to cognitive neuroscience, functional brain imaging, neuropsychological disorders, and the neural basis of higher cognitive functions such as memory, language, and attention. **P192M:** Neuroanatomy/physiology, neuroscience methods, neural basis of perception. **P192N:** Motor control, plasticity, development and aging, psychopathology. Prerequisite: Psychology and Social Behavior P9 or equivalent, or Psychology 9A-B or Biological Sciences 35, or consent of instructor. Same as Psychology 160A-B-C.

P196 Research Seminar in Psychology and Social Behavior (4). Seminar, three hours. Special topics research seminar. Content varies with interest of instructor. Capstone seminar for students who have conducted research with, or have a background in, the research topics of the Psychology and Social Behavior faculty member offering this seminar in a given quarter. Prerequisites: upper-division standing and consent of instructor. May be repeated for credit as topics vary.

DEPARTMENT OF PLANNING, POLICY, AND DESIGN

World Wide Web: http://www.seweb.uci.edu/ppd
Marlon G. Boarnet, **Department Chair**

The Department of Planning, Policy, and Design utilizes an interdisciplinary approach to the study of urban and regional planning, public policy issues, and the built environment. The Department faculty devote their scholarly and teaching efforts to theory-driven and empirically oriented urban research and their interests include urban and community development, environmental policy, health promotion and policy, and urban design and behavior. The faculty focus on education in urban, social, public policy, and environmental problems.

The Department offers the Ph.D. degree in Planning, Policy, and Design; the Master of Urban and Regional Planning professional degree (fully accredited by the national Planning Accreditation Board); and an undergraduate minor in Urban and Regional Planning. The Department's graduate degree programs feature innovative teaching often involving students in community projects, and a significant degree of accessibility by students to faculty members.

The 19 full-time faculty members in the Department are productive and influential scholars. The Department's teaching, research, and graduate training utilize UCI's proximity to both urban centers and planned communities, as well as the University's location within the dynamic and multicultural Southern California and Pacific Rim regions. Collaborative academic and research ties are maintained with UCI's Institute of Transportation Studies, Center for Global Peace and Conflict Studies, Newkirk Center for Science and Society, Focused Research Group on International Environmental Policy, Center for Community Health, Community Outreach Partnership Center, Center for Unconventional Security Affairs, Center for Organizational Research, and the Urban Water Research Center.

The common mission linking the Department's undergraduate, master's, and doctorate-level instruction and faculty research efforts is to bring applied research to the cause of bettering individuals, neighborhoods, communities, and regions. Southern California has grown dramatically over the past four decades and will soon become the nation's largest urban corridor. The challenges to maintain the quality of life, provide employment opportunities, and reduce the deep socioeconomic disparities of this bi-national and multicultural metropolitan region are enormous. Extremely diverse, multiethnic communities face the necessity of solving their problems in ways that are acceptable to their populations. Older central city areas that are vital to the region face issues of social and economic sustainability. The need to create employment opportunities, through the application of new technologies in industries and services, will be a constant feature of an urban region undergoing such population increases. At the same time, urban growth and transportation will have to meet increasingly stringent environmental regulations that can safeguard the population's health and quality of the diverse natural environments. The urban design and landscape of most communities stand to be reshaped as never before, as the building stock ages and the need to redevelop intensifies.

The Department is grouped into four major clusters, each addressing sets of important issues to contemporary society. Faculty members and students who study **urban and community development** examine contemporary planning approaches to managing local, community, and regional development and explore the spatial dynamics of urbanization in diverse settings and how public policy can guide urban and regional growth to balance environmental and economic concerns. Faculty members and students engaged in **design-behavior research** investigate the interrelationships of people and their socio-physical environments at all scales, from micro to macro, with emphasis on urban design and community-scale issues. Faculty members and students who examine **environmental policy** focus on the environment and natural resources as important policy and planning issues and provide a clear understanding about how politics, economics, ethics, and institutions affect planning and policy choices. Finally, faculty members and students who study **health promotion and policy** investigate issues at the interface between (1) urban planning and health policy and (2) community and individual health. They examine the public welfare, psychological, and health implications of social and physical planning, and the techniques and goals of public health policy making.

Ph.D. in Planning, Policy, and Design: See page 416.

Master of Urban and Regional Planning: See page 414.

Urban and Regional Planning Minor Requirements

Nine courses (36 units): Environmental Analysis and Design E8, E107U, and seven additional upper-division Environmental Analysis and Design courses selected from E100U, E102U, E104U, E105U, E106U, E108U, E109U, E111U, E123U, E124U, E128U, E131U, E132U, E135U, E136U, E137U, E138U, E140U, E141U, E142U, E143U, E144U, E145U, E148U, E151U, E154U, E155U, E156U, E157U, E158U, E159U, E160U, E179U, E189U, E190C, E190U, E191U.

Course descriptions for undergraduate courses are available in the Department of Environmental Health, Science, and Policy section.

NOTE: A maximum of three courses may be counted toward both the minor in Urban and Regional Planning and the majors in Environmental Analysis and Design or Social Ecology. (Environmental Analysis and Design E8 is by necessity one of the three.)

GRADUATE PROGRAMS

Graduate training in the School of Social Ecology is organized around the study of contemporary problems in the social and physical environment. Emphasis is placed primarily upon theory and research that have implications for policy and intervention. Problems are investigated from the complementary perspectives of a multidisciplinary faculty that includes specialists in social, developmental, clinical, environmental, and health psychology; urban and regional planning, public policy, and architecture; urban sociology; law; criminology; and environmental health sciences.

Among issues of long-standing interest in the School are crime and justice in society, social influences on health and human development over the life course, and the effects of the physical environment on health and human behavior. The graduate curriculum emphasizes an interdisciplinary orientation, training students to draw upon the knowledge offered by several of the traditional academic fields in order to examine important social, legal, and environmental problems from a perspective of breadth as well as depth.

The School offers M.A., M.A.S., M.S., M.U.R.P., and Ph.D. degree programs. Doctoral students have the opportunity to pursue an individualized course of study in the principles and methods of social ecology for the Ph.D. in Social Ecology, or a specialized course of study for the Ph.D. in Social Ecology with a concentration in Environmental Analysis and Design. Additional degree programs offered are: Ph.D. in Criminology, Law and Society; Ph.D. in Environmental Health Science and Policy; Ph.D. in Planning, Policy, and Design; and Ph.D. in Psychology and Social Behavior. Master's degree students may elect to pursue the M.A. in Social Ecology, the M.A. in Social Ecology with a concentration in Demographic and Social Analysis, the M.A.S. in Criminology, Law and Society, the M.S. in Environmental Health Science and Policy, and the Master of Urban and Regional Planning. In addition, many students in the Ph.D. programs in Criminology, Law and Society and in Psychology and Social Behavior obtain an M.A. in Social Ecology on the way to their Ph.D.

Social Ecology faculty members apply diverse methods of scientific inquiry to study social and environmental problems. Evaluation research, legal research, questionnaire and survey methods, field research, naturalistic observation, and quasi-experimental techniques receive emphasis along with laboratory experimentation. Collaborative research with faculty members is an important component of graduate education in the School.

A sampling of faculty research and teaching interests includes human stress; health promotion; biobehavioral bases of health and illness; program evaluation; economic change and behavioral disorders; atypical child development; adaptive aging; end-of-life medical decision-making; violence and aggression; legal sanctions and deterrence; white-collar and organized crime; police work; transitions to parenthood; personality and psychopathology; effects of chemical and social environments on early child development; urban growth management and policies; transportation policies; poverty and homelessness; community design and development; regional economic development; water quality and water policy; air quality; biotechnology; epidemiology; the use of scientific information in public policy formation and litigation; community approaches to HIV/AIDS prevention; the health impacts of work environments; environmental health sciences; and processes involved in environmental regulation.

ADMISSION

Students should submit their complete application file including the application form, transcripts, three letters of recommendation, and Graduate Record Examination (GRE) scores by December 15 if they are applying to the Department of Psychology and Social Behavior, or by January 15 if they are applying to the Department of Criminology, Law and Society; the Department of Environmental Health, Science, and Policy; or the Department of Planning, Policy, and Design. The deadline for the M.A.S. in Criminology, Law and Society is April 9. Additional information is available from the Social Ecology graduate counselors; telephone (949) 824-5918.

CAREER OPPORTUNITIES

Ph.D. graduates enjoy a wide variety of career opportunities and have succeeded in obtaining positions in academic institutions such as Stanford University; Rutgers University; The Johns Hopkins University; Temple University; University of California, Los Angeles; University of California, San Diego; University of Colorado; University of Kansas; University of Minnesota; the University of Oregon; the University of Wisconsin; Indiana University; Carnegie-Mellon University; The University of Texas at Austin; Arizona State University; and the City University of New York. Other graduates have established research and administrative careers in government agencies and private firms throughout the United States and Canada, including the National Institutes of Health; the Toronto Department of Public Health; Environmental Protection Agency; Centers for Disease Control; Food and Drug Administration; U.S. Department of Agriculture; Metropolitan Water District; Air Resources Board; Orange County Department of Health Services; The United Cerebral Palsy Foundation; The Philadelphia Geriatric Center; The New Mexico Tumor Registry; Orange County Superior Court; Southern California Metropolitan Water District; and in marketing and research firms such as the Yankelovich Group and McGuire Environmental Consultants. Master of Urban and Regional Planning graduates are employed in top urban planning consulting firms and in cities and counties throughout California and beyond.

Master's Programs

M.A. IN SOCIAL ECOLOGY

In very rare circumstances a student may be admitted directly to the M.A. degree program in Social Ecology. Students interested in this option only must call the Social Ecology Graduate Office at (949) 824-5918 before submitting their applications.

Each M.A. degree student is assigned a faculty advisor with whom the student discusses an individual program of education. The M.A. degree program in Social Ecology requires a thesis and satisfactory completion of seven approved courses (28 units), including the Seminar in Social Ecology (Social Ecology 200), Research Methods (Social Ecology 201), and at least one additional approved course in statistics or methodology. Other courses should be selected with regard to the student's academic and career objectives, and must be approved by the faculty advisor. The seven required courses must include at least five graduate courses and must be exclusive of any directed study, independent study, or thesis courses (Social Ecology 298, 299, or 295). A grade of B or better must be achieved in all courses. Students are advanced to candidacy for the M.A. degree, and a thesis committee is appointed, after a review of their graduate work and thesis plans by a faculty committee.

M.A. IN SOCIAL ECOLOGY WITH A CONCENTRATION IN DEMOGRAPHIC AND SOCIAL ANALYSIS

The M.A. in Social Ecology with a concentration in Demographic and Social Analysis offers training in the practical research skills needed to address analytical problems confronting society, business, government, and the nonprofit sector. The concentration emphasizes the Pacific Rim and issues defining Southern California's population, such as immigration, changing household and family structure, racial and economic inequalities, and the impact of local and regional population growth. Informed by the interdisciplinary field of demography, the program draws on faculty and courses in the Schools of Social Ecology and Social Sciences.

The concentration in Demographic and Social Analysis offers the option of additional professional certification for doctoral students already admitted to the School of Social Ecology. Admission, core course, and thesis requirements are identical to those for the general M.A. in Social Ecology. In addition, students must complete 12 units of designated electives in population issues or research methods. Up to two upper-division undergraduate courses may be approved to fulfill the elective requirement. Students interested in this concentration should call the Graduate Counseling Office at (949) 824-5924 for more information.

M.A.S. IN CRIMINOLOGY, LAW AND SOCIETY

The Master of Advanced Study (M.A.S.) in Criminology, Law and Society, the first online degree program of its kind in the University of California system, prepares professionals for leadership positions in the criminal justice and legal communities. The curriculum emphasizes theoretical and practical applications on topics that are central to crime and its control, social policy, and the law. In keeping with one of the main tenets of the School of Social Ecology, faculty and students approach topics from a multidisciplinary perspective.

This program is ideally suited for professionals interested in or working in the criminal justice or legal fields who are seeking a graduate degree for career advancement. The program consists of 52 units of course work completed over a two-year period (six quarters) plus a one-week in-residence requirement during the first summer. In lieu of a thesis, students are required to take a capstone course in the winter quarter of the second year of study. A degree is awarded upon completion of 10 required courses, plus three elective courses. One traditional face-to-face course taken on the UCI campus, in an accelerated format (five days), is required at the beginning of a student's course of study, with the remaining courses all completed online.

M.S. IN ENVIRONMENTAL HEALTH SCIENCE AND POLICY

The Master of Science (M.S.) in Environmental Health Science and Policy (EHSP) trains environmental professionals for applied analytical and administrative positions in environmental health businesses, government, and the nonprofit sector. In common with the doctoral program in EHSP, training focuses on the integration of natural and social science knowledge for the promotion of human health within a sustainable ecosystem. M.S. students must complete a core of five required courses: Environmental Health Science (EHS) I, II, III; Data Analysis, Part A (Social Ecology 264A); and Data Analysis, Part B (Social Ecology 264B) *or* Ecological Modeling (Social Ecology 252); and three electives. Students must also complete a field study of about six months in duration, resulting in a defended Master's thesis and degree completion within two to three years.

MASTER OF URBAN AND REGIONAL PLANNING

The Master of Urban and Regional Planning (M.U.R.P.) program trains professionals in contemporary methods related to planning. The program is fully accredited by the national Planning Accreditation Board and has 19 core full-time faculty. Students gain familiarity with planning problems and practices through a series of courses on the growth and development of metropolitan areas, and the environmental, economic, and social challenges that modern communities face. This program views planners as mediators between the market-driven forces of metropolitan change and the environmental, economic, and social impacts of such change.

The M.U.R.P. degree program requires the completion of 72 units, distributed between core and elective courses. Required courses are History of Urban Planning (U202); Theoretical Foundations of Planning (U203); Microeconomics Analysis for Urban Planning (U206); Quantitative Analysis for Planners (U214); Development Control Law and Policy or Environmental Law and Policy (U207 or U252); Analytical Methods for Planning (U215); Regional Analysis or Housing or Demographics for Planners (U223 or U246 or U228); and two quarters of Urban Planning Studio (U280A-B). Master's degree specializations include community development and social policy; economics and public policy; land use policy; environmental policy and planning; transportation policy; community health planning; and urban design and behavior. In addition, a written comprehensive examination or a professional report is required during the second year of the program. Successful completion of the examination or professional report is required before the degree can be awarded. A thesis is not required.

Some of the specific planning issues addressed include the environmental, social, health, and economic impacts of urban and regional development; regional growth management; state and municipal fiscal policy; poverty-related concerns; urban design; the operation of housing and land markets; land-use law and regulation; transportation planning; and planning for urban development in newly industrialized countries. Students are provided with a rigorous foundation in the tools that public and private sector planners use, and also with the intellectual wherewithal to use these tools effectively in addressing planning problems.

Practical experience in community planning in the form of part-time planning internships is strongly encouraged and supported as part of a student's education. Additionally, a two-quarter Planning Studio in the second year of study links classroom learning to work on a community-based and client-based planning project. Students have access to geographic information systems (ARC-GIS) courses. Students also have full access to computer laboratories in the two Social Ecology buildings which are equipped with word processing, statistical, spreadsheet, and database programs; electronic mail, and World Wide Web browsers.

The range of employment opportunities for professional planners in the public and private sectors is expanding due to rapid metropolitan growth, rising concerns over health and environmental issues, and the continuing need for redevelopment and social services in older communities. Career paths exist in government agencies dealing with urban planning; economic development; transportation planning; regional growth management; air quality and water treatment; public utilities; health care organizations and public health agencies; and conservation organizations and agencies. Many employment possibilities also exist with private consulting firms specializing in environmental impact assessment, with residential and commercial development firms, and many engineering and architectural firms.

Ph.D. Programs

The doctoral programs offered by the School of Social Ecology prepare students for academic careers in research and teaching. Graduates also are well qualified for employment in private or government agencies, where they can bring advanced academic training, strong methodological and statistical skills, and special expertise to such issues as environmental health and design; urban and regional planning; criminal justice; and social policies affecting mental and physical health across the life course. The normal time for completion of the Ph.D. degree is either five or six years, depending upon the specific program.

Each incoming Ph.D. student is assigned a faculty advisor with whom the student should meet at least once every quarter to discuss an individualized program of graduate education.

A student may be formally advanced to candidacy for the Ph.D. degree when all requirements except the dissertation have been completed, and when the student's dissertation plan has been approved by the candidacy committee appointed by the School of Social Ecology, on behalf of the Dean of Graduate Studies and the Graduate Council. The student will appear before this committee for an oral examination. The dissertation plan will include a thorough examination of the history of the problem being proposed for investigation, its current status, the way in which the proposed research will further knowledge, a detailed specification of the proposed method of investigating the problem, and a description of the planned methods for analyzing the data collected. The normal time for advancement to candidacy is either three or four years, depending upon the program. In no case will students be allowed to advance to candidacy after the end of their fifth year of study.

Formal advancement to candidacy for the Ph.D. degree will be approved by the Dean of Graduate Studies upon recommendation by a unanimous vote of the student's candidacy committee. Alternatively, the committee may recommend a course of action to strengthen the student for advancement to candidacy at a future date. When the student is advanced to candidacy, a doctoral committee will be appointed on behalf of the Graduate Council. The doctoral committee, ordinarily consisting of three members of the faculty, will supervise the preparation and completion of the doctoral dissertation. The dissertation should be completed and accepted within one to two years, and no later than three calendar years after the student's advancement to candidacy.

All Ph.D. students who have not been advanced to candidacy will be formally evaluated by members of the Social Ecology faculty at the end of each year. At that time, the faculty may recommend that the student continue toward the Ph.D. degree, complete the M.A. degree only, or cease graduate studies in the School. Evaluation of Ph.D. students who have advanced to candidacy is the responsibility of the student's doctoral dissertation committee.

Ph.D. IN SOCIAL ECOLOGY

The Ph.D. program in Social Ecology allows students to develop a tailored course of graduate study that draws upon the knowledge of several traditional academic disciplines. This is a small distinguished program intended for genuinely interdisciplinary doctoral students. The emphases of this training program are in keeping with the academic mission of the School, namely, its emphases on an ecological approach to research and policy, an interdisciplinary approach to research and community intervention, and the application of theory and research to community problem solving. Students are encouraged to integrate the diverse theoretical and methodological insights of several disciplines in order to analyze important social and environmental problems from a perspective of breadth as well as depth. In doing so, students gain familiarity with the classic and contemporary literature in social ecology and with the application of the ecological paradigm, as it has evolved in the natural and behavioral sciences. This program is ideally suited for independent students who wish to develop a unique interdepartmental program of study in consultation with faculty from several departments.

Each incoming student takes Seminar in Social Ecology (Social Ecology 200), Research Methods (Social Ecology 201), two approved quarters of graduate-level statistics, one additional approved research methods course, and six elective courses, chosen in consultation with the faculty advisor. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years. Students are encouraged to become involved in research in their first year of study by participating in the research projects of the faculty. Students complete a supervised research project before they begin work on their doctoral dissertation. Research is broadly construed to include experimental methods, questionnaire and interview studies, systematic field observation, secondary analyses, and legal analyses. This predissertation research project should be completed during the second year in residence and must be evaluated and approved by a committee of three faculty members.

Students complete the breadth requirement during their third year of study. This is accomplished through successful completion of either a written comprehensive examination or the submission of a major paper or series of papers that intensively examine specific substantive problems and bodies of research. Preferably, the perspective taken should be multidisciplinary, but a single disciplinary approach is acceptable if it is more congruent with the student's educational goals and is acceptable to the student's committee. Each student's plans for completing the breadth requirement are developed in collaboration with a committee of three Social Ecology faculty members. Students are encouraged to meet with this committee as early as possible during their graduate career and are required to do so no later than the third quarter of their second year. When the student's plans have been approved and implemented, the examining committee will determine whether the breadth requirement was successfully completed, and will recommend additional academic work if it is deemed necessary. The normal time for advancement to candidacy is three years. The fourth, and possibly fifth, years of study are devoted to developing and defending a dissertation proposal and conducting dissertation research.

Ph.D. IN SOCIAL ECOLOGY WITH A CONCENTRATION IN ENVIRONMENTAL ANALYSIS AND DESIGN

The doctoral concentration in Environmental Analysis and Design prepares students to conduct research on questions of vital importance to professionals in environmental analysis and evaluation and on related questions on the formulation of environmental and health policy. These questions reflect an overarching concern with the effects of the natural and built environments on the health and social well-being of humans.

This doctoral concentration particularly focuses on insights from a social ecological perspective. One of the concentration's strengths is its research sequence which spans the disciplines within the Department of Environmental Health, Science, and Policy and the Department of Planning, Policy, and Design. Students typically choose the majority of their graduate classes from those two departments, although students are encouraged to take classes across the campus to improve their knowledge of related fields as well.

Students conduct analyses of sociocultural, behavioral, biological, chemical, and physical factors that influence health and well-being of humans, including public and private sector policy as well as the environment as a whole. They are also trained to evaluate the effectiveness of interventions designed to enhance the health of individuals and the community as a whole. The curriculum and diversity of faculty within the concentration afford unique opportunities for multidisciplinary research and training.

Potential employment sources for graduates include academic and research institutions; state and federal agencies; policy-making organizations; national, community, and workplace health-promotion programs; and a diverse range of consulting firms ranging from engineering to design.

Each incoming student takes the five core courses required of most Ph.D. students, noted earlier, and eight elective courses drawn from the focal areas within this concentration: Environmental Analysis, Environmental Policy, Earthquake Geology and Environmental Hazard, Social Epidemiology, and Environmental Health. The elective courses cover topics such as environmental health risks, behavioral epidemiology, demography, and technological hazards and change. The normative time for completion of the Ph.D. is five years, and the maximum time permitted is seven years. Students are expected to become involved in research activities in their first year of graduate study. Students complete a supervised research project before they begin work on their doctoral dissertation. This predissertation research project should be completed during the second year in residence (preferably by the end of the winter quarter of the second year). The research project must be evaluated and approved by a committee of three faculty members. Students complete the breadth requirement, described earlier, during their third year of study. The normal time for advancement to candidacy is three years. The fourth and fifth years of study are devoted to developing and defending a dissertation proposal and conducting dissertation research.

Ph.D. IN CRIMINOLOGY, LAW AND SOCIETY

The study of crime, institutional responses to illegal behavior, and the interaction of law and society are the foci of the doctoral program in Criminology, Law and Society. Students examine issues related to the etiology of crime, the process of changing criminal behavior, social regulation, the civil justice system, and the social and cultural context of law.

Students gain familiarity with a number of subjects including sentencing; crime rates; modes of modifying criminal behavior; police behavior; white collar and organized crime; hate crimes; behavior of courts, juries, and regulatory agencies; environmental law; immigration law; Native American justice issues; and the interaction among law, culture, and identity. In general, students are introduced to the leading classical and contemporary issues in criminology, law and society and to ways of understanding them through interdisciplinary research. The program aims to develop theoretical sophistication and to prepare the graduate student for faculty positions at major universities; and for research and administrative work in institutions in the legal system, the criminal justice system, and related organizations.

In addition to the five core courses required of most Ph.D. students (Social Ecology 200, 201, two additional quarters of graduate-level statistics, and one additional approved research methods course), students take at least four required courses, Crime and Public Policy (C230), Theories of Crime, (C235), Law and Society, (C239), Legal Reasoning, (C237), and three elective courses in Criminology, Law and Society. These elective courses should be chosen in consultation with the student's faculty advisor. Students become involved in research activities from the earliest stages of their training and complete an independent, supervised research project during the second year of graduate study. Methods of research may include questionnaires and surveys, systematic field observation, computer simulation, legal analyses, and archival research. Students complete a written comprehensive examination during year three, which requires them to demonstrate mastery of major theoretical, substantive, and methodological issues in criminology, law and society. The normal time for advancement to candidacy is four years (three years for students who entered with a master's degree). The fourth and, possibly, fifth years of study are devoted to developing and defending a dissertation proposal and completing dissertation research. The normal time for completion of the Ph.D. is six years, and the maximum time permitted is seven years. (For students who entered with a master's degree the time to degree is five years, with a maximum of six years.) Opportunities for field placements in legal and criminal justice settings also are available.

Ph.D. IN ENVIRONMENTAL HEALTH SCIENCE AND POLICY

Human health and the integrity of the natural environment are interdependent. More now than ever, challenges in public health and the environment must be faced using knowledge both from the social and the natural sciences. The graduate program in Environmental Health Science and Policy (EHSP) is rooted in existing disciplines, but emphasizes cross-disciplinary research that is emerging from common bases that span both the social and the natural sciences. To optimize flexibility, including options for primary emphasis on laboratory and field work, the curriculum is organized around four concentrations. The **concentration in Environmental Biotechnology** provides training in the use of microbial, genetic, or molecular applications for environmental monitoring, environmental cleanup, and public health prevention and diagnostics of environmental hazards. The **concentration in Environmental Health Science** expands the conventional focus of this discipline to approach research questions in an ecological context. The **concentration in Environmental Management and Policy** explores the linkages between physical environmental problems and the social institutions that are both their cause and solution. The **concentration in Epidemiology and Public Health** embeds traditional approaches in these fields within a framework of physical, natural, and social systems.

Within each concentration, students are expected to develop interests in particular substantive problems, for example, those of the core faculty, including water quality monitoring and bioremediation, toxic metals in the environment (their characterizations, exposure levels, and health effects), international conflict and cooperation in resource management, epidemiology of environmental cancers as well as of violence and injury-prevention. Students are prepared to become active researchers, able to assume positions in higher education, government, commerce, or the nonprofit sector in environmental health sciences and related fields.

Students must elect one of the four EHSP concentrations within their first year. For all concentrations, students must complete a core of five required courses: Environmental Health Science (EHS) I, II, III; Data Analysis, Part A (Social Ecology 264A); and Data Analysis, Part B (Social Ecology 264B) *or* Ecological Modeling (Social Ecology 252). In addition, students must complete six approved electives relating to their respective concentrations. Consistent with the program's multidisciplinary nature, elective courses may be drawn not only from within the Department of Environmental Health, Science, and Policy but (with approval) from throughout the School of Social Ecology and the campus (including, for example, the College of Health Sciences and the Schools of Biological Sciences, Physical Sciences, and Engineering). After the second year, students must submit a written doctoral research proposal. Advancement to doctoral candidacy is achieved upon successful defense of the proposal during an oral, comprehensive qualifying examination. In addition, doctoral students must serve a minimum of three quarters as a teaching assistant. The normal time for advancement to candidacy is three years. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Ph.D. IN PLANNING, POLICY, AND DESIGN

The Planning, Policy, and Design doctorate program trains scholars to have national and international prominence in the analysis of social problems related to the built and natural environments. Faculty strengths span planning, policy, and design, and faculty are at the cutting edge of teaching and research that examines the interplay of these three currently distinct approaches.

There is a growing recognition that many pressing social problems require perspectives that combine an understanding of planning, policy process, and the built environment. For example, efforts to control transportation problems by building neighborhoods that encourage alternatives to the automobile require an understanding of travel behavior and human interactions with the built environment. Understanding how to reduce tobacco use requires an appreciation of how behavior is shaped by programmatic interventions, community settings and norms, and policy tools. Environmental cooperation across national borders often requires understanding of political processes, infrastructure systems, and metropolitan structure and governance in regions, such as the U.S.-Mexico border, where population is concentrated in urban settlements that span the border. And, issues of public safety are increasingly related to the design of public and private spaces, and how those spaces are used and regulated.

In all of these areas, public and private officials are increasingly working on topics that span the boundaries of several traditional academic disciplines. The PPD program is designed to give students a strong background in one of four specializations and thus to produce scholars and practitioners capable of responding to the complexity of problems facing contemporary society.

The PPD program offers four specializations—urban and community development, design-behavior research, environmental policy, and health promotion and policy. **Urban and Community Development** examines contemporary planning approaches to managing local, community, and regional development. Students explore the spatial dynamics of urbanization in diverse settings and how public policy can guide urban and regional growth to balance environmental and economic concerns. **Design-Behavior Research** investigates the inter-relationships of people and their socio-physical environments at all scales, from micro to macro, with emphasis on urban design and community-scale issues. The School of Social Ecology is an international leader in environment design research since the field's earliest developments. **Environmental Policy** focuses on the environment and natural resources as important policy and planning issues. A clear understanding about how politics, economics, ethics, and institutions affect planning and policy choices is the emphasis of this specialization. The School has among the largest concentrations of environmental policy faculty of any planning department in the United States. **Health Promotion and Policy** focuses on the interface between planning and community and individual health, examining the public welfare, psychological, and health implications of social and physical planning; and the techniques and goals of public health policy making.

The Ph.D. curriculum is composed of three parts: (1) Planning, Policy, and Design core (required of all students); (2) area cores (each student affiliates with one of four areas of specialization and is required to complete the core courses for that area); and (3) electives. All doctoral students take a total of 16 four-unit graduate courses, distributed across these three types of courses.

Required courses in the Planning, Policy, and Design core are Seminar in Social Ecology (Social Ecology 200); Research Design (U297); two courses in research methods/data analysis chosen from among the following: Data Analysis A (Social Ecology 264A), Data Analysis B (Social Ecology 264B), and Qualitative Research Methods: Overview (U209); and two courses selected in consultation with a faculty advisor that provide disciplinary/theoretical orientation.

In total, PPD students complete 72 units of study in their first two years. Participation in a faculty-supervised research project is required during the second year of study. The second year includes preparation for, and completion of, a comprehensive examination. The normal time for advancement to candidacy is four years. Following this, dissertation research begins. The normative time for completion of the Ph.D. in Planning, Policy, and Design is six years, and the maximum time permitted is seven years.

Graduates with a doctorate degree in Planning, Policy, and Design are employed in a wide array of activities, ranging from university teaching and research, to administrative and research-oriented positions in governmental agencies, international organizations, nonprofit organizations, and private consulting practices.

Ph.D. IN PSYCHOLOGY AND SOCIAL BEHAVIOR

The Department of Psychology and Social Behavior offers a Ph.D. program in Psychology and Social Behavior. The main goal of this program is to train behavioral scientists to apply theory and methods in psychology, together with perspectives and knowledge from allied disciplines, to the analysis of human behavior and health across the life span and in diverse sociocultural contexts. This program values both basic and applied research that is relevant to the improvement of individual, community, and societal functioning. Emphasis is placed on the integration of knowledge from several subspecialties in psychology in order to understand the antecedents and developmental course of adaptive or maladaptive behavior and on the conduct of research that has implications for social policies, programs, and interventions.

Training in this program emphasizes four core areas of psychology. The specialization in **Developmental Psychology** focuses on the development of individuals at various periods in the life course and the effects of varying social and cultural contexts on cognitive, social, and health outcomes. **Health Psychology** focuses on identifying, evaluating, and enhancing the psychosocial and behavioral factors that promote mental and physical health, prevent disease, and optimize medical treatments. The specialization in **Psychopathology and Behavioral Disorder** focuses on psychological, biobehavioral, and social environmental mechanisms that influence the development, expression, and amelioration of psychopathology and behavioral disorder. **Social and Personality Psychology** focuses on the effects of social and personality variables on individual behavior, attitudes, perceptions, motives, and intergroup relations. In addition, several faculty are doing research in the area of psychology and law.

Students will learn to understand human behavior from a social ecological, contextual perspective. They will be exposed to the major theories in each specialization and learn various social science research methods. All students are encouraged to become actively involved in research from the earliest stage of their training. Through close association with faculty members and participation in the faculty's research projects, students learn to conduct methodologically sophisticated research that addresses contemporary psychological and social issues. Current research teams are investigating stress, coping, and social support; biobehavioral mechanisms of cardiovascular reactivity; personality factors that increase resilience to health threats; child care and its effects on child development; transitions across the life course; the effects of divorce and custody arrangement; adaptive aging; end-of-life medical decision making; culture and adolescent psychosocial development; culture, self, and well-being; relations between cognitive and emotional development; emotion regulation; memory and eyewitness testimony; violence and anger management; the development of health-risking and health-protecting behaviors during childhood and adolescence; economic stress and psychopathology/behavioral disorders; and assessment of and responses to environmental and health risks.

Students take the following core courses required of most Ph.D. students in the School of Social Ecology: Social Ecology 200, 264A-B, and an additional research methods/data analysis course. They are also required to take Research Methods in Psychology (P201), Professional Issues in Psychology (P231), Research Directions in Psychology and Social Behavior (P294A-B-C), and Applied Psychological Research (P209A). In the latter course, students learn about applied venues for their research skills and consider significant intellectual issues, including the ethics of research and practice. In a second (optional) course, Applied Psychological Research in Community Settings (P209B), students may take a supervised internship position.

Additional courses are required for each specialization: Health Psychology (P258) and Biobehavioral Bases of Health and Illness (P273) for the Health Psychology specialization; Social Psychology (P214) and Personality (P233) for the Social and Personality Psychology specialization; Psychopathology and Behavioral Disorder (P239) and Ecological Context of Behavioral Disorder (P243) for the Psychopathology and Behavioral Disorder specialization; and, for each of these specializations, two elective courses from a specified list. The Developmental Psychology specialization requires Developmental Psychology (P220), two life-span courses, plus one additional course from approved developmental electives.

Finally, all students are required to select a minor specialization and complete one required specialization course and one elective course in this area. The minor specialization and elective courses should be chosen according to the plan that best meets the needs of the individual student, as determined in consultation with the student's faculty advisor and the departmental graduate advisor. In addition to courses offered by the Department of Psychology and Social Behavior and the School of Social Ecology, students may take courses offered by other departments in other schools such as the Departments of Cognitive Science, Anthropology, and Sociology in the School of Social Sciences and the Department of Neurobiology and Behavior in the School of Biological Sciences.

Students complete a supervised research project during their second year culminating in a paper that may form the basis for a publication. They take a written comprehensive examination during their third year, which requires them to demonstrate mastery of the principles of social ecology and of major theoretical, substantive, and methodological issues in the study of their major and minor specializations and in the psychology of human behavior. The normal time for advancement to candidacy is four years. The fourth year, and possibly fifth year, is devoted to developing and defending a dissertation proposal and completing dissertation research. The normal time for completion of the Ph.D. is six years. Students must complete all requirements for the Ph.D. in Psychology and Social Behavior no later than their seventh year of study, adjusted for any approved leaves of absence that may have been taken. It is expected that most students will complete the degree requirements well in advance of this deadline.

Potential employment sites for graduates of the program include academic institutions, research organizations, government policy institutes, health care and human services settings (e.g., hospitals, schools, community agencies), and a variety of private sector employers. The Ph.D. Program in Psychology and Social Behavior specializes in the training of researchers, not in the training of clinical practitioners.

Graduate Courses

SOCIAL ECOLOGY

200 Seminar in Social Ecology (4). Students are introduced to the classic and contemporary literature of human and social ecology and are expected to use the ecological paradigm to analyze social phenomena of interest to the differing subprograms.

201 Research Methods (4). In-depth analysis of the conceptualization of research and the design of appropriate research strategies. Topics covered are experimental design, questionnaire and interview construction, and observation techniques. Prerequisite: previous course work in statistics.

254 Research Design and Data Analysis (4). Examines the practical implications of linkages between research methods and data analysis. Considers the underlying assumptions of common statistical procedures (e.g., regression and ANOVA analysis) and how certain methodological choices can render their usage questionable.

261 Strategies of Theory Development (4). The goals are (1) to examine key issues and controversies facing the development of social ecological theory, and (2) to encourage students to develop their own abilities as theorists. Strategies for enhancing creative hypothesis formation are emphasized.

264A-B Data Analysis (4). Provides an appreciation and understanding of statistics necessary to conduct applied research. Topics include approaches to and presentation of data, robust statistics, standardization techniques, multivariate regression, and analysis of variance. Prerequisite: graduate standing or consent of instructor.

266A Structural Equation Modeling (4). The general structural equation model is developed including path models, recursive and nonrecursive structural models, multiple indicator models, and confirmatory factor models. Use of LISREL and other software for estimating model parameters is covered. Prerequisites: Social Ecology 264A-B or consent of instructor.

266B Applied Logistic Regression (4). Develops statistical models to be used where the dependent variable is dichotomous. Applications to be considered include cohort and ease-control analyses. Prerequisites: Social Ecology 264A-B or consent of instructor.

266C Analysis of Statistical Power (4). Statistical power is a crucial aspect of hypothesis testing. Students learn how to interpret statistical power; how to calculate statistical power for most common designs; and how to design experiments and quasi-experiments to optimize power. Prerequisites: Social Ecology 264A-B; and graduate standing or consent of instructor.

266D Analysis of Survival Data (4). Provides an introduction to survival analysis methods for the analysis of change in discrete dependent variables. Focuses on data collection strategies for obtaining longitudinal data and continuous-time hazards models. Communicates the variety and power of multivariate hazard models.

275 Special Topics in Social Ecology (2 to 4). Topics covered vary with interests of the instructor. Prerequisite: consent of instructor. May be repeated for credit.

290A Descriptive Multivariate Statistics I (4). Lecture, four hours; laboratory, two hours. Mathematical tools to organize and illuminate the multivariate methods. Multiple regression analysis. Multi-dimensional scaling and cluster analysis. Statistical computing via MDS(x), DMDP, and SPSS. Students must enroll in the laboratory section which meets on Wednesdays. Satisfactory/Unsatisfactory grading only. Prerequisite: Social Sciences 100A-B-C or equivalent. Same as Information and Computer Science 238A, Social Science 201A, and Management 290X.

290B Applied Multivariate Statistics (4). Lecture, four hours; laboratory, two hours. Presentation of the principle methods of multivariate statistics including criteria for appropriate use and the interpretation of resulting measurements. Computer exercises are used to demonstrate concepts. Prerequisites: Social Ecology 290A. Same as Information and Computer Science 238B, Management 290Y, and Social Science 201B.

290C Sampling Techniques and Estimation Methods (4). Review of confidence interval estimates derived from simple random samples followed by presentation of techniques for improving precision of sample-generated estimates that take account of realistic issues. Methods for dealing with bias and nonsampling errors. Prerequisite: Social Ecology 166A-B-C or equivalent. Same as Social Science 201C and Management 290.

291 Program Evaluation (4). Students are introduced to the use of research techniques and statistical methods in assessing the effectiveness of social programs. Different evaluative models are discussed using examples of actual program evaluations. Prerequisites: Social Ecology 201 and two quarters of graduate-level statistics. Intended for students in the Ph.D. program.

295 Master's Thesis Research and Writing (4 to 8). Prerequisite: advancement to candidacy. Satisfactory/Unsatisfactory only.

296 Doctoral Dissertation Research and Writing (4 to 12). Prerequisite: advancement to candidacy. Satisfactory/Unsatisfactory only.

297 Field Studies (2 to 4) F, W, S

298 Directed Studies (2 to 4) F, W, S

299 Independent Study (2 to 8) F, W, S. Prerequisite: consent of instructor. May be repeated for credit.

399 University Supervised Teaching (2 to 4) F, W, S. Required of and limited to Teaching Assistants. Prerequisite: consent of instructor. Satisfactory/Unsatisfactory only.

CRIMINOLOGY, LAW AND SOCIETY

C207 Development Control Law and Policy (4). Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns. Prerequisite: graduate standing. Same as Urban and Regional Planning U207.

C210 Introduction to Criminology, Law and Society (4). Familiarizes students with the interrelated fields of criminology, law and society studies, and criminal justice studies. Organized around three well-established interdisciplinary literatures: criminology, sociolegal studies, and criminal justice studies. Prerequisite: graduate standing or consent of instructor.

C211 Legal Institutions and Society (4). Acquaints students with the institutions of U.S. legal system and its operations, as well as with the constitutional framework undergirding this system, and defines the relationship between U.S. citizens and government at a variety of levels. Prerequisite: graduate standing or consent of instructor.

C212 Police, Courts, and Corrections (4). Focuses on basic policy issues in the administration of the criminal justice system. The key elements of the criminal justice system are police, courts, and corrections. Prepares students for continued study of these organizations. Prerequisite: graduate standing or consent of instructor.

C213 Crime and Social Deviance (4). Examines the major social scientific perspectives on criminal and deviant behavior. Specific deviant and criminal activities are described and explained using established theoretical frameworks. Prerequisite: graduate standing or consent of instructor.

C214 Research Methods (4) Structures research methodology, the approach to developing and evaluating knowledge of the sciences for use in criminal justice professional activities. Special emphasis on differentiating scientific approaches from pseudo-science. Prerequisite: graduate standing or consent of instructor.

C215 Applied Statistics (4). Provides a basis for the use of fundamental statistical analysis techniques for solving public policy and management problems through a series of assignments, examinations, and online discussions and demonstrations. Prerequisite: graduate standing or consent of instructor.

C216 Public Policy, Crime, and Criminal Justice (4). Increases understanding of crime, violence, and the criminal justice system. Assesses the state of knowledge on key policy issues of our time. Discusses the contribution of communities, schools, employment, drugs, guns, and alcohol to crime and violence. Prerequisite: graduate standing or consent of instructor.

C217 Leadership (4). Introduces concepts, ideas, and theories about leadership and its operation. Explores leadership concepts through interviews with leaders from the community and fellow classmates. Prerequisite: graduate standing or consent of instructor.

C218 Social Problems, Law, and Policy (4). Capstone course for the M.A.S. program in Criminology, Law and Society. Students choose a social problem related to crime, criminal justice, and law; relate the problem to legal and social issues; and devise a plan of action to research the problem. Open to M.A.S. students only.

C219 Hate Crime (4). Examines the causes, manifestations, and consequences of hate crimes, as well as the larger social context within which they occur, are reacted to, and seem to be proliferating. Prerequisite: graduate standing or consent of instructor.

C220 Law, Violence, and Human Rights (4). Examines how adequately law and liberal theories of the state recognize, explain, and delegitimize political violence, particularly the violence committed by states. Addresses theories of the state within which human rights law is embedded, the ethnographics of violence, the legal use of force. Prerequisite: graduate standing or consent of instructor.

C221 Sentencing and Corrections (4). Reviews U.S. attempts to punish and rehabilitate convicted law violators. Conflicts among major purposes of sentencing (rehabilitation, deterrence, incapacitation, and retribution) are discussed, as well as effects of different sanctions on public safety, offender rehabilitation, and justice system costs. Prerequisite: graduate standing or consent of instructor.

C222 Street Ethnography (4). Focuses on urban street populations, especially gangs, and outlines some of the major conceptual and theoretical issues related to this topic and the processes of street socialization. Methods of inquiry include mapping, ethnohistory, survey questionnaires, and other quantitative techniques. Prerequisite: graduate standing or consent of instructor.

C223 Introduction to Spatial Analysis and Statistics (4). Provides an introduction to and overview of the applications of spatial data analysis techniques in empirical social science research. Prerequisite: graduate standing or consent of instructor.

C224 Organizational Perspectives on the Legal System (4). Familiarizes students with organization theory and research as ways to make sense of, navigate, and act on the legal system. Acquaints students with major frameworks in organization theory and their application to the system of legal organizations. Prerequisite: graduate standing or consent of instructor.

C230 Crime and Public Policy (4). Discusses the measurement of violent crime; violent offenders and their victims; theoretical explanations of violence; the contribution of the media, drugs, guns, and alcohol to violence; and how the justice system treats and punishes violent offenders. Prerequisite: graduate standing or consent of instructor.

C232 Juvenile Delinquency (4). Examines the major theoretical perspectives regarding the onset, persistence, and desistance of juvenile delinquency and examines empirical evidence for each perspective. Prerequisite: graduate standing or consent of instructor.

C235 Theories of Crime (4). Examines classical and contemporary theories of crime and crime control by focusing on various explanations for why select types of conduct are categorized and treated as criminal, as well as why people engage in criminal behavior. Prerequisite: graduate standing or consent of instructor.

C236 Gender and Power in Law and Society (4). Focuses on questions of gender and sexuality in law and society studies. Drawing on a variety of theoretical frameworks, especially feminist legal theory, examines social processes and structures related to legal regulation, inequality, and social change. Prerequisite: graduate standing or consent of instructor.

C237 Legal Reasoning (4). Examines the leading theoretical and philosophical approaches to jurisprudence and legal reasoning; introduces primary print and electronic sources of legal data and basic legal research techniques. Prerequisite: graduate standing or consent of instructor.

C238 White-Collar Crime (4). Examines the illegal behavior of individuals who commit crimes in the course of their employment. Special attention will be paid to ways in which power and organizational structure affect the behavior of the white-collar offenders. Prerequisite: graduate standing or consent of instructor.

C239 Law and Society (4). Discusses the major schools in the sociology of law from the early years to the present. Addresses the differences among the schools and locates them in their historical and intellectual context. Presents case studies, comparing the utility of these theoretical traditions. Prerequisite: graduate standing or consent of instructor.

C244 Miscarriage of Justice (4). Systematically describes, explains, analyzes, and evaluates the causes and consequences of the wrongful prosecution, conviction, incarceration, and sometimes even execution, of the innocent in the American criminal justice system. Prerequisite: graduate standing or consent of instructor.

C245 Social Science and the Legal Process (4). Examines social science methods for understanding and affecting the legal process. Emphasizes a current legal issue. The class provides, through its research and legal analysis, input into the adjudication of the issue under consideration. Prerequisite: graduate standing or consent of instructor.

C248 Geographic Information Systems (4). Prepares students to become proficient interactive users of GIS within organizations. Areas covered include: basic geographic, cartographic, and GIS concepts; five steps for learning substantive and procedural materials; and experience with the leading GIS software, geographic base map files, and databases. Prerequisite: graduate standing or consent of instructor.

C249 Law and Morality (4). Examines major theoretical, empirical, and policy-oriented research related to the design, implementation, and analysis of government intervention, through the criminal sanction, in the spheres of vice and morality. Prerequisite: graduate standing or consent of instructor.

C251 Qualitative Criminological Analysis (4). Examines issues and strategies involved in the collection and analysis of qualitative data. Application of qualitative research methods with respect to criminology, law and society. Prerequisite: graduate standing or consent of instructor.

C252 Issues in Environmental Law and Policy (4). Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists. Prerequisite: graduate standing or consent of instructor. Same as Urban and Regional Planning U252.

C255 Public Policy (4). Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives. Prerequisite: graduate standing or consent of instructor. Same as Urban and Regional Planning U221 and Political Science 221A.

C264 Eyewitness Testimony (4). Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues. Prerequisite: graduate standing or consent of instructor. Same as Psychology and Social Behavior P264.

C265 Memory and the Law (4). Examines the controversial topic of repressed memory, or perception and memory of real-world events. Prerequisite: graduate standing or consent of instructor. Same as Psychology and Social Behavior P265.

C275 Special Topics in Criminology, Law and Society (4). Topics covered vary with interests of instructor. Prerequisite: consent of instructor. May be repeated for credit as topics vary.

C276 Social Deviance (4). Provides an in-depth examination of the field of social deviance. Major perspectives are examined in relation to policy issues concerning causation and control of deviant behavior. Prerequisite: graduate standing or consent of instructor.

ENVIRONMENTAL HEALTH, SCIENCE, AND POLICY

E205 Coastal Ecosystem Health (4). Examines the causes of coastal ecosystem degradation and strategies to restore the ecosystem balance or to prevent further coastal ecosystem health degradation. Prerequisite: graduate standing or consent of instructor. Same as Ecology and Evolutionary Biology 275.

E224 Environmental Health Sciences I: Introduction to Environmental Health Science (4). Presents environmental health science from a historical perspective. Legislative, social, and cultural policy outcomes of various environmental episodes are discussed, including disciplines interfacing with environmental health science. Prerequisite: graduate standing or consent of instructor. Formerly E225.

E225 Environmental Health Sciences II: Advanced Environmental Health Science (4). Explores the complex relationships among exposure processes and adverse health effects of environmental toxins focusing on specific chemicals, sources, transport media, exposure pathways, and human behaviors. Techniques of environmental sampling for exposure assessment are discussed. Prerequisite: graduate standing or consent of instructor. Formerly E224.

E226 Environmental Health Sciences III: Epidemiology (4). Presents descriptive and experimental approaches to the recognition of the causal association of disease in the general population, as these approaches apply to populations using different student designs and models from the literature. Prerequisite: graduate standing or consent of instructor.

E227 Environmental Health Sciences V: Biostatistics (4). Designed to help students develop an appreciation for the statistician's view of the research process, emphasizing biomedical research. Instills an understanding of how statistical models are used to yield insights about the data that form evidence-based understanding of the world around us. Prerequisites: graduate standing and consent of instructor.

E228 Public Health Cost-Effectiveness Analysis (4). Examines using cost-effectiveness information to allocate limited resources to maximize health benefits to a population; defining and measuring cost, survival, and health-related quality of life; and how to calculate cost-effectiveness using decision trees and Markov simulation models. Prerequisite: graduate standing or consent of instructor. Same as Psychology and Social Behavior P228 and Planning, Policy, and Design U226.

E230 Environmental Hydrology (4). Provides an overview of the occurrence, distribution, and movement of water in the environment. Quantitative methods are introduced for analyzing hydrologic processes. Human impacts on water distribution and quality are considered. Prerequisite: graduate standing or consent of instructor.

E231 Earthquakes and Seismic Hazard (4). Provides an overview of earthquakes and introduction to seismic hazard. Topics include characteristics and effects of earthquakes, sources of earthquakes, seismic hazard assessment, introduction to earthquake loss estimation and mitigation. California examples are emphasized. Prerequisite: graduate standing or consent of instructor.

E232 Seminar in Paleoseismology (4). Provides an introduction to paleoseismology and its applications. Topics include data collection methods, data analysis, earthquakes in different tectonic environments, and applications to seismic hazard assessment and fault characterization. Prerequisite: graduate standing or consent of instructor.

E245 Health Impacts of Environmental Change (4). Seminar on health impacts of environmental change at various scales of analysis. Uses numerical models such as "MIASMA" and "TARGETS" to analyze alternative outcomes of environmental-change scenarios. Presentations from experts are featured. Prerequisite: graduate standing or consent of instructor.

E250 Cancer Epidemiology (4). Concentrates on understanding how epidemiology plays a role in the search for cancer etiology, prevention, control, and treatment; gives an overview of cancer research with an appreciation of the multidisciplinary nature of the field. Prerequisite: Environmental Analysis and Design E226.

E251 Genetic Epidemiology (4). Concentrates on the role of genetic factors in the etiology of disease in human populations with an objective of disease control and prevention, and the role of interactions of genetic factors and environmental exposures in the occurrence of disease. Prerequisite: Environmental Analysis and Design E226.

E252 Ecological Modeling (4). Introduces students to the basic principles of modeling, and demonstrates the complex temporal and spatial relationships found in environmental science. Lectures and readings survey the broadest possible range of mathematical models found in the environmental-ecological literature. Prerequisite: graduate standing or consent of instructor.

E253 Environmental Pollution and Remediation (4). Topics include sources of natural and anthropogenic environmental pollutants using ecological concepts, chemical fate and transport, engineering and biological remediation technologies, economics, policy to provide understanding and solutions to these problems. Prerequisite: graduate standing or consent of instructor.

E254 Topics in Environmental Health Promotion and Education (4). Focuses on design of intervention strategies dependent on the environmental agent, exposure to assessment, SES, health effects, stakeholders, and support base. Programmatic design includes media selection, communication/education, and pre/post surveys. Analysis of transborder and local environmental health promotion programs. Prerequisite: graduate standing or consent of instructor.

E263 Issues in Potable Water Reuse (4). Provides an in-depth study of the treatment and subsequent reuse of wastewater for drinking. Analyzes existing regulations for both drinking water and reuse situations, microbial and chemical contaminants, hydrogeology, health concerns, and risk assessment. Prerequisite: graduate standing or consent of instructor.

E283 Environmental Health and Quality (4). Concepts and principles of environmental health. Focuses on industrial hygiene, water and air quality, noise pollution, and environmental carcinogens. Discusses theory and implementation practices through review of legislative measures and enforcement procedures. Examines social and biological interactions surrounding each topic. Prerequisite: graduate standing or consent of instructor.

E285 Seminar in Environmental Health, Science, and Policy (2). Topics relevant to the field of environmental health, science, and policy are covered in depth. Included are: hazardous and biological pollutants in soil, water, air; remediation technologies; water conflicts; and regulations pertaining to contaminants. Prerequisite: graduate standing or consent of instructor.

E290 Grant Writing in Environmental Health Sciences Seminar (4). Teaches graduate students fundamentals of grant writing through introduction to funding sources, the missions of these sources, and how differences in mission statements translate into different goals within a proposal. Prerequisite: graduate standing or consent of instructor.

E293 Environmental Health Science IV: The Lead Case (4). The social ecology of lead use and presence in subsistence goods and the environment, examined from earliest prehistory to the present. Lead has specific health impacts throughout human development. Public policy and surveillance are discussed. Prerequisite: graduate standing or consent of instructor.

E295 EHSP Master's Thesis Research and Writing (4 to 8). Prerequisite: advancement to candidacy and graduate standing. Satisfactory/Unsatisfactory only. May be repeated for credit.

E297 EHSP Graduate Field Seminar (2 to 4). Serves as a bridge between course work in environmental health sciences and policy and the undertaking of independent research. Helps guide students in developing their pre-thesis/pre-dissertation research project. Prerequisite: graduate standing or consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit.

E298 EHSP Directed Studies (2 to 4). Prerequisite: graduate standing or consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit.

E299 EHSP Independent Study (2 to 8). Prerequisite: graduate standing or consent of instructor. Satisfactory/Unsatisfactory only. May be repeated for credit.

PSYCHOLOGY AND SOCIAL BEHAVIOR

P201 Research Methods in Psychology (4). In-depth examination of the conceptualization of research problems and linkages between theory and the design of appropriate strategies for empirical research in psychological science. Topics include experimental and quasi-experimental designs, reliability and validity of measurement and non-experimental procedures. Prerequisite: graduate standing or consent of instructor.

P203 Development of Gender Differences (4). Evaluation of research on gender differences in physiology, psychology, and social behavior from the prenatal period through adulthood. Topics include cognitive skills, moral reasoning, achievement, prosocial behavior, aggression, and mental health. Examination of psychological and biological theories and explanations for gender differences. Prerequisite: graduate standing or consent of instructor.

P204 Adolescence (4). Considers pubertal and cognitive changes and their social consequences; the family, peer group, school, and cultural contexts in which adolescence is embedded; and selected psychosocial issues including autonomy, identity, health, and well-being. Prerequisite: graduate standing or consent of instructor.

P205 Issues in Social Psychology (4). Provides in-depth treatment of theoretical and empirical work relevant to selected topics in social psychology. Theories of attitude change, group dynamics, and attribution are applied to such problems as overpopulation, environmental degradation, media violence, and racial conflict. Prerequisite: graduate standing or consent of instructor.

P209A Applied Psychological Research (4). Focuses on scientific and professional issues in the field of psychology. Topics include communication skills; intervention approaches; collaboration, consultation, and referral; and ethical issues associated with at-risk populations research. Prerequisite: graduate standing or consent of instructor.

P209B Applied Psychological Research in the Community (4). Explores research and practice in the field of psychology. Students are placed in an actual field placement practicum. Prerequisites: P209A and graduate standing.

P214 Seminar in Social Psychology (4). Presents an overview of selected theoretical and empirical topics in social psychology including social influence and conformity, altruism and aggression, persuasion and attitude change, self and social perception, and social cognition. Prerequisite: graduate standing or consent of instructor.

P218 Infancy (4). Covers development from conception through the second year. Focus is on research and theory concerning infants' physical, social, cognitive, perceptual, emotional, and language development. Also covers transition to parenthood and family context of infant development. Prerequisite: graduate standing or consent of instructor.

P220 Developmental Psychology (4). Examines key concepts and research methods in the study of life span development. Considers different models of development; contextual and ecological perspectives; the nature of plasticity; continuity and change over time. Introduces research designs and statistical procedures for studying human development. Prerequisite: graduate standing or consent of instructor.

P223 Cross-Cultural Developmental Psychology (4). Examines human development in diverse cultures (e.g., Asian, American, and African). Cultural diversity within the U.S. and acculturation of various ethnic groups also discussed. Topics include parenting, family relations, language and cognition, schooling and academic achievement, and morality. Prerequisite: graduate standing or consent of instructor.

P226 Emotion in Psychology (4). Covers original and recent theories of emotions and how they guide current research. Specific topics include neuroanatomical structure of emotion, life-span emotional development, and health and emotion. Prerequisite: graduate standing or consent of instructor.

P228 Public Health Cost-Effectiveness Analysis (4). Examines using cost-effectiveness information to allocate limited resources to maximize health benefits to a population; defining and measuring cost, survival, and health-related quality of life; and how to calculate cost-effectiveness using decision trees and Markov simulation models. Prerequisite: graduate standing or consent of instructor. Same as Environmental Health, Science, and Policy E228 and Planning, Policy, and Design U226.

P230 Adulthood (4). Focuses on early and middle adulthood. Examines the extended period of transitioning to adulthood; changes in relationships with family members; impact of major role-related experiences (e.g., spouse, parent, worker) on development and well-being; continuity and change in personality and social identities. Prerequisite: graduate standing or consent of instructor.

P231 Professional Issues in Psychology (4). Examines a variety of issues related to the professional socialization and development of graduate students in psychology. Topics include the publication process, sources of research funding, alternative employment options, competitiveness on the job market, and the academic career route. Prerequisite: graduate standing or consent of instructor.

P233 Personality (4). Provides a frame of reference for understanding personality and its role in life-span development, the relationship of the individual to society, and both mental and physical illness. Prerequisite: graduate standing or consent of instructor.

P234 Childhood (4). Examines the development of children from two to 12 years of age, covering the areas of cognition, language, emotion, and social relations. Emphasizes recent research and contemporary theory and the ecological context of child development. Presumes familiarity with theories and basic principles of development. Prerequisite: graduate standing or consent of instructor.

P236 Issues in Human Development (4). Examines selected issues that have current research salience and policy significance, such as day care, parental employment and family functioning, sex differences in adults' well-being; developmental psychopathology; and the importance of social ties among the elderly. Prerequisite: Psychology and Social Behavior P220, graduate standing, or consent of instructor. Formerly P236A-B.

P239 Psychopathology and Behavior Disorders (4). Explores the antecedents, characteristics, course, outcomes, and options for the prevention or management of various forms of psychopathology and behavior disorder. Focuses on psychological and biobehavioral mechanisms that influence the development, expression, and amelioration of maladaption. Prerequisite: graduate standing or consent of instructor.

P243 Ecological Context of Behavioral Disorder (4). Surveys the epidemiology of behavioral and other health disorders as they may be affected by socioeconomic status, income disparity, employment stress, adverse employment change, and other social environmental factors. Reviews measurement and design issues in advancing research in this area. Prerequisite: graduate standing or consent of instructor.

P244 Personality Assessment (4). Examines the nature of personality as it influences assessment approaches. Discusses adequacy criteria for personality assessment and introduces some current approaches to personality assessment. Addresses applications to student research and practice needs and interests. Prerequisite: graduate standing.

P250 Emotion, Reasoning, and Memory (4). Examines research and theory on emotion from the perspective of cognitive psychology. Topics include the effects of emotions on attention, memory, and problem solving; the relations between emotional and cognitive development; flash-bulb memories of intense emotional experiences; eyewitness testimony. Prerequisite: graduate standing or consent of instructor.

P258 Health Psychology (4). Interdisciplinary exploration of emerging fields of health psychology and behavioral medicine. Topics: role of stress in the development and treatment of medical problems; sociocognitive determinants of health and illness; interpersonal health transactions; behavioral approaches to medical problems such as diabetes, obesity, hypertension. Prerequisite: graduate standing or consent of instructor.

P262 Interpersonal Processes and Health (4). Examines traditions of research linking interpersonal processes to emotional or physical health. Topics include: role of social support in ameliorating stress, effects of social control on health-compromising behaviors, adverse effects of social relationships on health, causes of deficient social relationships. Prerequisite: graduate standing or consent of instructor.

P264 Eyewitness Testimony (4). Examines the evidence that shows that faulty eyewitness memory is the major cause of wrongful convictions. Explores what the legal system thinks of eyewitness testimony and how the legal system has dealt with eyewitness issues. Prerequisite: graduate standing or consent of instructor. Same as Criminology, Law and Society C264.

P265 Memory and the Law (4). Examines the controversial topic of repressed memory, or perception and memory of real-world events. Prerequisite: graduate standing or consent of instructor. Same as Criminology, Law and Society P265.

P268 Coping with Stressful Life Events (4). Explores how individuals cope with serious life crises (e.g., illness, bereavement), life transitions, and daily stressors. Considers how such events impact on people's cognitions, emotions, and health, and the role of others in the coping process. Prerequisite: graduate standing or consent of instructor.

P270 Multilevel Models (4). Introduces contemporary statistical models associated with nested, hierarchical, or clustered data. Topics include multilevel thinking in theory, growth curve modeling, intraindividual variation, cross-sectional multilayered data, hypothesis-testing, statistical power, effect size estimation, and available software packages. Prerequisite: graduate standing or consent of instructor.

P273 Biobehavioral Aspects of Health and Illness (4). Examines the behavior-physiology interactions of some major bodily systems: the nervous, cardiovascular, gastrointestinal, and endocrine systems. Analysis of normal and abnormal states of these systems as they relate to tissue injury, disease, and rehabilitation. Prerequisite: graduate standing or consent of instructor.

P287 Employment and Family Functioning (4). Examines men's and women's employment in the context of the family. Focus is on the effects of work on adult well-being, parenting, marital quality, and child development. Includes social policies that impact the workplace and family. Prerequisite: graduate standing or consent of instructor.

P290 Research in Developmental Psychology (4). Introduces graduate students to research conducted by individual faculty members in the area of developmental psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research. Prerequisite: graduate standing or consent of instructor. May be repeated for credit.

P291 Research in Health Psychology (4). Introduces graduate students to research conducted by individual faculty members in the area of health psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research. Prerequisite: graduate standing or consent of instructor. May be repeated for credit.

P292 Research in Psychopathology and Behavior Disorder (4). Introduces graduate students to research conducted by individual faculty members in the area of psychopathology and behavior disorder. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research. Prerequisite: graduate standing or consent of instructor. May be repeated for credit.

P293 Research in Social and Personality Psychology (4). Introduces graduate students to research conducted by individual faculty members in the area of social and personality psychology. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research. Prerequisite: graduate standing or consent of instructor. May be repeated for credit.

P294A-B-C Research Directions in Psychology and Social Behavior (2-2-2) F, W, S. Introduces students to the current research of faculty, graduate students, and visitors to the Department of Psychology and Social Behavior. Includes examination of contemporary research issues and controversies, as well as issues related to students' development as professionals. Satisfactory/Unsatisfactory only. Prerequisite: consent of instructor.

P295 Research in Psychology and Law (4). Introduces graduate students to research conducted by individual faculty members in the area of psychology and law. This is accomplished by having students involve themselves in the conceptualization, strategy, and implementation of the faculty member's research. Prerequisite: graduate standing or consent of instructor.

PLANNING, POLICY, AND DESIGN

U202 History of Urban Planning (4). Introduction to the historical roots and fundamental perspectives of urban and regional planning. Exploration of the significant historical phases and personalities which have shaped the profession. The roles and responsibilities, the limitations and potential, of urban planning. Prerequisite: graduate standing or consent of instructor.

U203 Theoretical Foundations of Planning (4). Intellectual excursion into central themes in policy and planning, including philosophy of the market, institutionalization of space, hypostatizations of policy, constructions of communities, logics of spatial analysis. Objective is engagement of the professional in thoughtful reflections on practice and institutions. Prerequisite: graduate standing or consent of instructor.

U205 Environmental Economics and Policy (4). Provides a broad introduction to environmental economics and to environmental policy. Environmental problems facing the United States and Europe are analyzed, and whenever possible, the environmental problems facing developing countries. Prerequisite: graduate standing or consent of instructor.

U206 Microeconomic Analysis for Urban Planning (4). Provides students with a working knowledge of basic microeconomic concepts. Emphasizes applications related to urban planning and policy analysis. Topics covered include demand analysis, firm behavior, market structure, public goods, externalities, and the role of economics in land markets. Prerequisite: graduate standing or consent of instructor.

U207 Development Control Law and Policy (4). Investigates legal and institutional frameworks for development control. Review of constitutional issues implicated in land-use regulation. Traces development control historically and analyzes contemporary approaches to land-use control which reflect environmental and economic development concerns. Prerequisite: graduate standing. Same as Criminology, Law and Society C207.

U208 California's Population (4). Provides a non-specialist introduction to social demography through a focus on California population. Surveys historical and current trends in the State's growth, its industries and occupations, and its ethnic and racial makeup. Prerequisite: graduate standing or consent of instructor. Formerly Environmental Analysis and Design E210.

U209 Qualitative Research Methods: Overview (4). Introduces fundamentals and philosophical underpinnings of "qualitative" research and anti-positivistic inquiry. Explores the nature and varieties of qualitative inquiry. Overview of selected methods from among ethnography, naturalistic field research, case study, phenomenology, ethnomethodology, ethnoarchaeology, critical approaches. Prerequisite: graduate standing or consent of instructor.

U211 Urban Design and Behavior (4). Acquaints students with vocabulary, history, theories, process, and trends in urban design, and the relationship of design to human well-being. The local environment is used as a resource and a laboratory. Prerequisite: graduate standing and consent of instructor.

U212 Transportation Planning (4). Introduces current topics in transportation planning. Includes an analysis of the economic role of transportation in urban areas, land-use impacts of transportation projects, traffic congestion, air quality, alternatives to the automobile, and other transportation topics. Prerequisite: graduate standing.

U214 Quantitative Analysis for Planners (4). Introduces students to the basic statistical concepts used to address issues of public concern. Prepares students to perform, interpret, and evaluate quantitative data analyses commonly used in professional studies. Prerequisite: graduate standing or consent of instructor.

U215 Analytical Methods for Planning (4). Emphasizes the development of analytical techniques proven useful in the fields of management and administration. Topics include multiple regression, cost-benefit analysis and discounting, decision trees, and other techniques useful for the purposes of community analysis and planning. Prerequisite: graduate standing or consent of instructor.

U218A-B Advanced Research Methods for Planning (4-4). Provides in-depth training in research methods enabling students to conduct and critically evaluate research on planning and public policy. Statistical inference, data analysis, applied econometric methods. Regression techniques, OLS, heteroskelasticity, time series analysis, discrete choice analysis, panel data, and instrumental variables. Prerequisites: graduate standing and consent of instructor. Formerly U208A-B.

U219 Advanced Planning Theory (4). Focused readings and discussions aimed at developing a foundation for critical research into the theories and epistemologies of planning and policy. Topics include the liberal, communitarian, communicative, and other conceptions of nationality; praxis, hermaneutics, and policy; topologies of justice and social fracture. Prerequisite: graduate standing or consent of instructor.

U220 Qualitative Methods: Fieldwork and Data Collection (4). Covers fieldwork, data collections techniques, and related issues for anti-positivistic research. Data collection techniques include observation, physical traces, participation, in-depth interview. Data checks include veracity, detail, completeness, rigor. Prerequisite: graduate standing or consent of instructor.

U221 Public Policy (4). Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives. Prerequisite: graduate standing or consent of instructor. Same as Criminology, Law and Society C255 and Political Science 221A.

U223 Regional Analysis (4). Major concepts and techniques of regional analysis, with applications for urban and regional planning and public policy-making. Definition of regions, processes of economic change, regional structure, location of activities, and analysis of selected policy issues. Emphasis on practical applications. Prerequisite: graduate standing or consent of instructor.

U224 Environmental Politics and Policy (4). Reviews and critiques literature on discussion topics including: the nature and effectiveness of the environmental movement and environmental policies; the role of science and technology; the use of economic incentives in policy; decentralization of decision making; and creating arenas for public involvement. Prerequisite: graduate standing or consent of instructor. Same as Political Science 224A.

U225 Local Economic Development (4). Analyzes the economic development process. Attention is given to economic theories of local development and practical implications of those theories. Topics include local economic development and poverty, tax incentives, infrastructure credits, effects of government competition for economic activity. Prerequisite: graduate standing.

U226 Public Health Cost-Effectiveness Analysis (4). Examines using cost-effectiveness information to allocate limited resources to maximize health benefits to a population; defining and measuring cost, survival, and health-related quality of life; and how to calculate cost-effectiveness using decision trees and Markov simulation models. Prerequisite: graduate standing or consent of instructor. Same as Environmental Health, Science, and Policy E228 and Psychology and Social Behavior P228.

U227 Qualitative Methods: Case Study (4). Deals with case study as a qualitative, anti-positivistic research method. Discussion focuses on the essential nature of case study research, quality of case study, rigor, design, implementation, analysis, data collection techniques, analysis, and writing. Prerequisite: graduate standing or consent of instructor.

U228 Demographics for Planning and Policy (4). Provides planning and policy practitioners with a condensed, nonspecialist orientation to the sources, applications, and interpretation of population statistics, and conveys the steps used in constructing local-area population forecasts and projections. Prerequisite: graduate standing or consent of instructor.

U229 Communities and Health (4). Increasingly, communities rather than individuals are seen as the locus of change for making communities healthier. Reviews different theoretical approaches, analyzes programs in the U.S. and abroad, and undertakes a critical evaluation of their success. Prerequisites: graduate standing and consent of instructor.

U230 New Leadership Roles (4). Explores the impact and interaction of the various stakeholders of private, public, and nonprofit organizations and the effects these stakeholders have on the responsibilities and actions of the organizations' leaders. Focuses primarily on the relationships between leaders and various constituencies. Prerequisite: graduate standing or consent of instructor.

U231 Transportation and the Environment (4). Explores environmental impacts of transportation from several perspectives, including planning, industrial ecology, and economics. The main focus is on motor vehicle transportation, especially cars. Prerequisite: graduate standing or consent of instructor.

U232 Diversity and Urban Environments (4). Explores diversity and power in the use and design of the physical environment. Examines how people differ in their relationships to environments on the basis of gender, race/ethnicity, age, socioeconomic status, physical abilities, sexuality, religion, and culture.

U233 Transportation, Transit, and Land-Use Policy and Planning (4). Places students into a specific transportation public policy situation to devise real solutions, with the goal of helping students understand factors in land use, travel behavior, politics, and finance that shape transportation planning policy choices. Prerequisite: graduate standing or consent of instructor.

U234 Environmental Analysis (4). Explores theory and methods for the analysis of environmental patterns and their linkage to policy. Involves discussions on fundamentals of theories for analysis, along with hands-on instruction on analytical methods. Topics include: spatial analysis, risk representation, and sustainability planning. Prerequisite: graduate standing or consent of instructor.

U236 Community Design (4). Provides an overview of the current condition of urban design in the United States. Topics include the academic environment, the retail environment, multi- and single-family residential environments, the office environment, and new urban design tools. Prerequisite: graduate standing or consent of instructor.

U237 Introduction to Geographic Information Systems (4). Application of Geographic Information Systems (GIS) to the field of urban and regional planning. Emphasizes current issues that occur in actual implementation settings. Lecture/discussion followed by laboratory demonstrating the area of GIS discussed. Offers "hands-on" student usage of GIS software.

U238 Advanced Geographic Information Systems (4). Extends study of geographic information systems to more advanced issues, including data sources, data conversion, relational database integration, software customization, and spatial and three-dimensional analysis. Prerequisite: Urban and Regional Planning U237.

U240 International Environmental Policy (4). Explores causes and effects of environmental problems and the effectiveness of different adaptation or restoration strategies and how they are closely linked to ways in which political, economic, demographic, and cultural systems interact among themselves and ecological systems.

U241 Health Promotion and Planning (4). Focuses on health and health care in the United States, but discussion of global health issues and/or international comparisons will be made whenever possible. Considers both the social and economic aspects of health and disease. Prerequisite: graduate standing or consent of instructor.

U242 Regional Development Theory (4). Regional economic development concepts and studies, with applications for urban and regional planning, and public policy-making. Roles and performance of economic sectors, technological innovation, and communications in the process of development. Analysis of regional development policies and programs. Prerequisite: graduate standing or consent of instructor.

U244 Land-Use Policy (4). Examination of the role of public policy in guiding growth and development in urban and suburban environments. Description of a wide-ranging set of growth policies, the rationales underlying their use, controversies and legal constraints, and evaluation of their effectiveness. Prerequisite: graduate standing.

U246 Housing Policy (4). Examines the theories and practices of housing policy and the relationship of housing to larger neighborhood, community, and regional development issues. Considers the roles of private for-profit and not-for-profit developers, lenders, and all levels of government in the provision of housing. Prerequisites: basic statistics and consent of instructor.

U252 Issues in Environmental Law and Policy (4). Treatment of legal and policy strategies for promoting environmental protection and deterring environmental degradation within the context of other societal objectives. Topical approach with a focus on problems of special interest to criminologists and to environmental policy specialists. Prerequisite: graduate standing or consent of instructor. Same as Criminology, Law and Society C252.

U253 Site Planning (4). Examines site specific, neighborhood, and community site planning from the site designer and local government perspectives. By reviewing actual discretionary case applications and case studies, students learn how regulatory, environmental, and government constraints influence site planning. Prerequisite: graduate standing or consent of instructor.

U264 Planning, Policy, and Design Seminar (1). For first- and second-year doctoral students. Topics include professional development; refereed journal publication process; academic conference presentations; and the job market for doctoral students in and out of academia. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

U265 Urban and Community Development Seminar (1). For first- and second-year doctoral students. Topics include scholarship related to the urban and community development area. Discussion of assigned articles and book chapters and how they relate to urban and community development. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

U273 Global Urbanization (4). Examines the spread of cities worldwide in the twentieth century. What are the political and economic causes of this processes? What are the social-cultural, political, economic effects? How is contemporary urbanization linked to global restructuring of other kinds? Prerequisites: graduate standing, consent of instructor. Same as Social Science 254J and Sociology 252A.

U275 Special Topics in Urban Planning (4). Special topics in urban and regional planning are offered from time to time, but not on a regular basis. Course content varies with interest of the instructor. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

U276 Principles of Environmental Design (4). Explores the principles and processes of design in the built environment, including graphic analysis and behavioral programming. Prerequisite: graduate standing or consent of instructor. Formerly Environmental Analysis and Design E272.

U277 Environmental Design Research Practicum (4). Provides an intensive field research experience in environmental psychology. Overviews basic theory and methods of environmental assessment. The latter portion of the course involves consultation with professional designers and subsequent post-occupancy evaluation of an existing setting. Prerequisite: graduate standing or consent of instructor. Formerly Environmental Analysis and Design E289.

U278 Culture, Community, and Space (4). Covers how cultures relate to natural and built physical environments. Ways in which culture influences space; ways space influences culture. Concepts for understanding the interrelationship, including values, norms, traditions, religion, and place attachment. Culture and cities, urban form, ethnic communities. Prerequisite: graduate standing or consent of instructor.

U279 Power and Empowerment in Organizations (4). Studies different ways of thinking about power and the use of power in organizations. First considers different ways of understanding power and then deals with various forms of empowerment including assistance, participatory democracy, and workplace empowerment. Prerequisite: graduate standing or consent of instructor.

U282 Urban Design Studio for Planners: An Introduction (4). Introductory urban design for planners. Organized around a variety of assignments to encourage learning by design in a studio setting. Students work on design projects and drawing assignments to learn practical aspects of urban design. Prerequisite: graduate standing or consent of instructor.

U288 Environment-Behavior Studies (4). Provides an overview of major theoretical and research perspectives within the field of environment-design research/environment-behavior studies (EBS). Reviews contributions to EBS from architecture, planning, geography, psychology, sociology, and other fields. Prerequisite: graduate standing or consent of instructor.

U292 Professional Report (4). Workshop designed to assist M.U.R.P. students in conducting their professional reports. Students select topics, design projects, conduct professional investigations, and write up reports.

U297 Research Design (4). Provides training in research design and methods. Students learn how to evaluate the strength of research findings based on the methods used by a researcher and learn to use lessons from the course to develop a research proposal. Prerequisite: graduate standing or consent of instructor.

U298 Directed Studies in Urban Planning (2 to 4). Prerequisites: graduate standing and consent of instructor. May be repeated for credit.

U299 Independent Study in Urban Planning (2 to 8). Prerequisites: graduate standing and consent of instructor. May be repeated for credit.

SCHOOL OF SOCIAL SCIENCES

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Gilbert Gonzalez, Ph.D. University of California, Los Angeles, *Professor of Social Sciences and Chicano/Latino Studies*
Michael R. Gottfredson, Ph.D. State University of New York, Albany, *Executive Vice Chancellor and Professor of Social Ecology and Sociology*
Richard H. Granger, Ph.D. Yale University, *Professor of Computer Science and Cognitive Sciences*
Susan Greenhalgh, Ph.D. Columbia University, *Professor of Anthropology*
Bernard N. Grofman, Ph.D. University of Chicago, *Professor of Political Science and Economics*
Emily D. Grossman, Ph.D. Vanderbilt University, *Assistant Professor of Cognitive Sciences*
Frank Haight, Ph.D. University of New Zealand, *Adjunct Professor of Economics*
Gregory Hickok, Ph.D. Brandeis University, *Professor of Cognitive Sciences*
Donald Hoffman, Ph.D. Massachusetts Institute of Technology, *Professor of Cognitive Sciences*
Lawrence A. Howard, Ph.D. University of California, Irvine, *Lecturer in Cognitive Sciences*
C. Ronald Huff, Ph.D. Ohio State University, *Dean of the School of Social Ecology and Professor of Social Ecology and Sociology*
Matthew L. Huffman Ph.D. University of California, Santa Barbara, *Associate Professor of Sociology*
Tarow Indow, Ph.D. Keio University, *Professor Emeritus of Cognitive Sciences*
Helen Ingram, Ph.D. Columbia University, *Professor of Social Ecology and Political Science, and Drew, Chace, and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation*
Jun Ishii, Ph.D. Stanford University, *Assistant Professor of Economics*
Geoffrey J. Iverson, Ph.D. New York University, *Professor of Cognitive Sciences*
Mireille Jacobson, Ph.D. Harvard University, *Assistant Professor of Social Ecology and Economics*
Ivan Jeliazkov, Ph.D. Washington University in St. Louis, *Assistant Professor of Economics*
Valerie Jenness, Ph.D. University of California, Santa Barbara, *Chair of the Department of Criminology, Law and Society and Professor of Social Ecology and Sociology*
Kent E. Johnson, Ph.D. Rutgers University, *Assistant Professor of Logic and Philosophy of Science*
Joseph G. Jorgensen, Ph.D. Indiana University, *Professor Emeritus of Social Sciences*
Philippe Jorion, Ph.D. University of Chicago, *Professor of Management and Economics*
Marek Kaminski, Ph.D. University of Maryland, *Assistant Professor of Political Science*
Sheen T. Kassouf, Ph.D. Columbia University, *Professor Emeritus of Economics*
Mary-Louise Kean, Ph.D. Massachusetts Institute of Technology, *Professor of Cognitive Sciences*
George Kent, Ph.D. University of California, Berkeley, *Professor Emeritus of Social Sciences*
Claire Jean Kim, Ph.D. Yale University, *Associate Professor of Asian American Studies and Political Science*
Jerome Kirk, Ph.D. The Johns Hopkins University, *Professor Emeritus of Sociology*
Igor Kopylov, Ph.D. University of Rochester, *Assistant Professor of Economics*
David LaBerge, Ph.D. Stanford University, *Professor Emeritus of Cognitive Sciences*
Charles Lave, Ph.D. Stanford University, *Professor Emeritus of Economics*
Jennifer Lee, Ph.D. Columbia University, *Associate Professor of Sociology*
Karen Leonard, Ph.D. University of Wisconsin, *Co-Director of the Center for Asian Studies and Professor of Anthropology*
Christine Lofgren, Ph.D. University of California, Irvine, *Director of the Farm School and Lecturer in Cognitive Sciences*
Elizabeth F. Loftus, Ph.D. Stanford University, *UCI Distinguished Professor of Psychology and Social Behavior, Criminology, Law and Society, and Cognitive Sciences*
R. Duncan Luce, Ph.D. Massachusetts Institute of Technology, *UCI Distinguished Professor Emeritus of Cognitive Sciences and Economics*
Cecelia Lynch, Ph.D. Columbia University, *Director of the Center for Global Peace and Conflict Studies and Associate Professor of Political Science*
Gary S. Lynch, Ph.D. Princeton University, *Professor of Psychiatry and Human Behavior and of Cognitive Sciences*
Craig MacAndrew, Ph.D. University of Chicago, *Professor Emeritus of Psychology*
Penelope Maddy, Ph.D. Princeton University, *UCI Chancellor's Professor of Logic and Philosophy of Science and of Mathematics*
David B. Malament, Ph.D. Rockefeller University, *UCI Distinguished Professor of Logic and Philosophy of Science*
Virginia Mann, Ph.D. Massachusetts Institute of Technology, *Associate Dean for Graduate Studies, School of Social Sciences, and Professor of Cognitive Sciences*
Julius Margolis, Ph.D. Harvard University, *Professor Emeritus of Economics*
Richard Matthew, Ph.D. Princeton University, *Associate Professor of Social Ecology and Political Science*
William M. Maurer, Ph.D. Stanford University, *Associate Professor of Anthropology*
Robert May, Ph.D. Massachusetts Institute of Technology, *Professor of Logic and Philosophy of Science*
Michael McBride, Ph.D. Yale University, *Assistant Professor of Economics*
Anthony McGann, Ph.D. Duke University, *Assistant Professor of Political Science*
James L. McGaugh, Ph.D. University of California, Berkeley, *Research Professor of Neurobiology and Behavior and of Cognitive Sciences*
Martin C. McGuire, Ph.D. Harvard University, *Professor of Economics and Management, and Clifford and Elaine Heinz Chair in the Economics and Public Policy of Peace*
Richard B. McKenzie, Ph.D. Virginia Polytechnic Institute and State University, *Professor of Management and Economics, and Walter B. Gerken Chair in Enterprise and Society*
Marshall Medoff, Ph.D. University of California, Berkeley, *Lecturer in Economics*
James W. Meeker, Ph.D., J.D. State University of New York, Buffalo, *Associate Dean of Student Affairs, School of Social Ecology, and Professor of Social Ecology and Sociology*
Duane Metzger, Ph.D. University of Chicago, *Professor Emeritus of Anthropology*
David S. Meyer, Ph.D. Boston University, *Professor of Sociology and of Planning, Policy, and Design*
Kristen R. Monroe, Ph.D. University of Chicago, *Director of the Interdisciplinary Center for the Scientific Study of Ethics and Morality and Professor of Political Science*
Michael J. Montoya, Ph.D. Stanford University, *Assistant Professor of Anthropology and Chicano/Latino Studies*
Patrick Morgan, Ph.D. Yale University, *Professor of Political Science and Thomas T. and Elizabeth C. Tierney Chair in Peace Studies*
Calvin Morrill, Ph.D. Harvard University, *Department Chair and Professor of Sociology and Professor of Social Ecology*
Louis Narens, Ph.D. University of California, Los Angeles, *Professor of Cognitive Sciences*
Robert Newcomb, Ph.D. University of California, Santa Barbara, *Senior Lecturer with Security of Employment, Social Sciences*
Nicholas R. Noviello, Ph.D. University of California, Irvine, *Lecturer in Social Sciences*
Jack W. Peltason, Ph.D. Princeton University, *President Emeritus of the University of California, UCI Chancellor Emeritus, and Professor Emeritus of Political Science*
Mark P. Petracca, Ph.D. University of Chicago, *Department Chair and Associate Professor of Political Science and Associate Professor of Social Ecology*
Joy Pixley, Ph.D. Cornell University, *Assistant Professor of Sociology*
Dale Poirier, Ph.D. University of Wisconsin, Madison, *Professor of Economics*
Francesca Athene Polletta, Ph.D. Yale University, *Associate Professor of Sociology*

Henry N. Pontell, Ph.D. State University of New York, Stony Brook, *Professor of Social Ecology and Sociology*
M. Ross Quillian, Ph.D. Carnegie-Mellon University, *Professor Emeritus of Political Science*
Priya Ranjan, Ph.D. Columbia University, *Associate Professor of Economics*
Jen'nan Read, Ph.D. University of Texas at Austin, *Assistant Professor of Sociology*
Gary Richardson, Ph.D. University of California, Berkeley, *Assistant Professor of Economics*
Belinda Robnett, Ph.D. University of Michigan, *Associate Professor of Sociology*
A. Kimball Romney, Ph.D. Harvard University, *Professor Emeritus of Anthropology*
Shawn Rosenberg, M. Litt. University of Oxford, *Professor of Political Science and Social Psychology*
Michael D. Rugg, Ph.D. University of Leicester, *Director of the Center for the Neurobiology of Learning and Memory, and Professor of Neurobiology and Behavior, Cognitive Sciences, and Social Ecology*
Rubén G. Rumbaut, Ph.D. Brandeis University, *Professor of Sociology*
Donald G. Saari, Ph.D. Purdue University, *Director of the Institute for Mathematical Behavioral Sciences and UCI Distinguished Professor of Economics and Mathematics*
Kourosh Saberi, Ph.D. University of California, Berkeley, *Associate Professor of Cognitive Sciences*
Kamal Sadiq, Ph.D. University of Chicago, *Assistant Professor of Political Science*
Wayne Sandholtz, Ph.D. University of California, Berkeley, *Professor of Political Science*
Jean-Daniel M. Saphores, Ph.D. Cornell University, *Assistant Professor of Social Ecology, Civil and Environmental Engineering, and Economics*
Michael J. Scavio, Ph.D. University of Iowa, *Lecturer in Cognitive Sciences and Social Sciences*
William R. Schonfeld, Ph.D. Princeton University, *Director of the Center for the Study of Democracy and Professor of Political Science*
Tonya L. Schuster, Ph.D. University of California, Riverside, *Lecturer in Sociology*
Sarah Senesky, Ph.D. Yale University, *Assistant Professor of Economics*
Caesar D. Sereseres, Ph.D. University of California, Riverside, *Associate Dean for Undergraduate Studies, School of Social Sciences, Acting Director of International Studies, and Associate Professor of Political Science*
Paul Shirey, Ph.D. University of California, Irvine, *Lecturer in Economics and Social Sciences*
Stergios Skaperdas, Ph.D. The Johns Hopkins University, *Professor of Economics*
Brian Skyrms, Ph.D. University of Pittsburgh, *Director of the Minor in the History and Philosophy of Science and UCI Distinguished Professor of Logic and Philosophy of Science and of Economics*
Kenneth A. Small, Ph.D. University of California, Berkeley, *Professor of Economics and of Planning, Policy, and Design*
David A. Smith, Ph.D. University of North Carolina, Chapel Hill, *Professor of Sociology and Social Ecology*
David A. Snow, Ph.D. University of California, Los Angeles, *Professor of Sociology*
Etel Solingen, Ph.D. University of California, Los Angeles, *Professor of Political Science*
Dorothy J. Solinger, Ph.D. Stanford University, *Co-Director of the Center for Asian Studies, Co-Director of the Minor in Asian Studies, and Professor of Political Science*
George Sperling, Ph.D. Harvard University, *UCI Distinguished Professor of Cognitive Sciences and of Neurobiology and Behavior*
Ramesh Srinivasan, Ph.D. Tulane University, *Assistant Professor of Cognitive Sciences*
Preston Kyle Stanford, Ph.D. University of California, San Diego, *Associate Professor of Logic and Philosophy of Science*
Judith Stepan-Norris, Ph.D. University of California, Los Angeles, *Professor of Sociology*
Mark Steyvers, Ph.D. Stanford University, *Assistant Professor of Cognitive Sciences*
Yang Su, Ph.D. Stanford University, *Assistant Professor of Sociology*
Kaushik Sunder Rajan, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Anthropology*
James M. Swanson, Ph.D. The Ohio State University, *Chief of the Child Development Center and Professor of Pediatrics, Psychiatry and Human Behavior, and Cognitive Sciences*
Rein Taagepera, Ph.D. University of Delaware, *Professor Emeritus of Political Science*
Katherine Tate, Ph.D. University of Michigan, *Professor of Political Science*
Gary Thom, Ph.D. Yale University, *Professor Emeritus of Political Science*
Justin L. Tobias, Ph.D. University of Chicago, *Associate Professor of Economics*
Rodolfo D. Torres, Ph.D. Claremont Graduate School, *Associate Professor of Social Ecology, Chicano/Latino Studies, and Political Science*
Bernard Tranel, Ph.D. University of California, San Diego, *Professor of Linguistics*
Judith Treas, Ph.D. University of California, Los Angeles, *Professor of Sociology*
Yuliya V. Tverdova, M.P.A. Binghamton University, *Acting Assistant Professor of Political Science*
Carole J. Uhlaner, Ph.D. Harvard University, *Associate Professor of Political Science*
Robert Uriu, Ph.D. Columbia University, *Associate Professor of Political Science*
Kurt Van Dender, Ph.D. Katholieke Universiteit Leuven (Belgium), *Assistant Professor of Economics*
Sheila Vaughn, Ph.D. United States International University, *Lecturer in Cognitive Sciences*
Feng Wang, Ph.D. University of Michigan, *Associate Professor of Sociology*
W. C. Watt, Ph.D. University of Pennsylvania, *Professor Emeritus of Cognitive Sciences*
Martin P. Wattenberg, Ph.D. University of Michigan, *Professor of Political Science*
Kai F. Wehmeier, Ph.D. Westfalische Wilhelms-Universität Münster, *Associate Professor of Logic and Philosophy of Science*
Christian Werner, Ph.D. The Free University of Berlin, *Professor Emeritus of Economics*
Douglas R. White, Ph.D. University of Minnesota, *Professor of Anthropology*
Joseph L. White, Ph.D. Michigan State University, *Professor Emeritus of Social Sciences*
Charles E. (Ted) Wright, Ph.D. University of Michigan, *Department Chair and Associate Professor of Cognitive Sciences*
Valerie Wright, Ph.D. Fuller Theological Seminary, *Lecturer in Cognitive Sciences and Social Sciences*
John I. Yellott, Jr., Ph.D. Stanford University, *Professor Emeritus of Cognitive Sciences*
Fan-Gang (Frank) Zeng, Ph.D. Syracuse University, *Director of the Hearing and Speech Laboratory and Professor of Otolaryngology, Biomedical Engineering, and Cognitive Sciences*
Mei Zhan, Ph.D. Stanford University, *Assistant Professor of Anthropology*

OVERVIEW

Undergraduate and graduate education in the School of Social Sciences at UCI represents a commitment to modern social science. The classic subject areas of anthropology, economics, geography, linguistics, political science, psychology, and sociology are included in the School's educational programs, but these programs go well beyond the traditional disciplines and can be characterized by the following emphases.

First, the faculty recognizes the value of systematic empirical observation and quantitative analysis in the study of human behavior. Developments in computer science and in mathematics oriented toward the problems of the social sciences, and the refinement of techniques for the observational, experimental, and statistical study of human behavior, have contributed major new elements to social science. Students in the School of Social Sciences will become familiar with the mathematical, computational, and statistical tools underlying modern social science.

Second, many of the most interesting questions in the study of human behavior cannot be fixed within the traditional disciplinary boundaries. Some of the new and evolving areas which cross orthodox boundaries are political sociology, public policy, cognitive anthropology, and psycholinguistics. Therefore many courses and course modules are built around these interdisciplinary social science phenomena rather than representing social science disciplines.

Third, the School emphasizes the design of hypotheses and of systems of interrelated ideas as an essential part of scientific pursuit. Consequently, the educational programs place substantial emphasis on understanding social science phenomena through the development of theories that can be used to guide empirical studies.

Educational opportunities for students in the School of Social Sciences extend well beyond attendance at courses. Students may develop independent study proposals in cooperation with interested faculty members or may investigate social science applications via off-campus internships. They are invited to participate in the quarterly evaluation of courses and instructors, to propose new courses and other modifications in existing programs, to nominate candidates for visiting faculty appointments, and to serve on School committees. The School provides a variety of opportunities for faculty-student interaction, and students will find the faculty, administration, and academic counseling staff of the School highly accessible and responsive.

Special Facilities

The School of Social Sciences maintains several special facilities for research and education.

The **Social Sciences Research Laboratory,** used for both faculty and student research, occupies the entire fourth floor of the Social Sciences Laboratory Building. The facility contains 40 experiment and control rooms and several specialized facilities including a virtual reality facility and infant cognition laboratory.

The **Farm School**, a small, open, and ungraded elementary school located in a rural setting adjacent to the campus, serves as a research facility for faculty and students having interests in children and how they learn. Undergraduates receive course credit for assisting staff teachers, for developing educational materials, and for observing and analyzing child behavior at the school.

Three **Computer Laboratories** provide access to networked IBM-compatible systems, where students can work on assignments using full-featured word-processing, database, graphics, and statistical packages. In addition, these computers provide students with access to e-mail, Internet services, and the World Wide Web. The new Social Science Plaza facility contains state-of-the-art, high-tech lecture halls and is fully Internet accessible.

The **Social Sciences Academic Resource Center (SSARC)** provides personal assistance to all Social Sciences students on finding research opportunities, off-campus internships, and graduate and professional programs. The Center maintains a library of graduate school catalogues, Statement of Purpose tips and handouts, and GRE, GMAT, LSAT, and CBEST registration booklets and test preparation information. In addition, it offers a database of community and professional internships for students to attain hands-on experience in their field of study. SSARC is fully staffed and provides Internet access to students, disseminates information on scholarships, and conducts workshops on graduate school and other related post-baccalaureate opportunities. A Recommendation Coordination Service for obtaining letters of recommendation is available to School majors. The service provides assistance for students applying to graduate and professional programs.

The **Center for Global Peace and Conflict Studies** (CGPACS) is a multidisciplinary research unit housed in the School of Social Sciences. The mission of CGPACS is to promote research on international problems and processes. The Center's current research emphases include: weapons of mass destruction, especially biological weapons; international governance, focusing on the evolution of international norms and institutions; citizen peace building; international environmental cooperation; and religion in international affairs. CGPACS also sponsors research conferences and public colloquia on topics of current significance. The Center's Margolis Lecture brings to UCI high-profile speakers who have played active roles in international affairs. Recent Margolis Lectures have featured Justice Louise Arbour, former chief prosecutor for the International Criminal Tribunals; Chinese democracy activist Wei Jinsheng; Congressman Christopher Cox; former Secretary of State Warren Christopher; and former Secretary of Defense William Perry. For more information about CGPACS visit the Web site at http://hypatia.ss.uci.edu/gpacs.

The **Center for the Study of Democracy** (CSD) continues the work of the UCI Focused Research Program on Democratization that was founded in 1991 and sponsors research and training on the process of democratic transition and the expansion of the democratic process in already established democracies. CSD includes a multidisciplinary faculty from four UC campuses.

CSD's activities are focused on three areas. First, faculty administer a graduate training program on empirical democratic theory. The National Science Foundation selected UCI in 1995 as a national center for the training of doctoral students in democratization issues; the five-year NSF grant provides funding for graduate fellowships and other training activities.

Second, the Democracy research program aims at improving the democratic process in the United States and other established democracies as we enter the next century. The program focuses on reforms to increase the ability of citizens to express their preferences and have these preferences represented within the democratic process.

Third, CSD supports research on the development of sustainable democracies in Eastern Europe, East Asia, and other new democracies. The New Democracies Initiative contributes to the promotion of democracy in these formerly authoritarian systems. For more information visit the Center for the Study of Democracy's Web site at http://www.democ.uci.edu/democ.

Visiting Distinguished Professorships

The School sponsors a program of Visiting Distinguished Professorships that exposes students to seminal thinkers in the social sciences. The professorships normally are of a quarter's duration. Participants have included Martin Bronfenbrenner, Professor of Economics (Duke University) and Fellow of the American Academy of Arts and Sciences; Philip Converse, Robert C. Angell Professor of Political Sciences and Sociology (University of Michigan), President of the American Political Science Association, and member of the National Academy of Sciences and the American Academy of Arts and Sciences; Beatrice Whiting, Professor of Anthropology and Education Emeritus, Graduate School of Education (Harvard University), and member of the American Academy of Arts and Sciences; John Whiting, Professor of Social Anthropology (Harvard University) and member of the American Academy of Arts and Sciences; James Coleman, Professor of Sociology (University of Chicago) and member of the National Academy of Sciences and the American Academy of Arts and Sciences; and Robin M. Williams, Department of Sociology (Cornell University) and member of the American Academy of Arts and Sciences and the National Academy of Sciences.

Degrees

Anthropology	B.A., M.A., Ph.D.
Economics	B.A., M.A., Ph.D.
International Studies	B.A.
Linguistics [1]	B.A.
Philosophy [2]	M.A., Ph.D.
Political Science	B.A., Ph.D.
Psychology	B.A., Ph.D.
Social Science	B.A., M.A., Ph.D.
Sociology	B.A., M.A., Ph.D.
Transportation Science [3]	M.S., Ph.D.

Within the Ph.D. in Social Science is an optional concentration in *Mathematical Behavioral Sciences,* supervised by an interdisciplinary group of faculty.

Within the M.A. in Social Science, students may apply directly to the concentration in Demographic and Social Analysis; for those enrolled in a Ph.D. program at another institution, the M.A. concentration in Mathematical Behavioral Sciences is available.

[1] The availability of this degree is currently under review. Contact the Associate Dean of Social Sciences for details.

[2] Jointly administered by the Department of Philosophy in the School of Humanities.

[3] Supervised by the Interdepartmental Group in Transportation Science. See the Interdisciplinary Studies section of the *Catalogue.*

NOTE: Courses in Geography are offered under Social Science, however a degree program is not available at this time.

HONORS

Graduation with Honors. Of the graduating seniors, no more than 12 percent will receive honors: approximately 1 percent *summa cum laude,* 3 percent *magna cum laude,* and 8 percent *cum laude.* The selection for these awards is based on winter quarter rank-ordered grade point averages. To be eligible for honors at graduation, the student must, by the end of winter quarter of the senior year, have submitted an Application for Graduation; be officially declared a Social Sciences major; have completed at least 72 units while in residence at a UC campus by the end of the winter quarter of the academic year in which they graduate; have all corrections to the academic record processed by the Registrar's Office; if completing the Language Other Than English breadth requirement with a language exemption test, pass the test by the end of winter quarter; and be able to verify completion of all course work by the end of the spring quarter of the senior year. Other factors are also considered (see page 52).

Dean's Honor List. The quarterly Dean's Honor List is composed of students who have received a 3.5 grade point average while carrying a minimum of 12 graded units.

Departmental Honors Programs. Most departments in the School of Social Sciences offer an Honors Program (refer to the departmental information). Upon successful completion of the Honors Program, students graduate with Honors in their respective majors and their transcripts note that they were in the Honors Program.

Honor Societies. Several departments in the School of Social Sciences belong to a national honor society. Eligibility is based on satisfying the requirements of the specific honor society. In the School of Social Sciences, these national honor societies include: Lambda Alpha Kappa (Anthropology), Omicron Delta Epsilon (Economics), Pi Omicron of Pi Sigma Alpha (Political Science), Psi Chi (Psychology), Pi Gamma Mu (International Studies and Social Science), and Alpha Kappa Delta (Sociology).

Order of Merit. The Dean of the School of Social Sciences' Order of Merit award recognizes the most outstanding graduating undergraduates and graduate students for their academic achievements, contributions to the School, and service to the campus and community.

David Easton Award. This award is given for the outstanding qualifying paper written by a Political Science graduate student during the preceding academic year.

Harry Eckstein Award for the Outstanding Undergraduate Honors Thesis. This award is given annually for the best honors thesis written by a Political Science major.

Harry Eckstein Memorial Fund. The Harry Eckstein Memorial Fund is presented annually to Political Science graduate students conducting research toward the completion of the Ph.D. in Political Science at UCI. Recipients of the award are designated as Eckstein Scholars.

The Justine Lambert Prize in Foundations of Science. This award is given every other year to the best submitted graduate paper on the foundations of logic, mathematics, and the empirical sciences. The competition is open to all graduate students at UCI, regardless of department or school affiliation.

Alice B. Macy Outstanding Undergraduate Paper Award. This award is given to a Social Sciences undergraduate student in any discipline for a paper that demonstrates original research.

Jack and Suzie Peltason Scholarship. This award is given at the discretion of the department chair to support and facilitate the education of undergraduate Political Science majors. All undergraduate Political Science majors are eligible to apply.

Pi Omicron Award for Outstanding Political Science Major. This award is given annually by UCI's Pi Omicron Chapter of Pi Sigma Alpha to a graduating senior Political Science major who best exemplifies a commitment to academic excellence and public service.

A. Kimball Romney Outstanding Graduate Paper Award. This award is given to a Social Sciences graduate student in any discipline for a paper that demonstrates original research.

Robin M. Williams Award. This award is given to an undergraduate student and a graduate student for the best research paper in the field of sociology.

Undergraduate Program

PLANNING A PROGRAM OF STUDY

Since there are many alternative ways to plan a program, some of which may require careful attention to specific major requirements, students should consult with the School of Social Sciences Undergraduate Counseling Office to design an appropriate program of study.

Students who select one of the School majors in their freshman year might begin by taking the one-digit courses required by their major and one of the mathematics sequences listed under Part A of the School requirements. It is a good idea to take these courses early since they include fundamental concepts that will be widely applicable in more advanced courses. In addition, the lower-division writing requirement of the breadth requirement (Category I) should be completed during the first year. In the sophomore year, the student might complete the course on computing, three courses toward the breadth requirement, four courses in the social sciences, and four electives. Students who are planning to go on to graduate school can use their freshman and sophomore years to advantage by taking courses in theory, research methods, mathematics, and other areas important to graduate study. In the junior and senior years, the student should take courses in the major area and should create an individualized program of study through a combination of courses and course modules which fall in an area of interest. Particular attention should be paid to planning a program of study that will ensure that major requirements are met prior to graduation.

Change of Major. Students who wish to change their major to one offered by the school should contact the Social Sciences Undergraduate Counseling Office for information about change-of-major requirements, procedures, and policies. Information is also available at http://www.due.uci.edu/Change_of_Major.html.

Double Majors

In order to double major within the School of Social Sciences, major and school requirements must be met for *both* majors with no overlap of courses except for those used to satisfy the mathematics, computer technology, and introductory social science requirements. The mathematics and computer courses need only be taken once. Only two introductory social science classes are needed, provided this also meets the requirements of both major programs. The same two-digit and upper-division courses may *not* be used to meet the requirements of more than one major program. For example, a student who wishes to major in Psychology and Anthropology may take one of the mathematics sequences, Information and Computer Science 10A, 10B, or 21, or Social Science 3A, and may use Introduction to Psychology and Introduction to Anthropology to meet the major and School requirements for both programs. However, two different sets of two-digit and upper-division courses must be taken to complete the major and School requirements of the two programs.

Mathematics and Social Sciences

The mathematics requirement stems from the nature of modern social science. The concepts and terms of mathematics, statistics, and computers are an important part of the social scientist's vocabulary. Basic knowledge of these tools is necessary to an understanding of current literature in the social sciences, to the analysis of data, and to an intelligent use of social science models. Each candidate for a degree in the School of Social Sciences is expected to have a basic knowledge of probability, statistics, and computing. In addition, for students who are preparing for graduate school in an area of social science, it will be important to supplement the minimal mathematics requirements with additional courses related to mathematics and social science methodology. The particular courses which would be recommended are not specified here, however, since they are highly dependent on the major emphasis of the student. Students who are preparing for graduate study should consult their advisors to determine a program of study which will give them the research skills necessary for successful graduate work.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements

A. Familiarity with basic mathematical, computational, and statistical tools underlying modern social sciences. This requirement is met by passing a three-course sequence in mathematics (Anthropology 10A-B-C, Mathematics 2A-B, 7, Psychology 10A-B-C, Social Science 10A-B-C, Social Science 100A-B-C, or Sociology 10A-B-C). (NOTE: School of Social Sciences majors may not take Social Science 9A-B-C to fulfill the mathematics requirement.) Computer education is essential for a complete social science education. This requirement can be satisfied by passing Information and Computer Science 10A, 10B, or 21, or Social Science 3A. Departments may have preferences for specific courses. See your major department for acceptable courses. This course requirement should be taken during the student's first year.

B. An understanding of the fundamental concepts, analytical tools, and methods of social science. This requirement is met by taking two four-unit introductory courses in the School of Social Sciences bearing a one-digit course number. (Such courses include Anthropology 2A, 2B, 2C, 2D; Economics 1; Linguistics 3; Logic and Philosophy of Science 4A, 4B; Political Science 6A, 6B, 6C; Psychology 7; Social Science 1A, 5A, 5B, 5C, 5D; Sociology 1.) These courses normally should be taken during the student's first year. (NOTE: This requirement may be fulfilled by option B of the departmental requirements for students majoring in Political Science.)

C. An understanding of important advanced areas in social science. This requirement is met by passing satisfactorily nine four-unit upper-division courses in the School of Social Sciences, where at least three of these courses comprise core courses or a module. (NOTE: The major in Social Science requires 11 four-unit upper-division courses.) For modules which are listed with more than three courses, the student may normally elect to take any subset of three courses in the module. Appropriate substitutions may be made upon petition.

D. Four additional four-unit social science courses from any level.

Students are reminded that the Pass/Not Pass option is not applicable to course requirements A through D above or to any additional requirements listed for specific major programs. However, Information and Computer Science 10A, 10B, 21, and Social Science 100A are exceptions to this rule and may be taken Pass/Not Pass.

Courses used to meet requirements B through D above are included in the computation of the grade point average in courses required in the major program.

Maximum Overlap Between Major and Minor Requirements: Students completing both a major and a minor within the School of Social Sciences may count courses taken to fulfill the School's mathematics and computer science requirement toward satisfaction of both the major and the minor. No other course overlap is allowed.

TRANSFER STUDY RECOMMENDATIONS

The School recommends that students wishing to transfer to UCI do the following:

1. Complete the Intersegmental General Education Transfer Curriculum (IGETC) prior to transfer to UCI.
2. Refer to http://www.assist.org/ for information about community college courses that will fulfill UCI lower-division major requirements.

   Specific course recommendations:

   Prospective **Economics majors:** complete a second semester of calculus (in addition to the courses required for transfer-student admission; see the Department of Economics section).

   Prospective **International Studies majors:** complete two semesters of foreign language at the intermediate level.

   Prospective **Psychology majors:** complete a three-course sequence in introductory, physiological, and either social or abnormal psychology.

TRANSFER STUDENTS

Freshmen and Sophomores: Students transferring to UCI as freshmen or sophomores will fulfill the regular requirements of the four-year program either through work at UCI or through transfer credit for comparable work elsewhere.

Juniors: Following review by the School of Social Sciences, it may be determined that junior transfer students electing to major in one of the School's degree programs, who have good records at other accredited colleges and universities, have satisfied School requirement B and the University requirements. However, all transfer students must fulfill the upper-division writing breadth requirement (category I) while at UCI. Students anticipating transfer to UCI in their junior year should plan their curriculum so as to anticipate the special mathematics requirement (School requirement A). Every effort will be made to accommodate individual variation in background, provided students are prepared to commit themselves to intensive work in areas of deficiency. Ordinarily, the typical two-year program for junior transfers is simply the last two years of the regular four-year program, except that students who have not satisfied the mathematics requirements of the School should plan to do so in the junior year and must do so before graduation.

Seniors: Students wishing to graduate with a degree in the School by transferring to UCI in their senior year should plan their work carefully to ensure that the requirements can be met in one year of residence. In general, differences between the program at UCI and programs elsewhere make senior transfers difficult.

SERVICE LEARNING, COMMUNITY SERVICE, AND INTERNSHIPS

Service learning is a meaningful activity that integrates service within the curriculum. It is an opportunity for students to make positive contributions to underserved and marginalized communities through academic courses, field studies, and internships. Service learning provides out-of-class experiences to reinforce understanding of academic theory while addressing serious community concerns. When combined with a structured curriculum having research components, students can explore the role of the social scientist and help seek solutions to problems affecting society. The School of Social Sciences' philosophy is to practice research, service, and good citizenship.

The School actively supports service learning through its philosophy of enhancing the learning process by motivating, inspiring, and teaching students how to recognize and accept their civic responsibilities. The goal is to educate students about social issues and provide them with the necessary tools to solve the difficult problems society faces. Under the guidance and supervision of faculty and staff, students are offered the opportunity to experience personal, professional, social, and intellectual growth through the following School of Social Sciences programs: public- and private-sector internships, community service, field studies, and the specialization in Public and Community Service within the major in Social Science.

UNDERGRADUATE PROGRAMS IN K–12 EDUCATION

Undergraduate students who wish to pursue a career in the field of K–12 education are well-served in the School of Social Sciences and the Department of Education. The following interrelated programs provide opportunities for students to gain knowledge and experience in this important area.

Minor in Educational Studies

The minor in Educational Studies allows students to explore a broad range of issues in the field of education and provides a strong foundation for K-12 teaching. Both introductory and advanced courses are included, giving students a solid preparation for later teacher credential programs and many related occupations. NOTE: A Statement of Intent is required of all students wishing to enroll in this minor. See the Department of Education section of the *Catalogue* for more information.

Multiple Subject and Single Subject (Social Science) Preparation

Course work in the Social Science major (Social Sciences for Secondary School Education specialization) provides excellent preparation for students wishing to obtain a multiple subject teaching credential. Students who take additional course work can satisfy the subject matter requirement for a single subject teaching credential in social science. NOTE: Official enrollment in the single subject program is required to satisfy this requirement. The Counseling Office in 370D Social Science Tower can provide details.

Department of Education Programs

The Department of Education provides many other opportunities for prospective educators, including: a mentoring program which provides students with valuable experience while they work with credentialed teachers; UC Links, a program in which undergraduates tutor K–8 students in after-school settings; and advising services provided by counselors who assist students in planning future careers in education. Further information about these programs is available from the Department of Education counselors at 2001 Berkeley Place.

Students interested in obtaining a teaching credential should see the Department of Education section of the *Catalogue* for information.

SPECIAL PROGRAMS

3-2 Program with The Paul Merage School of Business

Outstanding students who are interested in a career in management may wish to apply for entry into The Paul Merage School of Business' 3-2 Program. Students normally apply for this program early in their junior year. See The Paul Merage School of Business section for additional information.

Campuswide Honors Program

The Campuswide Honors Program is available to selected high-achieving students from all academic majors from their freshman through senior years. For more information contact the Campuswide Honors Program, 1200 Student Services II; telephone (949) 824-5461; e-mail: honors@uci.edu; World Wide Web: http://www.honors.uci.edu/.

Education Abroad Program

Upper-division students have the opportunity to experience a different culture while making progress toward degree objectives through the Education Abroad Program (EAP). EAP is an overseas study program which operates in cooperation with host universities and colleges throughout the world. Additional information is available in the Center for International Education section.

Interdisciplinary Minors

A variety of interdisciplinary minors are available to all UCI students. **The minor in Conflict Resolution,** sponsored by the International Studies program in the School of Social Sciences, provides skills in conflict analysis and resolution and a useful understanding of integrative institutions at the local, regional, and international levels.

Information about the following minors is available in the Interdisciplinary Studies section of the *Catalogue*.

The minor in Chicano/Latino Studies is designed to provide an awareness, knowledge, and appreciation of the language, history, culture, literature, sociology, anthropology, politics, social ecology, health, medicine, and creative (art, dance, film, drama, music) accomplishments in the Chicano/ Latino communities.

The minor in Global Sustainability trains students to understand the changes that need to be made in order for the human population to live in a sustainable relationship with the resources available on this planet.

The minor in the History and Philosophy of Science explores how science is actually done and how it has influenced history, and is concerned with determining what science and mathematics are, accounting for their apparent successes, and resolving problems of philosophical interest that arise in the sciences.

The minor in Native American Studies focuses on history, culture, religion, and the environment. The three core courses serve as an introduction to the Native American experience from the perspective of different historical periods and frameworks of analysis.

Information about the following interdisciplinary minors is available in the School of Humanities section.

The minor in African American Studies offers undergraduate students an opportunity to study those societies and cultures established by the people of the African diaspora and to investigate the African American experience from a variety of disciplinary perspectives and theoretical approaches.

The minor in Asian American Studies examines the historical and contemporary experiences of Asians after their arrival in the United States and seeks to provide an awareness of the history, culture (e.g., literary and creative art accomplishments), psychology, and social organization of Asian American communities.

The minor in Asian Studies creates opportunities for students to explore Asian topics in a variety of fields, to develop advanced language skills, and to acquire broader perspectives.

The minor in Latin American Studies is designed to develop in students an awareness, knowledge, and appreciation of Latin American issues in the areas of language, history, culture, literary studies, sociology, anthropology, political science, health, folk medicine, and creative (art, dance, film, drama, music) accomplishments.

The minor in Religious Studies focuses on the comparative study of religions in various cultural settings around the world and seeks to provide a wide-ranging academic understanding and knowledge of the religious experience in society.

The minor in Women's Studies offers a curriculum drawing from the humanities, social sciences, and the arts to examine contributions of women from different backgrounds to culture and society and to explore women's and men's lives in the context of changing gender relations.

CAREERS IN SOCIAL SCIENCES

Business and industry often look to social science graduates to fill positions in management, finance, marketing and advertising, personnel, production supervision, and general administration. In the public sector, a wide variety of opportunities are available in city, county, state, and federal government. Teaching is a frequently chosen career at all levels from elementary school teacher to professor. In addition, many graduates enter professional practice, becoming lawyers, psychologists, researchers, or consultants in various fields.

Because all Social Sciences degrees involve an educational program that is interdisciplinary and that prepares students to understand quantitative methods of data analysis, graduates of the School are well-positioned for research and analysis careers at all levels of government and in private firms. Their solid grounding in contemporary social science methods and their familiarity with a broad spectrum of social scientific thinking gives them an excellent foundation for the pursuit of further training in graduate and professional programs.

The UCI Career Center provides services to students and alumni including career counseling, information about job opportunities, a career library, and workshops on resume preparation, job search, and interview techniques. Additional information is available in the Career Center section.

Graduate Program

The School of Social Sciences offers graduate training in the following areas: Anthropology (Ph.D. in Anthropology), Cognitive Sciences (Ph.D. in Psychology), Economics (Ph.D. in Economics), Logic and Philosophy of Science (Ph.D. in Philosophy), Mathematical Behavioral Sciences (Ph.D. in Social Science), Politics and Society (Ph.D. in Political Science), and Sociology (Ph.D. in Sociology). In addition, an interdisciplinary concentration in Public Choice is offered within the programs in Economics and Political Science, a specialized concentration in Transportation Economics is offered within the program in Economics, an emphasis in Social Networks is offered within the Mathematical Behavioral Sciences concentration, and a concentration in Political Psychology is offered within the program in Political Science. When an applicant's interests lie outside of or across these areas, the Associate Dean of Graduate Studies, School of Social Sciences, may, on rare occasions, appoint a three-member faculty committee to guide an independent course of study for the Ph.D. degree in Social Science.

The M.A. degree in Anthropology, Economics, Philosophy, Social Science, or Sociology may be conferred upon students in Ph.D. programs after completion of the necessary requirements.

Additionally, the M.A. degree program in Social Science with a concentration in Demographic and Social Analysis is supervised by faculty from the Schools of Social Sciences and Social Ecology. Students may apply directly to this M.A. program.

The M.S. and Ph.D. degree program in Transportation Science is supervised by an interdepartmental faculty group. Information is available in the Interdisciplinary Studies section of the *Catalogue.*

In cooperation with the UCI Department of Education, students enrolled in a School of Social Sciences graduate program may choose to pursue a teaching credential while working toward their degree. After completion of requirements for an M.A. degree, students may apply for admission into the credential program administered by the Department of Education. As required by law, the applicant must pass the California Basic Educational Skills Test (CBEST), obtain a Certification of Clearance, and successfully complete the appropriate subject area examination or an approved subject-matter program. A detailed description of the program may be obtained from the Social Sciences Graduate Office or the Department of Education.

ADMISSION

Potential graduate students should apply by January 15 to receive fullest consideration for financial aid. Applicants should indicate the title of the degree sought (Anthropology, Economics, Political Science, Psychology, or Social Science), and the academic area of concentration (see above). All applicants are required to submit Graduate Record Examination General Test scores. Letters of recommendation and the applicant's statement of interest are important factors in the admission decision.

In addition to the University admission requirements described in the Research and Graduate Studies section, individual graduate programs may prescribe special requirements or expectations of applicants, subject to the approval of the Graduate Council. Such requirements are minimum standards only; successful applicants typically must exceed them by a substantial margin.

FINANCIAL SUPPORT

Many students receive financial support in the form of fellowships, teaching assistantships, or research assistantships available under grants to individual faculty. Before accepting an offer of admission with financial support for the first year, applicants should inquire about the likelihood of such support in future years. Occasionally, a newly admitted student may receive a multiyear commitment of some specified financial support, but this is not the rule. Students are also advised to seek aid from sources external to the University. (NOTE: Teaching assistantships do not include remission of fees or nonresident tuition.)

LENGTH OF STUDY AND RESIDENCE

The normal time for completion of the Ph.D. degree is either five, six, or seven years, depending upon the specific program. See the department sections for information.

Students admitted to the M.A. concentration in Demographic and Social Analysis should be able to earn the M.A. within one to two years.

Because the intellectual training offered by the School requires full-time study and constant contact with the faculty, the School does not accept part-time students.

DEPARTMENT OF ANTHROPOLOGY

4229 Social Science Plaza B; (949) 824-7602
Michael L. Burton, **Department Chair**

Anthropology is the comparative study of past and present human societies and cultures. The Department of Anthropology emphasizes contemporary theory, field research, and a variety of methods for analyzing anthropological data. The Department has a strong interdisciplinary bent, with research and teaching interests in economic anthropology, political economy, social history and social change, culture and health, identity and ethnicity, gender and feminist studies, cognitive anthropology, social networks, modernity and development, religion, and the arts and expressive culture. The Department also has a strong emphasis on the study of contemporary issues and modern problems, such as international flows of goods, peoples, images, and ideas; the relationship between global processes and local practices; immigration, citizenship, and refugees; population politics; violence and political conflict; ethnicity and nationalism; gender and family; medicine; law; development and economic transformation; urban studies; and environmental issues. While the program gives students a breadth of knowledge in classical anthropology, the faculty do not merely pursue research on the traditional subjects of anthropological study, but bring anthropological analyses to bear on pressing contemporary social issues. Geographic regions of expertise include China, Southeast Asia, South Asia, Oceania, Europe, Latin America, the Caribbean, East Africa, Latino communities of the United States, and diasporic and transnational communities in the United States and abroad.

Undergraduate Program

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 430.

Departmental Requirements for the Major

School requirements must be met and must include 12 courses (48 units) as specified below:

A. Anthropology 2A.

B. Anthropology 2B, 2C, or 2D.

C. Anthropology 30A or 30B.

D. Three topical courses (12 units) from Anthropology 120–159, 170–179).

E. Two courses (eight units) on a geographical area, from Anthropology 160–169.

F. Four additional elective courses (16 units) from Anthropology 30A, 30B, 40–179, 180A.

Students are strongly encouraged to take Anthropology 180A after they have had at least three courses beyond Anthropology 2A and 2B, 2C, or 2D. Students are also strongly encouraged to take both Anthropology 30A and 30B.

The faculty encourages Anthropology majors or minors to study abroad and experience a different culture while making progress toward degree objectives. The Center for International Education, which includes the Education Abroad Program (EAP) and the International Opportunities Program (IOP), assists students in taking advantage of many worldwide opportunities. For example, EAP offers excellent opportunities to study anthropology at many universities abroad and courses taken for departmental requirement C, D, and E would be excellent choices to take. Study abroad also can provide opportunities for cross-cultural experience, field research, and foreign language training. See the Center for International Education section of the *Catalogue* for additional information.

Honors Program in Anthropology

The Honors Program in Anthropology is designed to allow undergraduates to pursue field research and write an honors thesis on topics of their choice under the guidance of Department of Anthropology faculty members. Research projects typically involve a combination of library research, exploratory ethnographic interviews, participant observation, and systematic data collection and analysis. The program is open to all senior Anthropology majors with a grade point average of 3.3 or better overall, with 3.5 in Anthropology courses (at least five courses). Successful completion of the Honors Program and the honors thesis satisfies the upper-division writing requirement.

Although course work for the Honors Program does not start until the senior year, it is highly recommended that during the spring quarter of the junior year, students find a professor willing to serve as their research project advisor on the basis of a mutually acceptable abstract that indicates the goal and significance of their project. If extensive research is to be undertaken at this time, students enroll in Anthropology 199.

During the fall quarter of the senior year, students enroll in Anthropology H190A and write a proposal describing their research question, the relevant background literature, and the method of data collection and analysis. Field work for the project may begin during this quarter.

In the winter quarter of the senior year, students begin or continue enthnographic field research by enrolling in Anthropology H190B. Field research typically combines exploratory field research with fixed format data collection methods.

In the spring of the senior year, students enroll in Anthropology H191 and complete a senior honor thesis that is typically 40 to 80 pages long. Honor theses are read and evaluated by the advisor and a second faculty member chosen by the chair of the undergraduate committee in consultation with the advisor.

Anthropology Minor Requirements

Requirements for the minor in Anthropology are met by taking seven anthropology courses (28 units) as specified below:

A. Anthropology 2A.

B. Anthropology 2B, 2C, or 2D.

C. Anthropology 30A or 30B.

D. Two topical courses (eight units) from Anthropology 120–159, 170–179).

E. Two courses (eight units) on a geographical area, from Anthropology 160–169.

Graduate Program

Participating Faculty

Victoria Bernal: Feminist theory, capitalism and social transformation, the Islamic revival, civil society, globalization, and cyberspace

Tom Boellstorff: Sexuality, postcoloniality, HIV/AIDS, mass media and popular culture, language and culture, Indonesia, Southeast Asia

Michael Burton: Economic anthropology, ecological anthropology, psychological anthropology, gender; Africa, Micronesia

Teresa Caldeira: Urban violence; spatial segregation and urban changes in multicultural societies; citizenship, individual rights, and conceptions of the body; racism; gender, critical urban studies, and contemporary developments in social theory; Brazil

Frank Cancian: Economic anthropology, inequality, peasants; Mexico

Leo R. Chávez: International migration, Latin American immigrants, medical anthropology, transnational communities, cultural analysis of popular images

Benjamin Colby: Culture theory and cultural pathology, content analysis, psychological anthropology, cognition, narrative structures, psychoneuro-immunology; Japan, Mesoamerica, women's health and well-being in Orange County

Robert Garfias: Ethnomusicology, ethnicity

Susan Greenhalgh: Social studies of science, technology, and medicine; politics of population reproduction, modernity/globalization, feminism/gender, China, Taiwan, Pacific Rim

Karen Leonard: Social history of India, caste, ethnicity and gender, Asian-Americans and Muslim Americans, religion, ethnicity, class, and gender

William M. Maurer: Anthropology of law, globalization, transnationalism, citizenship and nationalism, finance capital, identity, Caribbean

Michael J. Montoya: Social inequality and health; race and ethnicity; social and cultural studies of science, technology, and medicine; the participation of ethnic populations in biomedical research; the U.S./Mexican border, critical bioethics

A. Kimball Romney: Experimental and psychological anthropology, quantitative and cognitive anthropology

Kaushik Sunder Rajan: Biotechnology, capitalism, comparative ethnography, genomics, globalization, nation-state, political economy, post-colonialism, science and technology studies, subjectivity; India

Douglas White: Cross-cultural research, mathematical anthropology, social networks, longitudinal analysis, development and social change

Mei Zhan: Medical anthropology, cultural and social studies of science, globalization, transnationalism, gender, China, the United States

Affiliated Faculty

Duran Bell: Economics, economic anthropology

Susan Bibler Coutin: Law, culture, immigration, human rights, citizenship, political activism, Central America

John P. Boyd: Kinship, social networks, mathematical anthropology

Carol Burke: Folklore, cultural studies

Lara Deeb: Islam, gender, modernity, religious movements, transnational feminism, public sphere, Middle East and North Africa, Lebanon

J. Paul Dourish: Human-computer interaction, computer-supported cooperative work

Paula Garb: Anthropology of conflict and conflict resolution, ethnic and environmental conflict in the former U.S.S.R.

Inderpal Grewal: Feminist theories of internationalism and transnationalism, cultural studies, South Asia and its diasporas

Bonnie Nardi: Human-computer interaction, activity theory, cultural responses to technology development

James Diego Vigil: Urban, psychology, socialization and educational anthropology, sociocultural change, urban poverty, Mexico and U.S. Southwest ethnohistory, comparative ethnicity

The Department of Anthropology offers a Ph.D. degree program in Anthropology. The program focuses on social and cultural anthropology, with emphases in political economy and economic anthropology, cognitive anthropology, ethnography, and medical anthropology, and has multiple faculty interested in ethnicity, gender, historical anthropology, international migration, and social networks. The program also provides rigorous methodological training, with special strengths in quantitative and formal analysis and in the methodology of ethnographic fieldwork. The Department is committed to exploring new and innovative approaches to culture and society in a pluralistic and intellectually open academic environment. Program faculty take diverse theoretical and methodological approaches to a variety of substantive issues. They are united, however, in a willingness to question taken-for-granted theoretical premises and analytic frames, and to engage in good-faith intellectual dialogue about alternative models and approaches.

ADMISSION

Students are admitted to the program based on their application materials and evidence of scholarly potential, including grade point average, GRE scores, and letters of recommendation.

REQUIREMENTS

Students must complete a one-year Proseminar in Anthropology during their first year and one course in Anthropological Fieldwork during their second year. In addition, students are required to complete two quarters of Statistics, one course in Research Design, and six elective courses in Anthropology, which are selected in consultation with their advisor and which normally cover a coherent area of specialization within the field. All course work must be completed before a student is advanced to candidacy. Students must demonstrate competence to read one foreign language, in accordance with the requirements of the Ph.D. degree in Anthropology.

At the end of the first year, students must pass a formal evaluation which is made by the Department of the basis of (1) the first-year course work and (2) examinations to be taken as part of the Proseminar. Students should advance to candidacy by the end of the third year; the advancement to candidacy examination is based on a research proposal, a review of relevant literature, and an annotated bibliography. The fourth (and, in many cases, some or all of the fifth) year is normally devoted to extended anthropological fieldwork. The sixth year (in some cases, also part of the fifth) is devoted to writing the dissertation, in close consultation with the advisor. The normal time for completion of the Ph.D. is seven years, and the maximum time permitted is eight years.

Feminist Studies Emphasis

A graduate emphasis in Feminist Studies also is available. Refer to the Women's Studies section of the *Catalogue* for information.

Social Networks Track

A track in Social Networks within Anthropology may be completed by taking any three Social Networks seminars. This includes the core Network seminars Social Science 241A (Interaction Models), 241B (Network Theories of Social Structure), and 241C (Analysis of Relational Data), as well as other courses listed in the Social Networks section of the *Catalogue.* Those seminars taught by members of the Anthropology Department count as Anthropology electives, and other seminars as outside electives.

Courses in Anthropology

LOWER DIVISION

2 Introduction to Anthropology. Basic introduction to anthropology. These courses can be taken in any order.

2A Introduction to Sociocultural Anthropology (4). Introduction to cultural diversity and the methods used by anthropologists to account for it. Family relations, economic activities, politics, gender, and religion in a wide range of societies. Stresses the application of anthropological methods to research problems. **(III, VII-B)**

2B Introduction to Biological Anthropology (4). Evolutionary theory and processes, comparative primate behavior, primate fossil record, human variation, and the adequacy of theory, i.e., fit of theory and empirical data. **(III)**

2C Introduction to Archaeology (4). Archaeological theory and cultural processes with emphasis on the American Southwest, Mesoamerica, and Mesopotamia. **(III)**

2D Introduction to Language and Culture (4). Explores what the study of language can reveal about ourselves as bearers of culture. After introducing some basic concepts, examines how cultural knowledge is linguistically organized and how language might shape our perception of the world. Same as Linguistics 68. **(III)**

10A-B-C Probability and Statistics (4-4-4). An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from anthropology, sociology, and related social science disciplines. Same as Sociology 10A-B-C. Students who receive credit for Anthropology 10A-B-C may not receive credit for Psychology 10A-B-C, Social Ecology 13, Social Science 9A-B-C or 10A-B-C, or Sociology 10A-B-C. **(V)**

20A People, Cultures, and Environmental Sustainability (4). An anthropological consideration of global environmental sustainability from the perspective of human cultures and communities. Causes and consequences of population growth, natural resource management, environmental law, environmental ethics. Case studies emphasize tropical rain forests, arid lands of Africa and North America. Same as Environmental Analysis and Design E20.

30A Global Issues in Anthropological Perspective (4). Explores anthropological perspectives on issues of importance in an increasingly global society. Topics vary from year to year; may include emphases on ethnic conflict; identity; immigration and citizenship; religion and religious diversity; medical anthropology; legal anthropology; development and economic change; gender.

30B Ethnography and Anthropological Methods (4). Explores the role of ethnography in anthropological and other social research. Provides theoretical and reflective readings on ethnography, as well as practical exercises in ethnographic method, to explore ethnography's traditional place as anthropology's main methodological contribution to the social sciences.

41A Origins of Global Interdependence (4). Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift. Same as International Studies 11. **(VII-B)**

85A Cultures in Collision: Indian–White Relations Since Columbus (4). An introductory survey of topics such as: indigenous religious belief and socio-political organization, stereotypic "images," intermarriage, the fur trade, Native leaders, warfare, and contemporary issues. Slides, films, and trips to local museums enhance student learning. Same as Sociology 65. **(VII-A)**

89 Special Topics in Anthropology (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

UPPER-DIVISION

121A Kinship and Social Organization (4). Organization of social life primarily in preindustrial societies. Theories of kinship, marriage regulations, sexual behavior, and social roles. Comparisons of biological, psychological, sociological, and economic explanations of social organization. **(VII-B)**

121D Cross-Cultural Studies of Gender (4). Familiarizes students with the diversity of women's experiences around the world. Gender roles and relations are examined within cultural and historical contexts. A central concern is how class, race, and global inequalities interact with women's status. Prerequisite: Anthropology 2A or 2B. **(VII-B)**

121E Women, Race, and Social Movements in Latin America (4). Analyzes the emergence and transformation of social movements in Latin America from the 1980s to the present. Focuses on two groups of protagonists: women (who organized various types of movements), and Black Latin Americans (whose organization has been limited). **(VII-B)**

121G Political Anthropology (4). Utilizes anthropological accounts of Western and non-Western societies to question conventional ways of thinking about power and politics. Classical traditions in political anthropology are critiqued; an alternative view is presented through recent anthropological political analyses of topics such as class, gender, aesthetics, and popular culture.

121H Social Inequality: Anthropological Perspectives (4). Concrete anthropological and sociological studies from across the world, including the United States, are compared to give perspectives on social status, power, economic differences, race, ethnicity, and gender. Prerequisite: one course in Anthropology, Economics, Political Science, or Sociology. Same as Sociology 165A. **(VII-B)**

121J Urban Anthropology (4). Cultural roles of urban centers and processes or urbanization in comparative perspective, focusing on nonwestern, nonindustrial societies of past and present; relationship between modern urban centers and Third World peoples. Migration, urban poverty, adaption, social and political integration of rural folk in urban settings in Africa, Asia, Latin America. **(VII-B)**

125A Economic Anthropology (4). Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world. Prerequisite: one course in general science, anthropology, economics, geography, or sociology. Same as Economics 152A. **(VII-B)**

125B Ecological Anthropology (4). Studies relationships between human communities and their natural environments. The role of environment in shaping culture; effects of extreme environments on human biology and social organization; anthropologist's role in studying global environmental problems, e.g., African famine, destruction of tropical rain forests. Prerequisite: Anthropology 2A, 2B, or 2C. Same as Environmental Analysis and Design E125. **(VII-B)**

125F Culture and Evolution (4). Explores interacting historical cultures in changing political, economic, religious, social, and conflictual contexts over several millennia to the present. **(VII-B)**

125M Community Change and Transnational Development (4). Focuses on community, national, and international perspectives on findings and applications of anthropological and economic research concerning development and social change. Anthropological critiques of development processes, development agencies, and development economics.

125P-Q Evolution of Social Formations I, II (4-4). 125P: Models and ethnographic descriptions of noncommodity economic relationships of the form that characterize intergroup and intragroup economic processes of many tribal societies. Includes analyses of gift exchange and resource allocation within the household. **125Q:** Devoted entirely to supervised research by class members. Prerequisites: Economics 20A-B-C; Economics 152A or Anthropology 125A recommended. Prerequisite for 125Q: satisfactory completion of the lower-division writing requirement. Same as Economics 152P-Q. **(VII-B)**

125S The Anthropology of Money (4). Anthropological approaches to monetary systems; impact of money on subsistence economies; cultural history of money in the west; and modern transformations of money. Also considers recent developments in the cultural history of money, "securitization," credit alternative currencies, and digital cash.

125X Immigration in Comparative Perspective (4). Examines issues related to the migration and settlement of immigrants. Although the focus is on the Mexican migration to the United States, comparisons are also made to immigrant groups from Korea, Japan, Southeast Asia, Central America, the Caribbean, and Europe. Same as Chicano/Latino Studies 161. **(VII-A)**

125Y South Asian American Experience (4). Examines and compares the experiences of South Asian immigrants in the U.S. over time. Looks at the economic, political, and social positions of the immigrants, with special emphasis on religious changes and the changes in the second and later generations. Same as Asian American Studies 151F.

125Z Muslim Identities in North America (4). Explores multiple identities of Muslims in North America, including indigenous Muslims (e.g., African American Muslims and Sufis) and immigrants of many national origins. Explores religious, political, cultural, ethnic, class differences among American Muslims, turning to Islamic institutions near UCI to conduct small research projects. Same as Asian American Studies 142. **(VII-A)**

126G Marriage and Bridewealth (4). The rules by which children are positioned within a social system and by which men claim rights over women vary widely among societies. Analyzes these rules on the basis of a formal theory of wealth allocations between and among corporate groups that challenge neoclassical models. Prerequisites: Anthropology 2A and Economics 20A-B-C, or consent of instructor. Same as Economics 152M.

127A Law and Modernity (4). The rise and spread of Enlightenment legal traditions, social contract theory, individual rights, ideologies of "liberty, equality, fraternity"; contradictions of liberal law, its understandings of "primitive" and "civilized"; pervasive myths of property, difference, race, and rights. Reading- and writing-intensive. Same as Criminology, Law and Society C191. **(VII-B)**

128A Introduction to Science Studies (4). Explores the ways in which science and technology have been conceived of in the Social Sciences through the twentieth century. Emphasis on recent literature in Science and Technology Studies (STS), especially writings that concern the relationship of science to power and politics.

128B Race, Science, and Disease (4). Contemporary issues of race, ethnicity, and the science of disease. "Race" as a biological, social, legal, and cultural construct is examined from three interlinked axes: genetic ideologies, disease explanations, and social inequalities. Historical and current analyses of health and inequality. Same as Chicano/Latino Studies 176. **(VII-A)**

128C Culture, Power, and Cyberspace (4). Explores cultural and political implications of the infotech revolution and the ways new media are used around the world, new cultural practices and spaces (e.g., cybercafes), debates surrounding the meanings of these new technologies, and their implications for transforming society.

129 Special Topics: Social and Economic Anthropology (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

132A Psychological Anthropology (4). Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics, biocultural aspects of child development and attachment, evolutionary models of culture and behavior, politically linked personality, cognitive anthropology, psychology of narrative forms, comparative national character studies. Prerequisite: Anthropology 2A or Psychology 7A or Psychology 9A-B-C. Same as Psychology 173A.

133A Latinos/Latinas and Medicine (4). Introduction to medical social science perspectives of Latinos/Latinas in a variety of settings. Emphasis placed on understanding the intersection of immigration, mental health, gender, reproduction, and spirituality in analyzing how the experience of health and illness is shaped by these factors. Same as Chicano/Latino Studies 175. **(VII-A)**

134A Medical Anthropology (4). Introduces students to cross-cultural perspectives and critical theories in anthropological studies of medicine. Special attention is given to diverse ways of understanding bodies, illnesses, and therapeutic practices in our changing world. **(VII-B)**

134D Culture and Health (4). Explores America's cultural diversity by examining differing systems of belief and behavior in relation to illness, curing, disease, practitioner behavior, and use of conventional medical services. Groups focused on include Native Americans, African Americans, Latinos, and Asians. Same as Chicano/Latino Studies 172.

134E Ways of Healing (4). Designed to explore and discover the diverse ways humans have devised to heal themselves. The theoretical premise is that social ties are an essential ingredient to successful healing and, indeed, protection against the onset of illness.

134G HIV/AIDS in a Global Context (4). Examines issues concerning cultural conceptions of HIV infection and disease worldwide. Topics include treatment and prevention, identity and behavior, risk, ethnicity, gender, youth, sexuality, activism, drug use, illness, religion, the clinical encounter, national belonging, and the pharmaceutical industry. Prerequisite: satisfactory completion of the lower-division writing requirement. **(VII-B)**

135A Religion and Social Order (4). An anthropological exploration of religious belief and practices in diverse social and historical contexts. Emphasis placed on selected non-western traditions of the sacred, and on issues of power, ritual, moral order, and social transformation. **(VII-B)**

135H Religion in South Asia (4). Introduction to South Asian civilization looking not only at Hinduism and Islam but at the socioeconomic and political systems which have supported religions traditions. **(VII-B)**

135I Modern South Asian Religions (4). Nineteenth- and twentieth-century developments in Hinduism, Islam, and Sikhism are covered, with emphasis on changing forms as well as contents of religious movements.

136A Nationalism and Ethnicity in the Contemporary World (4). An exploration of the concepts of identity, culture, ethnicity, race, and nation through ethnographic cases, with a view to asking larger questions: How do people create nativeness and foreignness? How does "culture" get worked into contemporary racisms and nationalisms?

136B History of Anthropological Theory (4). A review of competing approaches in anthropological theory from the nineteenth century to the present, covering social evolutionism, functionalism, structuralism, and cultural relativism, as well as more recent intellectual movements and issues such as feminism, cultural studies, poststructuralism, and postmodernism.

136D Conflict Management in Cross-Cultural Perspective (4). Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations. Same as Political Science 154G. **(VII-B)**

136G Colonialism and Gender (4). An anthropological enquiry into the ways colonial relations of power have been structured and gendered throughout the world, and to what effect. Examines the social locations of men and women in the everyday exercises of colonial and imperial power.

136K The Woman and the Body (4). Probes culture and politics of the female body in contemporary American life. Focusing on "feminine beauty," examines diverse notions of beauty, bodily practices, and body politics embraced by American women of different classes, ethnicities, and sexualities. **(VII-A)**

137A Reading Images Culturally (4). Students are provided with the analytical tools necessary to undertake research on visual representations. Images, as cultural productions, are steeped in the values, ideologies, and taken-for-granted beliefs of the culture which produced them. Of concern are representations of race, identity, gender, and the "Other." Same as Chicano/Latino Studies 116.

138M Music as Expressive Culture (4). Fundamental requirements for development of a musical tradition. Guiding structural principles which must be agreed upon for new forms of expression to be understood and accepted. How members of society develop their own individual musical cultures and how these permit them to interact with the personal cultures of others.

138N Readings in Ethnomusicology (4). A guided introduction survey through some of the written research in the field of ethnomusicology. Assigned readings and class discussion. Prerequisite: consent of instructor.

138O Music and Society in the Ottoman Sphere (4). The unique character of Ottoman society created a musical culture which spread throughout much of Eastern Europe and into much of the Arabic speaking world. This influence is still clearly manifest in these regions as well as in Turkey. **(VII-B)**

138P Music of Asia (4). A survey of the major music traditions of Asia and a consideration of the broad cultural and historical patterns which brought them about. Discusses the interaction and development of regional forms and communicates something of the value systems underlying these forms. **(VII-B)**

138Q Latino Music: A View of Its Diversity and Strength (4). A survey of the musics of the many Latin cultures of the Americas including Mexico, Central and South America, as well as the Caribbean, and of those many Latin cultures which thrive and survive in the United States. Same as Chicano/Latino Studies 115A. **(VII-B)**

138R Cross-Cultural Parameters of Popular Music (4). A consideration of popular music in the U.S. and abroad. How is pop defined and what does its evolution in other cultures tell us about our own pop music? The course will consider how the various cultures within the U.S. fit into the pop music scene, how they modify it today, and how they have in the past. **(VII-A)**

138S Music of Greater Mexico (4). A wide range of musics exist in Mexico, and in the Mexican traditions within the United States. From the indigenous traditions of Mexico and the ancient Aztec and Mayan civilizations through the Colonial and Revolutionary periods, the variety of Mexican music is explored. Same as Chicano/Latino Studies 115B.

139 Special Topics in Cultural and Psychological Anthropology (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

141A Ancient Civilizations of Mexico and the Southwest (4). The prehistory and cultural evolution of the civilizations which originated in Mexico, including the Olmecs, Aztecs, Toltecs, Maya, and Zapotec, as well as the Pueblos of the Southwestern U.S. Topics include the origins of food production and of the state, political and social history, ancient cities, and the Spanish conquest.

149 Special Topics in Archaeology (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

161T Field Research: Asian Immigrants and Refugees in Orange County (4). Instruction in field work methodology via research projects involving the local communities of immigrants and refugees from Asia. Open only to School of Social Sciences and Asian American Studies majors. Same as Asian American Studies 197. **(VII-A)**

162A Peoples and Cultures of Latin America (4). Surveys the prehistory of Latin America and its indigenous cultures, emphasizing the impact of colonial rule, capitalism, and twentieth-century transformations. Emphasis on communities from several countries. In some years, emphasis on comparisons between the Latin American and Caribbean experiences. **(VII-B)**

162B Indian North America (4). A survey of indigenous peoples in North America: American Indians, Alaska Natives, First Nations, Native Americans. Tribal populations and geographic distributions, political and social organization, sovereignty, self-determination, intergovernmental relations; cultural continuity and change; management, preservation, development of environments/resources. Prerequisite: satisfaction of the lower-division writing requirement. **(VII-A)**

163A Peoples of the Pacific (4). The cultural history and recent developments among the Pacific peoples of Polynesia, Micronesia, Melanesia, New Guinea, and Australia. **(VII-B)**

163I Transforming China (4). Focuses on transformations in the everyday life in post-socialist China. Explores topics including privatization, consumerism, urbanization, rural development, national and ethnic identities, religion, family, gender, sexuality, medicine, food, pop culture, transnationalism, and globalization. **(VII-B)**

163K Korean Society and Culture (4). Introductory background to the social and cultural forces that affect the lives of the Koreans, including those in the United States. Considers traditional values and contemporary issues within a historical framework. Same as East Asian Languages and Literatures 130 and Sociology 175A. **(VII-B)**

164A African Societies (4). Comparative studies of the cultures and societies of Sub-Saharan Africa, with emphasis on critical study of colonialism and postcoloniality, social transformation, and the politics of identity. Prerequisite: Anthropology 2A.

164P Peoples and Cultures of Post-Soviet Eurasia (4). Examines the cultures and political conflict of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management. Same as Political Science 154F. **(VII-B)**

169 Special Topics in Area Studies (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

174A World Cultural Comparisons (4). Introduction to ethnology/ethnography, comparative research and theory, culminating in processes of discovery and hypotheses testing using world cultural databases to which students can contribute. Prerequisite: satisfaction of the lower-division writing requirement. **(VII-B)**

176A Exploring Society Through Photography (4). Students explore society through presentation, interpretation, and discussion of their own photographs. A few common exercises at the beginning of the quarter are followed by individual projects. Photography as social observation and the relation of photographs in an essay are stressed. Prerequisite: basic darkroom techniques or the digital equivalent. Same as Social Science 182A and Sociology 114A.

179 Special Topics: Methods and Formal Representations (1 to 4) F, W, S. Prerequisites vary. May be repeated for credit as topic varies.

SPECIAL COURSES

180A Anthropology Majors Seminar (4-4-4). A course in anthropological theory designed especially for majors in Anthropology. Different issues are considered in different years. Prerequisite: Anthropology major only or consent of instructor.

190 Senior Thesis (4). May be taken a total of three times. Prerequisite: consent of instructor.

H190A Honors Research Workshop (4) F. Students articulate the goals and significance of their research projects. Written work consists of an eight- to fifteen-page research proposal, due by quarter's end, describing the research question, the relevant literature, and methods of data collection and analysis. Prerequisites: open only to students in the Honors Program in Anthropology; consent of instructor.

H190B Honors Field Research (4) W. Students begin or continue ethnographic field research that combines exploratory field research (e.g., participant-observation, interviews, study of archival and documentary materials) with fixed format data collection methods (e.g., standardized interviews, behavioral observations). Prerequisite: Anthropology H190A; consent of instructor.

H191 Honors Senior Thesis (4) S. Student drafts a senior honor thesis (typically) with the following sections: problem statement, literature review, ethnographic background, description of the methods, results, and conclusions. Prerequisites: Anthropology H190A, H190B; satisfaction of the lower-division writing requirement; consent of instructor.

197 Field Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

198 Group Directed Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

199 Independent Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

GRADUATE

202A-B-C Proseminar in Anthropology (4-4-4). Year-long intensive introduction to the history of anthropological thought and reading in classical and contemporary ethnography for first-year graduate students. Prerequisite: graduate standing or consent of instructor.

208A Anthropological Fieldwork Methodology (4). A survey of anthropological fieldwork methodology techniques, including attention to contemporary analysis of fieldwork. Prerequisite: graduate standing or consent of instructor.

208B Seminar on Content Analysis (4). A research course on systematic analysis of visual and verbal material. Possibilities include coding answers to open-ended questions, scoring thematic apperception (picture) tests, analyzing films and narratives. Tailored to the particular research projects of students. Prerequisite: graduate standing.

210A-B-C Graduate Statistics I, II, III (4-4-4). Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model. Prerequisites: graduate standing, consent of instructor. Same as Sociology 221A-B-C and Social Science 255M-N-P.

221A Family and Life History (4). Interdisciplinary and comparative work in family and life history. Prerequisite: graduate standing or consent of instructor. Same as Social Science 253A.

222A Analysis of Relational Data (4). A practicum in social networks data analysis focusing on the special problems raised by data sets that embody relations. Log-linear and quadratic assignment procedures are stressed along with multidimensional scaling and other representational models. Prerequisites: graduate standing; consent of instructor. Same as Social Science 201G, 241C, and 256A, and Sociology 225A.

222B Network Theories of Social Structure (4). Explores communicative, social, political, economic, and other flows of behavior using foundational network concepts and measures such as centrality, group, role, pattern, and system. Defines social structure, processes that generate structures, and behavioral consequences of structural rather than individual dispositional properties. Prerequisite: graduate standing or consent of instructor. Same as Social Science 241B.

222D Social Networks and Dynamics (4). Network dynamics provides an integrated anthropological basis for modeling cultural, sociocognitive, and social network phenomena. Students convert data relevant to research questions into a network format, explore themes and materials that provide a basis for research findings, and write up results in a term project. Prerequisite: graduate standing.

223A Research Design (4). Data collection, organization, and analysis in ethnographic or quasi-experimental settings, including interviewing, participant observations, behavior observations, and questionnaires. Research design issues include sampling, longitudinal research, and comparative research. Emphasis on the integration of qualitative and quantitative data. Prerequisite: graduate standing or consent of instructor. Same as Social Science 255A/Sociology 220A. Anthropology 223A and Sociology 265 may not both be taken for credit.

225A Grant and Proposal Writing (4). Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research. Prerequisite: graduate standing or consent of instructor. Same as Social Science 255C.

230A Anthropology and History (4). An examination of the complex, longstanding relationship between anthropology and history. Themes include: history, culture, and colonialism; history and the power to represent; nostalgia and the uses of the past in struggles over "national history." Prerequisite: graduate standing or consent of instructor. Same as Social Science 251A.

234B Gender and Globalization (4). Teases out gender implications of transformations in global culture and political economy. By examining processes such as globalization of production and investment, spread of religious fundamentalisms, and extension of mass media throughout the world, maps out terrain for future ethnographic and theoretical work. Same as Social Science 254K.

235A Transnational Migration (4). The immigrant experience will be examined in order to explore how specific theoretical issues are examined empirically. These issues include ethnic enclave formation, gendered differences in migration and settlement, class differences, the migration of indigenous groups, identity formation, and issues of representation. Same as Social Science 254A.

240A Economic Anthropology (4). Classic and contemporary theory in economic anthropology. Case studies from Latin America (primarily Mexico and the Andes), Africa, and the Pacific. Substantive topics include non-market exchange, markets and marketplaces, households, gender, management of common property (fisheries, pastoral lands, forests), labor, development, and change. Prerequisite: graduate standing or consent of instructor. Same as Social Science 254E.

242A The Politics of Ethnography (4). Explores the way that ethnographies are linked to wider contexts within which they are produced. Through examination of recent critiques of ethnographic writing, and a series of cases, shows how ethnography is bound up with the politics of representation. Prerequisite: graduate standing or consent of instructor. Same as Social Science 254F.

245A Seminar in Political Anthropology (4). Explores anthropological approaches to politics. Covers a range of issues and topics, including: theories of culture, power, and hegemony; approaches to colonial and post-colonial relations of global inequality; and ethnographic approaches to the modern state. Prerequisite: graduate standing or consent of instructor. Same as Social Science 254H.

246B Law, Colonialism, and Nationalism (4). Origins and spread of law in colonial and nationalist contexts: law's role in constituting and policing difference. Recent theoretical approaches; property in things and people; human and indigenous rights; "customary" law; legal foundations of nationalism; resistance to/through law; globalization. Prerequisite: graduate standing. Same as Social Science 254M.

247A Structuralism and Post-Structuralism (4). Traces recent theoretical discussions and arguments over the philosophical and historical "subject" from structuralist decenterings toward the characteristically "post-structuralist" contemporary concern with the historical and political constitution of subjectivities and subject positions. Prerequisite: graduate standing or consent of instructor. Same as Social Science 252G.

248A Approaches to Globalization (4). Historical and contemporary approaches to the world economy, emphasizing anthropological questions of culture, power, identity, inequality. Examines "neo-imperialism," "late capitalism," accumulation, global markets, urban space, the state, business and policy globalization discourse, "local" responses to and instantiations of the "global." Prerequisite: graduate standing or consent of instructor. Same as Social Science 254L.

250A The Cultural Politics of Visual Representation (4). Develops a theoretical framework for analyzing and reading visual images. Images, as cultural productions, are steeped in the values, ideologies, and taken-for-granted beliefs of the culture which produced them and a political economy that is class, race, and gender inflected.

250B Cybersociality (4). Explores questions of sociality in cyberspace, including what social theories and ethnographic methods are effective in studying online cultures. Topics include general issues like indexicality, reference, temporality, spatiality, and embodiment, and topics such as language, gender, ethnicity, property, and inequality. Prerequisite: graduate standing.

251A Reading Seminar in Science Studies (4). Reading- and writing-intensive seminar that explores various genres of writing about science and technology. Specific emphasis and readings vary from year to year. Special attention to relationships among science studies, cultural anthropology, and social theory. Prerequisite: graduate standing or consent of instructor.

259A, B, C Dissertation Writing Seminar (4, 4, 4). Intended for advanced, post-fieldwork Anthropology graduate students. Emphasis on the presentation of research design and results, problems of ethnographic writing, and qualitative and quantitative data and analysis. Prerequisites: post-fieldwork; graduate standing in Anthropology or consent of instructor.

289 Special Topics in Anthropology (4). Special topics vary from quarter to quarter. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

290 Dissertation Research (4 to 12). Prerequisite: graduate standing or consent of instructor. May be repeated for credit.

299 Independent Study (4). Prerequisite: graduate standing or consent of instructor. May be repeated for credit.

DEPARTMENT OF COGNITIVE SCIENCES

3221 Social Science Plaza B; (949) 824-3771
Charles E. (Ted) Wright, **Department Chair**

The Department of Cognitive Sciences is committed to the investigation of the abstract, complex structures that underlie human cognition: language, thought, memory, learning, sensorimotor integration and perception. The main areas of research strength within the Department are visual and auditory perception, experimental psychology, cognitive psychology, and mathematical psychology.

Undergraduate Program

Students should be aware that psychology courses are offered in several different departments and programs. Students interested in general psychology including the areas of development, clinical, perception, learning, memory, and cognitive processes are advised to consult the course listings here in the Department of Cognitive Sciences section. These courses are designed to provide students with a strong foundation in general psychology. Students interested in other areas of psychology are advised to consult the course listings in the School of Social Ecology section.

In anticipation that the number of students who are qualified to elect Psychology as a major will exceed the number of positions available, students applying for admission for fall 2006 should be sure to file their application before November 30, 2005.

Change of Major: Information about change-of-major requirements, procedures, and policies is available in the School of Social Sciences Undergraduate Counseling Office and at http://www.due.uci.edu/Change_of_Major.html.

Excellence in Psychological Research: Psychology majors doing independent research under Psychology 199 may be eligible for participation in the Undergraduate Research Opportunities Program (UROP). Participants can obtain research funding and have the opportunity to have their research papers published in a peer-reviewed student journal or to present them at a special conference of UCI student research. Guidelines for the program are available from the Department of Cognitive Sciences office.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 430.

Departmental Requirements for the Major in Psychology

School requirements must be met and must include 18 courses (70 units) as specified below:

A. Psychology 9A-B-C.

B. Two introductory courses (eight units) in the social sciences chosen from Anthropology 2A or 2B, Economics 1, Linguistics 3, Political Science 6A, 6B, or 6C, Sociology 1, or, by petition, one or two quarters of Social Science H1E, H1F, or H1G, when topic is not psychology.

C. A one-quarter course and laboratory in experimental psychology or research methods selected from Psychology 112A and 112LA, 112G and 112LG (requires 112F and 112LF as prerequisites), 112M and 112LM, or 112P and 112LP. (Psychology 112F and 112LF were previously numbered 115A and 115LA.).

NOTE: These courses have as prerequisites Psychology 9A-B-C and one year of mathematics/statistics (see course listings). These prerequisites are strictly enforced. Psychology 112A, 112LA are the first quarter of a multi-quarter sequence that satisfies the upper-division writing requirement and allows students to plan and conduct research projects. Students taking these courses should plan to continue in them through at least the second quarter. Students who intend to fulfill the upper-division writing requirement in some other way should consider taking Psychology 112M, 112LM, or 112P, 112LP to fulfill the laboratory requirement.

D. Four upper-division Psychology core courses are required (16 units). These courses are designated with the ending number "0" and include the following: Psychology 120A, 120D, 120H, 120P, 130A, 140C, 140L, 140M, 160A.

E. Seven additional courses (four or more units each) with emphasis in psychology, distributed as follows:

(1) No more than one of the seven may be lower-division. Psychology 7A, 11E, 46A, 56L, 76M may not be used to fulfill this requirement.

(2) Three of the upper-division courses used to satisfy requirements D and E must be taken from one of the following modules: Psychology 110–119 (Research Methodologies), 120–129 (General Psychology), 130–139 (Perception and Sensory Processes), 140–149 and 150–159 (Learning and Cognition and Semiotics and Language combined), 160–169 (Cognitive Neuroscience), and 170–179 (Interdisciplinary Studies).

(3) Certain courses offered in the School of Biological Sciences and the School of Social Ecology may be used in partial satisfaction of this requirement. A total of three of these courses (12 units) may be used in this way with a maximum of two from either of these Schools.

The courses that may be used in this way are those in the Department of Cognitive Sciences' course listings numbered Psychology 127, 147, and 177, as well as Psychology and Social Behavior P109 (same as E108U), P121D, P134H, P164S (same as C105), and Biological Sciences D137, E174, N110, N159.

(4) No more than two of the courses (each of four or more units) may be numbered 190–199.

NOTE: Psychology majors are strongly encouraged to take Biological Sciences 1A-B and 35 in satisfaction of the natural sciences portion of the breadth requirement (Category II). Furthermore, it is strongly recommended that students who intend to pursue postbaccalaureate work in psychology take the Psychology 112A-B-C sequence. Most psychology graduate programs require statistics (which, at UCI, may be satisfied by taking Social Science 10A-B-C, Psychology 10A-B-C, or Social Science 100A-B-C), but some require calculus (which, at UCI, may be satisfied by taking Mathematics 2A-B).

Honors Program in Psychology

The two-year honors program in Psychology is open to selected juniors who are majoring in Psychology. It provides thorough grounding in research methods and culminates with the opportunity for basic research in some area of psychology under faculty supervision. The program has a limited number of openings and seeks to attract outstanding students who plan to undertake postgraduate education in some field of the psychological sciences. Admission to the program is based on a formal application that is normally submitted in the spring quarter of the sophomore year. Applicants should have an overall grade point average of at least 3.2 and a grade point average of at least 3.5 in psychology courses, although this requirement may be waived in unusual cases.

During the junior year, students who participate in the program are expected to enroll in Honors Experimental Psychology (H111A-B-C), and in the fall quarter of the Honors Seminar in Psychology (H101A). As seniors, following successful completion of these junior-year requirements, Psychology honors students are enrolled in the Honors Seminar in Psychology (H101B-C) in the fall and spring quarters. Participants in the honors program are expected to complete course work beyond the breadth requirement in one or more of the following areas: biological sciences, mathematics, computer science, physical science, linguistics, philosophy. The honors seminar may be used to satisfy two of the courses required by Part E of the Psychology major requirements. To graduate with Honors in Psychology, a student must successfully complete the requirements for the B.A. degree in Psychology with an overall grade point average of 3.2 and a grade point average of at least 3.5 in Psychology courses. In addition, Honors students must successfully complete a senior honors thesis as part of the senior-year course work.

Sample Programs — Psychology Majors

GENERAL	GRADUATE SCHOOL TRACK	HONORS
Freshman		
Psych. 9A-B-C	Psych. 9A-B-C	Psych. 9A-B-C
2 Intro. Soc. Sci.	Humanities Core	Humanities Core
ICS 10A or 10B or 21	Math. 2A-B-C	Math. 2A-B-C
6 Breadth		
Sophomore		
3 quarters Statistics[1]	3 quarters Statistics[1]	3 quarters Statistics[1]
3 Core[2]	3 Core[2]	3 Core[2]
6 Breadth/Electives	2 Intro. Soc. Sci.	2 Intro. Soc. Sci.
	ICS 21	ICS 21
	3 Breadth	3 Breadth
		Apply to Honors in spring
Junior		
1 Core[2]	1 Core[2]	Psych. H111A-B-C
3 Module/upper-division Psych.	3 Module/upper-division Psych.	Psych. H101A
4 Breadth/Electives	4 Breadth/Electives	1 Core[2]
Select one of the following:	*Select one of the following:*	2 upper-division Psych. courses
Psych. 112A-B-C and 1 upper-div. Psych.	Psych. 112A-B-C and 1 upper-div. Psych.	
Psych. 112F-G and 2 upper-div. Psych.	Psych. 112F-G and 2 upper-div. Psych.	
Psych. 112M or 112P and 3 upper-div. Psych.		
Senior		
9 Electives	9 Electives	8 Electives
Select one of the following:	2 Psych. 199	Psych. H101B-C
2 Psych. 199 and Psych. 190	1 Psych. 190	2 Psych. 199
3 upper-division Psych.		

Sample Program — Transfer Psychology Majors

Junior	Senior
Psych. 9A-B-C	1 Core[2]
3 quarters Statistics[1]	3 Module/upper-div. Psych. courses
ICS 10A or 10B or 21	1 Elective
2 Intro. Soc. Sci.	*Select one of the following:*
3 Core[2]	Psych. 112A-B-C and 3 upper-div. Psych. courses
	Psych. 112F-G and 4 upper-div. Psych. courses
	Psych. 112M or Psych. 112P and 5 upper-div. Psych. courses

[1] Either Psychology 10A-B-C, Social Science 10A-B-C, or Social Science 100A-B-C, with Psychology 10 and Social Science 100 recommended for those planning to attend graduate school in Psychology.

[2] Psychology core course, an upper-division course with the ending number "0."

Psychology Minor Requirements

Requirements for the minor in Psychology are met by taking seven or eight psychology courses (28 or 32 units) as specified below:

A. Psychology 7A (for the 28-unit minor) or 9A-B-C (for the 32-unit minor).

B. Three upper-division Psychology courses chosen from the following core courses in Psychology: 120A, 120D, 120H, 120P, 130A, 140C, 140L, 140M, 160A.

C. For students who take Psychology 7A, three additional psychology courses (four or more units each) no more than one of which is a lower-division course. For students who take Psychology 9A-B-C, two additional upper-division Psychology courses (four or more units each). Psychology 190–199 cannot be used to fulfill this requirement.

D. In addition, the School mathematics and computer science requirement (School requirement A) must be satisfied.

Graduate Program

Participating Faculty

William Batchelder: Mathematical models of learning and memory, mathematical psychology, and measurement
Bruce Berg: Psychoacoustics of complex sounds, auditory attention
Myron Braunstein: Visual perception and computer applications
Scott D. Brown: Mathematical models of reaction time and practice
Charles F. Chubb: Visual perception, psychophysics, neural networks
Barbara Dosher: Memory, information processing, attention, perception
Michael D'Zmura: Vision, color, attention, image understanding, virtual reality
Jean-Claude Falmagne: Mathematical behavioral sciences
Emily D. Grossman: Neural basis of biological motion perception
Gregory Hickok: Neural organization of language and cognition
Donald Hoffman: Human and machine vision, recovery of three-dimensional structure from image motion, visual recognition of objects by their shape
Tarow Indow: Mathematical models in visual space, color space, and human memory
Geoffrey J. Iverson: Cognitive science and mathematical models
Mary-Louise Kean: Linguistic theory and biological foundations of higher mental processes
R. Duncan Luce: Mathematical behavioral science; measurement theory, utility theory, response times
Virginia Mann: Speech perception and its development, the development of reading ability, developmental dyslexia
Louis Narens: Measurement, logic, and metacognition
Kourosh Saberi: Brain and signal detection, genetics
George Sperling: Vision, perception, information processing
Ramesh Srinivasan: Perception, development, and cortical dynamics
Mark Steyvers: Computational models of memory, reasoning, and perception
W.C. Watt: Cognitive semiotics
Charles E. (Ted) Wright: Motor control, skill learning, timing
John I. Yellott, Jr.: Mathematical psychology and visual perception

GRADUATE STUDY IN THE COGNITIVE SCIENCES

The Department of Cognitive Sciences offers a Ph.D. degree program in Psychology, with a specialization in cognitive science, to prepare students for research and teaching careers in academia, industry, and government. The emphasis is on modern techniques of experimentation and theory construction. Special attention is given to providing hands-on research experience and equipping students with sophisticated mathematical and computing skills. The Department has 23 faculty; two are members of the National Academy of Sciences, and many serve as editors or editorial board members of leading professional journals, and as members of NSF and NIH study panels. Many Cognitive Sciences faculty are also members of UCI's Institute of Mathematical Behavioral Sciences, and the Department is generally regarded as one of the world's leading centers for mathematically oriented research in cognitive psychology. One sign of this is the fact that six of its members serve on the Board of Editors of the *Journal of Mathematical Psychology.*

Some Cognitive Sciences faculty participate in the Interdepartmental Neuroscience Program. See the School of Biological Sciences section of the *Catalogue* for information about this graduate "gateway" program.

ADMISSION

In addition to meeting the general requirements for admission, applicants should have acquired a background in mathematics equivalent to at least one year of calculus. (That background is required for completing the program's research methods courses.) Advanced courses in some of the following fields are considered highly desirable: psychology, computer science, mathematics and the physical sciences, biology, logic, and linguistics. Standard requirements for admission include Graduate Record Examination

(GRE) scores for tests taken within the past five years, official transcripts of all college course work, and at least three letters of recommendation. Applicants whose first language is not English must also take the Test of English as a Foreign Language (TOEFL) and achieve a score of 550 or higher. Applicants who are not citizens of countries where English is either the primary or dominant language as approved by the UCI Graduate Council and who apply for a teaching assistantship, must pass the Test of Spoken English (TSE), or the Speaking Proficiency English Assessment Kit (SPEAK) examination, with a score of 50 or more.

To receive full consideration for fellowship and assistantship awards, applications must be received by December 15. Late applications may be considered until July 1 on a space-available basis. Since the program starts in the fall quarter, students are not normally admitted in the winter or spring, though exceptions may be made. Application materials may be obtained by contacting the Social Sciences Graduate Office.

REQUIREMENTS FOR THE DOCTORAL DEGREE IN PSYCHOLOGY

Each student is expected to take two three-course graduate sequences in the first year. One is a three-quarter proseminar sequence covering areas such as learning, memory, perception, and linguistics (Psychology 202A-B-C). The other is a research methods sequence covering the areas of probability, statistics, and experimental design (Psychology 203A-B-C). Suitable substitutes may be made with written approval of the Department's Director of Graduate Studies. Completion of the research methods sequence may be extended over two years if warranted by the background or needs of the student. Additional advanced course work in other fields relevant to the student's interests will supplement the required courses. Students are expected to enroll in the Cognitive Sciences Research Seminar (Psychology 201A-B-C) during all quarters in residence prior to passage of the advancement-to-candidacy examination.

In addition, students must take at least six more courses prior to advancement to candidacy. These courses are normally taken from at least three of the following seven modules: Foundations (Psychology 200–209); Human Cognition (Psychology 210–229); Methodologies and Models (Psychology 230–239); Virtual Reality (Psychology 240–249); Human Performance (Psychology 250–259); Cognitive Neuroscience (Psychology 260–269); and Sensation and Perception (Psychology 270–289).

Each student is expected to carry out theoretical/empirical research during the first two years. By the end of the second year, each student should have completed a research project of a scope and nature that is potentially publishable in a professional journal. Every student is assigned a faculty advisor, and the advisor is responsible for assisting in the planning and other facets of the project. Students are required to present a talk to the Cognitive Sciences Research Seminar, based on their research project, by the end of the spring quarter of their second full year in the graduate program. (Another forum for the second-year talk may be substituted with the written approval of the Graduate Director.)

By the following fall quarter, students are required to write a paper based on their research project. The paper must be approved by the student's advisor and the Director of Graduate Studies.

At the end of each academic year the faculty of the Department meet to discuss and provide feedback on the progress of each student in the program.

Requirements for the M.A. Degree

NOTE: Although the Department does not have an M.A. program, students may earn an M.A. degree as part of the Ph.D. program.

The student must: (1) complete the required course work as outlined above; (2) present a talk and submit an approved paper, both based on empirical/theoretical research, as described above; and (3) fulfill a computer-programming language requirement by either completing one of the courses offered by the University that is on a list of approved courses maintained by the Graduate Director or by demonstrating proficiency in a programming language as assessed by one faculty member and approved by the Graduate Director.

Requirements for Advancement to Candidacy

The requirements for advancement to candidacy are: (1) the student must meet the requirements listed above for the M.A. degree; (2) the student must, in addition, form a five-member faculty committee selected according to Graduate Studies policy. The committee will examine the student on a paper, the topic of which is determined in consultation with the committee. The paper should demonstrate an understanding of the background and issues for a research topic and sufficient preparation and creativity to undertake planning for a dissertation project (e.g., by describing a possible experimental design or outlining a possible theoretical development); and (3) students are required to advance to candidacy by the end of the fall quarter of their third year in the program.

Requirements for the Ph.D. Degree

The requirements for the Ph.D. degree are: (1) the student must formally present and defend a written dissertation proposal to a committee of at least three members selected according to Graduate Studies requirements. The dissertation proposal presentation may take place as part of the examination for Advancement to Candidacy, in which case, that five-member committee will approve the dissertation proposal; (2) the proposal must be approved prior to the final dissertation defense (usually at least three months before to allow time for the candidate to incorporate suggestions and changes required by the committee); (3) prior to the approval of the final version of the dissertation the student is expected to defend the dissertation in a public colloquium announced with at least one week's notice; and (4) all requirements for the Ph.D. degree must be fulfilled within three years after advancement to candidacy.

The normal time for advancement to candidacy is three years. The normal time for completion of the Ph.D. is six years, and the maximum time permitted is eight years.

Courses in Psychology

LOWER DIVISION

7A Introduction to Psychology (4) F, W, S, Summer. Weekly topics include human development, memory and problem solving, learning theory, perception, biological mechanisms, emotions and motivation, personality theory, social psychology, and behavior disorders. Students have the opportunity to volunteer for participation in several ongoing laboratory experiments. Formerly Psychology 7. No credit for Psychology 7A if taken after 9A-B-C. **(III)**

9A-B-C Psychology Fundamentals (4-4-4) F, W, S. A year-long sequence designed to provide freshman Psychology majors with an in-depth survey of general psychology. Topics include biological bases of behavior, sensation, perception, cognition, development, personality, psychopathology, and social psychology. Prerequisite: freshman Psychology major; consent of instructor. No credit for Psychology 7A if taken after 9A-B-C. **(III)**

10A-B-C Probability and Statistics in Psychology I, II, III (4-4-4). An introduction to probability and statistics. Emphasis on thorough understanding of the probabilistic basis of statistical inference. Examples drawn primarily from psychology. Prerequisite or corequisite for 10A: Psychology 9A. Students who receive credit for Psychology 10A-B-C may not receive credit for Anthropology 10A-B-C, Social Ecology 13, Social Sciences 9A-B-C or 10A-B-C, or Sociology 10A-B-C. **(V)**

11E Social Psychology of Higher Education (4). Focuses on issues and concerns unique to freshmen enrolled at a major research institution. Theoretical framework for understanding the role of higher education in today's society. The field of research and inquiry from a social/psychological perspective. Critical understanding of key issues. Although designed for freshmen, beneficial for all students.

13T Fundamentals, Pragmatics, and Ethics of Psychological Testing (4). Basic principles of psychological testing including test type, selection, structure, procedure, ethics, cultural factors, and interpretation are presented to better equip potential user, consumer, or interpreter of psychological tests in future personal and professional settings. Prerequisite: Psychology 7A. **(III)**

21A Adolescent Psychology (4). Focuses on psychosocial dynamics of today's adolescents in America emphasizing the quest for identity, independence, values, and sexual orientation. The influence of society, family, school, and peers is analyzed. Strategies for helping troubled adolescents are discussed. Prerequisite: Psychology 7A or 9A-B-C. Psychology 21A and Psychology and Social Behavior P114D may not both be taken for credit. **(III)**

21F Psychology and the Family (4). Examines theories, research, implications, and applications of psychology as they relate to the understanding of family structure, process, development, and change. Prerequisite: Psychology 7A or 9A-B-C.

23A Principles of Applied Psychology (4). Introduction to the understanding of human functioning through cognitive and behavioral analysis and application. **(III)**

24A Life-Span Development (4). Combines developmental and clinical psychology concepts to explore major life transition stages and adjustment challenges faced by individuals across the life span. Introductions to personality development and coping adaptively with these changes are covered. Prerequisite: Psychology 7A or 9A-B-C.

46A Introduction to Human Memory (4). Covers the core concepts of modern research and theorizing about human memory, including structural subdivisions (e.g., perceptual memory, short-term memory, long-term memory), different measures of memory (e.g., recall, reorganization), and some practical applications of memory research (e.g., mnemonics). Prerequisite: Psychology 7A or 9A-B-C. Psychology 46A may not be taken for credit after Psychology 140M or Psychology and Social Behavior P192J. **(III)**

56L Acquisition of Language (4). What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year olds. Comparison of kinds of data on which these theories are based. Same as Linguistics 51. **(III)**

76M Language and the Mind (4). The relationship of knowledge of grammar to mental processes and mental representations. How linguistic behavior is rule governed. Same as Linguistics 52.

78A Introduction to Social Psychology (4). Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction. Same as Sociology 31. **(III)**

89 Special Topics in Lower-Division Psychology (4). Prerequisites vary. May be repeated for credit as topic varies.

UPPER DIVISION

H101A-B-C Honors Seminar in Psychology I, II, III (4-4-4). Focuses on the research activities and honors thesis research projects of each student and on the research of various Cognitive Sciences faculty. Students discuss their research interests in the early and later stages of their projects. Research projects and write-ups are required. Restricted to students in the Honors Program in Psychology. H101B: Pass/Not Pass only.

RESEARCH METHODS

H111A Honors Experimental Psychology (4) F. Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections. Corequisite: Psychology H111LA. Prerequisites: Psychology 9A-B-C; either Psychology 10A-B-C or any other 10A-B-C series in the School of Social Sciences, Social Science 100A-B-C, Mathematics 2A-B-C, or Mathematics 2A-B and 7. Open only to students in the Honors Program in Psychology or by consent of instructor. Psychology 111A and 112A may not both be taken for credit.

H111LA Honors Experimental Psychology Laboratory (2) F. Corequisite: Psychology H111A.

H111B Honors Advanced Experimental Psychology (4) W. Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research. Corequisite: Psychology H111LB. Prerequisite: Psychology H111A or Psychology 112A. Open only to students in the Honors Program in Psychology or by consent of instructor.

H111LB Honors Advanced Experimental Psychology Laboratory (2) W. Corequisite: Psychology H111B.

H111C Honors Research in Experimental Psychology (4) S. Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter. Prerequisite: Psychology H111B or 112B. Open only to students in the Honors Program in Psychology or by consent of instructor.

NOTE: Students who wish simply to fulfill the laboratory/research-methods requirement in one quarter should take Psychology 112M or 112P. Students also wishing an opportunity to conduct their own research and fulfill the upper-division writing requirement should take either Psychology 112A-B-C or 112F-G.

112A Experimental Psychology (4) F. Emphasis on design of experiments and analysis of results. Experiments are conducted in laboratory sections. Corequisite: Psychology 112LA. Prerequisites: Psychology 9A-B-C; Psychology 10A-B-C or any other 10A-B-C series in the School of Social Sciences, Social Science 100A-B-C, Mathematics 2A-B-C, or 2A-B and 7. Only one course from Psychology 111A, 112A, and 112F-G may be taken for credit.

112LA Experimental Psychology Laboratory (2) F. Corequisite: Psychology 112A.

112B Advanced Experimental Psychology (4) W. Design and analysis of multivalent, factorial, and correlational studies. Students prepare proposals for independent research. Corequisite: Psychology 112LB. Prerequisite: Psychology 112A, 112LA. Only one course from Psychology 112B and 112F-G may be taken for credit.

112LB Advanced Experimental Psychology Laboratory (2) W. Corequisite: Psychology 112B.

112C Research in Experimental Psychology (4) S. Each student conducts a research project in experimental psychology. The projects are discussed in a seminar format. Written reports on each project are submitted at the end of the quarter. Prerequisite: Psychology 112B, 112LB. Only one course from Psychology 112C and 112F-G may be taken for credit.

112F-G Behavioral Research (4-4) F, W. A two-quarter introduction to the practice of behavioral research: generating research ideas, finding and reading previous research, research methods, quantifying observations, sampling, drawing inferences from data, and writing up results. Students propose and conduct their own research project with approval. Corequisite: Psychology 112LF-LG. Prerequisites for 112F: Psychology 9A-B-C and one of the following series: Psychology 10A-B-C, or any other 10A-B-C sequence in the School of Social Sciences, or Social Science 100A-B-C, or Mathematics 2A, 2B, 7. Prerequisites for 112G: completion of the lower-division writing requirement and a passing grade in 112F. Only one sequence from Psychology 112F-G and 112A-B-C may be taken for credit. Psychology 112F and 112M may not both be taken for credit.

112LF-LG Behavioral Research Laboratory (2-1) F, W. Corequisite: Psychology 112F-G.

112M Research Methods in Psychology (4) F. Research methods in psychology for majors who wish to fulfill this requirement separately from upper-division writing. Covers both experimental and descriptive research methods, analysis of results, and reading the psychological literature. Research experience is provided in laboratory sections. Corequisite: Psychology 112LM. Prerequisites: Psychology 9A-B-C; Psychology 10A-B-C or any other 10A-B-C series in the School of Social Sciences, Social Science 100A-B-C, or Mathematics 2A-B and 7. Psychology 112M and 112F may not both be taken for credit. May not be taken for credit after completion of any other Psychology 112 course.

112LM Research Methods in Psychology Laboratory (2) F. Corequisite: Psychology 112M.

112P Research in Perception and Psychophysics (4). Introduction to design and practice of experiments: students perform auditory, visual, tactile, or other experiments. Emphasis on methodology, finding and reading previous research, generating research ideas, statistical analysis. Students propose and conduct their own final research project with approval. Corequisite: Psychology 112LP. Prerequisites: Psychology 9A-B-C; Psychology 10A-B-C or any other 10A-B-C series in the School of Social Sciences, Social Science 100A-B-C, or Mathematics 2A-B and 7; Psychology 130A.

112LP Research in Perception and Psychophysics Laboratory (2). Corequisite: Psychology 112P.

113T Introduction to Psychological Tests and Measurements (4). Principles of psychological measurement, including elementary psychophysics, psychometrics, test theory, and the measurement of abilities, attitudes, traits, and interests. Reliability and validity of psychological measurements. Prerequisites: Psychology 7A or 9A-B-C; Psychology 10A or any other 10A course in the School of Social Sciences or equivalent.

114A Informal and Formal Reasoning (4). Examines human reasoning, focusing on scientific argument and elementary logic. Involves the translation of informal arguments from everyday language into logic. Specific feedback allows students to pace themselves through this computer-assisted course. Weekly informal classroom discussions.

114C Computers and Psychology (4). Introduction to computer applications in applied and research psychology, including automated psychological assessment, diagnosis, prescription developments, artificial intelligence applications, and "expert systems." Prerequisite: Psychology 112A, 112F, 112M, or 112P.

114I Interactive Computer Graphics (4). An introduction to the background and skills necessary to construct and animate complex virtual reality environments. Prerequisites: acquaintance with elementary linear algebra and an ability to program in C++. Concurrent with Psychology 240A.

114M MATLAB Programming (4). MATLAB is a mathematical software package for solving quantitative problems often encountered in experimental psychology. Topics include rudiments of programming, statistical analysis of data, matrix algebra, signal processing, graphic visualization, and simulated models of cognitive and perceptual processes. Concurrent with Psychology 235M.

114Q Design and Implementation of Auditory Experiments (4). Topics include physics and measurement of sounds, digital signal processing (DSP), recording/processing of speech and music, generating complex sounds (e.g., FM and AM), use of sound level meter and artificial ear (coupler), digital filtering, signal mixing, autocorrelation and cross-correlation. Prerequisite: Psychology 114M or consent of instructor. Concurrent with Psychology 238.

119 Special Topics in Research Methodologies (1 to 4). Prerequisites vary. May be repeated for credit as topic varies.

GENERAL PSYCHOLOGY

120A Abnormal Psychology (4). Introduction to psychopathology and behavioral deviations, and the concepts of theories regarding these conditions. Prerequisite: Psychology 7A or 9C. Psychology 120A and Psychology and Social Behavior P105 may not both be taken for credit.

120D Developmental Psychology (4). A general introduction to the study of the physical, intellectual, social, and emotional development of the child from birth to adulthood. Prerequisites: Psychology 7A or 9A. Psychology 120D and either Psychology and Social Behavior P106 or P113D may not both be taken for credit.

120H History of Psychology (4). A history of the development of various schools and systems of psychological thought. Prerequisites: Psychology 7A or 9A-B-C, or Psychology and Social Behavior P9, or equivalent, or consent of instructor. Same as Psychology and Social Behavior P192A.

120P Personality Theories (4). A survey of the evolution of personality theory during this century. An overview of major perspectives in the field, with special attention to Freud, Jung, and Adler. Prerequisite: Psychology 7A or 9C. Psychology 120P and Psychology and Social Behavior P144C may not both be taken for credit.

121A Creative Learning in Children (4) F, W, S. Seminar, two hours; field work, six hours. Students assist in teaching children at the Farm School, recording and studying their interactions with the children, and developing materials for use in the School. The Farm School is ungraded; the children range in age from five to twelve. Open to students in any major. May be taken for credit three times.

121M Theories of Motivation (4). Factors affecting the behavioral performance of organisms. A survey of theoretical and empirical approaches to the physiological, psychological, and social factors which generate behavior. Prerequisites: Psychology 7A or 9A-B-C. Psychology 121M and Psychology and Social Behavior P191D may not both be taken for credit.

121S Psychology of Sleep and Dreaming (4). Covers the physiology, neurochemistry, and neuroanatomy associated with sleep, contemporary sleep theory, REM and NREM, phenomenology, sleep disorders, examination of differences between conscious and unconscious cognitive function, the history of sleep and dream theories from ancient time to present day.

122C Clinical Psychology (4). Provides overview of the clinical psychology field including theories and techniques used in counseling and testing.

122I Organizational/Industrial Psychology (4). Introduction to applied psychology in organizations, including personnel testing, selection, training and evaluation, job and classification analysis, job satisfaction and motivation, organizational development, leadership, market research and consumer psychology. Potential ethical problems are discussed. Prerequisite: Psychology and Social Behavior P9 or equivalent or consent of instructor. Same as Psychology and Social Behavior P192B.

127A Adult Development (4). Examines why and how we change (with attention to gains as well as losses) from ages 25–65 and the nature and sources of continuity over time. Topics include physical and intellectual functioning, personality, coping strategies, and social roles and relationships. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P116D.

127B Behavior Modification (4). Principles and methods of behavior modification derived from psychological theories of learning. Considers applications of behavior techniques to treat childhood disorders, school problems, juvenile delinquency, marital and sexual problems, alcoholism, and eating disorders. Behavioral interventions in community and industrial settings. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent; Psychology 122C or consent of instructor. Same as Psychology and Social Behavior P149C.

127C Clinical Child Psychology (4). Examines research and theory concerning childhood psychopathology and behavior disorders. Diagnosis and assessment, early identification of high-risk children, fear and phobias, antisocial behavior, childhood psychoses, autism, depression, hyperactivity and attention deficit disorders, ethical and policy implications of identifying children who are different. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P107.

127D Development of Gender Differences (4). Examination of research on how sexes differ in physiology, cognitive functioning, personality, and social behavior. Sex-differentiated development from the prenatal period through adulthood. Explanations for male-female differences are sought, focusing on biological (genetic, hormonal), and social (familial, cultural) mechanisms. Prerequisites: Psychology 9A-B-C, Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P122D.

127E Psychology and Emotion (4). General theories of emotion and research regarding cognitive, behavioral, physiological, and subjective experience of emotion. Specific topics include emotion regulation, emotion and health, emotional intelligence, and emotional development. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P143H.

127G Gerontology (4). Examines stereotypes and myths associated with aging; physiological and psychological changes that accompany old age; distinguishes behavior changes due to aging *per se* from those due to historical and socioeconomic factors; political, social aspects of old age in contemporary society. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P117D.

127H Child Health Psychology (4). Exploration of psychological antecedents, concomitants, and consequences of medical illnesses in children. Children's beliefs about health, illness, and medication; the role of stress; coronary-prone behavior; therapeutic adherence and physician-patient interaction; coping with chronic illness; effects of a child's illness on family. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent; Social Ecology 10 recommended. Same as Psychology and Social Behavior P131H.

127I Infant Development (4). Study of human development from conception through the first two years of life, covering processes and events in the domains of physical, social, and cognitive development. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P115D.

127S Attitudes and Behavior (4). Intended for students interested in theory and research on how attitudes influence, and are influenced by, behavior. Topics include: voting behavior, Fishbein and Ajzen's theories of reasoned action and planned behavior, attitude accessibility, prejudice and discrimination, and cognitive dissonance theory. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P157S.

127T Child Therapies (4). Examines research methodologies, empirical data, and implications of diverse intervention strategies. Primary topics include psychotherapy process and outcome, family therapies, behavioral intervention, cognitive behavior modification, pediatric psychopharmacology, and ethical and social policy implications of intervening in other people's lives. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent; Psychology 122C or consent of instructor; Social Ecology 10 recommended. Same as Psychology and Social Behavior P151C.

128 Trends in Psychology (0). Explores current trends in different fields of psychology. Two units of workload credit. Prerequisite: consent of instructor. Pass/Not Pass only. May be repeated for credit as topics vary.

129 Special Topics in General Psychology (1 to 4). Prerequisites vary. May be repeated for credit as topic varies.

PERCEPTION AND SENSORY PROCESSES

130A Perception and Sensory Processes (4). A general introduction to the scientific study of sensory processes and perceptual phenomena, with special emphasis on the visual system. Prerequisites: Psychology 7A or 9A-B, or Psychology and Social Behavior P9, or equivalent, or consent of instructor. Psychology 130A may not be taken for credit after 131A or 131B. Same as Psychology and Social Behavior P192E.

131A Vision (4). Visual perception and the anatomy and physiology of the visual system. Topics include: the retina and the visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and the development of the visual system. Psychology 130A may not be taken for credit after Psychology 131A. Same as Biological Sciences N182.

131B Hearing (4). Auditory perception, the anatomy and physiology of the auditory system, and the physics of sound. Topics include: neural transduction of sound, sensitivity, sound localization, complex sound perception, and hearing loss. Prerequisites: Psychology 9A-B; upper-division standing or consent of instructor. Psychology 130A may not be taken for credit after 131B.

131C Advanced Perception and Sensory Process (4). A continuation of Psychology 131A and 131B. In-depth study of selected topics, emphasizing the way questions in sensory and perceptual research are formulated and pursued. Prerequisites: Psychology 9A-B; 131A and 131B or consent of instructor.

131D Vision, Visualization, and Computer Graphics (4). More than one-half of the human brain is devoted to processing visual information. This course provides an overview of visual processing, visualization, and computer graphics, and also introduces elementary concepts in linear algebra and in linear systems. Prerequisites: Mathematics 2A, Psychology 9B, Information and Computer Science 21, or similar courses recommended. Formerly Psychology 114P.

133P Advanced Topics in Visual Perception (4). Topics in vision related to ophthalmology and optometry. Course for students considering a career in eye care. Prerequisites: upper-division standing; Psychology 130A or consent of instructor.

134A Human Attention (4). Reviews and discusses methods of research, current data, and current theories in the field of human attention. Prerequisites: Psychology 7A or 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P192F.

134R Visual Attention Research (2). Review and discussion of current research on the role of attention in the perception of visual patterns. Experiments are designed, run, and analyzed. Students have the option of participating as subjects or writing a term paper. Prerequisites: upper-division standing; Psychology 7A or 9A-B-C; consent of instructor.

135D Perceptual Development (4). Human perceptual development is examined from birth through childhood with emphasis on localization, discrimination, and pattern recognition abilities in vision and audition. The role of perceptual development in cognition is evaluated. Prerequisites: Psychology 130A and upper-division standing.

135M The Mind/Body Problem (4). What is consciousness and what is matter and how are the two related? How can brains have minds? This multidisciplinary course draws on information from the fields of computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

139 Special Topics in Perception and Sensory Processes (4). Prerequisites vary. May be repeated for credit as topic varies.

LEARNING AND COGNITION

140C Cognitive Science (4). Introduction to investigations of the structure and function of the mind, from viewpoints of computation, neuroscience, philosophy, and cognitive psychology. Topics include: perception, attention, knowledge representations, learning and memory, action, reasoning, and language. Prerequisite: Psychology 7A or 9B, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P192G.

140L Principles of Learning Theory (4). Investigation of the learning and memory processes of humans and animals. Basic experimental approaches to learning and memory, empirical results, and theoretical interpretations of the evidence are discussed. Prerequisite: Psychology 7A or 9A, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P192I.

140M Human Memory (4). Developments in the area of memory; history of memory research; theories of the nature of memory. Visual memory, recognition memory, high-speed scanning, free recall, short-term memory, mnemonics, retrieval, relationship of memory to thinking. Selected theoretical formulations for memory. Prerequisite: Psychology 7A or 9B or Psychology and Social Behavior P9 or equivalent. Psychology 46A may not be taken for credit after Psychology 140M. Same as Psychology and Social Behavior P192J.

141A Education and Children (4). Students tutor children in an educational setting and reflect on their experiences by documenting events and analyzing them. Pass/Not Pass only. May be taken for credit three times.

141D Cognitive Development (4). An analysis of intellectual development from birth through maturity. Mechanisms of cognitive growth from Piagetian and current information processing theories are examined. Recent research on developmental changes in concept formation, knowledge structures, memory skills, and problem-solving strategies is presented. Prerequisites: Psychology 120D and upper-division standing. Psychology 141D and Psychology and Social Behavior P120D may not both be taken for credit.

142I Psychology of Learning, Abilities, and Intelligence (4). Overview of classic positions on the mind, human abilities, and intelligence, especially as related to academic achievement. Contrasting views: psychometric versus information processing; experimental versus correlational research. Prerequisite: introductory course in psychology, or consent of instructor. Same as Education 176.

143D Choice and Decision Models (4). Introduction to some of the main concepts in the study of individual decision making. The interplay of empirical observation and mathematical theory is emphasized. Prerequisites: elementary mathematical formalism, including sets, relations, functions, and basic concepts of probability.

143H Human Factors (4). The application of knowledge of human characteristics to the design of equipment, facilities, and environments for human use. Research on attention, perception, learning, and decision-making are applied to problems involving aviation, space, highway safety, industrial safety, consumer products, human-computer interaction, and aging. Prerequisite: upper-division standing or consent of instructor.

143P Human Problem Solving (4). Modern developments in the psychology of human problem solving. Topics include: concept identification, arithmetic, sets, logic puzzles, story problems, group problem solving, and theorem proving. Prerequisites: Psychology 7A or 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P192K.

143R Psychology of Reading (4). Surveys the major components of skilled reading and the determinants of successful reading acquisition. Examination of contemporary models of skilled reading. Focuses on models of the development of reading. Research on the causes of developmental dyslexia. Prerequisite: Psychology 7A or 9A-B-C; Psychology 140C or Linguistics 150A; satisfactory completion of the lower-division writing requirement.

144A-B-C HABLA: Language Intervention for Disadvantaged Children (4-4-4). Trains students (fall quarter) to deliver home visits (winter and spring) that promote school readiness among two–four year-olds from low SES and educational backgrounds. Covers fundamentals of child language, literacy, cognitive development; procedures, ethics of home visitation. Work with parents and children to create better home literacy and language environment. Prerequisites: must pass an interview by instructor, be fluent in English and one other language (Spanish most typically), must have experience with preschool children and be culturally sensitive. Same as Chicano/Latino Studies 191A-B-C and Social Science 186A-B-C.

145P-Q-R Attention and Learning Deficits in Children I, II, III (4-4-4). Learning in normal and attention-deficit disordered children. Covers the normal developmental course of learning and a variety of deficits. Includes field work with attention-deficit disordered children. Prerequisite: consent of instructor.

146M Writing About Memory (4). Covers a broad range of texts, literary, philosophical, and scientific, each probing the nature of memory and its meaning in human life. Readings are drawn from across many disciplines and many perspectives. Prerequisites: Psychology 7A or 9B or equivalent; satisfactory completion of the lower-division writing requirement.

147C Cognitive Behavior Therapy (4). Presentation of principles and procedures of therapeutic interventions based on cognitive-behavior methods. Cognitive factors in learning, emotional arousal, psychological disorder, and psychotherapy reviewed. Introduces the application of cognitive behavioral methods to problems of depression, anxiety, anger, pain, and impulsivity. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P150C.

149 Special Topics in Cognition and Learning (4). Prerequisites vary. May be repeated for credit as topics vary.

SEMIOTICS AND LANGUAGE

156A Psychology of Language (4). Examines modern research in psycholinguistics. Focuses on theoretical issues and empirical findings in brain-language research, speech perception, speech production, sentence processing, lexical access, language acquisition, and reading development. Same as Linguistics 150.

159 Special Topics in Semiotics and Language (1 to 4). Prerequisites vary. May be repeated for credit as topics vary.

COGNITIVE NEUROSCIENCE

160A-B-C Cognitive Neuroscience I, II, III (4-4-4). Explores the neural basis of human perceptual, motor, and cognitive abilities. **160A:** Introduction to cognitive neuroscience, functional brain imaging, neuropsychological disorders, and the neural basis of higher cognitive functions such as memory, language, and attention. **160B:** Neuroanatomy/physiology, neuroscience methods, neural basis of perception. **160C:** Motor control, plasticity, development and aging, psychopathology. Prerequisites: Psychology 9A-B or Biological Sciences 35, or consent of instructor, or Psychology and Social Behavior P9 or equivalent. Same as Psychology and Social Behavior P192L-M-N. Concurrent with Psychology 260A-B.

161 Language and the Brain (4). Analysis of current research on the biological bases of human linguistic capacity. Development, focusing on hemispheric specialization and plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation. Prerequisite: Biological Sciences 35 or N110, or consent of instructor. Same as Linguistics 158 and Biological Sciences N160. Formerly Psychology 156B.

162A Neurobiology of Learning and Memory (4). How the brain and behavior change as a result of experience, with an emphasis on identifying the neurochemical processes through which memory is stored and the parts of the brain that are involved. Prerequisite: Biological Sciences 35 or N110. Same as Biological Sciences N158. Formerly Psychology 145B.

162B Human Memory Disorders (4). Focuses on models and methods of assessing human memory and its disorders. Exposure to conventional and new assessment devices provided. Prerequisite: Psychology 46A or consent of instructor. Formerly Psychology 146D.

163A Genetics of Sensory and Cognitive Processes (4). Introduction to genetic bases of sensory and cognitive functions. Mutations affecting vision, hearing, learning, and memory in animal model systems. General and specific cognitive abilities and failures in humans. Environmental effects on gene regulation, origin of new functions, and quantitative genetics. Prerequisites: Psychology 9A-B-C or consent of instructor. Formerly Psychology 167.

169 Special Topics in Cognitive Neuroscience (4). Prerequisites vary. May be repeated for credit as topics vary.

INTERDISCIPLINARY STUDIES

173A Psychological Anthropology (4). Cultural differences and similarities in personality and behavior. Child-rearing practices and consequent adult personality characteristics; biocultural aspects of child development and attachment; evolutionary models of culture and behavior; politically linked personality; cognitive anthropology; psychology of narrative forms; comparative national character studies. Prerequisite: Psychology 7A or 9A-B-C, or Anthropology 2A. Same as Anthropology 132A.

174A Asian American Psychology (4). Examines the social and psychological concerns of Asian Americans, e.g., coping with racial prejudice, maintaining bicultural identities, dealing with cross-cultural conflicts in interracial relationships, and trying to reconcile generational differences between immigrant parents and their American-born children. Same as Asian American Studies 141. **(VII-A)**

174B Social Psychology of African American Families (4). Social psychological analysis of African American families from an Afro-centric perspective with examination of historical and contemporary factors which affect their structure and functioning and the psychosocial development of family members. Issues and challenges in the twenty-first century. **(VII-A)**

174C Adolescent Psychology in Urban American Society (4). Psychosocial dynamics of adolescents in American society; their ongoing quest for identity, independence, values, moral and cognitive development, peer group relationships, sexuality and sex role preference. Analysis of power struggle between adolescent subcultures and institutions of dominant society.

174D Adolescent Psychological Disorders (4). Examines how predictable internal and external adolescent conflicts involving self, family, society become intensified until a breakdown in coping pattern occurs. Specific syndromes indicative of increased adolescent stress as well as major psychological, social, and psychiatric treatment approaches are discussed. Prerequisites: senior standing; Psychology or Social Ecology majors only; one previous course in adolescent psychology.

174E Psychology of the African American (4). Historical overview of the development of Black psychology and the African American frame of reference. Topics include personality development, psychological assessment, issues in education, Black mental health, and the role of the African American psychologist in the community. **(VII-A)**

174F Chicano/Latino Psychology (4). Examines research and literature investigating Chicano/Latino ethnicity as a variable influencing behavior. Explores mental health needs and issues of Chicano/Latinos and discusses competent, sensitive methods of mental health service delivery. Prerequisite: Psychology 7A or 9A-B-C. Same as Chicano/Latino Studies 171. **(VII-A)**

174G Psychology of Ethnic Children and Adolescents (4). Reviews specific psychological issues and challenges experienced by African American, Asian American, Mexican/Latino American, and Native American children and adolescents. Broaden understanding of how cultural factors influence human behavior and increase cultural/ethnic awareness as it relates to assessment and psychotherapy. **(VII-A)**

176A Political Psychology (4). Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses such topics as the formation of political attitudes, the process of political decision-making, and the nature of political leadership. Same as Political Science 128A.

177D Deviance (4). Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior. Same as Sociology 156 and Criminology, Law and Society C107. Previously Psychology 178D.

177F Forensic Psychology (4). Presents theoretical and empirical basis for a psychological perspective of criminal behavior, particularly violent behavior. Examines violence, sexual offending, and mental disorder related to crime with regard to clinical assessment, treatment, and rehabilitation; mental health services within forensic institutions. Prerequisites: Psychology and Social Behavior P9 or equivalent, Psychology and Social Behavior P105, P175P or Criminology, Law and Society C149, or consent of instructor. Same as Criminology, Law and Society C136 and Psychology and Social Behavior P145C.

177I Impacts of Divorce (4). Examines divorce in historical, economic, and, primarily, psychological contexts, emphasizing recent research pertaining to the impacts of divorce on children, families, and society. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent. Same as Psychology and Social Behavior P171P.

177P Developmental Psychopathology (4). Research and theory of origins, course, and outcomes of disordered behavior. Continuity and change in patterns of behavior; environmental challenges and buffers; stress and competence in children; vulnerable and invincible children; children of mentally ill parents; families at risk; childhood antecedents of adult disorders. Prerequisites: Psychology 9A-B-C, or Psychology and Social Behavior P9, or equivalent; Psychology 120A or consent of instructor; Social Ecology 10 recommended. Same as Psychology and Social Behavior P152C.

178N Social Psychology of Networks (4). Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network study of cognitive social structure, exchange and communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues. Same as Sociology 135.

179 Special Topics in Interdisciplinary Studies (1 to 4). Prerequisites vary. May be repeated for credit as topic varies.

190 Senior Thesis (4-4-4). In progress grading. Prerequisite: consent of instructor.

197A-Z Field Study (4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

198A-Z Directed Group Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

199 Independent Study (1 to 4). Prerequisite: consent of instructor. Students may enroll in only one 199 per quarter. May be repeated for credit as topic varies.

GRADUATE

201A-B-C Cognitive Sciences Research Seminar (1.3-1.3-1.4) F, W, S. Weekly reports and colloquia by faculty, students, and visitors. Prerequisite: admission to graduate program in Cognitive Sciences or consent of instructor.

202A-B-C Proseminar in the Cognitive Sciences (4-4-4) F, W, S. Year-long intensive introduction to the conceptual foundations and basic research results in the cognitive sciences for first-year graduate students. Prerequisite: graduate standing or consent of instructor.

203A Discrete Mathematics and Probability (4). Logic and set theory are covered during the first three weeks, using an interactive computer system. The remaining seven weeks are devoted to probability theory and cover elementary concepts from samples spaces to Chebychev's Inequality and the moment generating function. Prerequisite: graduate standing.

203B Introduction to Mathematical Statistics (4). An introduction to statistical estimation and statistical inference. Topics include sufficiency and the Rao-Blackwell Theorem, completeness and the Lehmann-Scheffe Theorem. The method of maximum likelihood is explored in some detail. Inference in linear models covers regression and analysis of variance.

203C Experimental Design (4). Discussion of the logic of experimental design and inferential statistics. Presentation of mathematical ideas from behind analyses of variance and covariance, analysis of counted data; main emphasis on research applications rather than mathematical formulations. Prerequisite: graduate standing or consent of instructor.

204A, B, C Professional and Laboratory Skills (2.7, 2.7, 2.6) Using a variety of formats, this course allows students to develop and practice their professional skills and introduces students to equipment and technical procedures used for a variety of research. Satisfactory/Unsatisfactory only. Prerequisite: graduate standing in Psychology or consent of instructor. May be repeated for credit.

213 The Mind/Body Problem (4). Course is multidisciplinary, drawing on information from the fields of quantum physics, computer vision, artificial intelligence, cognition, neurophysiology, philosophy, and psychophysics.

229 Special Topics in Human Cognition (1.3 to 4). Current research in brain/ behavior relationships, human memory, and learning theory is presented. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

233A-B-C Observer Theory I, II, III (4-4-4). Provides framework for mathematical analysis of perception/cognition and its relation to the physical world. Permits a unified treatment of perceptual and physical interactions and lays the foundation for a nondualistic, nonreductionistic science. Mathematical aspects include a study of Markovian dynamic systems. Prerequisite: graduate standing or consent of instructor.

234A-B Mathematical Models of Cognitive Processes I, II (4-4). Mathematical models of various cognitive processes developed since 1960, including learning, memory, perception, psycholinguistics, and problem solving. Models are formulated in different mathematical languages: calculus, algebra, logic, probability, and computer. Difficulties in testing and validating models discussed. Prerequisite: graduate standing or consent of instructor.

235M MATLAB Programming (4). MATLAB is a mathematical software package for solving quantitative problems often encountered in experimental psychology. Topics include rudiments of programming, statistical analysis of data, matrix algebra, signal processing, graphic visualization, and simulated models of cognitive and perceptual processes. Concurrent with Psychology 114M.

236 Multivariate Time Series Analysis (4). Introduces multivariate time series analysis theory and methods emphasizing computational methods in spectral analysis, autoregressive modeling, information theory, principal and independent components analysis, and nonlinear dynamics. Applications to human neuroimaging data are extensively discussed. Prerequisite: Psychology 235M or equivalent.

236F Advanced Statistical Methods in fMRI Analysis (4). Introduces advanced statistical methods used in inferencing and exploratory fMRI analysis. Topics include hierarchical general linear modeling, parameter estimation variance components, design optimization, parametic designs, factor methods such as principle components, independent components, and path analysis. Prerequisite: Psychology 235M or 265C.

237A-B Cognitive Modeling I, II (4-4). Covers a range of computational models in psychology (e.g., connectionist, dynamic systems, symbolic, artificial life) using practical modeling exercises, class presentations, and individual modeling projects. Promising projects are expected to lead to conference presentations. Prerequisite: previous knowledge of cognitive modeling not necessary. Some skill in computer programming desirable, but not required. Any programming language (e.g., Matlab, C/C++, Mathematica) may be used; even a spreadsheet program such as Excel could potentially be used.

238 Auditory Signal Processing and Experimental Design (4). Topics include physics and measurement of sounds, digital signal processing (DSP), recording/processing of speech and music, generating complex sounds (e.g., FM and AM), use of sound level meter and artificial ear (coupler), digital filtering, signal mixing, autocorrelation and cross-correlation. Prerequisite: Psychology 235M or consent of instructor. Concurrent with Psychology 114Q.

239 Special Topics in Methodology and Models (1.3 to 4). Current research in cognitive sciences methodologies, concepts, and models is presented. May be repeated for credit as topics vary. Formerly Psychology 249.

240A Interactive Computer Graphics (4). An introduction to the background and skills necessary to construct and animate complex virtual reality environments. Prerequisites: acquaintance with elementary linear algebra and an ability to program in C++. Concurrent with Psychology 114I.

240C Virtual Reality: Research Applications (4). An in-depth examination of the application of virtual reality techniques in a variety of research areas. Students implement a large-scale virtual reality project. Prerequisite: Psychology 240B.

249 Special Topics in Virtual Reality (1.3 to 4). Current research in virtual reality techniques, principles, and concepts. May be repeated for credit as topics vary. Prerequisite: graduate standing or consent of instructor.

251 Human Factors (4). An introduction to the field of human factors for graduate students in cognitive sciences and related fields. Focuses on relationships between basic research in cognitive psychology and the study of human performance in a variety of environments. Prerequisite: graduate standing or consent of instructor.

254 Human Information Processing (4). Detailed introduction to speed-accuracy tradeoff experimental procedures; speed-accuracy tradeoff issues; quantitative modeling of temporal aspects of human information processing. Prerequisite: graduate standing or Honors Program in Psychology undergraduate with consent of instructor.

259 Special Topics in Human Performance (1.3 to 4). Current research in the human issue involved with sensation, perception, and cognition. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary. Formerly Psychology 269.

260A-B Cognitive Neuroscience I, II (4-4). Explores the neural basis of human perceptual, motor, and cognitive abilities. **260A:** Introduction to cognitive neuroscience, functional brain imaging, neuropsychological disorders, and the neural basis of higher cognitive functions such as memory, language, and attention. **260B:** Neuroanatomy/physiology, neuroscience methods, neural basis of perception. Concurrent with Psychology 160A-B.

265A-B-C Introduction to Functional MRI (4). Describes the fundamentals of imaging the human brain function using Magnetic Resonance Imaging (MRI). **265A:** Basic physics and data acquisition. **265B:** Experimental design and analysis. **265C:** Acquisition and analysis laboratory.

266 Genetic Bases of Sensory and Cognitive Processes (4). Explores genetic bases of sensory and cognitive functions. Mutations affecting vision, hearing, learning, and memory in animal model systems. General and specific cognitive abilities and failures in humans. Environmental effects on gene regulation, origin of new functions, and quantitative genetics. Prerequisite: graduate standing or consent of instructor.

269 Special Topics in Cognitive Neuroscience (1.3 to 4). Current research in cognitive neuroscience. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

271A, B, C Perception Seminar (1.3, 1.3, 1.4). Participants, who include faculty interested in auditory and visual perception/psychophysics, along with interested graduate students, make research presentations and discuss current publications. The seminar also serves as a forum for presentations by visiting researchers. Satisfactory/Unsatisfactory only.

274 Physiological Bases of Visual Perception (4). Covers visual perception and the anatomy of physiology of the visual system. Topics include: the retina and visual pathway; visual sensitivity; color vision; spatial vision; motion perception; and development of the visual system. Prerequisites: graduate standing, consent of instructor.

275 Spatial Hearing (4). Explores models of space perception, auditory virtual reality and image externalization, depth perception, motion perception, auditory object formation, spatiotemporal processing, binaural cross-correlation, and recent technological advances. Prerequisite: graduate standing or consent of instructor.

289 Special Topics in Sensation and Perception (1.3 to 4). Current research in the reception and processing of visual and auditory stimuli presented. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

290 Dissertation Research (4 to 12). Prerequisites: consent of instructor, graduate standing, psychology major only. May be repeated for credit.

299 Individual Study (4 to 12). Prerequisites: consent of instructor, graduate standing. May be repeated for credit.

DEPARTMENT OF ECONOMICS

3223 Social Science Plaza B; (949) 824-5788

Economics is concerned with the way individuals or societies allocate scarce resources and distribute goods and services. Any situation requiring choice among competing alternatives can be viewed as an economic problem. Economics courses enable students to study the way individuals make these choices (microeconomics), the way governments make these choices (public choice), and the aggregate consequences of these choices (macroeconomics). In addition, the economics curriculum addresses international trade, money and banking, and economic development of the less developed nations.

The Department of Economics is composed of faculty with interests in a broad range of areas within micro- and macroeconomics, and the evaluation of public policy. It is especially strong in econometrics (both Bayesian and Classical), public choice, and empirical microeconomics including transportation, energy, industrial organization, labor, and urban development. Members of the Department maintain close ties with members of the Department of Political Science and The Paul Merage School of Business.

Undergraduate Program

In anticipation that the number of students who want to major in Economics will exceed the number of positions available, students applying for admission for fall 2006 should be sure to file their application before November 30, 2005.

In the event the major in Economics receives more qualified applicants than can be accommodated, applicants may be subject to screening beyond minimum University of California admissions requirements. Freshman applicants not selected for Economics at the time of admission will be encouraged to opt for the Undeclared major within the School of Social Sciences or for any other open major for which they qualify. However, lower-division courses prerequisite to upper-division major study are available to all students.

Change of Major. Information about change-of-major requirements, procedures, and policies is available in the School of Social Sciences Undergraduate Counseling Office and at http://www.due.uci.edu/Change_of_Major.html.

Transfer-Student Applicants: For transfer-student admission, preference will be given to junior-level applicants with the highest grades overall and who satisfactorily complete course prerequisites. All applicants must complete the following required courses: one year of microeconomics and macroeconomics with a minimum average grade of B, and one semester or two quarter courses of approved calculus with a minimum average grade of B.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 430.

Departmental Requirements for the Major

School requirements must be met and must include 16 courses (64 units) as specified below:

A. Economics 20A-B-C, or equivalent.

B. Economics 110A-B-C, or Statistics 120A-B-C, or equivalent.

C. Mathematics 2A-B and 4, or equivalent courses.

D. Economics 100A-B-C.

E. Four additional four-unit upper-division Economics courses, including a set of courses that involves the production of a significant research paper.

Honors Program in Economics

The Honors Program in Economics provides outstanding students an in-depth study of economic theory and an opportunity to work more closely with faculty members in smaller honors-designated courses. Students complete an honors thesis devoted to the collection and rigorous analysis of data, demonstrating their achievement of an advanced level of research and analytical skills. The program is open to selected students who are majoring in Economics, and admission is based on a formal application that is normally submitted in the spring quarter after students have completed three quarters of calculus, one course in linear algebra, and Economics 20A-B. Applicants should have an overall grade point average of at least 3.2 and a grade point average of at least 3.5 in Economics courses. In the first year of the program, students enroll in Honors Intermediate Economics I, II, III (Economics H100A-B-C), Statistics 120A-B-C (if not taken earlier), and, in the second year, Econometrics I, II, III (Economics 123A-B-C). The honors thesis is usually completed while taking Economics 123C. Upon successful completion of an approved thesis, students graduate with Honors in Economics and their transcript notes that they have completed the Honors Program in Economics. Successful completion of the thesis also satisfies the upper-division writing requirement.

To graduate with Honors in Economics, School requirements must be met and must include 20 courses (80 units) as specified below:

A. Economics 20A-B-C.

B. Mathematics 2A-B and 4 must be completed prior to taking Economics H100A.

C. Mathematics 6C or an equivalent course.

D. Statistics 120A-B-C or equivalent.

E. Economics H100A-B-C.

F. Economics 123A-B-C.

G. An honors thesis.

H. A minimum of four additional upper-division Economics courses, with a grade point average of at least 3.2.

I. Achievement of a grade point average of at least 3.2 in all upper-division Economics courses taken to fulfill requirements.

Sample Program — Economics Majors

GENERAL	HONORS
Freshman	
Economics 20A-B-C 2 Lower-div. writing courses Mathematics 2A-B, 4 2 Soc. Sci. intro. courses 2 Breadth	
Sophomore	
Economics 100A-B-C Economics 110A-B-C Soc. Sci. computer requirement 5 Breadth	Economics H100A-B-C Statistics 120A-B-C Soc. Sci. computer requirement Mathematics 6C 4 Breadth
Junior	
Economics 121A-B-C 2 Upper-div. Economics courses 2 Breadth Electives	Economics 123A-B-C 2 Upper-div. Economics courses 3 Breadth Electives
Senior	
3 Upper-div. Economics courses Electives	3 Upper-div. Economics courses Electives

Sample Program — Transfer Economics Majors

This program is based on successful completion and certification of the Intersegmental General Education Transfer Curriculum (IGETC).

Junior	Senior
Economics 100A-B-C Economics 110A-B-C 2 Upper-div. Soc. Sci. courses 1 Lower- or upper-div. Soc. Sci. course Soc. Sci. computer requirement Electives	4 Upper-div. Economics courses Electives

Graduate Program

Participating Faculty

Marigee Bacolod: Labor economics, economics of education, applied econometrics
Duran Bell: Models of social processes
Volodymyr Bilotkach: Industrial organization, regulation, and transportation economics
Dan Bogart: Macroeconomics, economic development
William A. Branch: Macroeconomics
David Brownstone: Econometrics and applied microeconomics
Jan K. Brueckner: Urban economics, public economics, industrial organization, and housing finance
Linda R. Cohen: Political economy, economics of science and innovation, law and economics
Michelle R. Garfinkel: Macroeconomics and political economy
Amihai Glazer: Political economy
Jun Ishii: Industrial organizations, regulated industries, applied econometrics
Ivan Jeliazkov: Econometrics, applied econometrics
Sheen T. Kassouf: The theory of stochastic speculative pricing
Igor Kopylov: Microeconomics, decision theory, game theory
Charles A. Lave: Transportation economics
R. Duncan Luce: Mathematical behavioral science; measurement theory, utility theory, response times
Julius Margolis: Political economy of national defense and government behavior
Michael McBride: Microeconomics, game theory, political economy
Martin C. McGuire: Public finance, international trade, economics of peace and security
Dale Poirier: Theoretical and empirical econometrics, Bayesian econometrics
Priya Ranjan: International economics, macroeconomics
Gary Richardson: Economic history, immigration, institutions, and economic development

Donald G. Saari: Social choice, voting theory, economic theory and mathematical economics
Sarah Senesky: Labor economics, applied microeconomics, econometrics
Stergios Skaperdas: Economic theory, political economy
Kenneth A. Small: Urban economics, transportation economics, discrete-choice econometrics
Justin L. Tobias: Econometrics, Bayesian econometrics, economics of education
Kurt Van Dender: Transportation economics
Christian Werner: Mathematical geography

Affiliated Faculty

Dennis J. Aigner: Statistical and econometric methodology, efficiency estimation
Marlon G. Boarnet: Urban economics, urban planning, urban economic development
Thomas C. Buchmueller: Economics of health care
Michael L. Burton: Economic anthropology, cognitive anthropology; kinship, gender, and households
Frank Cancian: Economic anthropology, comparative social inequality
Christopher S. Carpenter: Health economics and labor economics
Paul J. Feldstein: Health economics
Bernard Grofman: Mathematical models of decision making, electoral rules and reappointment
Mireille Jacobson: Health economics
Phillipe Jorion: International finance
Marek Kaminski: Public and social choice and political economy
Richard McKenzie: Public choice
Jean-Daniel Saphores: Environmental and natural resource economics and policy
Brian Skyrms: Game theory and decision making
Carole J. Uhlaner: Comparative political participation, formal models of political behavior

The Department of Economics offers a Ph.D. degree program in Economics. Drawing upon the School's strong quantitative tradition, it specializes in public choice, transportation economics, urban economics, econometrics, and applied microeconomics. Admission is highly selective and is limited to students whose interests mesh closely with those of the faculty. By requiring a high degree of overlap between faculty and student research interests, the program offers extensive faculty contact within a tutorial framework. Motivated and well-qualified students find the graduate program highly attractive because of its small size and its great flexibility. Self-discipline and an inquiring mind are prerequisites.

ADMISSION

The deadline for application for admission is January 15 for fall quarter. Students are admitted for winter or spring quarters only under exceptional circumstances. Late applications are considered on a space-available basis. All applicants must take the Graduate Record Exam (GRE) prior to the application deadline. Foreign applicants must also submit Test of English as a Foreign Language (TOEFL) scores. To be considered for any financial aid (including a teaching assistantship), students who are not citizens of countries where English is either the primary or dominant language as approved by the UCI Graduate Council must submit a passing score from the Test of Spoken English (TSE); for teaching assistantship consideration, such students must pass the TSE or the UCI SPEAK examination by the time they advance to candidacy.

REQUIREMENTS

All students must show competence in the core areas of microeconomics, macroeconomics, and econometrics. This is done by taking the three-quarter required course sequences in microeconomics and macroeconomics, and the four-quarter required course sequence in econometrics. All of these required courses must be passed with a grade of B or better. Students also must master two fields of applied economics by taking a two-course sequence (possibly including independent reading courses) and writing a research paper in each field. Students also must enroll for at least four quarters in the graduate colloquium, in which attendance at regular Economics faculty research colloquia is supplemented by discussion of the papers presented and additional reading. Students are encouraged to become conversant with areas of current economic research early in their graduate careers, in order to facilitate a timely transition from meeting course and field requirements to thinking through a dissertation research plan. After meeting the above requirements, the student will be advanced to candidacy upon completion of an oral examination on a written dissertation proposal. Students are expected to advance to candidacy by the end of their third year, and are expected to complete their dissertation by the end of their fifth year. The maximum time permitted for completion of the Ph.D. is six years.

Concentration in Transportation Economics

Students can also pursue a Ph.D. in Economics with a concentration in Transportation Economics. This option draws upon the transportation researchers on the campus within the School of Social Sciences, The Henry Samueli School of Engineering, The Paul Merage School of Business, and the School of Social Ecology. Students benefit from association with the Institute of Transportation Studies, which facilitates student research by providing research assistantships and interdisciplinary seminars on all modes of transportation.

Requirements for the concentration are the same as those described above with the following three exceptions: (1) instead of the third quarter of microeconomics and macroeconomics, students may substitute specified courses such as Discrete Choice Econometrics (Economics 223A), Advanced Travel Demand Analysis (Engineering CE220A), or Operations Research for Management (Management 201B); (2) one of the student's two required fields of competence must be transportation economics; the other must be a related field such as urban economics, labor economics, industrial organization, or a transportation-related field from outside economics (such as travel demand and flow theory, urban and transportation policy analysis, environmental impacts of transportation, or urban and transportation planning) subject to the approval of the Director of Graduate Studies for Economics; and (3) students must take at least one additional course from a list of designated courses in transportation and related subject areas.

Concentration in Public Choice

Students can also pursue a Ph.D. degree in Economics with a concentration in Public Choice. This is an interdisciplinary field, at the intersection of Economics and Political Science, which draws on quantitative tools to model the functioning of political institutions. Faculty from the Departments of Economics, Political Science, and Logic and Philosophy of Science and from The Paul Merage School of Business are involved in research that supports the concentration.

Students who elect this concentration are admitted under the normal procedures for the program in Economics and must fulfill all the requirements for the Economics degree with the following modifications: (1) one of the student's two required fields of competence must be public choice; included is a three-quarter core course in public choice, Economics 270A-B-C, which is jointly organized by faculty in the Departments of Economics and Political Science. (A background in economic theory equivalent to Economics H100A-B-C, Honors Intermediate Economic Theory, is a prerequisite to this sequence.) The requirement for competence in a second field may be met with a one-quarter course, instead of two, if it provides sufficient fluency in the field; and (2) students must obtain a background knowledge in political science equivalent to that provided by a one-year undergraduate survey course, if they do not already have it.

RESEARCH FACILITIES

UCI is a major research university with an excellent library, as well as special interlibrary loan arrangements with other University of California libraries. The School of Social Sciences provides a computer laboratory. The Economics Department has a small library with current journals and unpublished working papers from other universities. Students also have access to advanced computing resources as well as PC and UNIX laboratories. Three Organized Research Units, the Institute of Transportation Studies, the Center for Research on Information Technology and Organizations, and the Institute for Mathematical Behavioral Sciences, provide research opportunities for graduate students.

Courses in Economics

NOTE: Students are reminded that each quarter of a sequential course (i.e., Economics 100A-B-C) must be taken in order. Priority for admission to upper-division Economics courses is given to Economics majors and International Studies majors.

LOWER-DIVISION

1 Introduction to Economics (4) F, W, S. An analysis of the problems society faces in organizing itself to provide goods and services. How decisions of government, business, and the individual relate to current economic problems such as unemployment, inflation, poverty, and environmental pollution. Open only to non-Economics majors. Credit will not be given for Economics 1 if taken concurrently or after Economics 20A-B-C. **(III)**

13 Global Economy (4) S. Acquaints students with the fundamental patterns of the global economy. Emphasizes the historical roots and political implications of economic choices. Same as International Studies 13. **(VII-B)**

20A-B Basic Economics I, II (4-4) F, W. The fundamentals of economics: microeconomics and macroeconomics. The behavior of firms and of consumers: markets, supply/demand, utility maximization, resource allocation, and efficiency. Government behavior: monetary and fiscal policy, inflation, and unemployment. **(III)**

20C Basic Economics III (4) S. Same description as Economics 20A-B. **(III)**

UPPER-DIVISION

100–119: GENERAL ECONOMICS

100A-B-C Intermediate Economics I, II, III (4-4-4) F, W, S. Determinants of supply and demand; operation of competitive and monopolistic markets; imperfections of the market system, explanations of unemployment, inflation, recessions; public policy for macroeconomic problems. Prerequisites: Economics 20A-B-C and Mathematics 2A-B and completion of or concurrent enrollment in Mathematics 4. For 100B: Economics 100A. For 100C: Economics 100B.

H100A-B-C Honors Intermediate Economics I, II, III (4-4-4) F, W, S. An advanced and mathematical version of Economics 100A-B-C for students in the Honors Program. Prerequisites: Economics 20A-B-C and Mathematics 2A-B and 4.

101A-B Advanced Macro- or Microeconomics (4-4). 101A: Consumption and investment theories. Theories of money demand and supply. **101B:** A presentation of the theory of production and distribution, relying heavily upon formal mathematical models. Prerequisites: Economics 100A-B-C and Mathematics 2A-B and 4.

102A The Economics of Accounting Principles (4). Introduction to accounting concepts and principles, including the accounting model and accounting cycle, transaction analysis, and the preparation of financial statements. An analysis of the similarities and differences between accounting and economic concepts (e.g., value, profits). Prerequisites: Economics 20A-B-C.

104A History of Economic Thought (4). Discussion of the principal schools of economic thought. Emphasis on ideas expressed by Smith, Malthus, Ricardo, Marx, Jevons, J.B. Clark, Bohm-Bawerk, Wicksell, Marshall, and Keynes. Assignments include readings (in English) of important selections from the original works. Prerequisite: Economics 20A-B-C.

109 Special Topics in Economic Theory (4). Prerequisites vary. May be repeated for credit as topic varies.

110A-B-C Probability and Statistics in Economics I, II, III (4-4-4) F, W, S. An introduction to probability statistics and econometrics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Examples from economics. Prerequisites: Mathematics 2A-B and 4.

120–124: QUANTITATIVE METHODS

121A-B Data Analysis I, II (4-4). Practical applications-oriented course on multiple regression. How to discover and explore general socioeconomic models in data. Prerequisites: Economics 110A-B-C or equivalent.

121C Data Analysis–Writing (4). Advanced regression analysis. Covers practical techniques for solving model-building problems. Strong emphasis on learning clear, effective writing. Prerequisite: Economics 121B or 123B.

123A-B-C Econometrics I, II, III (4-4-4) F, W, S. 123A-B: Specification, estimation, and testing of econometric models. Applications in various areas of microeconomics and macroeconomics. **123C:** Seminar course in which students do an original econometric research project. Prerequisites: Mathematics 2A-B and 4 or equivalent; Statistics 120A-B-C and Economics 100A-B-C. For 123C: satisfactory completion of the lower-division writing requirement.

124A Time Series Analysis (4). Introduction to the basic techniques of time series analysis. Univariate time series models and forecasting. Multivariate models. Transfer function models. Relations between time series models and econometric models. Prerequisite: Economics 123A.

129 Special Topics in Quantitative Methods (4). Prerequisites vary. May be repeated for credit as topic varies.

130–139: FINANCIAL ECONOMICS

The Economics of Risk and Uncertainty (4). The theory of insurance and joint-ownership of risky enterprises; optimal procedures for the allocation of uncertain payoffs. Prerequisites: Economics 100A-B; prior or concurrent enrollment in Economics 110A-B-C or equivalent.

132A Portfolio Selection and Capital Market Theory (4). Optimal design of portfolios based upon mean-variance characteristics. An examination of the efficiency of present-day capital markets. Prerequisites: Economics 10A-B and 30, or equivalent courses; Economics 100A-B-C.

134A Corporate Finance (4). Provides an overview of the modern theory and practice of corporate finance and focuses on two fundamental financial decisions; investment as well as financing. Prerequisite: Economics 100A-B-C.

135 Mathematics of Finance (4). Introduces the mathematics of finance with an emphasis on financial derivatives. After a review of certain tools from probability, statistics, and elementary differential and partial differential equations, concepts such as hedging, arbitrage, Puts, Calls, and the design of portfolios are discussed. Prerequisites: Mathematics 2A-B-J. Same as Mathematics 176.

139 Special Topics in Financial Economics (4). Prerequisites vary. May be repeated for credit as topic varies.

140–149: ECONOMICS OF PUBLIC AND PRIVATE ORGANIZATIONS

141A-B-C Economic Analysis of Government Behavior I, II, III (4-4-4). The study of government using the tools of economics. **141A:** The influence of voters' preference on governmental policy; Arrow's impossibility theory; the Downsian theory of voting. **141B:** The effects of various taxation and expenditure policies, such as social security. **141C:** Research course in which students write a paper testing one of the theories covered in the first two quarters of the sequence. Prerequisite: Economics 100A-B. Same as Political Science 127A-B-C. Economics 141B also same as Environmental Analysis and Design E158U.

142A-B-C Industrial Organization I, II, III (4-4-4) F, W, S. 142A: The theory of market structure. Imperfect markets, government policies, and industry performance. **142B:** Regulation and antitrust theory and performance in industries. **142C:** Research in industrial organization. Prerequisites: Economics 100A-B; prior or concurrent enrollment in Economics 110A-B-C or equivalent. For 142C: satisfactory completion of the lower-division writing requirement.

144A-B-C Urban Economics I, II, III (4-4-4). 144A: Focus on spatial impact of economic process within urban areas. **144B:** Emphasizes economic theory and the assessment of the urban problem including housing, transportation, environmental quality, and public finance. **144C:** Allows students to apply knowledge of urban and transportation economics in the conduct of individual research. Prerequisites: Economics 20A-B-C; Economics 110A-B-C or equivalent. For 144C: satisfactory completion of the lower-division writing requirement.

144T Mathematical Analysis of Transportation Networks (4). Models of transportation demand; optimal utilization of transportation networks; cost-benefit analysis of network design projects; the economic impact of transportation networks. Prerequisites: Economics 20A-B-C. Same as Social Science 118A.

145E Economics of the Environment (4). Surveys economic aspects of natural resources, pollution, population, and the environment. Examines the causes of pollution, e.g., air, water, noise, toxic waste, and nonoptimal utilization of certain resources, e.g., fisheries; analysis of public polices regarding these problems. Emphasis on microeconomic aspects of environmental problems. Prerequisites: prior or concurrent enrollment in Economics 10A-B and 30, or equivalent courses; Economics 100A-B.

145F Economics of the Environment II (4). Applications of the tools covered in Economics 145E to such topics as global warming, destruction of the ozone layer, and emissions trading. Emphasis on independent research papers. Syllabus and classes include writing technique. Prerequisites: Economics 110A-B-C or equivalent, 145E, and satisfactory completion of the lower-division writing requirement.

145L Economics of Law (4). Examination of several economic concepts which are useful in understanding legal rules: externalities, the assignment of property rights, and Coase's theorem. Examples are drawn from the fields of pollution control, no-fault insurance, medical malpractice, and product liability. Prerequisites: Economics 100A-B or concurrent enrollment in Economics 100B.

146 Public Policy Issues (4). An examination and interpretation of the public policy areas such as schooling, housing and homelessness, occupational licensing, F.D.A. drug approval, credit bureaus, the U.S. Postal Service, and auto emissions. Prerequisites: Economics 100A-B-C; Economics 110A-B-C or equivalent; satisfactory completion of the lower-division writing requirement.

148A-B Political Economy of National Defense I, II (4-4). 148A: Analysis of the adoption of military solutions to international problems; military budgets, weapons policy, and procurement; distribution of benefits and costs of military systems. Emphasis given to nuclear military policy. Focuses on empirical and descriptive works on policy and practice. **148B:** Research seminar. Research paper required. Prerequisites: Economics 20A-B-C.

148I-J-K Political Economy of International Relations I, II, III (4-4-4). 148I-J: Migration, trade, and finance in competitive markets; bargaining and compacts; hegemony and imperialism; alliances; multinational firms; international institutions; international law; war and national boundaries; common markets; nationalism; super power conflicts. **148K:** Research seminar. Prerequisites: prior or concurrent enrollment in Economics 10A-B and 30, or equivalent courses; Economics 20A-B-C.

149 Special Topics in Economics of Public and Private Organizations (4). Prerequisites vary. May be repeated for credit as topic varies.

150–159: HUMAN RESOURCES

151A-B-C Labor Economics and Human Resources I, II, III (4-4-4) F, W S. Analysis of wage determination and the role of labor in production. **151A:** Develops, extends, and applies basic supply/demand analysis. **151B:** Labor market discrimination. **151C:** Original research by students. Prerequisites: Mathematics 2A-B and 4; Economics 100A-B-C; Economics 110A-B-C or equivalent courses. For 151C: satisfactory completion of the lower-division writing requirement.

152A Economic Anthropology (4). Economic systems in comparative perspective: production, distribution, and consumption in market and non-market societies; agricultural development in the third world. Prerequisite: one course in general science, anthropology, economics, geography, or sociology. Same as Anthropology 125A. **(VII-B)**

152M Marriage and Bridewealth (4). The rules by which children are positioned within a social system and by which men claim rights over women vary widely among societies. Analyzes these rules on the basis of a formal theory of wealth allocations between and among corporate groups that challenge neoclassical models. Prerequisites: Anthropology 2A and Economics 20A-B-C, or consent of instructor. Same as Anthropology 126G.

152P-Q Evolution of Social Formations I, II (4-4). 152P: Models and ethnographic descriptions of noncommodity economic relationships of the form that characterize intergroup and intragroup economic processes of many tribal societies. Includes analyses of gift exchange and resource allocation within the household. **152Q:** Devoted entirely to supervised research by class members. Prerequisites: Economics 20 A-B-C; Economics 152A or Anthropology 125A recommended. Prerequisite for 152Q: satisfactory completion of the lower-division writing requirement. Same as Anthropology 125P-Q. **(VII-B)**

155A Economics of the Family (4). Students write and rewrite papers on topics that are suggested by the models and literature in the "economics of the family." Prerequisites: Economics 100A-B-C; Economics 110A-B-C or equivalent; satisfactory completion of the lower-division writing requirement. Economics 151A-B-C desirable.

159 Special Topics in Economics in Human Resources (4). Prerequisites vary. May be repeated for credit as topic varies.

160–169: MACROECONOMICS

161A Money and Banking (4). Basic elements of money and banking: institutional features and economics of financial markets and, in particular, of the U.S. banking system; determinants of interest rates; the Federal Reserve and its role in the money supply process; effects of money on output and inflation. Prerequisites: Economics 100A-B-C or 100A-B and concurrent enrollment in 100C.

161B International Money (4). Open economy macroeconomics and determination of exchange rates. Asset-market approach to the balance of payments. Internal and external balance in the economy. Macroeconomic policies under fixed and floating exchange rates. The international monetary system and institutions. Prerequisites: Economics 100A-B-C or 100A-B and concurrent enrollment in 100C.

161C International Trade and Commercial Policy (4). Determination of trade flows and the relative prices. Gains from trade, the terms of trade, and income distribution. Imperfect competition and international trade. The effect of tariffs, export subsidies, and import quotas. The effects of free and restricted trade on economic welfare. Prerequisites: Economics 100A-B or 100A and concurrent enrollment in 100B; Economics 110A-B-C or equivalent.

161D Advanced Money and Banking (4). What happened in the Great Depression and why? Could it happen again? What is the transmission mechanism? What do economists know about the money supply process? What is the evidence on the demand for money? What are the more important current issues for monetary policy? Prerequisite: Economics 161A.

162A The Japanese Economy (4). An analysis of the structure and performance of the Japanese economy in the post-World War II period. The mechanism and policies of rapid growth. Japan's industrial structure, labor market, and financial system. United States-Japanese trade friction and policy issues. Prerequisites: Economics 100A-B-C; Economics 110A-B-C or equivalent.

163 Communism in Russia and China (4). Examines the politics, economics, and history of revolutionary Marxism during the twentieth century. Begins by discussing the theoretical foundation of communism and then contrasting those theories with the actual institutions established in communist nations and with socialist, capitalist, and democratic systems. Prerequisites: Economics 20A-B-C.

164A The Industrial Revolution in Western Europe (4). How do economists explain the process of economic development during the past three centuries? How has the process of industrialization affected living standards? In focusing on these questions, students learn how to apply economic theory and quantitative methods to the study of historical issues. Prerequisites: Economics 100A-B-C; satisfactory completion of the lower-division writing requirement.

164B The Industrial Revolution in the United States (4). How do economists explain the process of economic development during the past three centuries? How has the process of industrialization affected living standards? In focusing on these questions, students learn how to apply economic theory and quantitative methods to the study of historical issues. Prerequisites: Economics 100A-B-C; satisfactory completion of the lower-division writing requirement.

169 Special Topics in Development Economics (4). Prerequisites vary. May be repeated for credit as topic varies.

GRADUATE

200A-B-C Graduate Colloquium for Economics I, II, III (2-2-2) F, W, S. Weekly reports and colloquia by faculty, students, and visitors. Supplemented by class discussion of these presentations and other material on current research methodology. Prerequisite: admission to graduate program in Economics or consent of instructor. May be repeated for credit.

201A-B-C Graduate Student Prospectus Seminar (4-4-4). Graduate students present their dissertation prospectus and job market papers to other graduate students and faculty. All graduate students on the job market must enroll and present their job market papers, and all third-year graduate students are strongly encouraged to enroll. Prerequisite: graduate standing. May be repeated for credit.

203A Mathematics for Economists (4). Gives students the mathematical background required for graduate work in economics. Topics covered include multivariate calculus, differential equations, and linear algebra. Prerequisite: graduate standing or consent of instructor.

210–219: GRADUATE ECONOMIC THEORY

210A-B-C Microeconomic Theory I, II, III (4-4-4) W, S. Theoretical microeconomics. Emphasis on the meaning and empirical interpretation of theoretical models. Topics include theory of the firm, theory of the market, theory of the consumer, duality theory, application to econometrics, general equilibrium and welfare economics, uncertainty, game theory. Prerequisite: graduate standing or consent of instructor.

210D-E-F Macroeconomic Theory I, II, III (4-4-4) F, W, S. Advanced macroeconomic theory including alternative macroeconomic models, microeconomic foundations of macroeconomics, investment and growth theory, inflation and unemployment, rational expectations and macroeconomic policy, wealth effects, crowding out and fiscal policy, money and interest, open economy models.

219A-Z Special Topics in Economic Theory (4) F, W, S. Prerequisites vary. May be repeated for credit.

220–229: QUANTITATIVE METHODS

220A-B-C-D Statistics and Econometrics I, II, III, IV (4-4-4-4). 220A: Covers probability mathematical statistics necessary to prepare students for econometric study and empirical work. Topics include probability theory, distributions, sampling, and classical point estimation. A likelihood perspective is emphasized. **220B:** Begins with Bayesian point estimation. Then covers interval estimation and hypothesis testing from both classical and Bayesian perspectives, followed by a general discussion of prediction. Finally, all these techniques are applied to the standard linear regression model under ideal conditions. **220C:** Begins by relaxing the ideal conditions of the standard regression model. Topics include kernel density estimation, Generalized Least Squares (GLS), instrumental variables (IV), two stage least squares (2SLS), panel data models, and simulation-based Bayesian methods, including Gibbs sampling. **220D:** Begins by reviewing estimation theory and the bootstrap. Topics include econometric time series, discrete choice and count models, sample selection, and duration models. Covers both Bayesian and classical asymptotic methods.

221A-B-C-D Statistics and Econometrics Laboratory I, II, III, IV (2-2-2-4). 221A-B-C: Discussion of problems in statistics and econometrics and their relationship to statistical and econometric theory. Instruction in the use of computers for applied econometric work. **221D:** Before the course begins, students choose a published empirical economics article and obtain the necessary data to replicate it. Then, students replicate and extend the economic analysis and write a paper describing their work. Satisfies econometrics requirement for the Ph.D. in Economics. Corequisites: Economics 220A-B-C-D.

223A Discrete Choice Econometrics (4). Specification, estimation, and testing of discrete choice models, with emphasis on cross-section application. Qualitative choice, limited dependent variables, sample selection bias, and latent variables. Students use computer packages to apply models to real data. Prerequisites: Economics 220A-B-C-D.

224A Time Series Econometrics (4). Econometric analysis of time series data. Moving average and autoregressive series, regression analysis, Box-Jenkins techniques, computational methods, and causality conditions. Prerequisites: Economics 220A-B-C-D.

229A-Z Special Topics in Quantitative Methods (4). Prerequisites vary. May be repeated for credit as topics vary.

239: FINANCIAL ECONOMICS

239A-Z Special Topics in Financial Economics (4). Prerequisites vary. May be repeated for credit as topics vary.

240–249: MICROECONOMICS

241A-B Industrial Organization I, II (4-4). Analysis of the structure and economic performance of markets, and the impact of public policy and their efficiency and equity. Effects of information structure. **241A:** Oligopoly, cartels, mergers, vertical integration, patents, innovation, antitrust, and regulation; **241B:** price flexibility and dispersion, auctions, search and industrial structure, intrafirm organization. Prerequisites: Economics 100B and 203A.

243A Game Theory (4). A formal introduction to noncooperative game theory. Topics include properties of Nash Equilibrium and equilibrium refinements, dynamic games, repeated games, games with imperfect information, and games with incomplete information. Prerequisites: Economics 201A-B-C; graduate standing or consent of instructor.

243B Advanced Game Theory (4). Provides advanced instruction and research opportunities in game theory for students interested in using game theory in their research. Prerequisites: Economics 243A and consent of instructor.

249A-Z Special Topics in Microeconomics (4). May be repeated for credit as topics vary.

250–259: HUMAN RESOURCES

251A-B Labor Economics I, II (4-4). Analytic and empirical study of labor markets. Topics include labor supply and demand, human capital, educational sorting, life-time earnings profiles, discrimination, unemployment, unions; several econometric techniques including combined time-series and cross-sections, sample selection bias, and switching regressions are taught as needed. Prerequisites: Economics 100B and 203A.

259A-Z Special Topics in Human Resources (4). Prerequisites vary. May be repeated for credit as topics vary.

260–269: MACROECONOMICS

261A-B International Trade I, II (4-4). Covers theoretical models, empirical methods, and policy issues in international trade. Following the conventional treatment of the Ricardian model, the Heckscher-Ohlin model, and the specific factors model; new trade models which incorporate scale economies and imperfect competition are discussed. Prerequisite: Economics 210A-B.

269A-Z Special Topics in Macroeconomics (4). Prerequisites vary. May be repeated for credit as topics vary.

270–279: PUBLIC CHOICE

270A-B-C Seminar in Public Choice I, II, III (4-4-4). Public choice lies at the intersection of economics and political science. This course involves the use of tools derived from economics to understand the behavior of governments and of citizens when they deal with politics. Prerequisite: graduate standing and Social Science 111H. Same as Political Science 270A-B-C.

279A-Z Special Topics in Public Choice (4). Prerequisites vary. May be repeated for credit as topics vary.

280–289: URBAN AND TRANSPORTATION ECONOMICS

281A-B Urban Economics I, II (4-4). Theoretical and empirical analysis of the economic functioning of urban areas. Urban economic development, location of firms and households, housing markets, urban public finance. Econometric estimation of hedonic price functions for housing. Prerequisites: Economics 100B and 203A or equivalent.

282A-B Transportation Economics I, II (4-4). 282A: Applies microeconomic concepts of demand, costs, pricing, investment, and project evaluation to analyze transportation activities. Empirical studies include travel demand using discrete models, and cost functions. **282B:** Policy analysis in the presence of road transport externalities (such as environmental spill-overs), imperfect instruments, and other economic distortions such as imperfectly priced networks and imperfect competition. Connections of transportation economics with environmental economics, public finance, spatial economics and industrial organization.

285A-B-C Colloquium for Transportation Science I, II, III (2-2-2). Selected perspectives on transportation based on the study of human behavior. Organized by Interdisciplinary Program in Transportation Science. Research presentations by faculty, students, and visitors supplemented by class discussion. Satisfactory/Unsatisfactory only. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

289A-Z Special Topics in Urban and Transportation Economics (4). Prerequisites vary. May be repeated for credit as topics vary.

290–299: SPECIAL COURSES

290 Dissertation Research (4 to 12). Prerequisite: consent of instructor. May be repeated for credit.

299 Independent Study (4). May be repeated for credit.

THE CURRICULUM IN GEOGRAPHY

The curriculum in geography covers such topics as the evolution of the landscape, arrangement of urban centers, the internal structure of cities, the arrangement of industrial and agricultural activities, the pattern of movement of people, goods and ideas, and relationships between humans and the environment. The B.A. in Geography is not available.

Courses in Geography

LOWER-DIVISION

Social Science 5 Introduction to Geography. Basic introduction to geography.

5A Introduction to Human Geography (4). Human behavior in a geographical context. Spatial patterns and organization of the cultural, social, and economic activities of man as imposed on and influenced by the earth's physical setting. **(III)**

5B Introduction to Physical Geography (4). An introduction to the physical world we live in. Distribution and dynamics of the earth's air, water, and solid crust. Concepts and principles from climatology and geology. Selected examples from North America and beyond. **(III)**

5C Environment and Resources (4). Analysis of landscapes, with special attention to California and the West. Emphasis on humans as agents of environmental change. **(III)**

5D U.S. and World Geography (4). Provides a broad survey of general geographical principles and facts on a world scale as well as introduces students to the broad regional and resource geography of the U.S., emphasizing in particular the interactions of physical and cultural factors. **(III)**

Social Science 18A Evolution of Landforms (4). Introduction to geomorphology; major forces which shape the relief of the earth's surface and the forms which result from their activity. General principles demonstrated using examples from the western United States with special emphasis on California. **(III)**

Social Science 18C Dynamics of the Physical Landscape (4). A seminar on landscape processes and the management of natural hazards (e.g., erosion, flooding, droughts, landslides, earthquakes). Emphasis on Southern California. Students research and make oral presentations on topics determined by agreement with instructor.

Social Science 18D Models in Economic Geography (4). Economic decision making in a spatial context: the location, distribution, and dynamics of economic activities. Theories of population growth, urbanization, industrial location, interregional trade, and regional planning. **(III)**

UPPER-DIVISION

Course modules emphasizing geography are assigned numbers 118 and 119.

Social Science 118 Geographical Analysis

118A Mathematical Analysis of Transportation Networks (4). Models of transportation demand; optimal utilization of transportation networks; cost-benefit analysis of network design projects; the economic impact of transportation networks. Prerequisites: Economics 20A-B-C. Same as Economics 144T.

118C Transportation Theory (4). Advanced topics in transportation systems analysis and planning; land-use and traffic generation; traffic flow and network theory; transportation impact; transportation policy. Emphasis on theoretical approaches and mathematical models. Prerequisites: Economics 20A-B-C.

118D Urban Policy (4). The first quarter of a series of urban policy issues in view of the principles of urban politics and urban administration. Special emphasis on transportation problems.

118E Urban Theory (4). Urban theory as it pertains to American metropolitan areas. Location theory, central place theory, and theories of urban land use and social areas. Prerequisite: Social Science 118D or consent of instructor.

118F Urban Analysis (4). Students participate in design of an urban research project; involves analysis of transit systems and their relationship to urban structure of metropolitan areas. Focus is on the methodology of evaluation research as it relates to public programs and public policy analysis. Prerequisite: consent of instructor.

118G Regional Geography of California (4). Geographical analysis of selected regions of California, in particular their geomorphological, hydrological, and climatic conditions, as well as their economic and social strengths and weaknesses. Includes discussion of Orange County on environmental, social, and residential problems.

118J Maps and Landscapes (4). Focuses on (1) the principles of map preparation, with examples and exercises; and (2) the interpretation of maps, with special emphasis on the topographic maps of the U.S. Geologic Survey, again with selected examples and exercises. Recommended prerequisite: introductory course work in physical geography or earth sciences.

118L Spatial Structure of Metropolitan Areas (4). The spatial arrangement of activities in U.S. metropolitan areas. Identification of the economic, social, and technological processes which affect urban spatial structure. The processes of urbanization and suburbanization are discussed, and the policy implications of contemporary urban spatial structure are examined. Prerequisites: upper-division status and either Economics 1 or 20A-B; Social Science 5A recommended.

Social Science 119A-Z Special Topics in Geography (4) F, W, S. May be repeated for credit. Prerequisites vary.

THE UNDERGRADUATE MAJOR IN INTERNATIONAL STUDIES

5135 Social Science Plaza A; (949) 824-9229
World Wide Web: http://hypatia.ss.uci.edu/istudies/
Caesar D. Sereseres, **Acting Director**

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David A. Smith, *Professor of Sociology and Social Ecology*
Robert Uriu, *Associate Professor of Political Science*

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Patrick Morgan, Ph.D. Yale University, *Professor of Political Science and Thomas T. and Elizabeth C. Tierney Chair in Peace Studies*
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Kenneth L. Pomeranz, Ph.D. Yale University, *UCI Chancellor's Professor of History and of East Asian Languages and Literatures*
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Kamal Sadiq, Ph.D. University of Chicago, *Assistant Professor of Political Science*
Wayne Sandholtz, Ph.D. University of California, Berkeley, *Professor of Political Science*
William Schonfeld, Ph.D. Princeton University, *Director of the Center for the Study of Democracy and Professor of Political Science*
Caesar D. Sereseres, Ph.D. University of California, Riverside, *Associate Dean for Undergraduate Studies, School of Social Sciences, Acting Director of International Studies, and Associate Professor of Political Science*
Stergios Skaperdas, Ph.D. The Johns Hopkins University, *Professor of Economics*
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David A. Snow, Ph.D. University of California, Los Angeles, *Professor of Sociology*
Etel Solingen, Ph.D. University of California, Los Angeles, *Professor of Political Science*
Dorothy J. Solinger, Ph.D. Stanford University, *Co-Director of the Center for Asian Studies, Co-Director of the Minor in Asian Studies, and Professor of Political Science*
Steven C. Topik, Ph.D. University of Texas, *Professor of History*
Robert Uriu, Ph.D. Columbia University, *Associate Professor of Political Science*
Feng Wang, Ph.D. University of Michigan, *Associate Professor of Sociology*
Charles J. Wheeler, Ph.D. Yale University, *Assistant Professor of History*

Affiliated Faculty

Nurudeen Alao, Ph.D. Northwestern University, *Lecturer in Geography*
Marigee Bacolod, Ph.D. University of California, Los Angeles, *Assistant Professor of Economics*
Nina Bandelj, Ph.D. Princeton University, *Assistant Professor of Sociology*
Victoria Bernal, Ph.D. Northwestern University, *Associate Professor of Anthropology*
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Helen Ingram, Ph.D. Columbia University, *Professor of Social Ecology and Political Science, and Drew, Chace, and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation*
Lina Kreidie, Ph.D. University of California, Irvine, *Associate Director of the Interdisciplinary Center for the Scientific Study of Ethics and Morality and Lecturer in Political Science*
Karen Leonard, Ph.D. University of Wisconsin, *Co-Director of the Center for Asian Studies and Professor of Anthropology*
Lynn Mally, Ph.D. University of California, Berkeley, *Professor of History*
Richard Matthew, Ph.D. Princeton University, *Associate Professor of Social Ecology and Political Science*
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Priya Ranjan, Ph.D. Columbia University, *Associate Professor of Economics*
Yang Su, Ph.D. Stanford University, *Assistant Professor of Sociology*
Kaushik Sunder Rajan, Ph.D. Massachusetts Institute of Technology, *Assistant Professor of Anthropology*
Timothy Tackett, Ph.D. Stanford University, *Professor of History*
Ngugi wa Thiong'o, *Director of the International Center for Writing and Translation and UCI Distinguished Professor of English and Comparative Literature*
Anne Walthall, Ph.D. University of Chicago, *Co-Director of the Minor in Asian Studies and Professor of History and of East Asian Languages and Literatures*
Susan Wierzbicki, Ph.D. University of Washington, *Assistant Professor of Sociology*
Mei Zhan, Ph.D. Stanford University, *Assistant Professor of Anthropology*

The major in International Studies provides an interdisciplinary perspective on global issues, societies, and cultures. International Studies majors acquire twenty-first-century analytical skills and knowledge that will enable them to understand and contribute to shaping the rapidly evolving global community. The degree in International Studies prepares students for careers in a variety of fields such as international affairs and public policy, international business and finance, international organizations, and academic research and teaching.

Requirements for the major include: a three-course core sequence (Origins of Global Interdependence, Global Issues and Institutions, and Global Economy), three additional lower-division courses, four upper-division courses on a region, five upper-division courses on a theme, and foreign language competence. Faculty advising is an essential part of the major.

International Studies majors are also required to pursue some form of international experience, as explained in detail in requirement F below.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 430.

Requirements for the Major

A. International Studies 11, 12, and 13.

B. Three additional lower-division courses from the following list: Anthropology 2A, 2D, 20A, 30A; Economics 20A, 20B, 20C; History 11, 21B, 21C; Linguistics 1; Political Science 41A, 42A, 43D, 51A; Social Science 12A; Social Science (Geography) 5A, 5B, or 5D (one course only to count toward major); Sociology 2, 3, 44, 75, 77; Environmental Analysis and Design E8, E20. (Students should be advised that these courses provide critical "stepping stones" to advanced study. Please consult with a counselor concerning appropriate course work for your chosen upper-division module and educational and career objectives.)

C. Five upper-division module courses, at least three of which must be from one module. The four modules are: Global Issues and Institutions, Global Conflict and Negotiation, Global Role of U.S. and California, and Global Society and Culture. The approved courses are:

Global Issues and Institutions: Anthropology 125A, 125B, 126N, 136M; Economics 148A, 148D, 152A, 161B, 161C; International Studies 111A, 112A; Political Science 141B, 141D, 143E, 144A, 147A, 147B, 148B, 151G, 154C, 154E, 155E, 156A, 157A, 172A, 173A; Sociology 173; Criminology, Law and Society C129; Environmental Analysis and Design E127, E132U, E137, E155U, E173; History 135D, 190 (approval required as topics vary); Management 190 (when title is International Business).

Global Conflict and Negotiation: Anthropology 136D; International Studies 121; Political Science 141D, 142G, 143B, 143C, 143F, 146A, 147A, 148B, 154G, 155E; Social Science 183B, 183C; Sociology 178, 179 (when title is Ethnicity in World Perspective); Environmental Analysis and Design E113; History 126A, 126B, 126C; Psychology and Social Behavior P175P.

Global Role of U.S. and California: Anthropology 125X, 161T; Economics 148A; Political Science 126C, 141E, 142D, 142E, 142F, 142G, 145A, 145B, 147B; Social Science 173I; Criminology, Law and Society C128; Environmental Analysis and Design E143U; History 158A, 158B, 158C, 166.

Global Society and Culture: Anthropology 121D, 121G, 121H, 121J, 125A, 125B, 125M, 129, 132A, 132B, 134E, 135A, 136A, 136G, 174A; Political Science 138A, 157A, 158A; Sociology 144, 146, 147A, 165A, 173, 178, 179 (when title is Ethnicity in World Perspective); Criminology, Law and Society C102; Environmental Analysis and Design E102, E144U, E149U; Psychology and Social Behavior P124D.

D. Four upper-division Regional Studies courses, at least three of which must cover one geographic region. Students may obtain credit for one of these three courses through participation in a study abroad program within the particular region. These regions are: Europe, Middle East/Africa, Asia/Pacific Rim, and the Americas (excluding U.S.A.). Approved courses are: Anthropology 121E, 135H, 135I, 138O, 138P, 138Q, 138S, 138T, 141A, 160–169 (excluding 161T and 162B); Economics 162A; International Studies 179; Political Science 141C, 141D, 141E, 142C, 145A, 151A–151F, 152A–152F, 153A–153F, 154F, 155F, 155G, 156C; Social Science 172F, 172G, 176A; Sociology 175A, 175B, 175C; History 110–129, 130A-B, 132, 133, 161–169, 170.

The list of approved Regional Studies courses is available on the World Wide Web at http://hypatia.ss.uci.edu/ssrc/instud.htm.

E. Competency in an approved modern international language other than English. Competency is established by completion of *one course beyond* the 2A level. The language requirement may be met through: (1) language courses at UCI, (2) language courses taken during study abroad, (3) a proficiency examination, or (4) courses taken at another college-level institution when the language is not offered at UCI. The following languages will automatically be approved: Arabic, Chinese (Mandarin), French, German, Italian, Japanese, Korean, Portuguese, Spanish, and Russian. Other languages will be considered on a case-by-case basis by petition. (Students are strongly encouraged to go beyond these minimal requirements with additional work in the language and literatures and culture courses taught in the language.)

F. International Studies majors are also required to pursue some form of international experience for a minimum of one quarter. Majors are encouraged to study abroad through the Education Abroad Program (EAP) or the International Opportunities Program (IOP), which are available for periods of a quarter, semester, year, or summer. When this is not possible, work overseas (through IOP) or a domestic internship with the UCDC Internship Program, the Washington D.C. Center Program, or the Social Science Internship Program (Social Science 197) with an international focus may be substituted.

HONORS PROGRAM IN INTERNATIONAL STUDIES

The Honors Program allows International Studies majors to engage in research leading to the completion of an honors thesis. The topic for the honors thesis is selected by the student, in consultation with a faculty advisor, and should reflect a theme consistent with the student's module in the International Studies major. The Honors Program is open to all junior and senior International Studies majors with an overall GPA of 3.0 and a 3.5 GPA in the major who have taken all three core courses (International Studies 11, 12, and 13) and at least two upper-division courses that count toward the International Studies major. Successful completion of a written senior thesis in the International Studies 190 course satisfies the upper-division writing breadth requirement.

During the spring quarter of the junior year or during the summer before the senior year, students formally apply to the Honors Program. Students will be notified of their selection to the Honors Program by September 1. In the fall quarter of the senior year, students enroll in International Studies H180, Honors Research Seminar. In this course, each student formulates a written research plan (i.e., prospectus) for the honors thesis. Students also select a faculty member who agrees to supervise the research, evaluate the written work, and approve the honors thesis. In the winter quarter of the senior year, students enroll in International Studies H190, Senior Thesis, with their faculty advisor. The faculty advisor supervises and evaluates data collection and analysis and reads and edits chapter drafts. In the spring quarter of the senior year, students enroll in a second quarter of Senior Thesis, with their faculty advisor. The thesis is to be completed by the student and approved by the advisor prior to the end of the quarter.

Honors students must also demonstrate a high level of language proficiency by completing two courses beyond the 2A level in language, literature, or culture taught in their chosen international language.

International Studies majors are also required to pursue some form of international experience, as explained in detail in major requirement F.

Courses in International Studies

11 Origins of Global Interdependence (4). Offers a general overview of the rise of global interdependence in political, economic, demographic, and cultural terms. Considers what drove people from relative isolation into intensified intercourse with one another, and investigates the consequences of this shift. Same as Anthropology 41A. **(VII-B)**

12 Global Issues and Institutions (4). Surveys recent developments in the nature of global interdependence. Examines the major political, economic, and military conflicts and recent problems of population growth, environmental decay, ethnic/national antagonism and violence, and post-Cold War politics. Same as Political Science 44A. **(VII-B)**

13 Global Economy (4). Acquaints students with the fundamental patterns and problems of the global economy. Emphasizes the historical roots and political implications of economic choices. Same as Economics 13. **(VII-B)**

111A Economic Development (4). Reviews the process of economic development across the globe. Topics include main theories of economic development, influence of domestic and international policies on economic development, and the effect of economic development on institutions and the environment. **(VII-B)**

112A International Business (4). Introduction to conducting business in the international arena, the process of decision making in the organization, and the globalization of markets and production.

120 Global Environmental Issues (4). While many agree that environmental problems threaten humankind, there is much disagreement over the nature of these threats and how to address them. This course examines global environmental issues from various perspectives in order to provide answers to these questions. Same as Environmental Analysis and Design E132U and Political Science 143D.

121 Social Ecology of Peace (4). Examination of differing definitions of the problem of achieving peace and the special problems of seeking peace in the nuclear age. Same as Environmental Analysis and Design E113. **(VII-B)**

122 Nuclear Environments (4). Understanding the impact of the nuclear age on the environment and human health through the interrelated developments of nuclear power and nuclear weapons. The early years of weapon development, catastrophic environmental pollution, perils of nuclear power in the U.S. and Russia. Same as Environmental Analysis and Design E127. **(VII-B)**

123 International Environment Management (4). Network of intergovernmental organizations (the United Nations, in particular) and international nongovernmental organizations in the field of environmental management. Analysis of key international projects and sources of information. Lessons for the integration of international research expertise. Prerequisite: Criminology, Law and Society C7. Same as Environmental Analysis and Design E137U and Criminology, Law and Society C129.

179 Regional Topics in International Studies (4). May be repeated for credit as topics vary. **(VII-B)**

H180 International Studies Honors Research Seminar (4). Designed to assist students prepare a thesis prospectus for the Honors Program in International Studies. The student identifies a thesis topic, reads on the subjects of writing and research methods, orally presents and defends the prospectus, and prepares a written prospectus/literature review. Prerequisite: acceptance into the International Studies Honors Program. Formerly Social Science H158A.

189 Special Topics in International Studies (4). May be repeated for credit as topics vary. **(VII-B)**

190 Senior Thesis (4). Prerequisite: Consent of instructor. May be taken for credit twice. Formerly Social Science H158B.

Minor in Conflict Resolution

The minor in Conflict Resolution, sponsored by the International Studies Program, is an interdisciplinary curriculum that can help students both discover and prepare themselves for professional careers. The course of study provides skills in conflict analysis and resolution and a useful understanding of integrative institutions at the local, regional, and international levels. Conflict plays a key role in all areas of our lives, and has placed a shaping role in the history of nations. It can have destructive or constructive potential. This program explores how conflict arises, how it is represented and discussed, how it is prevented, mitigated, managed, and used for change in interpersonal relations, within and between organizations and other kinds of groups inside nations, and between nations. The minor consists of seven four-unit courses and two two-unit courses.

Course descriptions are available in the academic department sections of the *Catalogue*.

Requirements for the Minor

Three core courses: History 11 (Introduction to Peace and Conflict), Political Science 43D (Global Security and Cooperation), and Political Science 154G/Anthropology 136D (Conflict Management in Cross-Cultural Perspective).

Two relevant upper-division courses: These are examples of courses offered: Economics 148A-B (Political Economy of National Defense I, II); English and Comparative Literature CL 102 (The Literature of World War I, Imagining War and Peace), E 105 (The Literature of Modern War); Environmental Analysis and Design E100 (International Environmental Issues), E113, E122 (Social Ecology of Peace); Environmental Analysis and Design E105U/Criminology, Law and Society C128 (Environmental Law); History 190 (Multinationals and Tribes); Management 181 (Managing Organizational Behavior); Political Science 142G (U.S. Coercive Diplomacy), 143C (Arms Control and International Security); 147A (International Cooperation); Psychology and Social Behavior P175P (Violence in Society); Sociology 141 (Organizations), 178 (Sociology of Peace and War).

The International Studies Forum: Social Sciences/Social Ecology/Humanities 183A. Students attend forum lectures presented by scholars from a variety of institutions on topics related to peace, conflict, and global cooperation. The course must be taken twice and carries two units of credit, Pass/Not Pass only.

Senior Seminar in Conflict Resolution: Social Sciences/Social Ecology/Humanities 183B-C. Designed for seniors (juniors may also enroll) who are pursuing the minor in Conflict Resolution and/or the International Studies major. The courses provide a forum in which students refine skills and theory in the study of cooperation and conflict, from local to global arenas. Each course carries four units of credit. The second course (183C) confers upper-division writing credit when completed with a grade of C or better.

The International Studies Theme House Discussions

Students are encouraged to participate in the weekly discussions and other events on international peace and conflict held at the International Studies Theme House. Students enroll in the Theme House course (Social Science 184D) for two units of credit per quarter.

DEPARTMENT OF LINGUISTICS

5221 Social Science Plaza B; (949) 824-7504

Faculty

Bernard Tranel: Phonological theory, French linguistics

Affiliated Faculty

Michael Fuller: Classical Chinese grammar and literature
Gregory Hickok: Neural organization of language
Kent E. Johnson: Philosophy of language, philosophy of mind
Mary-Louise Kean: Biological foundations of language
Glenn S. Levine: Applied linguistics, pedagogy
Virginia A. Mann: Speech perception, psycholinguistics
Robert May: Semantics, syntax, philosophy of language
Robin Scarcella: Sociolinguistics, second-language acquisition
Armin Schwegler: Spanish, historical linguistics, pidgins and creoles
Mark Warschauer: Second-language acquisition, sociolinguistics
W.C. Watt: Cognitive semiotics

Language is one of the most fundamental human instincts. It is an extraordinarily intricate system that all of us master as young children without special teaching, and that gives us the ability to communicate, tell stories, and express our deepest feelings. Linguistics is the scientific study of this human language. It is concerned with understanding the nature of language and our knowledge of it, how we acquire it, and how that knowledge is put to use. It is connected to many other fields of study, including psychology, anthropology, sociology, biology, physics, mathematics, computer science, philosophy, and literature.

The availability of the B.A. in Linguistics is currently under review. Please contact the Associate Dean of Social Sciences for details.

Undergraduate Program

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: *See pages 56–60.*

School Requirements: See page 430.

Departmental Requirements for the Major

School requirements must be met and must include 14–15 courses (56–63 units) as specified below:

A. Six core courses: Linguistics 3, 10, 20, 100, 111, and 121.

B. Six linguistics courses, at least four of which must be upper-division. One of these four upper-division courses must be 112, 122, or 143.

C. Natural/Formal language requirement. One of the following three groups of courses:

(1) Three courses in a single language other than English, or equivalent. Courses taken to satisfy breadth requirement category VI do not qualify.

(2) Two linguistics courses on the structure of foreign languages (e.g., Linguistics 165A, 165B, 165C, 166A, and as the topics might apply, 160, 164A, and 169).

(3) Two courses in logic (selected from Logic and Philosophy of Science 30 *or* 104, 105A-B-C) or computation (selected from the Information and Computer Science series 21–22).

Residence Requirement for the Linguistics Major: At least five upper-division courses required for the major must be completed successfully at UCI.

Honors Program in Linguistics

The Honors Program in Linguistics is designed for selected junior and senior Linguistics majors who have shown interest in moving beyond the material covered in the regular undergraduate program and demonstrated their readiness for more advanced work than is usually expected at the undergraduate level. An overall grade point average of 3.0 with 3.5 in Linguistics courses is required.

Participating students design their program in consultation with the faculty and complete a specified set of courses, culminating in the production and oral defense of a senior thesis. Successful completion of the Honors Program satisfies the upper-division writing requirement.

Four one-quarter courses are required, including Linguistics H195 (Honors Research Workshop) and H190 (Senior Thesis). Students also select one or two courses from Linguistics 114, 119, 124, 129, 139, 149, 159, and H192. Students also may choose to take either Linguistics 198 or 199. Each of these courses will normally require a term paper, and satisfactory completion of these papers with a grade of A- or better is required for Honors students. These term papers usually are closely connected to the senior thesis topic and contribute to its final form. Two of the courses taken toward fulfilling the Honors Program requirements will also count toward the requirements for the major in Linguistics.

Linguistics Minor Requirements

Requirements for the minor in Linguistics are met by taking seven linguistics courses (28 units) as specified below:

A. Linguistics 3, 10, and 20.

B. Four additional linguistics courses, three of which must be upper-division.

Residence Requirement: At least three upper-division courses required for the minor must be completed successfully at UCI.

Courses in Linguistics

LOWER DIVISION

1 Languages of the World (4). The world has over 5,000 languages, with an *exuberant variety of sounds, words, and grammars. Introduction to a repre-*sentative selection (about eight), drawn from every continent. Students are not expected to learn these languages, but rather to explore them and study their structure and complexity. **(VII-B)**

2 Discovering Language (4). Explores language's pervasiveness and diversity; demonstrates ways linguistics illuminates language's crucial—albeit hidden—societal role. Issues: self- and group-identification, language death, language in legal and educational settings. Illustrations: spoken and signed languages, English dialects (including Black English), American Indian languages. **(VII-A)**

3 Introduction to Linguistics (4). Emphasis on the notion that language is a remarkable achievement of the human mind. Current insights into the nature of language. Survey of various subfields of linguistics. Introduction to linguistic analysis. **(III or V)**

10 Introduction to Phonology (4). Basic concepts in phonetic description and phonological analysis. Prerequisite: Linguistics 3. **(III or V)**

20 Introduction to Syntax (4). Basic concepts in syntactic description and grammatical analysis. Prerequisite: Linguistics 3. **(III or V)**

51 Acquisition of Language (4). What children say, what they mean, and what they understand. Theories about the learning of language by one-, two-, and three-year olds. Comparison of kinds of data on which these theories are based. Same as Psychology 56L. **(III)**

52 Language and the Mind (4). The relationship of knowledge of grammar to mental processes and mental representations. How linguistic behavior is rule governed. Same as Psychology 76M.

68 Introduction to Language and Culture (4). Explores what the study of language can reveal about ourselves as bearers of culture. After introducing some basic concepts, examines how cultural knowledge is linguistically organized and how language might shape our perception of the world. Same as Anthropology 2D. **(III)**

80 Introduction to Semiotics. (4). How humans and other animals communicate with each other by means of symbols and other signs. The symbols of everyday life, of movies and literature, of religion and society. Symbolic systems and symbolic evolution. **(III)**

99 Special Topics in Linguistics (4). Special topics at lower-division level. May be repeated for credit when topic varies.

UPPER DIVISION

100 Grammatical Theory (4). Has both a phonology and a syntax component, and forms a bridge between lower-division course offerings and more advanced courses in phonology, syntax, and morphology. Emphasis on development of analytical skills, and evaluation of alternative proposals. Prerequisites: Linguistics 10 and 20.

101–109: COMPUTATIONAL LINGUISTICS

102 Formal Languages and Automata (4). Formal aspects of describing and recognizing languages by grammars and automata. Parsing regular and context-free languages. Ambiguity, nondeterminism. Elements of computability; Turing machines, random access machines, undecidable problems, NP-completeness. Prerequisites: ICS 23 and ICS 51 with grades of C or better; Mathematics 2A-B and Statistics 67/Mathematics 67; Mathematics 6A/ICS 6A; Mathematics 6B; Mathematics 6C or 3A. Same as Information and Computer Science 162.

109 Special Topics in Computational Linguistics (4). Prerequisites vary. May be repeated for credit as topics vary.

110–119: PHONETICS / PHONOLOGY

111 Intermediate Phonology (4). Fundamentals of phonological theory. Intensive practice in phonological analysis. Prerequisite: Linguistics 100 or equivalent. Concurrent with Linguistics 211.

112 Advanced Phonology (4). Overview of recent developments in phonological theory. Prerequisite: Linguistics 111. Concurrent with Linguistics 212.

114 Current Topics in Phonological Theory (4). Phonology seminar. Intensive study of a small number of current topics in phonological theory. Prerequisite: Linguistics 112. May be repeated for credit as topic varies. Concurrent with Linguistics 214.

119 Special Topics in Phonetics/Phonology (4). Prerequisites vary. May be repeated for credit as topic varies.

120–129: SYNTAX

121 Intermediate Syntax (4). Examination of syntactic phenomena and analysis, with emphasis on current issues in grammatical theory. Focus on the nature of syntactic rules, representations, and constraints as they determine empirical properties of language. Prerequisite: Linguistics 100 or equivalent. Concurrent with Linguistics 221.

122 Advanced Syntax (4). Intensive investigation of selected current topics in syntactic theory. Readings drawn from primary literature. Prerequisite: Linguistics 121. Concurrent with Linguistics 222.

124 Current Topics in Syntactic Theory (4). Research seminar in syntax. Intensive study of a small number of well-defined topics which have had significant impact on the development of syntactic theory. Prerequisite: Linguistics 122. May be repeated for credit as topic varies. Concurrent with Linguistics 224.

129 Special Topics in Syntax (4). Prerequisites vary. May be repeated for credit as topic varies.

130–139: MORPHOLOGY

132 Morphology and the Lexicon (4). Study of the lexical representations of words; relation of the lexicon to phonology, morphology, and syntax, with special emphasis on recent theoretical developments. Prerequisite: Linguistics 10 or 20 or consent of instructor. Concurrent with Linguistics 232.

139 Special Topics in Morphology (4). Prerequisites vary. May be repeated for credit as topic varies.

140–149: SEMANTICS

140 Formal Foundations of Linguistics (4). Introduction to the fundamental concepts of logic, set theory, and automata theory, and their relation to linguistics. Prerequisite: at least one of the following: Linguistics 121 or 143, Philosophy 105B, Mathematics 150, ICS 162, or consent of instructor. Concurrent with Linguistics 240.

141 Topics in Philosophy of Language (4). Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts. May be repeated for credit as topics vary. Same as Philosophy 145 and Logic and Philosophy of Science 145. May be repeated for credit as topics vary.

143 Semantics (4). The role of semantics in an integrated linguistic theory. Examination of a truth theory for natural language and the role of logical form as the interface of syntax and semantics. Discussion of reference, predication, quantification, and intentionality. Readings drawn from linguistic and philosophical sources. Prerequisite: at least one of the following: Linguistics 100 or 140, Philosophy 105B, Mathematics 150, ICS 162, or consent of instructor. Concurrent with Linguistics 243.

149 Special Topics in Semantics (4). Prerequisites vary. May be repeated for credit as topic varies.

150–159: PSYCHOLINGUISTICS

150 Psychology of Language (4). Examines modern research in psycholinguistics. Focuses on theoretical issues and empirical findings in brain-language research, speech perception, speech production, sentence processing, lexical access, language acquisition, and reading development. Same as Psychology 156A.

154 Theories of Second Language Acquisition (4). Research in the acquisition and learning of second and foreign languages. The influence of language acquisition theory on past and current teaching methodology. A comparison of first and second language acquisition. Prerequisite: Linguistics 3. Recommended: Linguistics 51.

157 Psychology of Reading (4). Surveys the major components of skilled reading and the determinants of successful reading acquisition. Examination of contemporary models of skilled reading. Focuses on models of the development of reading. Research on the causes of developmental dyslexia. Prerequisites: Psychology 7A or 9A-B-C; Linguistics 150 or Psychology 140C; satisfactory completion of the lower-division writing requirement. Same as Psychology 143R.

158 Language and the Brain (4). Analysis of current research on the biological bases of human linguistic capacity. Development, focusing on hemispheric specialization and plasticity; localization of specific linguistic functions in adults, with emphasis on study of aphasias; relation of linguistic capacity to general cognitive capacity, considering research on retardation. Prerequisite: Biological Sciences 35 or N110, or consent of instructor. Same as Biological Sciences N160 and Psychology 161.

159 Special Topics in Psycholinguistics (4). Prerequisites vary. May be repeated for credit as topic varies.

160–169: LANGUAGE STUDIES

160 Language Typology (4). Cross-linguistic survey of major linguistic phenomena, especially as they pertain to word order, phrase structure, grammatical relations, anaphora, movement processes and constraints. Discussion of the relation between language universals and linguistic typology. Prerequisite: Linguistics 121. Concurrent with Linguistics 260.

163B The Structure of English (4). An examination of American English phonology, morphology, and syntax. Useful for prospective teachers of English in elementary and secondary schools and for teachers of English as a second language. Prerequisite: Linguistics 3. Same as English 181.

164A Topics in Romance Languages (4). Prerequisites vary. May be repeated for credit as topic varies. Concurrent with Linguistics 264A.

164B French Phonetics (4). Study of the sound structure of French. Introduction to elements of general phonetics, contrastive (French/English) phonetics, and French phonetics and phonology. Designed to help students improve their pronunciation. Also serves as a preparatory course for language teaching. Prerequisite: French 2C or equivalent.

165A Linguistic Structure of Chinese (4). Introduction to the phonology and major syntactic patterns of Mandarin Chinese. Prerequisite: Chinese 2C or Linguistics 10 or 20. Same as East Asian Languages and Literatures 113. Concurrent with Linguistics 265A.

165B Linguistic Structure of Japanese (4). Detailed analysis of essential grammatical aspects of Japanese. Comparison with aspects of English grammar. Course not designed to teach Japanese per se, but to study the grammatical characteristics of Japanese from the perspective of theoretical linguistics. Prerequisite: Linguistics 10 or 20. Same as East Asian Languages and Literatures 123.

165C Linguistic Structure of Korean (4). Introduction to essential grammatical aspects of the Korean language. Comparisons to other languages. Prerequisite: East Asian Languages and Literatures 2C or consent of instructor. Same as East Asian Languages and Literatures 133.

166A Structures of Non-Indo-European Languages (4). Nontechnical analysis of essential grammatical aspects of selected non-Indo-European languages. Comparison and contrast with aspects of the grammars of more familiar Indo-European languages (e.g., English and French) are emphasized. Prerequisite: Linguistics 3.

166B Indian Languages of the Americas (4). Survey of the native languages of North and/or South America, focusing on the range of sound systems, morphological processes, and syntactic structures exhibited by this diverse group of languages. Also considers the linguistic affiliations of the surveyed languages. Prerequisite: Linguistics 3.

168A Sociolinguistics (4). Examines descriptions and explanations of systematic patterns of language use in society, in particular how geographical and social factors give rise to a range of variations in a given language (dialects). Includes aspects of language change, language planning, language death. Prerequisites: Linguistics 3 and satisfactory completion of the lower-division writing requirement.

169 Special Topics in Language Studies (4). Prerequisites vary. May be repeated for credit as topic varies.

170–179: HISTORICAL LINGUISTICS

170 Historical Linguistics (4). Study of language change. Methods of historical analysis of language. Classification of languages and aspects of language change by internal reconstruction and the comparative method. Prerequisite: Linguistics 3. Recommended: Linguistics 10.

172 History of English (4). External (historical and social) and internal (linguistic) changes which have affected the English language from its Germanic roots to the present day. Prerequisite: Linguistics 3. Same as English E 184.

179 Special Topics in Historical Linguistics (4). Prerequisites vary. May be repeated for credit as topic varies.

180–189: COGNITIVE SEMIOTICS

180 Introduction to Cognitive Semiotics (4). Symbols and their webs. The foundation course in cognitive semiotics, comprising an introduction both from the philosophical standpoint represented by Peirce and from the linguistic standpoint represented by Dalgarno and Saussure. Current cognitive developments are studied.

181 History of Semiotic Theory (4). The history of semiotic theory from Aristotle through the Greek and Roman Stoics and St. Augustine to Peirce and the present. The seventeenth-century obsession with the creation of a "universal and philosophical language" is treated. Prerequisite: Linguistics 180. A reading knowledge of Greek and/or Latin is very helpful.

182 Cognitive Iconics (4). The study of writing systems (alphabets, runes, Mayan and Egyptian hieroglyphics) and their evolution and modern changes introduced spontaneously through "mistakes," with a view toward exploring aspects of the human mind.

183 Semiotic Theory of Writing Systems (4). Ancient and modern writing systems, ranging from Sumerian pictographs through Egyptian and Mayan hieroglyphs to the Phoenician alphabet and its modern descendants (including our own). Distinctive traits of written language (what can be written that cannot be said?) and issues distinguishing hand-execution from eye-recognition. Prerequisite: Linguistics 10.

184 Foundations of Communication (4). The logical and semiotic foundations of communication and signification.

189 Special Topics in Cognitive Semiotics (4). Prerequisites vary. May be repeated for credit as topic varies.

190–199: SPECIAL COURSES

H190 Senior Thesis (4-4-4). Prerequisite: enrollment in Honors Program in Linguistics and consent of instructor; completion of lower-division writing requirement.

H192 Honors Seminar (4). Critical reading of current literature and discussion of work in progress by members of the department. A research paper is required. Prerequisite: enrollment in Honors Program in Linguistics and consent of instructor. May be repeated for credit as topics vary.

H195 Honors Research Workshop (4). Research methods and paper-writing skills. Students present various stages of their Honors thesis research projects for feedback and guidance from the professor and each other. Prerequisite: enrollment in Honors Program in Linguistics and consent of instructor. May be repeated for credit as topics vary.

197 Field Study (4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

198 Directed Group Study (4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

199 Independent Study (4). Prerequisite: consent of instructor. May be repeated for credit as topic varies. Students may enroll for only one 199 each quarter.

GRADUATE

209 Topics in Linguistics (1 to 4). Focuses on ongoing research in linguistics. Variable units based on course content as determined by Department. May be repeated for credit as topics vary.

210–219: PHONETICS/PHONOLOGY

211 Phonology I (4). Fundamentals of phonological theory. Intensive practice in phonological analysis. Prerequisite: graduate standing. Concurrent with Linguistics 111.

212 Phonology II (4). Overview of recent developments in phonological theory. Prerequisite: Linguistics 211. Concurrent with Linguistics 112.

214 Phonology III (4). Intensive study of a small number of current topics in phonological theory. Prerequisite: Linguistics 212. May be repeated for credit as topic varies. Concurrent with Linguistics 114.

218 Seminar in Phonetics/Phonology (4). Focuses on ongoing research in phonetics/phonology. Prerequisite: Linguistics 214 or consent of instructor. May be repeated for credit as topic varies.

219 Topics in Phonetics/Phonology (4). Prerequisites vary. May be repeated for credit as topic varies.

220–229: SYNTAX

221 Syntax I (4). Examination of syntactic phenomena and analysis, with emphasis on current issues in grammatical theory. Focus on the nature of syntactic rules, representations, and constraints as they determine empirical properties of language. Prerequisite: graduate standing. Concurrent with Linguistics 121.

222 Syntax II (4). Intensive investigation of selected current topics in syntactic theory. Readings drawn from primary literature. Prerequisite: Linguistics 221. Concurrent with Linguistics 122.

224 Syntax III (4). Research seminar in syntax. Intensive study of a small number of well-defined topics which have had significant impact on the development of syntactic theory. Prerequisite: Linguistics 222. May be repeated for credit as topic varies. Concurrent with Linguistics 124.

228 Seminar in Syntax (4). Seminar representing instructor's and graduate students' current research. Prerequisite: Linguistics 224 or consent of instructor. May be repeated for credit as topic varies.

229 Topics in Syntax (1 to 4). Prerequisites vary. May be repeated for credit as topic varies.

230–239: MORPHOLOGY

232 Morphology and the Lexicon (4). Study of the lexical representations of words; relation of the lexicon to phonology, morphology, and syntax, with special emphasis on recent theoretical developments. Prerequisite: graduate standing. Concurrent with Linguistics 132.

239 Topics in Morphology (4). Prerequisites vary. May be repeated for credit as topic varies.

240–249: SEMANTICS

240 Formal Foundations of Linguistics (4). Introduction to the fundamental concepts of logic, set theory, and automata theory, and their relation to linguistics. Prerequisite: graduate standing. Concurrent with Linguistics 140.

241 Topics in Philosophy of Language (4). Prerequisite: graduate standing. May be repeated for credit as topics vary. Same as Logic and Philosophy of Science 245 and Philosophy 245.

243 Semantics I (4). The role of semantics in an integrated linguistic theory. Examination of a truth theory for natural language and the role of logical form as the interface of syntax and semantics. Discussion of reference, predication, quantification, and intentionality. Readings drawn from linguistic and philosophical sources. Prerequisite: graduate standing. Concurrent with Linguistics 143.

244 Semantics II (4). The empirical study of semantics within linguistic theory. Emphasis on the Theory of Logical Form and its integration in the broader context of the representation of syntactic and semantic structure. Explores quantification, anaphora and ellipsis. Prerequisite: Linguistics 243.

248 Seminar in Semantics (4). Focuses on ongoing research in semantics. Prerequisite: Linguistics 244 or consent of instructor. May be repeated for credit as topic varies.

249 Topics in Semantics (4). Prerequisites vary. May be repeated for credit as topic varies.

250–259: PSYCHOLINGUISTICS

258 Seminar in Psycholinguistics (4). Focuses on ongoing research in psycholinguistics. Prerequisite: graduate standing. May be repeated for credit as topic varies.

259 Topics in Psycholinguistics (4). Prerequisites vary. May be repeated for credit as topic varies.

260–269: LANGUAGE STUDIES

260 Language Typology (4). Cross-linguistic survey of major linguistic phenomena, especially as they pertain to word order, phrase structure, grammatical relations, anaphora, movement processes and constraints. Discussion of the relation between language universals and linguistic typology. Prerequisite: Linguistics 221 or consent of instructor. Concurrent with Linguistics 160.

264A Topics in Romance Languages (4). Prerequisites vary. May be repeated for credit as topic varies. Concurrent with Linguistics 164A.

265A Linguistic Structure of Chinese (4). Introduction to the phonology and major syntactic patterns of Mandarin Chinese. Open only to Linguistics graduate students or consent of instructor. Concurrent with Linguistics 165A and East Asian Languages and Literatures 113.

268 Seminar in Language Studies (4). Seminar in language studies. Prerequisite: graduate standing. May be repeated for credit as topic varies.

269 Topics in Language Studies (4). Prerequisites vary. May be repeated for credit as topic varies.

DEPARTMENT OF LOGIC AND PHILOSOPHY OF SCIENCE

721 Social Science Tower; (949) 824-1520
Jeffrey A. Barrett, **Department Chair**

The Department of Logic and Philosophy of Science (LPS) brings together faculty and students interested in a wide range of topics loosely grouped in the following areas: general philosophy of science; philosophy of the particular sciences; logic, foundations and philosophy of mathematics; and philosophy of mathematics in application. LPS enjoys strong cooperative relations with UCI's Department of Philosophy; in particular, the two units jointly administer a single graduate program which offers the Ph.D. in Philosophy. LPS also has strong interconnections with several science departments, including Mathematics and Physics, as well as the School of Biological Sciences, the Donald Bren School of Information and Computer Sciences, the Departments of Cognitive Sciences and Economics, and the graduate concentration in Mathematical Behavioral Sciences.

Graduate Program

Faculty

Aldo Antonelli: Logic, philosophy of mathematics, history of analytic philosophy
Jeffrey A. Barrett: Philosophy of science, philosophy of physics, philosophy of quantum mechanics, epistemology
William Demopolous: Frege and the philosophy of logic and mathematics
Kent Johnson: Philosophy of language, philosophy of mind
Penelope Maddy: Philosophy of mathematics, philosophy of logic, philosophy of science, history of analytic philosophy
David Malament: Philosophy of physics, foundations of geometry, foundations of relativity theory
Robert May: Semantics, syntax, philosophy of language
Brian Skyrms: Philosophy of science, decision theory, game theory, philosophy of biology, epistemology, metaphysics
Kyle Stanford: Philosophy of science, philosophy of biology, history of modern philosophy, metaphysics
Kai F. Wehmeier: Logic, philosophy of mathematics, history of analytic philosophy

Affiliated Faculty

Francisco Ayala: Evolutionary biology, philosophy of science, philosophy of biology
Patricia Churchland *(UCSD):* Philosophy of neuroscience and psychology
Paul Churchland *(UCSD):* Philosophy of science, philosophy of mind, artificial intelligence and cognitive neurobiology, epistemology, and perception
Paul Eklof: Mathematical logic
Matthew Foreman: Mathematical logic
Steven Frank: Evolutionary biology
Donald Hoffman: Human and machine vision
Duncan Luce: Mathematical behavioral science
D.A. Martin *(UCLA):* Logic, set theory, philosophy of mathematics
James McGaugh: Neurobiology of learning and memory
Yiannis Moschovakis *(UCLA):* Set theory, recursion theory
Louis Narens: Measurement, logic, and metacognition
Riley Newman: Experimental particle physics and gravitational physics
Terence Parsons *(UCLA):* Philosophy of language, metaphysics
Donald Saari: Mathematical economics, mathematical behavioral science, celestial mechanics
Jonas Schultz: Experimental particle physics
Norman Weinberger: Neural bases of attention and learning
Martin Zeman: Logic and combinatorics

The Department of Logic and Philosophy of Science and the Department of Philosophy jointly administer a Ph.D. program in Philosophy with two independent tracks: the Philosophy track and the LPS track. Both tracks begin from a common core of requirements in standard philosophical fields (e.g., history of philosophy, logic, ethics, metaphysics/epistemology) and branch off thereafter; both tracks offer the Ph.D. degree in Philosophy. Applicants are advised to apply to the unit whose faculty, areas of specialization, and curriculum correspond best with their interests. Students are expected to reside in the same unit as their primary advisor, but faculty in both units are available for all other academic purposes (course work, independent studies, committee membership, and more). See the Department of Philosophy in the School of Humanities for a description of the Philosophy track.

The M.A. degree in Philosophy may also be awarded to Ph.D. students who complete the necessary requirements.

ADMISSIONS

Applicants for the LPS track must have a bachelor's degree, but there is no formal requirement as to the field of that degree. The most natural undergraduate majors for LPS graduate students would be philosophy, mathematics, or the sciences, but those with other degrees who are interested in the LPS fields should feel free to apply.

Complete applications must include GRE scores, transcripts, letters of recommendation, and a writing sample. The deadline for application is January 15.

Several forms of incoming fellowships are available on a competitive basis; these include a stipend, student fees, and tuition (for out-of-state students). In subsequent years, some additional fellowship funding is available, but students in good standing are most often supported with teaching assistantships.

REQUIREMENTS OF THE LPS TRACK

All required courses must be completed with a grade of B or better.

The **History of Philosophy Requirement** provides a broad perspective. Graduate courses in three out of the following four areas—Modern Rationalism, Modern Empiricism, Kant, and Twentieth Century—must be completed by the end of the seventh quarter in residence.

The **Logic Requirement** acquaints students with the fundamentals of modern logic: elementary set theory, metalogic, effective procedures and Gödel's incompleteness theorems. LPS 205A, 205B, and 205C must be completed by the end of the seventh quarter in residence.

The **Field Requirement** provides exposure to a range of philosophical disciplines. One graduate course in moral philosophy and one graduate course in metaphysics/epistemology must be completed by the end of the seventh quarter in residence. (These courses may not also be used to satisfy the History Requirement.)

The **Philosophy of Science Requirement** provides exposure to a range of philosophy of science, from general philosophy of science to the philosophies of particular sciences (e.g., physics, biology), to the philosophies of mathematics and logic. Three selected courses from LPS 240–247 must be completed by the end of the seventh quarter in residence. (These courses may be repeated as topics vary.) Courses used to satisfy the Philosophy of Science Requirement may also be used to satisfy the History or Field Requirements.

The **Tools of Research Requirement** provides some flexibility for students with various levels of interest in pursuing the philosophy of a particular science. So, for example, a student most interested in historical issues in the philosophy of mathematics might benefit most from the study of German, while a student most interested in the philosophy of quantum mechanics should take a series of graduate courses in physics. (Students wishing to specialize further in the philosophy of a particular science might wish to pursue more demanding options; see the Mathematics and Physics emphases, below.) To satisfy this requirement, a student must pass an examination on an appropriate foreign language or receive a grade of B or better in three appropriate graduate courses in a discipline or disciplines outside philosophy by the end of the ninth quarter in residence. Though the discipline(s) here must be outside philosophy, they might be taught by Philosophy or LPS faculty. The two-hour language examination will be administered by an LPS faculty member and will require the student to translate (with the aid of a dictionary) a passage or passages from philosophical or scientific authors.

The **Portfolio Requirement** ensures that students have acquired dissertation-level skills in the writing of philosophy: e.g., the ability to isolate, understand and evaluate arguments in the philosophical literature; the ability to assimilate secondary literature; the ability to formulate and defend an original philosophical thesis. The portfolio is designed to display these skills. To satisfy this requirement, a student must submit an extended writing sample, most often consisting of several individual papers, that demonstrates the skills necessary to write a Ph.D. dissertation. (A successful portfolio typically consists of several papers totaling around 80 pages. These may be revisions of term papers. Each paper should present and defend a definite thesis and should be accessible to faculty members unfamiliar with the literature in question. The papers in the portfolio need not be of publishable quality, but they must, collectively, demonstrate the specified skills.) Portfolios will be evaluated by the entire LPS faculty. (LPS track students may request that relevant Philosophy Department faculty also be present at the evaluation meeting.) Portfolios must be submitted by the end of the fourth week of the seventh quarter.

The **Candidacy Examination** demonstrates that the student has a viable dissertation topic and an adequate grasp of related literature. To satisfy this requirement, a student must prepare and be examined on a reading list of canonical literature in the area of the dissertation and a brief (15-20 page) dissertation proposal. The reading list should in effect define the context of the proposed dissertation. The examination must be completed by the end of the tenth quarter in residence. The normal time for advancement to candidacy is 3.3 years.

Dissertation Defense. Students must pass a final oral examination focussing on the content of the dissertation administered by the Dissertation Committee. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

LPS TRACK EMPHASIS IN MATHEMATICS

In addition to the LPS track described above, there is a more demanding option open to LPS students wishing to specialize in the foundations and/or philosophy of mathematics. Faculty in the UCI and UCLA Departments of Mathematics participate in the Mathematics emphasis. Students in the emphasis take courses and receive advising from these participating Mathematics professors, as well as from the faculty of LPS and the Philosophy Department. Mathematics emphasis students must satisfy the following requirement in addition to the usual LPS track requirements:

Mathematics Requirement. A student must receive a grade of B or better in six graduate courses in mathematics. (Some of these courses may also be used to satisfy the Tools of Research Requirement.) In addition, the student's Candidacy and Dissertation Committees must include an active member from the UCI or UCLA Departments of Mathematics.

LPS TRACK EMPHASIS IN PHYSICS

In addition to the LPS track described above, there is a more demanding option open to LPS students wishing to specialize in the foundations and/or philosophy of physics. Physics emphasis students must satisfy the following requirement in addition to the usual LPS track requirements:

Physics Requirement. A student must receive a grade of B or better in three sections of LPS 241 whose topics are Philosophy of Quantum Mechanics, Geometry and Spacetime, and Probability and Determinism, as well as in three additional graduate courses in Physics or Mathematics. (Students in the Physics Emphasis may also use these courses to satisfy the Tools of Research Requirement, but not the Philosophy of Science Requirement.)

SALZBURG EXCHANGE PROGRAM

LPS and the Department of Philosophy jointly administer an Exchange Program with the University of Salzburg. The program has two parts. The Scholarly Exchange provides opportunities for faculty and graduate students in LPS and Philosophy to visit Salzburg and for faculty and graduate students from Salzburg to visit one or the other of the UCI units. The Program also sponsors joint conferences, held alternately in Irvine and in Salzburg; these are co-sponsored by Salzburg and the UCI Interdisciplinary Program in the History and Philosophy of Science.

To be eligible for the Salzburg Exchange, a graduate student must have advanced to candidacy. The selected student spends one semester in Salzburg, usually teaching one course in the general area of the thesis topic. An upper-division course may be taught in English, but lower-division courses must be taught in German. (Some previous visitors have learned serviceable German by attending a Goethe institute during the preceding summer.) Typically, a Salzburg visitor will receive a Salzburg Fellowship intended to cover travel expenses, and a stipend; those who teach while in Salzburg will also receive a salary intended to cover living expenses (including health and dental insurance).

Applications from LPS graduate students (including a curriculum vita and syllabi for courses that might be taught) should be sent to the LPS Salzburg Exchange Director by November 1.

Courses in Logic and Philosophy of Science

LOWER-DIVISION

4A Scientific Revolutions (4). Explores two central themes: (1) using philosophical analysis to investigate the nature of the social sciences, and (2) using the social sciences themselves to study to nature of science. **(III)**

4B Case Studies in Social Science (4). Introduces students to three case studies in three different social science areas in order to show how the social sciences are in fact practiced. **(III)**

29 Critical Reasoning (4). Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies. Same as Philosophy 29. **(V)**

30 Introduction to Symbolic Logic (4). An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction and semantic tableaux. Same as Philosophy 30. **(V)**

31 Introduction to Inductive Logic (4). Philosophical questions concerning the foundations of scientific inference, e.g., the traditional problem of induction, the Goodman paradox, the concept of cause, Mill's method of inductive reasoning, probability calculus, different interpretations of probability, and their interaction in inductive reasoning. Prerequisite: Logic and Philosophy of Science 30 or 104. Same as Philosophy 31. **(V)**

40 Scientific Inquiry (4). Introduces the ways of science focusing on scientific methods and practices. Concrete historical examples of successful scientific inquiry are used including proposed solutions. The foundations and use of the social sciences to study scientific inquiry are examined.

102 Introduction to the Theory of Knowledge (4). A study of one or more of the basic issues in epistemology, e.g., the role of perception in the acquisition of knowledge, the nature of evidence, the distinction between belief and knowledge, and the nature of truth and certainty. Same as Philosophy 102.

104 Introduction to Logic (4). Introduction to sentence logic, including truth tables and natural deduction; and to predicate logic, including semantics and natural deduction. Same as Philosophy 104.

105A Elementary Set Theory (4). An introduction to the basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers. Prerequisite: Logic and Philosophy of Science 104, Mathematics 6B, an upper-division course in Mathematics, or consent of instructor. Logic and Philosophy of Science 105A and Mathematics 151 may not both be taken for credit. Same as Philosophy 105A.

105B Metalogic (4). Introduction to formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Löewenheim-Skolem theorems. Prerequisite: Logic and Philosophy of Science 105A or consent of instructor. Logic and Philosophy of Science 105B and Mathematics 150 may not both be taken for credit. Same as Philosophy 105B.

105C Undecidability and Incompleteness (4). Introduction to the formal theory of effective processes, including recursive functions, Turing machines, Church's thesis, and proofs of Göedel's incompleteness theorem for arithmetic, and Church's undecidability theorem for first-order logic. Prerequisite: Logic and Philosophy of Science 105B or consent of instructor. Logic and Philosophy of Science 105C and Mathematics 152 cannot both be taken for credit. Same as Philosophy 105C.

106 Topics in Logic (4). Selected topics in mathematical or philosophical logic. Prerequisite: Logic and Philosophy of Science 105B or consent of instructor. May be repeated for credit as topics vary. Same as Philosophy 106.

107 Computability Theory (4). Aims to provide an introduction to recursive function theory, with special emphasis on the theory of the recursively enumerable sets of natural numbers and their "fine structure" under various notions of reducibility. Same as Philosophy 107.

108 Topics in Induction, Probability, and Decision Theory (4). Selected topics in induction, probability, and decision theory. May be repeated for credit as topics vary. Same as Philosophy 108.

113 Topics in Modern Philosophy (4). Focuses on the works of one or more of the central philosophical figures of the modern period (e.g., Descartes, Leibniz, Hobbes, Locke, Hume, Kant) or the treatment of one or more central philosophical problems by a number of these figures. May be repeated for credit as topics vary. Same as Philosophy 113.

115 Topics in History of Analytic Philosophy (4). Review of one or more central theories or figures in the history of analytic philosophy. Emphasis is on the study of original sources, especially writings of Frege, Russell, Schlick, Carnap, and Quine. Topics include the nature of meaning and truth, the synthetic/analytic distinction, and scientific knowledge. May be repeated for credit as topics vary. Same as Philosophy 115.

120 Topics in Metaphysics (4). Examines central philosophical questions concerning our own fundamental nature and that of the world around us (e.g., causation and necessity, determination, free will, personal identity, the mind-body problem). May be repeated for credit as topics vary. Same as Philosophy 120.

121 Topics in the Theory of Knowledge (4). One or more topics in the theory of knowledge, e.g., the nature of rational justification, of perceptual knowledge, of *a priori* knowledge. May be repeated for credit as topics vary. Same as Philosophy 121.

140 Topics in Philosophy of Science (4). Selected topics in contemporary philosophy of science, e.g., the status of theoretical entities, the confirmation of theories, the nature of scientific explanation. May be repeated for credit as topics vary. Same as Philosophy 140.

141A Topics in Philosophy of Physics (4). Selected topics in the philosophy of physics, e.g., the interpretation of quantum mechanics, the nature of spacetime, the problem of quantum field theories. May be repeated for credit as topics vary. Same as Philosophy 141A.

141B Geometry and Spacetime (4). An examination of issues concerning the mathematical and philosophical foundations of the special theory of relativity. Among topics discussed is the alleged conventionality of simultaneity. Same as Philosophy 141B.

141C Philosophy of Quantum Mechanics (4). An examination of the standard von Neumann-Dirac formulation of quantum mechanics. The quantum measurement problem is discussed along with several proposed solutions, including GRW, many-worlds, man-minds, and Bohm's theory. Same as Philosophy 141C.

141D Probability and Determinism (4). An examination of a number of interrelated issues concerning determinism and probability in physics. Includes the senses in which Newtonian mechanics is and is not deterministic and a discussion of the probabilistic structure of quantum mechanics. Same as Philosophy 141D.

142 Writing/Philosophy of Biology (4). Philosophy of biology, e.g., scientific method in biology, the structure of evolutionary theory, teleology, ethics, and evolution. Course work includes one 4,000-word and four 1,000-word papers. Prerequisite: satisfactory completion of the lower-division writing requirement; Philosophy 40 recommended as background. Same as Biological Sciences E142 and Philosophy 142.

143 Topics in Philosophy of Psychology (4). Selected topics in the philosophy of psychology, e.g., the nature of psychological explanation, reductionism, issues in cognitive, behavioral, and neuroscience. May be repeated for credit as topics vary. Same as Philosophy 143.

145 Topics in Philosophy of Language (4). Selected topics in the philosophy of language, e.g., the nature of meaning, mechanisms of reference, speech acts. May be repeated for credit as topics vary. Same as Linguistics 141 and Philosophy 145. May be repeated for credit as topics vary.

146 Topics in Philosophy of Logic (4). Selected topics in the philosophy of logic, e.g., the nature of logical truth and our knowledge of it, the status of propositions, definite descriptions, and existential presuppositions. May be repeated for credit as topics vary. Same as Philosophy 146.

147A Introduction to Philosophy of Mathematics (4). Historical background (e.g., Kant), the three great schools at the turn of the century (logicism, formalism, intuitionism), the positivists and their critics (Carnap, Quine), contemporary views and problems (e.g., Quine, Benacerraf). Same as Philosophy 147A.

147B Topics in Philosophy of Mathematics (4). Further historical or contemporary issues in the philosophy of mathematics. May be repeated for credit as topics vary. Same as Philosophy 147B.

199 Independent Study (1 to 4). Investigation of special topics. May be taken for credit for a total of 12 units.

GRADUATE

200 Topics in Logic and Philosophy of Science (4). May be repeated for credit as topics vary.

205A Set Theory (4). The basic working vocabulary of mathematical reasoning. Topics include: sets, Boolean operations, ordered n-tuples, relations, functions, ordinal and cardinal numbers. Same as Philosophy 205A.

205B Metalogic (4). Formal syntax (proof theory) and semantics (model theory) for first-order logic, including the deduction, completeness, compactness, and Loewenheim-Skolem theorems. Prerequisite: Logic and Philosophy of Science 205A. Same as Philosophy 205B.

205C Undecidability and Incompleteness (4). Formal theory of effective processes, including recursive function, Turing machines, Church's thesis, and proofs of Goedel's incompleteness theorem for arithmetic, and Church's undecidability for first-order logic. Prerequisite: Logic and Philosophy of Science 205B. Same as Philosophy 205C.

206 Topics in Logic (4). May be repeated for credit as topics vary. Same as Philosophy 206.

209 Logic for Artificial Intelligence (4). After introducing the standard theory and meta-theory of classical first-order logic, the course surveys the fundamental tools, methods, and results developed in Artificial Intelligence in order to represent defeasible reasoning.

213 Topics in Modern Philosophy (4). May be repeated for credit as topics vary. Same as Philosophy 213.

215 Topics in Analytic Philosophy (4). May be repeated for credit as topics vary. Same as Philosophy 215.

220 Topics in Metaphysics (4). May be repeated for credit as topics vary. Same as Philosophy 220.

221 Topics in Epistemology (4). May be repeated for credit as topics vary. Same as Philosophy 221.

232 Topics in Political and Social Philosophy (4). Same as Philosophy 232.

240 Topics in Philosophy of Science (4). May be repeated for credit as topics vary. Same as Philosophy 240.

241 Topics in Philosophy of Physics (4). May be repeated for credit as topics vary. Same as Philosophy 241.

242 Topics in Philosophy of Biology (4). May be repeated for credit as topics vary. Same as Philosophy 242.

243 Topics in Philosophy of Psychology (4). May be repeated for credit as topics vary. Same as Philosophy 243.

244 Topics in Philosophy of Social Science (4). May be repeated for credit as topics vary. Same as Philosophy 244.

245 Topics in Philosophy of Language (4). May be repeated for credit as topics vary. Same as Linguistics 241 and Philosophy 245.

246 Topics in Philosophy of Logic (4). May be repeated for credit as topics vary. Same as Philosophy 246.

247 Topics in Philosophy of Mathematics (4). May be repeated for credit as topics vary. Same as Philosophy 247.

289 Logic and Philosophy of Science Workshop (1 to 4). A two- or three-quarter-long workshop on selected topics in logic and philosophy of science. In-progress grading, Satisfactory/Unsatisfactory only. May be repeated for credit as topics vary. Same as Philosophy 249.

298 Independent Study (4 to 12). May be repeated for credit for a total of 12 units.

299 Dissertation Research (4 to 12). May be repeated for credit for a total of 12 units.

398 Teaching Assistant Training Program (4 to 12). May be repeated for credit for a total of 12 units.

399 University Teaching (4 to 12). May be repeated for credit for a total of 12 units.

DEPARTMENT OF POLITICAL SCIENCE

5229 Social Science Plaza B; (949) 824-5361
Mark P. Petracca, **Department Chair**

Undergraduate Program

The Department of Political Science offers a wide variety of courses at the introductory, lower-division, and more specialized upper-division levels. Courses in both micropolitics (individual and group politics) and macropolitics (politics at the state and international levels) are offered. The curriculum is organized into five areas: American politics and society, political theory, international relations, comparative politics, and public law. The Department also offers an Honors Program in Political Science for juniors and seniors, culminating in a senior honors thesis.

The Department is composed of a strong and diverse faculty especially interested in analyzing central questions of political science related to such topics as policy-making, political structures, participation, conflict, change and development, power and authority, and interstate relations. The faculty has particular strength in interdisciplinary approaches, in comparative analysis, and in the application of quantitative data to political science issues.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 430.

Departmental Requirements for the Major in Political Science

School requirements must be met and must include 11 courses (44 units) as specified below:

I. Five lower-division (one or two digit) Political Science courses selected as indicated either in option A or option B. Students are encouraged to take most of these courses during their first two years as a Political Science major at UCI.

Option A: Political Science 6A, 6B, and 6C (12 units), plus the lower-division introductory course (4 units) for the module selected under II below, plus any one additional lower-division course in Political Science (4 units).

Option B: Three lower-division courses (12 units) selected from Political Science 21A, 31A, 41A, 51A, and 61A, plus any two additional lower-division Political Science courses (8 units). One of these five courses must be the lower-division introductory course for the module selected under II below.

II. Six upper-division courses in Political Science (24 units) chosen from among the Political Science modules numbered 120–179. Three of these courses must be from one module.

Honors Program in Political Science

The Honors Program in Political Science is open to all junior and senior Political Science majors who meet the minimum academic qualifications (3.5 GPA in Political Science courses and 3.2 GPA overall). In addition to satisfying the requirements for the major in Political Science, Honors Program participants must complete additional course work as specified below.

During their junior year, Honors program students must enroll in at least one Honors Seminar (Political Science H180). These courses include intensive reading and discussion of the most influential works and fundamental issues in modern political science, and prepare students for rigorous independent research. Students should also prepare a written proposal for their senior thesis. Proposals are approved by their faculty advisor and filed with the Department and Undergraduate Counseling offices.

During their senior year, students must enroll in the Honors Thesis Workshop (Political Science H182A, offered during the fall quarter), and three quarters of the Senior Thesis course (Political Science 190). Students write their senior thesis, which is designed and completed under their faculty advisor's supervision. Upon successful completion of their senior thesis, students graduate with Honors in Political Science and their transcripts note that they were in the Honors Program in Political Science.

Public Affairs Internship Program

The Public Affairs Internship Program, sponsored by the Department of Political Science, is designed to provide Political Science and other students with professional experience in the fields of government, nongovernmental organizations, the media, law, business, consulting, and others. The program is open to all sophomores, juniors, and seniors.

This program provides a selection of internship opportunities open to students by intern-sponsors, as available. Students also may create their own internship opportunities, consistent with Departmental guidelines. Students are required to enroll in Political Science 183 during the quarter of their internship. This course, supervised by the internship coordinator and participating members of the faculty, is offered Pass/Not Pass and cannot be used to satisfy upper-division Political Science requirements.

Information and applications are available in the Department office.

Political Science Minor Requirements

Requirements for the minor in Political Science are met by taking seven political science courses (28 units) as specified below:

A. One course selected from Political Science 6A, 6B, or 6C.

B. Three upper-division political science courses, chosen from one Political Science module.

C. Three additional courses in political science, chosen from those numbered Political Science 6A, 6B, 6C, 20–79, or 120–179.

Graduate Program

Participating Faculty

Matthew N. Beckmann: American political institutions, the Presidency, Congress, interest groups, and survey research methodology
Alison Brysk: International relations, Latin American politics, human rights
Russell J. Dalton: West European politics, mass political behavior
James Danziger: Urban political systems, public policy analysis, and technology and politics
Louis DeSipio: American politics, ethnic politics, Latino politics and public policy
David Easton: Political systems, political structures
Martha Feldman: Organization theory, organizational change, decision making, public management, qualitative research methods
Lisa García Bedolla: Chicana-Latina studies, American politics, race and ethnicity
Bernard Grofman: Mathematical models of collective decision making, formal democratic theory, sequential decision making, and politics of small groups
Helen Ingram: Public policy, U.S.–Mexico relations, American politics
Marek Kaminski: Institutions of democracy, game theory, methodology, and statistics
Claire Jean Kim: Racial and ethnic politics, protest and social movements, contemporary political theory
Cecelia Lynch: International relations, peace politics, and international law
Richard Matthew: International politics, environmental policy
Anthony McGann: Formal modeling of political systems, comparative political economy, West European politics
David S. Meyer: Social movements, public policy, peace and war, social justice
Kristen R. Monroe: Political economy, rationality, American politics, methodology

Patrick Morgan: National security policy, American foreign policy, international politics, U.S.–European relations, Soviet politics
Jack W. Peltason: Constitutional law and civil liberties
Mark P. Petracca: American political institutions (presidency and congress), interest organizations, public policy, power and political discourse
Shawn Rosenberg: Political psychology, cognitive psychology, public opinion
Kamal Sadiq: Comparative politics, immigration in developing countries, India and South East Asia, Asian security
Wayne Sandholtz: International political economy, European community
William Schonfeld: Authority, democratic theory, and comparative politics
Caesar D. Sereseres: U.S. foreign policy, U.S.–Latin American relations, Mexican-American politics
Etel Solingen: International relations theory, international political economy, and world politics
Dorothy J. Solinger: Chinese domestic politics and political economy, comparative politics, East Asian politics, and democratization
Rein Taagepera: Mathematical models and quantitative analysis of elections, inequality, arms races, growth-decline phenomena and Baltic area studies
Katherine Tate: African American and minority politics, voting behavior, public opinion and American elections, state and urban politics
Rodolfo D. Torres: Urban politics, the State and class structures, studies in racism and inequality, poverty and social policy
Yuliya V. Tverdova: Comparative politics, methodology
Carole J. Uhlaner: Comparative political participation, formal models of political behavior
Robert Uriu: International relations, international political economy, Japanese political economy
Martin Wattenberg: American political behavior and institutions

The Department of Political Science offers a Ph.D. degree program in Political Science. The Department has attained a reputation for producing the very best innovative and interdisciplinary scholarship. Faculty are engaged in the study of such key questions as the politics of advanced and democratizing societies, international cooperation and peace, the politics of racial and ethnic minority groups, and the origins of altruism and morality and their impact on world politics.

Graduate students can pursue concentrations in public choice and political psychology and specializations in democracy studies, international relations, and race and minority politics. The Ph.D. program offers big payoffs to graduate students, in fact, because of the extended range of inquiry an interdisciplinary program affords.

Political Science faculty members are regular participants in and help direct several research units on campus. The Center for the Study of Democracy, an Organized Research Unit at UCI, sponsors research and education aimed at improving the democratic process in the United States and expanding democracy around the world. The UCI Interdisciplinary Center for the Scientific Study of Ethics and Morality explores questions concerning the origins and causes of morality. The Center for Global Peace and Conflict Studies (CGPACS), housed in the School of Social Sciences, is a multidisciplinary program dedicated to promoting scholarly, student, and public understanding of international conflict and cooperation. The Institute for Mathematical Behavioral Sciences, also located in the School of Social Sciences, offers opportunities for participation in ongoing faculty research, notably with faculty members engaged in fields of public choice and political economy.

ADMISSIONS

The deadline for application for fall quarter admission is January 15. Students are admitted for winter or spring quarters only under exceptional circumstances. Additional information is available in the general section on admission to Social Science graduate programs. Please note especially the required examinations.

REQUIREMENTS

First-year students must take a core program of graduate seminars, focusing on major substantive areas as well as research methods. Students are required to complete one year of statistics, preferably before enrollment but no later than their first year. Competence in a foreign language is required. Students may substitute mastery of an advanced research skill in place of a foreign language. To acquire such a skill (which could involve course work in such disciplines as economics, mathematics and computer science, or statistics), students could take courses in econometrics, advanced multivariate regression, or computer science. Attendance in a colloquium series also is required for all graduate students during their first two years in residence.

Reviews and Examinations

Students ordinarily are expected to maintain a grade point average of 3.5 or better. At the completion of the first year, a review of performance in the graduate program will be conducted for each student by the Political Science faculty.

A set of three papers, normally completed by the third year of study, tests the student's competence in a set of major domains for intellectual inquiry. These domains are determined by the student and the Political Science Graduate Director. Upon successful completion of these papers and demonstration of competence in mathematics and a foreign language or an advanced research skill, a candidacy committee is appointed to oversee the qualifying examination and the formal advancement to candidacy. Students are expected to advance to candidacy by the ninth quarter of graduate study.

After the student advances to candidacy, the doctoral committee, usually composed of three members of the candidacy committee, reviews a dissertation prospectus and supervises work toward completion of the dissertation. Within six months of the oral qualifying examination (the formal advancement to candidacy), students are expected to meet with their doctoral committee, in order to discuss with the members a dissertation prospectus.

The normal time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

Concentration in Public Choice

Public Choice is an interdisciplinary field, at the intersection of political science and economics, which draws on sophisticated quantitative tools to model the functioning of political institutions. Public Choice examines such areas as theories of voter and party choice; the theory of constitutions; the theory of committees and elections; models of regulation; problems of public goods and externalities; rent-seeking models; and issues in social choice, social welfare, and demand revelation.

This concentration is administered by an interdisciplinary committee of faculty from the Departments of Political Science and Economics. Students who elect this concentration are admitted under the normal procedures for the program in Political Science and must fulfill all the requirements for the Political Science degree, with the following modifications:

(1) Students must complete the three-quarter core sequence in Public Choice, which is taught jointly by Political Science and Economics faculty. This sequence is usually taken in the student's second or third year.

(2) Students must complete three additional graduate-level, four-unit courses in related fields with the consent of their graduate advisor, chosen from a set of courses designated by the interdisciplinary committee. The courses chosen are to be tailored to the individual interests and academic background of the student and

usually will include at least two Economics courses (such as Econometrics, Game Theory, and Law and Economics) and one Political Science course (such as those on electoral systems, party systems, constitutions, courts).

(3) Students are expected to write their dissertation on a topic related to Public Choice. Usually the dissertation advisor will be a Political Science member of the interdisciplinary committee.

Concentration in Political Psychology

The last two decades have seen an explosion of interest in the field of political psychology. UCI's graduate concentration is part of this development, but enjoys a rather distinctive place. The concentration offers students a broader education than is typically available at other institutions. In this vein, the program aims to provide: (1) a strong background in both political science and psychology; (2) an emphasis on theoretical and conceptual issues as well as empirical and methodological ones; and (3) a familiarity with research being done outside of the United States as well as within it. In this context, a number of research concerns central to the participating faculty are considered, including: social change and democratization, ideology, altruism, social and political identity, public policy, community building, mass media effects, voting behavior, and international integration. Believing in academic community, the concentration's sponsoring faculty offer a host of activities including colloquia, reading groups, and joint research opportunities to facilitate contact between students and faculty and among the students themselves.

Requirements. The purpose of the concentration is to provide a course of study which supplements the Ph.D. degree in Political Science. Therefore, students are required to complete all degree requirements for the Ph.D. stipulated by the Department of Political Science. As part of or in addition to these requirements, students must take five courses: Introduction to Political Psychology I and II (Political Science 285A and 285B), and three graduate psychology courses which provide a strong background in psychology (selected from an approved group which includes courses such as Personality in Development, Society and Pathology, Personality Assessment, Proseminar in Cognitive Science, and Human Information Processing). These courses are taught in the Department of Cognitive Science in the School of Social Sciences and the Department of Psychology and Social Behavior in the School of Social Ecology.

Courses in Political Science

LOWER-DIVISION

6 Introduction to Political Science. Basic introduction to politics and society. These courses can be taken in any order.

6A Introduction to Political Science: Political Analysis (4). Presents various modes of understanding politics. Emphasis on basic approaches to political analysis, their uses in constructing theories, and their application to particular national political systems. **(III, VII-B)**

6B Introduction to Political Science: Macropolitics (4). Introduction to political inquiry at the level of the nation-state. Addresses the questions: how do we account for the emergence of a world system of nation-states; how does the course of political development affect the distribution of political power within nation-states; what is the evolutionary linkage between liberal democracies and the transformation of capitalism; what are the major challenges to political governance facing western democracies. **(III)**

6C Introduction to Political Science: Micropolitics (4). Introduction to political behavior of individuals and groups within national systems. Three major questions are addressed: How do individuals come to understand the political world? How do individuals behave within this world? How do groups and individuals engage in the political process? **(III)**

21A Introduction to American Government (4). Introduction to American political processes and institutions. Topics include elections, political participation, parties, interest groups, the Presidency, Congress, the bureaucracy, and the judiciary. **(III)**

27A Introduction to Asian American Politics (4). Examines the political experiences of Asian immigrants and Asian Americans from the mid-1800s to the present, with a special focus on how an Asian American identity came to be constructed and deployed in the struggle for political equality. Same as Asian American Studies 51. **(VII-A)**

29 Special Topics for Introductory Courses (4). May be repeated for credit as topic varies.

31A Introduction to Political Theory (4). Types of questions: What is politics? What are the theoretical and philosophical bases for different types of political arrangements? How do these perspectives get translated into reality? Among others, the works of Rousseau, Locke, Mill, and Marx are read. **(III)**

39 Lower-Division Special Topics in Political Theory (4). May be repeated for credit as topics vary.

41A Introduction to International Relations (4). Analysis of political relations between and among nations with emphasis on explanations of conflict and cooperation. The role of ideologies and their relation to international problems are also examined. **(III, VII-B)**

42A Nuclear Arms and Global Conflicts (4). Introduction to the history, technical basis, military capacity, and political conceptions and perceptions that bear on the global nuclear arms race. Topics include how weapons work and are delivered, theories of deterrence, arms race models, prospects for arms control and disarmament. **(VII-B)**

43D Global Security and Cooperation (4). Examination of global conflict and cooperation since World War II, and future prospects. The Cold War, nuclear arms race, regional conflicts, arms proliferation and control, deterrence theory, psychology of conflict, governmental and nongovernmental efforts to promote global peace and cooperation. **(VII-B)**

44A Global Issues and Institutions (4). Surveys recent developments in the nature of global interdependence. Examines the major political, economic, and military conflicts of this century and recent problems of population growth, environmental decay, ethnic/national antagonism and violence, and post-Cold War politics. Same as International Studies 12. **(VII-B)**

49 Lower-Division Special Topics in International Relations (4). May be repeated for credit as topics vary.

51A Introduction to Comparative Politics (4). Presents various analytical methods used to compare political systems. Emphasis on examination of theories and research with national political systems as units of analysis. Understanding how it is possible to compare political units and make meaningful statements about them. **(III)**

59 Lower-Division Special Topics in Comparative Politics (4). May be repeated for credit as topics vary.

61A Introduction to Minority Politics (4). Examines major theories that attempt to explain the roles of race and ethnicity in U.S. politics, while also looking at the political attitudes and behaviors of ethnic and racial populations in order to measure their contemporary political influence. Same as Chicano/Latino Studies 64. **(III, VII-A)**

71A Introduction to Law (4). An introduction to the study of judicial politics. Questions include: what is law?; what is a court?; who are the judges? Analysis of a wide range of judicial decisions illustrates the political importance of courts in the U.S. and elsewhere. **(III)**

79 Lower-Division Special Topics in Law (4). May be repeated for credit as topics vary.

UPPER-DIVISION

120–129: AMERICAN POLITICS AND GOVERNMENT

121A The American Presidency (4). Presents a comprehensive survey of the American presidency and considers the question of political power.

121B Mass Media and the Nomination Process (4). Examines changes in the presidential nomination process over the last four decades as well as the role of the media in this process. Students do a research paper comparing the media's coverage of two nomination races in different historical eras.

121C U.S. Elections and Voting Behavior (4). Examines how voters evaluate political parties, candidates, and issues in electoral campaigns to reach their decisions. Numerous controversies concerning the degree of issue voting, sophistication of candidate evaluations, and the decline of political parties are discussed.

121D Public Policy (4). Introduction to the developmental processes, determinants, and substance of U.S. national public policy. The stages of issue generation, agenda-building, policy resolution, and implementation are examined within the context of specific policy areas.

121E Public Policy Analysis (4). Examines different approaches to the analysis of public policy with differing notions of what constitutes good policy, the role of government, and how citizens participate in policy-making. Suggests a policy-design perspective which builds upon other frameworks but concentrates on goals, implementation structures, tools, and rationales. Prerequisites: Environmental Analysis and Design E8 and E109U. Same as Environmental Analysis and Design E157U.

121F Presidents Since World War II (4). Reviews the actions and character of presidents from Harry Truman through Bill Clinton. Each week a different president is examined from a variety of perspectives. Students are expected to write a substantial original research paper. Prerequisite: Political Science 21A.

122A American Metropolitan Politics (4). An analysis of the politics of urban and suburban cities. Main themes include alternative explanations of how political power is exercised and how policy decisions are made for urban governments; the structure of local political systems, including the problems of metropolitanism and federalism; the major policy problems facing the urban area, particularly from the perspective of the "underclass."

122B California Politics (4). Explores California state politics in comparison to other states in such dimensions as: nature of electoral competition, state constitutions, lobbying patterns, gubernatorial leadership, scope and innovativeness of major policies, relationship of politics and policies to differing electoral orientations and economic conditions.

122C The American Electorate (4). Provides an overview of how polls are conducted, and how they can be manipulated by question wording, sampling techniques, interviewing procedures, and context. Public attitudes toward Congress are examined, and students analyze survey data on their own as a research project.

123A Parties and Political Organizations (4). A consideration of the role that parties and other political organizations play in the American political process. Also looks at the development and significance of PACs, interest groups, and social movements as vehicles for democratic participation.

123B Representation and Redistricting (4). Deals with classical theories of representation: issues of racial and political representation in U.S. legislatures and city councils; proportional representation models and comparative election systems. Prerequisite: Political Science 21A.

123C Reforming American Politics (4). Assesses the demands and prospects for political reform in America. Where is political reform most needed? Why? What form shall it take? Focuses specifically on ethics of public decision-making, professionalization of American politics, institutional designs for democratic governance.

123D Research Methods in Political Science (4). Introduction to the methods of social science research. Examines the principles of the scientific method and then applies these methods in a class research project. Heavy emphasis on hands-on research.

124A The Politics of Protest in the U.S. (4). Examines the Civil Rights movement, the Black Power movement, and the women's movement in light of existing social movement theories. The theories are used to illuminate the three cases, and the cases are used to critique and revise the theories. **(VII-A)**

124B Latinos in U.S. Politics (4). Comparing the political issues facing Latino groups by examining their migration histories, voting behavior, non-electoral participation, and policy issues. Latino issues are examined on the national, state, and local levels, including formal representation, immigration, affirmative action, and language policy. Same Chicano/Latino Studies 151. **(VII-A)**

124C Comparative Minority Politics (4). Examines the political experiences of Blacks, Latinos, and Asian Americans in the United States from roughly 1950 to the present. Focuses on how each group has pursued political empowerment via both conventional political channels and social movements. Same as African American Studies 151, Asian American Studies 132, and Chicano/Latino Studies 147. **(VII-A)**

124D Race and Citizenship in America (4). The role U.S. citizenship policy has played in the social construction of race. Looks comparatively at citizenship experiences of different racial/ethnic groups to understand how the meaning of being a U.S. "citizen" has varied over time and across groups. Same as Chicano/Latino Studies 152. **(VII-A)**

124E African American Politics (4). Examines the politics of African Americans in order to gain a broader perspective of the American political process. Major developments in African American politics (including the civil rights movement, Black presidential bids), continuing problem of racism, responsiveness of key governing institutions. Same as African American Studies 121.

125A The United States Congress (4). Does the Congress do a good job of representing the American citizenry? Is it the most appropriate mechanism for the creation, resolution, and implementation of public policy? Prerequisite: satisfactory completion of the lower-division writing requirement.

125B Congress: The New Institutionalist Approach (4). Study of the U.S. Congress emphasizing how rules and institutions (filibuster, veto, the committee system, party caucuses) structure how the Congressional game is played. Combines theoretical study of procedures with the practical study of actual bills.

126A Mexican-Americans and Politics (4). Examines political development of Mexican-Americans. Topics include their "territorial" roots in the Southwest, demographics, political leadership and organization; policy issues of immigration, bilingualism, education, and economics; relations with other minority groups; the role of Mexican-Americans in U.S.–Mexico relations. Same as Chicano/Latino Studies 143. **(VII-A)**

126B Urban Policy Analysis (4). Problem-solving seminar examining key issues for urban political systems and the metropolitan area. Evaluation of the nature, quality, and feasibility of alternative analyses of a series of policy problems, such as housing, poverty/welfare policy, transportation, crime, education. Prerequisite: consent of instructor.

126C U.S. Immigration Policy (4). Examines selected immigration policy debates since the nineteenth century, rationale and consequences of immigration law since 1965, problems of administration, implementation and enforcement, impact of immigration policy on foreign relations, and contemporary debate regarding the future of U.S. policy. Same as Chicano/Latino Studies 163. **(VII-A)**

126D Urban Politics and Policy (4). Examines the economic limits of cities and welfare policy. Addresses such issues as why are the poor concentrated in the central cities? Which anti-poverty programs will work best in the cities? Which level of government is best able to combat poverty in the U.S.?

126E Education Politics and Policy (4). Examines the politics surrounding issues of public education (K-12) and the policies used to achieve certain education-related goods. Topics include political equality within policies of desegregation, funding, various types of choice, and standardized testing. Satisfactory completion of the lower-division writing requirement.

127A-B-C Economic Analysis of Government Behavior I, II, III (4-4-4). The study of government using the tools of economics. **127A:** The influence of voters' preferences on governmental policy; Arrow's impossibility theory; the Downsian theory of voting. **127B:** The effects of various taxation and expenditure policies, such as social security. **127C:** Research course in which students write a paper testing one of the theories covered in the first two quarters of the sequence. Prerequisite: Economics 100A-B or consent of instructor. Same as Economics 141A-B-C. Political Science 127B also same as Environmental Analysis and Design E158U.

128A Political Psychology (4). Examination of how psychological theory and research may be used to better understand political thought and behavior. Drawing on theories of learning, cognition, and personality, discusses the formation of political attitudes, the process of political decision-making, the nature of political leadership. Same as Psychology 176A.

128B Political Ideology (4). Examination of how people think about and understand politics, covering a range of issues from the nature of liberalism-conservatism opposition to the development of ideological thought during the college years, and using the work of anthropologists, psychologists, sociologists, political scientists. Prerequisite: satisfaction of the lower-division writing requirement.

129 Special Topics in American Politics and Society (4). May be repeated for credit as topic varies.

130–139: POLITICAL THEORY AND METHODS

130A Game Theory and Politics I (4). Introduction to game theory and a survey of its political applications. Examples of topics covered include voting in small committees, legislatures, and mass elections; interest group activities and environmental issues; institutional design, and the evolution of cooperative behavior. Prerequisite: Mathematics 1A or 1B.

130B Game Theory and Politics II (4). More advanced game theory and its political applications, beginning where Game Theory and Politics I ends. Examples of topics covered include revolutions; arms race; spatial models of party competition; political manipulation; political coalitions and their power. Prerequisite: Political Science 130A.

131A Political Thought Since Hobbes (4). Classic statements of political values from Hobbes to the present: classical liberalism, conservatism, radical democracy, liberal democracy, socialism, pluralism, Marxism, fascism, neoconservatism. Emphasis on underlying views of human nature and history. Prerequisite: upper-division standing or consent of instructor.

131B Marx and Nietzsche (4). Juxtaposes and compares two of the most powerful and penetrating intellects of the nineteenth century. Lectures deal primarily with biographical material and historical setting. Reading and discussions emphasize systematic comparison of their respective views of human nature, history, social discontents, and the future of Western societies.

131D Nietzsche (4). The social, economic, and political philosophy of Nietzsche. Nietzsche's seminal ideas about knowledge and language and how these ideas have influenced contemporary thinking concerning these subjects. Same as Sociology 127.

132A Critical Political Theory (4). Acquaints students with current political theories, critical of conventional thinking, which attempt to join political, economic, social, historical, linguistic, and philosophical concerns to questions involving the relationships between and among individuals, groups, and institutions in the society, economy, and polity. Prerequisite: upper-division standing. Same as Sociology 126.

132B-C-D Radical Social Proposals (4-4-4). An examination of current proposals for alternative mass media systems, political systems, and economic systems. Focus is on proposals aimed at increased citizen participation and control, and at more equal distribution of wealth. Prerequisite for 132B: satisfactory completion of the lower-division writing requirement.

132E Basic Societal Issues (4). For students who have serious concern about peace, economic justice, the environment, or the future of human society generally. Attempts to provide an understanding of the fundamental issues underlying such social problems; fundamental alternatives available for attempting to cope with them. Same as Sociology 172E. Students may not receive credit for both Political Science 32A/Sociology 72 and Political Science 132F/Sociology 172E.

133D Analytic Political Research (4). Encourages students to think creatively and analytically about politics by applying mathematical techniques as a means to increase understanding. Introduces the use of both static and dynamic mathematical models on such political topics as elections, revolution, and arms races.

134A Democratic Theory and Liberalism (4). A modern approach to democratic theory including social choice and empirical democratic theory. Addresses issues such as how institutions can be democratic, how minorities can be protected, how rights can be balanced against obligations, and how democracy can promote deliberation.

134B Modern Political Theory (4). Focuses on a different aspect of modern political theory each quarter.

134C Theories of Political Structure (4). An examination of alternative theories of political structure with particular attention to those found among sociologists such as Parsons, anthropologists such as Lévi-Strauss and Nadel, psychologists such as Piaget, and Marxists such as Althusser and Poulantzas. The objective is to test the utility of these approaches for the construction of a theory of political structure. Prerequisite: upper-division standing.

134D Theories for the Study of Politics (4). A critical introduction to alternative theories used for the study of politics. Special attention will be given to interpreting political life as a system of institutions and behaviors.

134F Social and Political Theory (4). Focus is on recent major work in social and political theory. An in-depth analysis of a relatively small body of writing. Authors discussed include Jurgen Habermas, Anthony Giddens, and Richard Rorty.

134H Language and Power (4). Seminar to study a theory of how reality/meaning/knowledge is created in language as a consequence of structures of power. Prerequisite: upper-division standing and consent of instructor. Strongly recommended: 3.5 GPA and/or background in modern language analysis.

134J Sexism and Power (4). Sexism may be seen as a particular form of socially constructed power which creates and maintains gender differences as relations and practices of structured inequalities. Males and females are objects constructed in a powered language dominated and controlled by males to their positional and distributional advantage. Prerequisite: upper-division standing. Same as Sociology 168.

135A Origins of Liberalism (4). Examines the ideals, social forces, and historical events that gave rise to liberal political theory. Topics include patriarchal authority, the divine right of kings, religious toleration, slavery, colonialism, political economy, the evolution of law, and tensions between liberty and equality. Prerequisite: Political Science 6B or 6C or consent of instructor.

136A Political Economy (4). Introduction to the interrelationships between the American economy and American politics. Follows two basic premises: (1) one can know nothing about politics if one does not understand its relationship to the economy; and (2) one can know nothing about economics if one does not understand how the economy is related to politics and how political language is used for economic purposes. Recommended: introductory courses in politics and economics.

136B History of Political Economy (4). Introduction to the major ideas in political economy. Stresses linkages between the humanities and political economic thought. A consideration of premarket and socialist politico-economic systems focuses attention on the cultural, historical, and political influences on economic systems. Politico-economic thought is viewed as part of the larger body of scientific inquiry into the natures of nature and humanity.

137A Politics and Human Nature (4). Addresses the central debate between positive social science and normative political theory: is there an intrinsic human nature? If so, what is it? What is its origin? And how much cultural variation does it display? Prerequisite: satisfactory completion of the lower-division writing requirement.

137B Types of Political Representation (4). Political representation plays an important role in democratic systems, but is elusive once examined closely. Students delve into the concept and relate different views to political life. Half of the course is spent on writing instruction. Prerequisite: satisfactory completion of the lower-division writing requirement. Recommended for upper-division students. Formerly Political Science 158B.

138A Moral Choice During the Holocaust (4). Considers moral choice by comparing some of the major theories of moral choice with empirical examinations of moral exemplars during one of the most difficult periods in recent history: the Holocaust. Prerequisite: satisfactory completion of the lower-division writing requirement.

138B Ethics and Public and Private Life: Advanced Seminar (4). Examines ethical issues in public and private life by considering traditional moral theory in light of specific moral dilemmas, such as environmental policy, genocide, abortion, euthanasia, social welfare, and aid to other countries. Prerequisite: satisfactory completion of the upper-division writing requirement or consent of instructor. Same as Environmental Analysis and Design E154U.

139 Special Topics in Political Theory and Methods (4). May be repeated for credit as topic varies.

140–149: INTERNATIONAL RELATIONS

141A Environmental Politics and Policy (4). Lecture, three hours. Provides a multifaceted foundation for the development of environmental problem-solving and policy-making skills. Examines "nature" from a range of historical and cultural perspectives. Links socio-ecological stress theories to a range of landscapes and contemporary debates. Current air, water, and land policies. Same as Environmental Analysis and Design E145U.

141B International Political Economy (4). Examination of problems in global political-economic relations through competing conceptual lenses or grand theories: mercantilism, liberalism, and marxism. Surveys North-North and North-South issues relating power and wealth. **(VII-B)**

141C International Political Economy of East Asia (4). Integration of theoretical perspectives in international political economy with the study of economic development in East Asia, with special emphasis on regional integration. **(VII-B)**

141D The European Union (4). Examination of the European Union as an ongoing political experiment. Assesses diverse explanations for the evolution of European economic and political integration. Analyzes the development of EU institutions/policies in such areas as trade, high technology, monetary relations, foreign policy. Prerequisite: upper-division standing. **(VII-B)**

141E U.S. Foreign Policy Toward Asia (4). U.S. policy toward the countries of East Asia: bilateral and regional security relationships, U.S. economic relations with the major Asian countries, the development of regional institutions, and human rights. **(VII-B)**

142B The International Relations of East Asia (4). Surveys various aspects of relations between the nations of East Asia. Topics include historical development of the region; current political and security relations, including the impact of the American military presence; other issues such as economic relations and human rights.

142C International Relations of Japan (4). An undisputed economic "superpower," Japan is internationally more significant today than ever before. Examines the historical background, salient issues, and future scenarios of the international relations of Japan.

142D U.S. Foreign Policy I: Globalism and Cold War (4). Looks at the changing international perspectives, policy responses, and military strategies of presidential administrations from Truman to Reagan. In assessing the motives and objectives of U.S. foreign policy leaders during the "Cold War" era, the concept of "national interest" is examined.

142E U.S. Foreign Policy II: Cold War Decline and After (4). Deals with U.S. foreign policy from the post-Vietnam War era through the collapse of the Cold War and into the emergence of the post-Cold War era, roughly from 1972 to the present.

142F U.S. Foreign Policy III: National Security Decision-Making (4). Concept of "national security" from 1947–1990s is reviewed. Organizational and psychological factors that influence decision-making, the dangers of "groupthink," and the issues of accountability are analyzed. National security agenda (military, economic, environmental, and social) for the 1990s is discussed.

142G U.S. Coercive Diplomacy (4). Examines the theory of compellence and the U.S. practice of coercive diplomacy—the power to change the behavior of other governments. Specific case examples include the Cuban missile crisis, bombing of North Vietnam, the Nicaraguan Contras, Desert Shield/Desert Storm, and Libya. Prerequisite: junior or senior standing.

143B Alternative Security (4). Seminar designed to critically evaluate the major means of preventing the outbreak of a great war—deterrence—and some major alternatives to this policy. Prerequisite: Political Science 42A.

143C Arms Control and International Security (4). General introduction to the theory and practice of arms control between the nuclear superpowers. Examines the history of the arms race, the disenchantment with disarmament, and the development of arms control as an alternative or complement to military power as a means of ensuring security. Prerequisite: Political Science 42A or consent of instructor.

143D Global Environmental Issues (4). While many agree that environmental problems threaten humankind, there is much disagreement over the nature of these threats and how to address them. This course examines global environmental issues from various perspectives in order to provide answers to these questions. Same as Environmental Analysis and Design E132U and International Studies 120.

143E Globalization and Its Discontents (4). Reviews current literature on globalization and its impact on global, regional, and domestic politics. Explores how different states, nations, and cultures respond to common global predicaments and opportunities emanating from the international economy and the global institutions associated with it. **(VII-B)**

143F Intelligence in International Politics (4). Intelligence agencies, activities, and functions—their impact on international politics; how governments and societies seek to control intelligence agencies and activities; and how intelligence agencies work—their techniques, resources, technology, problems, successes, and failures.

144A Approaches to International Relations (4). Reviews theoretical and methodological approaches to the study of international relations using contending perspectives to analyze power and influence, capabilities, interdependence, reciprocity, international regimes, anarchy, cooperation, imperialism, and hegemony.

145A Central America and U.S. Policy (4). Examines revolution in Latin America and U.S. response of accepting, shaping, or opposing "radical" regimes. Recent conflicts in Central America compared to Mexico, Bolivia, Guatemala, Cuba, and Grenada. The theory and practice of coercive diplomacy and the case of U.S.-Nicaragua relations (1979–90) studied in detail.

145B U.S.–Mexican Relations (4). Realism and interdependence theories are applied to this asymmetric relationship. Analysis of NAFTA, relations with Canada, current issues in trade, capital flows, migration, narcotics control, and energy. Emphasis on interplay of domestic politics (California, Mexican Americans) and foreign policy. Same as Chicano/Latino Studies 164. **(VII-B)**

146A Ethics and International Relations (4). Introduces students to the dynamic field of ethics and international relations. A variety of traditional and emerging perspectives are examined, skeptical views are discussed in detail, and arguments are illustrated with current cases. Same as Environmental Analysis and Design E190C. **(VII-B)**

147A International Cooperation (4). Examines different approaches to the study of international cooperation placing special emphasis on multilateral institutional and "regimes" in areas such as trade (GATT), security (nonproliferation), and the global environment. **(VII-B)**

147B Interdependence in World Politics (4). Examines the effects of transnational networks and international economic interactions—e.g., migration, trade, and capital flows—on international political outcomes. Focuses on the cases of U.S.–Mexican and U.S.–Canadian relations. **(VII-B)**

148B United Nations (4). Designed to familiarize students with the inner workings of the most important international organization in the world—the United Nations. Its purpose, structure, and influence on different regions of the world is discussed at length. Looks at other international and regional organizations. **(VII-B)**

149 Special Topics in International Relations (4). May be repeated for credit as topic varies.

150–159: COMPARATIVE POLITICS

151A East Asian Politics (4). Explores the recent history and political systems of China, Japan, and Korea, comparing the three countries with each other and with occasional reference to the United States, British, and French systems. **(VII-B)**

151B Introduction to Chinese Politics (4). Background to the Chinese revolution, rise of the Communist party; and institutions, ideology, and structure of Communist party rule from 1949–present. **(VII-B)**

151C Chinese Politics: Policy, Leadership, and Change (4). Examines major policies from 1949 to the present, and considers the changing role of the Communist Party and its shifting treatment of various social groups; the era of Mao Zedong, reforms under Deng, and post-Deng politics. **(VII-B)**

151D Japanese Politics: State and Economy in Modern Japan (4). Introduction to the political foundations and economic achievements of modern Japan. Focus on the development and evolving roles and functions of the principal institutional actors in Japan's political economy. **(VII-B)**

151F Korean Politics and Society (4). Examination of contemporary political/social structures and process of Korea (South and North). Historical and cultural influences on current political systems and policies. Also included are economic development, national security, unification issues, and foreign relations. **(VII-B)**

151G Electoral Systems (4). A worldwide overview of electoral laws by which votes are converted into assembly seats. Systematic analysis of these laws and their effect on political process and stability. Single-, two-, and multi-party systems. Proportional representation versus plurality rule. Majoritarian and consensus patterns of government. Political Science 52B and 151G may not both be taken for credit.

152A Politics in Britain (4). The politics and processes of government in Britain; the operation of parliamentary government; the responses of the political system to the issues and problems in contemporary Britain. Racism and immigration policy; economic stagnation and entry into the Common Market; Northern Ireland; the linkages between social class and politics.

152B French Politics and Society (4). A general overview of the nature of French politics and society. Some of the basic literature on France is read, and students select a topic of particular interest to them. Students with a reading knowledge of French particularly welcome. **(VII-B)**

152C German Politics and Society (4). Concentrates on twentieth-century German politics and society, focusing on the contemporary political system of democratic West Germany. Study of the historical legacies of Weimar and the Nazi period, the postwar division between the two German states, and their reunification. **(VII-B)**

152D-E Post-Soviet Politics I, II (4-4). An overview of the present sociopolitical structure and of the major national cultures within the former Soviet Union. **152E:** Expands on the themes of 152D plus individual research on any former Soviet topic. Prerequisite for 152E: Political Science 152D or consent of instructor; satisfaction of the lower-division writing requirement. (152D: **VII-B)**

152F West European Politics (4). Explores four main themes: (1) thinking scientifically about politics; (2) understanding the linkages between different political structures and spheres of activity; (3) evaluating some theories about politics; (4) learning about three countries: Britain, France, and Germany. **(VII-B)**

152G European Politics (4). An introduction to the politics of Europe including the smaller countries and the former Warsaw Pact. Includes case study of three or four countries, as well as contemporary issues such as globalization, immigration, population decline, and European integration.

153A Latin American Politics (4). Explores the common political dynamics of Latin America, as well as the political histories and prospects of selected countries of the region. Places Latin American politics in an analytical framework derived from comparative politics. **(VII-B)**

153B Canadian Politics (4). An overview of contemporary Canadian government and politics. In addition to consideration of the basic structures and processes of Canadian government, topics may include regionalism, federalism, western alienation and oil, Canadian solutions to social welfare policy questions, developments in Quebec. **(VII-B)**

153C Research in Canadian Politics (4). Intensive consideration of several topics in Canadian politics and society, leading to the writing of a research paper by each student. Topics are oriented toward contemporary issues of public policy. Prerequisite: Political Science 153B or consent of instructor.

153D Mexican Politics (4). An overview of contemporary Mexican government and politics and their evolution in the twentieth century. Emphasis on state-society relations, the changing role of government in the economy, democratization, and the impact of opposition groups in politics and policy, including foreign policy.

153E Human Rights (4). Examines the causes and consequences of human rights violations with a focus on Latin America. What are human rights? When and where are they violated? What political mechanisms are available to deal with human rights problems? How effective are they? **(VII-B)**

153F Social Movements in Latin America (4). Explores leading issues in the study of social movements, through a series of Latin American cases. Provides a framework for thinking about the relationship between social forces and the political system, as well as knowledge of experiences important for studying Latin American politics. **(VII-B)**

154C Comparative Politics: Four Nations, Three Continents (4). Studies four countries in a comparative fashion: their respective political histories and cultural traditions, actual differences among their superficially similar party, parliamentary, and executive institutions; contemporary economic policy. The countries represent three continents and stand at varying levels of economic development. **(VII-B)**

154E Comparative Political Economy (4). Examines the interaction between politics and markets, both in theory and in practice, explicitly linking classic works on political economy with current policy debates. Studies how political systems and markets are organized in different national settings.

154F Peoples and Cultures of Post-Soviet Eurasia (4). Examines the cultures and political conflicts of the more than 130 indigenous ethnic groups in the European and Asian territories of the former U.S.S.R. Emphasis is on the theoretical issues of ethnicity, nationalism, and conflict management. Same as Anthropology 164P. **(VII-B)**

154G Conflict Management in Cross-Cultural Perspective (4). Examines theories of conflict management. Analyzes how conflict is mitigated in diverse cultures: at the interpersonal level, between groups, and on the international scale. Students discuss readings, hear from conflict management practitioners, and simulate negotiations. Same as Anthropology 136D. **(VII-B)**

155B Political/Social Impacts of Computing (4). Aims to increase our understanding of the major impacts of computer and telecommunications technologies on contemporary society. Emphasis on the uses and effects of these technologies on the political world, as well as other effects on society that are policy-relevant. Analytic research paper required. Prerequisite: consent of instructor.

155C Organizations (4). How bureaucracies, formal organizations, and voluntary associations work, how and why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations. The limits of bureaucratization and attempts to overcome these limits through decentralization. Same as Sociology 141.

155E Revolution and Collective Political Violence (4). Examines the theory of collective political violence, internal war, and insurgency. Considers causes and "process" of revolutions; comparative characteristics of organized armed movements; personality of revolutionary leaders. U.S. foreign policy and military doctrine on insurgency and low-intensity conflict reviewed. Prerequisite: satisfaction of the lower-division writing requirement.

155F Political Economy of Japan (4). Surveys postwar developments in the politics and political economy of Japan. Topics include the political and institutional context of policy making; pressures for change which Japan's political economy has faced in the last decade; and Japan's foreign policies, past and present. **(VII-B)**

155G Advanced Topics in Japanese Politics (4). Analysis of four current issues in Japanese politics: political reform, administrative reform and economic deregulation, foreign economic relations, and Japan's defense and security policies. **(VII-B)**

156A Political Participation (4). The ways in which people in various political systems take part in politics, especially in activities directed toward affecting outcomes. Who is active, what they do, why they do it, and what difference it makes. **(VII-B)**

156B Participation and Representation (4). Examines the concepts "political participation" and "political representation" and the interconnection between these concepts. Addresses both the theoretical issues and debates raised by these concepts and considers how they are studied empirically. Prerequisite: upper-division standing or consent of instructor.

156C Citizen Politics (4). Study of the role of public opinion in the political process. Reviews some of the key research approaches and findings on which our current understanding of public opinion is based, and provides an opportunity to conduct research and to analyze public opinion surveys. Prerequisite: satisfactory completion of the lower-division writing requirement.

156D Social Movements and Collective Behavior (4). A survey of models of collective action drawn from sociology, economics, psychology, and political science, and focusing on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture. Prerequisite: Political Science 6A, Sociology 1, or Economics 1. Same as Sociology 174.

157A Nationalism (4). Nationalism, one of the most potent social and political forces of the twentieth century, is explored. Seeks to understand the sources and nature of various forms of nationalism. Prerequisite: satisfactory completion of the lower-division writing requirement. **(VII-B)**

158A Political Corruption (4). Political corruption is universal. Examines how standards of corruption have changed over time in the United States, and how they vary from country to country. This seminar-style course emphasizes discussion of both ethical and practical issues relating to corruption. Prerequisite: satisfactory completion of the lower-division writing requirement.

159 Special Topics in Comparative Politics (4). May be repeated for credit as topic varies.

170–179: PUBLIC LAW

171A Law and Society (4). Examination of the law and its various roles in society. The nature and meaning of law; legality and power in the American system; law as a mechanism for social change; the role of law in dispute processing, social control, compliance with judicial decisions. Prerequisites: Political Science 71A and satisfactory completion of the lower-division writing requirement.

171B Jurisprudence (4). A survey of legal philosophies. Explores jurisprudence from the ancient Greeks to the present, including natural law philosophy; legal positivism and realism; sociological jurisprudence; and liberal, radical, and conservative thought. Prerequisite: Political Science 71A.

171C Comparative Constitutional Politics (4). Examines the impact of constitutional courts on politics and policy-making in Canada, France, Germany, and the United States. Cases may focus on the constitutional politics of free speech, abortion, rights to property, and the conduct of foreign relations. Prerequisite: Political Science 71A and satisfaction of the lower-division writing requirement.

171D American Constitutional Law (4). American constitutional interpretation through extensive analysis of cases involving the separation of powers, federal-state relations, rights of property, free expression, privacy, criminal due process, political participation, and equality. Corollary topics include legal research methods, development of judicial review, legal reasoning, and the political impact of Supreme Court decisions. Prerequisite: Political Science 71A. Political Science 171D and Criminology, Law and Society C122 may not both be taken for credit.

171E Law and Social Sciences (4). The use of social science evidence in litigation is examined. Looks at the complex interaction of social facts, law, statistical models, and normative judgments, focusing on political science and sociological testimony in areas of Fourteenth Amendment equal protection jurisprudence. Prerequisite: Political Science 71A.

171F Law and Society in the Twenty-First Century (4). Examines the complex relationship between law, the social sciences, and modern society. Lectures explore such issues as the interplay between technology and constitutional rights, the impact of science on law, and the evolving roles of attorneys and judges. Same as Social Science 172D.

172A International Law (4). Examination of the origin, changing structure, and application of international law, and the role of legal norms in regulating the behavior of states and maintaining international order. The use of force, pacific settlement of disputes among nations, human rights, international terrorism. Prerequisite: Political Science 71A. **(VII-B)**

173A Comparative Legal Systems (4). Comparative survey and analysis of legal systems, actors, cultures, and norms in nations of the following traditions: common law (U.S. and British Commonwealth), civil law (Western Europe and Latin America), socialist (Soviet Union and Eastern Europe), and Asian (China and Japan). Prerequisite: Political Science 71A or consent of instructor. **(VII-B)**

174A Civil Liberties (4). Political analysis of selected Supreme Court cases involving claims under the Bill of Rights and the Fourteenth Amendment. Topics include: race, sex, and other forms of discrimination; criminal justice; privacy; freedom of speech and related claims. Prerequisite: Political Science 71A.

174B Constitutional Rights (4). Addresses a central aspect of politics: the interpretation and application of the United States' fundamental rules. These rules tell us something about the goals of society, and the means chosen to achieve them by allocating rights and duties, costs, and benefits among its members. Prerequisite: Political Science 71A or consent of instructor.

174C U.S. Supreme Court (4) Detailed overview and analysis of the role played by the U.S. Supreme Court in the American political system. Judicial review, appointment of justices, judicial activism and judicial restraint, process of case selection, court deliberation, land decision-making, impact of Supreme Court decisions. Prerequisite: satisfactory completion of the lower-division writing requirement.

179 Special Topics in Public Law (4). Prerequisite: Political Science 71A. May be repeated for credit as topics vary.

SPECIAL COURSES—UPPER DIVISION

H180 Honors Seminar in Political Science (4). Restricted to students enrolled in the Honors Program in Political Science. May be taken for credit three times as topics vary.

H182A Honors Thesis Workshop (4). A weekly seminar/workshop to facilitate the exchange of ideas and research strategies among students and to review their progress in writing the thesis. Prerequisite: consent of instructor. Open only to students in the Political Science Senior Thesis program.

183 Public Affairs Internship (4). Supervised internship and study in political, governmental, nonprofit, or related organizations for students participating in the Department's Public Affairs Internship Program. Enrollment dependent upon availability of intern positions. Pass/Not Pass only. Prerequisite: consent of instructor. May be taken for credit three times.

184 Government Internship (4). Internship and study in political, governmental, nonprofit, or related organizations for students participating in the UCDC Program. Pass/Not Pass only. Prerequisite: consent of instructor. May be taken for credit twice.

190 Senior Thesis (1 to 4). Prerequisite: consent of instructor. May be taken for credit for a total of three times.

197 Field Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

198 Directed Group Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

199 Independent Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies. Students may enroll for only one 199 each quarter.

GRADUATE

210A-B-C Research Seminar in Politics and Society (1.3-1.3-1.4). Weekly reports and colloquia by faculty, students, and visitors. Students required to report on one research project over the course of three quarters. Required of first- and second-year graduate students in Political Science. Satisfactory/Unsatisfactory only. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

211A Foundations of Modern Political Science (4). Provides an introduction to major works by highly influential scholars in the nineteenth and twentieth centuries, such as Marx and Engels, Mosca, Michels, Weber, Wallas, and Lasswell, that constitute the foundation of contemporary political science. Required of first-year graduate students in Political Science. Prerequisite: graduate standing or consent of instructor.

211B Micropolitics (4). Provides students with comprehensive introduction to the substance and methods of the study of political behavior. Focuses on the level of individual behavior, but the relation to macrosocial analysis is considered. Required of first-year graduate students in Political Science. Prerequisite: graduate standing or consent of instructor.

211C Macropolitics (4). Examines some of the major research issues in political science involving macro-level questions: systemic processes, political institutions, or system outputs. Required of first-year graduate students in Political Science. Prerequisite: graduate standing or consent of instructor.

219A-Z Special Topics in Politics and Society (4). Current research in politics and society. May be repeated for credit as topics vary.

221A Public Policy (4). Explores different approaches to public policy analysis, the diverse conceptions of the goals and objectives that should be served by policy, and the appropriate role of the policy analyst. Policy consequences are traced to indirect and subtle incentives and disincentives. Prerequisite: graduate standing or consent of instructor. Same as Criminology, Law and Society C255 and Urban and Regional Planning U221.

224A Environmental Politics and Policy (4). Reviews and critiques literature on discussion topics including: the nature and effectiveness of the environmental movement and environmental policies; the role of science and technology; the use of economic incentives in policy; decentralization of decision making; and creating arenas for public involvement. Prerequisite: graduate standing or consent of instructor. Same as Urban and Regional Planning U224.

229 Advanced Research Methods: Varied Topics (4). Topics in advanced research methods. Topics will vary. Prerequisite: graduate standing. May be repeated for credit as topics vary.

232B Electoral Systems Seminar (4). Studies electoral systems worldwide, analyzes their effect on the number of parties and duration of government cabinets, and applies the results to the present democratizing countries. Prerequisite: graduate standing or consent of instructor.

234A Research Methods in Political Science (4). An introduction to standard research techniques in political science. Issues of epistemology, research design, and approaches to empirical analysis. Prerequisites: graduate standing or consent of instructor, and upper-division or graduate-level statistics.

240A American Foreign Policy Decision Making (4). Assesses the changing international perspectives, policy instruments, and decision making processes of United States presidential administrations since World War II. Prerequisite: graduate standing or consent of instructor.

241B Seminar in International Relations Theory (4). Overview of the major theories guiding research and scholarship in international relations. Focus on major conceptual approaches (realism, neoliberalism, marxism) and levels of analysis (systemic, state, and subnational), as well as on methodological/epistemological debates engulfing the field. Prerequisite: graduate standing or consent of instructor.

241C Theories of International Cooperation (4). Examines and evaluates theories of international cooperation and their relations to more general conceptual and methodological approaches in international relations. Prerequisite: graduate standing or consent of instructor.

252A The State in Comparative Perspective (4). Seminar examining the state from theoretical, empirical, comparative perspectives. How the state came into being, the state's role in the economy, toward society and internationally, and in policy-making in Western Europe, East Asian newly industrialized countries, the Third World. Prerequisite: graduate standing or consent of instructor.

252E Democracy and Rationality (4). A modern approach to democratic theory including social choice and empirical democratic theory. Addresses the relationship of rationality and democracy, how minorities can be protected, and how democracy can promote deliberation, considering in particular the work of Rawls and Habermas. Prerequisite: graduate standing or consent of instructor.

253B Regime Change in East Asia (4). Regime change from authoritarianism to democracies (Japan, South Korea, Taiwan); gradual political change (China). Uses theories from comparative literature on regime transition; combines theory with historical institutions, political culture, prior regimes, elements in the transition process in the four countries. Prerequisites: graduate standing or consent of instructor.

254A Rational Choice: Models, Methods, and Limitations (4). Basic models of rational choice. Introduction to noncooperative games, social choice, and other approaches. Examples of topics covered include the Prisoner's Dilemma, Nash Equilibrium, repeated games, spatial models of party competition, May's Theorem, voting and manipulation, Arrow's Theorem. Prerequisite: graduate standing or consent of instructor.

260B Political Participation (4). Examines theoretical approaches to the explanation of the pattern of participation and consideration of the results of empirical studies of such activity by mass publics (mainly in Europe and North America). Addresses issues in both comparative politics and political behavior. Prerequisite: graduate standing or consent of instructor.

270A-B-C Seminar in Public Choice I, II, III (4-4-4). Public Choice lies at the intersection of economics and political science. This course involves the use of tools derived from economics to understand the behavior of governments and of citizens when they deal with politics. Prerequisite: graduate standing and Social Science 111H. Same as Economics 270A-B-C.

285A Introduction to Political Psychology I (4). Reviews theoretical questions regarding the relationship between the analytical and normative and the polity. Considers the relationship between the analytical and normative concerns of psychology and political science, addressing empirical literatures including works on political socialization, ideology and public opinion, identity and nationality.

285B Introduction to Political Psychology II (4). Discusses the complex set of relationships among the three disciplines of politics, psychology, and economics, focusing on human decision-making processes and political choice. Prerequisite: graduate standing or consent of instructor. Formerly Political Science 262C.

290 Dissertation Research (4 to 12). Prerequisite: consent of instructor. May be repeated for credit.

299 Independent Study (4). May be repeated for credit.

THE UNDERGRADUATE MAJOR IN SOCIAL SCIENCE

The major in Social Science provides an interdisciplinary perspective on the study of society, both at the individual and group level. Using the knowledge and methods of all social science disciplines, a student majoring in Social Science develops the skills to think clearly about social concepts and issues. Social Science majors have an opportunity to use their classroom knowledge in applied and individual learning experiences, such as internships, field studies, or research with a faculty advisor.

The core curriculum for the major exposes students to various social science methods and topics, teaching applied computer-based research and statistical analyses. Students select one of four specializations, which guides their upper-division course work. The specialization in Multicultural Studies examines the role of ethnic and cultural diversity in the economics, politics, and culture of California and the United States. The specialization in Public and Community Service provides students with internship experiences in community, public, and educational organizations. Students who choose the Research and Social Policy specialization gain a more in-depth understanding of social science research and methodology. The specialization in Social Sciences for Secondary School Education prepares students for teaching at the secondary school level. This specialization includes a State-certified subject matter program in social sciences for teaching in California secondary schools.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 430.

Requirements for the Major

A. An understanding of the fundamental concepts, analytical tools, and methods of social science. This requirement is met by taking Social Science 1A, 3A, 12A, and one additional introductory course in the School of Social Sciences bearing a one-digit course number. These courses should be taken during the student's first year.

B. A decision with respect to area of focus. This requirement is met by declaring a specialization before the end of the junior year.

C. An understanding of the advanced areas in social science. This requirement is met by satisfying course work requirements as defined for the declared specialization.

Students are reminded that the Pass/Not Pass option is not applicable to course requirements A through C above or to any additional requirements listed for specific majors. Courses used to meet requirements A through C are included in the computation of the grade point average in courses required in the major program.

NOTE: Social Science 189 (Sage Leadership Research) and 192 (Washington Seminar) may not be used to satisfy the School of Social Sciences requirement.

Specialization in Multicultural Studies

This specialization examines various American ethnic and cultural communities (African American, Asian American, Chicano/Latino, and Native American) from an interdisciplinary perspective. It provides students with the understanding necessary to address social, political, and economic issues arising from the multicultural environment found within societies in the United States and California.

Satisfaction of School requirements and 15 courses (60 units) as follows:

1. Four courses as specified in major requirement A above.
2. Two lower-division courses: one course selected from Social Science 70A, Sociology 63, or Sociology 69, and one selected from Anthropology 85A, Chicano/Latino Studies 61, 62, 63, Social Science 70B, 70C, 78A, 78B, 78C, or other lower-division courses in U.S. ethnic or gender studies.
3. Six upper-division courses as follows: two each from Asian American, African American, and Chicano/Latino Studies (see the academic counselors for a list of approved courses in Chicano/Latino Studies).
4. Three additional upper-division courses from: Anthropology 134D, 136K, 138Q, 138S, 138T; Political Science 124A, 126A, 126C; Psychology 174A, 174B, 174E, 174F; Social Science 166, 167, 168, 170B, 170D, 170E, 170H, 171A, 172B, 172C, 172D, 172E, 173F-G, 173H, 173I, 173K-L, 175A, 175B, 176A, 178A, 178B, 178C, 178D, 178E; Sociology 161, 167A, 168.

NOTE: It is recommended that the upper-division writing requirement be satisfied by taking Sociology 167A.

Students are strongly encouraged to pursue a minor in either African American Studies, Asian American Studies, Chicano/Latino Studies, or Native American Studies.

Specialization in Public and Community Service

Public and Community Service (PCS) is a program integrating academic learning with community and governmental activities. The specialization actively engages students in academic learning through civic participation. It offers students an opportunity to learn about public and community issues by working in designated community agencies and government organizations and to apply academic theories and analytical skills to the solution of real-world problems. Students engage in local communities as they develop programs addressing community needs. The required internship experiences include a responsibility at a community or government agency for a single or series of significant projects. Through these experiences, students become familiar with various social issues affecting society.

The goal of the program is to develop a better understanding of integrating academia and service in the community. Students identify and analyze socially significant needs addressed in the community in the context of one or more social science disciplines. The program broadens students' university experiences by exposing them to "the real world" and providing opportunities to conduct research on social issues. PCS students gain a more realistic perspective of society, greater self-knowledge, and increased leadership skills. The curriculum emphasizes urban contexts and multicultural issues, as well as historical, social, economic, and global perspectives. The faculty emphasizes relationships between educational theory and practice, providing students with the skills and knowledge needed to serve as educational leaders in community settings.

The requirements are:

1. Satisfaction of School requirements. School requirement A will be met only by taking Social Science 10A-B-C and 3A for this specialization.
2. Four courses as specified in major requirement A.
3. Additional introductory course: Social Science 70C or Sociology 63.
4. Required upper-division leadership course: Social Science 181.
5. Three upper-division courses selected from the following categories (at least one from each area):

   Health: Anthropology 134D; 134E; Sociology 143, 154, 164, 176; Psychology 174A, 174E, 174F.

   Public Policy and Community Studies: Anthropology 121G, 121J, 125M; Political Science 121D, 121E, 122A, 124C, 125A, 126B, 126D, 132B-C-D, 132E, 155C; Psychology 121A; Social Science 187, 191, 195A-B-C; Sociology 111, 141, 144, 147A, 156, 158A-B, 167A, 172E-F.
6. One upper-division writing course: Social Science 172A or 185 or Anthropology 174A, when offered with a "W" suffix.
7. One upper-division research methods course: Social Science 170A.
8. Two quarters of off-campus internship experience linked to one of the selected fields above, and for which upper-division credit is earned. Internship guidelines are available in the School of Social Sciences Undergraduate Counseling Office. Students must enroll in Social Science 194 to receive credit for this experience.
9. Social Science 193A-B-C (Field Studies in Public and Community Service). Students should see their academic advisor for more information.

Specialization in Research and Social Policy

This specialization creates a more in-depth understanding of social science methods and research. Students with this specialization are prepared for graduate or professional programs, or the job market.

The requirements are:

1. Satisfaction of School requirements. School requirement A will be met only by taking Social Science 10A-B-C and 3A for this specialization.
2. Four courses as specified in major requirement A above. Introductory course must be chosen from the following: Sociology 3, Psychology 7, Economics 1, or Political Science 6A.
3. Additional introductory course: Social Science 70C.
4. Two additional lower-division courses selected from two different disciplines: Anthropology 2A, 30A, 30B; Economics 1 (if not used as an introductory course); International Studies 11, 12, 13; Political Science 21A, 43D, 61A, 71A; Sociology 43, 44, 63, 74, 75, 79 (when topic applies).
5. Seven upper-division courses selected from the following categories:

   One research methods course selected from the following: Social Science 100A-B-C, 101E; Psychology 113T, 114M; Political Science 171B, 171F; Sociology 114A, 119 (when topic applies).

   Three social policy courses selected from the following: Anthropology 121H, 125M, 125X, 125Z, 133A, 134A, 134D; Chicano/Latino Studies 101, 131, 140, 144, 154; International

Studies 111A, 121; Political Science 121D, 122A, 123B, 124A–D, 126A–D, 128A, 132E, 138A, 138B, 141A, 143D, 171A, 171D, 171F, 174A; Psychology 174A–G; Social Science 172D, 173H, 177A; Sociology 141, 144, 154, 157A, 158B, 165A, 167A, 173, 176.

Three qualitative research methods courses: Social Science 193A-B-C.

6. One upper-division writing course: Social Science 172A or 185 or Anthropology 174A, when offered with a "W" suffix.
7. Three additional upper-division courses as follows: Social Science 170A; one quarter research experience through Social Science 195A (Educational Policy Field Studies), and one quarter Social Science 199 (Independent Study).

Specialization in Social Sciences for Secondary School Education

This specialization provides a broad overview to the social sciences, with an emphasis on maintaining an interdisciplinary perspective. This specialization also helps to prepare students for teaching in elementary schools. Students wishing to teach social science at the intermediate and high school levels can enroll in the State-approved subject matter preparation program through this specialization. (Students *must* consult with an academic counselor to enroll in the subject matter preparation program.)

Satisfaction of School requirements and 22 courses (88 units) as follows:

1. Social Science 1A, 2A, 3A, and one upper-division course in integrative study of History, Social Sciences, and the Humanities (selected from Asian American Studies 150; Classics 175; Comparative Literature 104, same as Art History 114, Art History 125, or Humanities 110 when topic is appropriate; History 142, 144–146, 180–185; Women's Studies 139, 180–185).
2. Six courses in History (History 21A, 21B, 21C, 40A, 40B, 40C).
3. Seven Social Sciences courses (Anthropology 2A; Economics 1; Political Science 21A, 122B, 154C; and Social Science 5D, 118G).
4. One Cultural/Area Studies course (selected from Anthropology 125Y, 125Z, 135H, 138O–138T, 160–169; East Asian Languages and Literatures 110, 120, 130, 155; History 161–169, 170–171, 177–178; International Studies 179); and one World Philosophies course (selected from Philosophy 113–117; Social Science 170H, 170P).
5. Two courses in Education (Education 100 or 160 and 124).
6. One additional upper-division Social Science elective.

HONORS PROGRAM IN SOCIAL SCIENCE

The Honors Program for Social Science majors allows students to engage in research leading to the completion of an Honors thesis. The topic for the Honors thesis, reflecting a social science theme, is determined by the student in consultation with a faculty advisor. In addition to satisfying the requirements for the major in Social Science, Honors Program participants must complete additional course work as specified below.

The Honors Program is composed of three four-unit courses: Social Science H190A (Honors Research Workshop), H190B (Honors Thesis Research), and H190C (Honors Thesis). Satisfactory completion of the Honors Thesis course also satisfies the upper-division writing requirement. The Honors Program is open to all junior and senior Social Science majors with an overall GPA of 3.00 and a 3.30 GPA in at least five Social Science courses.

The schedule of courses for the Honors Program is:

1. During the spring quarter of the junior year and over the following summer before the senior year, students formally apply to the Honors Program through the School of Social Sciences Undergraduate Office, 370D Social Science Tower.
2. In the fall quarter of the senior year, students enroll in H190A. This course ends with each student having formulated a written research plan for the honors thesis. Students also select a faculty mentor who has agreed to supervise the research and evaluate the final version of their Honors thesis.
3. In the winter quarter of the senior year, students enroll in H190B with their faculty mentor, who supervises and evaluates data collection and analysis.
4. In the spring quarter of the senior year, students enroll in H190C and work with their faculty mentor to complete the final version of their Honors thesis.

Courses in Social Science

LOWER-DIVISION

The Social Science curriculum includes major methodological and statistical courses suitable for social science students generally; courses which do not fall within disciplinary boundaries; and senior thesis, field study, and independent study courses.

1A Principles in the Social Sciences (4) W. Introduction to various disciplines within the social sciences. Provides an interdisciplinary perspective on understanding human behavior and social institutions, including interpersonal, economic, political, and cultural activities. For those students desiring a broad introduction to the social sciences. **(III)**

H1E-F-G Honors: Critical Issues in the Social Sciences (6-6-6) F, W, S. Major themes, methods, and works in the social sciences from an interdisciplinary perspective. Each quarter focuses on a different topic. Weekly small seminars emphasizing the development of the skills of critical thinking and quantitative analysis through regular written work are integral to the course. Prerequisite: restricted to members of the Campuswide Honors Program. Same as Social Ecology H20A-B-C. **(III)**

3A Computer-Based Research in the Social Sciences (4) W. Focuses on the data manipulation, data visualization, and information searching techniques that are becoming increasingly popular and important as we move into the twenty-first century. Hands-on experience with mapping, graphics, and data arrays. Prerequisites: freshmen only or consent of instructor; school majors only.

8 Introduction to Social Science Statistics Computing (4) F, W, S. Utilization of analysis tools within the Statistical Package for the Social Sciences (SPSS). Methods of data management, and interpretation of computer output results covering descriptive statistics, correlation, ANOVA, regression, and factor analysis. Prerequisites: Social Science 9A-B-C or consent of instructor.

9A General Statistics and Probability I (4) F. Introduction to the variety of statistical applications in many fields, including the humanities, physical and social sciences, business, forensic and health sciences. Descriptive statistics, including percentile ranks, standardization, and normal approximation. Estimation and the measurement of error. For non-Social Sciences majors only. Students who receive credit for Social Science 9A may not receive credit for Anthropology 10A, Psychology 10A, Social Ecology 13, Social Science 10A, or Sociology 10A. **(V)**

9B General Statistics and Probability II (4) W. Introduction to statistical inference, sampling distributions, standard error. Hypothesis tests for proportions and means. Inferential techniques for nominal variables including chi-square. Selected applications in fields such as ecology, forensic science, and quantitative stylistics are based on student interests. For non-Social Sciences majors only. Prerequisite: Social Science 9A. Students who receive credit for Social Science 9B may not receive credit for Anthropology 10B, Psychology 10B, Social Ecology 13, Social Science 10B, or Sociology 10B. **(V)**

9C General Statistics and Probability III (4) S. Focus on correlation and regression. One-way and two-way factorial analysis of variance. Introduction to repeated measures designs and non-parametric statistics. Critiquing the use of statistics in newspapers and popular magazines. Locating, accessing, and evaluating statistical data. For non-Social Sciences majors only. Prerequisite: Social Science 9B. Students who receive credit for Social Science 9C may not receive credit for Anthropology 10C, Psychology 10C, Social Ecology 13, Social Science 10C, or Sociology 10C. **(V)**

10A Probability and Statistics in the Social Sciences I (4) F. Introduction to the variety of statistical applications in the social sciences. Descriptive statistics. Measures of central tendency and dispersion. Percentile ranks. Standardization and normal approximation. Basic probability theory focuses on application to statistical inference and binomial distribution. Laboratory required. Corequisite or prerequisite: Social Science 3A. Prerequisite: lower-division standing or consent of instructor. Students who receive credit for Social Science 10A may not receive credit for Anthropology 10A, Psychology 10A, Social Ecology 13, Social Science 9A, or Sociology 10A. **(V)**

10B Probability and Statistics in the Social Sciences II (4) W. Introduction to statistical inference, sampling distribution, standard error. Hypothesis tests for proportions and means. Inferential techniques for nominal variables including chi-square, study measures of strengths, significance of relationships between variables, assumptions, data requirements, and types of error in significance tests. Prerequisite: Social Science 10A. Students who receive credit for Social Science 10B may not receive credit for Anthropology 10B, Psychology 10B, Social Ecology 13, Social Science 9B, or Sociology 10B. **(V)**

10C Probability and Statistics in the Social Sciences III (4) S. Focus on correlation, regression, and control for effects of variables. One-way and two-way factorial analysis of variance. *A priori* and *a posteriori* comparisons. Introduction to repeated measures design and non-parametric statistics. Discuss use of statistics in newspapers and popular magazines. Prerequisite: Social Science 10B. Students who receive credit for Social Science 10C may not receive credit for Anthropology 10C, Psychology 10C, Social Ecology 13, Social Science 9C, or Sociology 10C. **(V)**

12A Introduction to Social Science Analysis (4). Introduction to social science research and analytical models. Theory construction and use of research methods in an interdisciplinary context. Discussion of the application of social science research to public policy. Computer laboratories develop creative thinking, graphing, and data presentation skills. Prerequisite: Social Science 10A. Formerly Social Science 2A.

16A Current Topics in Global Peace and Conflict Studies (2). Topics focus on the perspectives of academic disciplines that examine global issues, bilateral and multilateral relations, and issues related to regions or countries. Students choose seminar subjects, prepare opening remarks, and lead discussions with a faculty member or guest lecturer.

20 Model United Nations (2). Focuses on simulations of the foreign policy pursuits of selected countries in the international community. Emphasis placed on understanding the rules of debate, as well as the policy positions of the student's selected country in the United Nations. Should be taken as a one-year sequence. May be taken for credit six times. Formerly Social Science 30.

70A U.S. Ethnic and Racial Cultures (4). A survey of ethnic and racial groups in the United States, comparing their histories, evolution, and cultural individuality. Emphasis on cultural variations in the U.S. as well as the processes and changes, historical and current, within distinct demographic populations. **(III, VII-A)**

70B Introduction to Expressive Forms in American Society (4). A survey of the expressive forms of minority culture groups in the United States. Literature, music, visual art, ritual, and folklore are studied, with an emphasis upon understanding their relationship to their social and cultural contexts. **(III, VII-A)**

70C Comparing Cultures (4). Introduces students to the scope of cross-cultural comparisons by analyzing the theories, methodologies, and facts utilized by anthropologists, sociologists, social psychologists, political scientists, and historians in comparing cultures. **(III, VII-A)**

70T The History of Minorities in American Films (4). An examination of the cultural content of American films as it applies to the resident minority groups in the United States. Films projecting images of Afro-Americans, Asians, Native Americans, and Latinos/Hispanics are screened. **(VII-A)**

78A Introduction to Asian American Studies I (4). Examines and compares the diverse experiences of major Asian American groups since the mid-nineteenth century. Topics include: origins of emigration; the formation and transformation of community; gender and family life; changing roles of Asian Americans in American society. Same as Asian American Studies 60A and History 15C. **(III, VII-A)**

78B Introduction to Asian American Studies II (4). Examines the renewal of Asian immigration following World War II. Focuses on domestic and international conditions influencing the liberalization of U.S. immigration laws, and the impact of contemporary Asian immigration on the U.S. political economy and social order. Same as Asian American Studies 60B. **(III, VII-A)**

78C Introduction to Asian American Studies III (4). Analyzes the Asian American experience in comparative perspective, which includes comparisons of different ethnic and racial groups, and across gender and class. Possible topics include labor, economy, politics, migration, nation, popular culture, gender, family, sexuality, and multiraciality. Same as Asian American Studies 60C. **(III, VII-A)**

89A-Z Special Topics in Social Sciences (2 to 4). May be repeated for credit as topic varies.

UPPER-DIVISION

100A-B-C Foundations of Applied Statistics I, II, III (4-4-4). Lecture, four hours; laboratory, three hours. **100A-B:** Descriptive statistical concepts and techniques most widely used in social science research. Weekly laboratories employ computer graphics to investigate concepts. 100A: Pass/Not Pass only. **100C:** Classical statistical inference, limited to simple random sampling or simple randomization designs. Characteristics of sampling distributions; bias, standard error, mathematical models, estimation, hypothesis testing. Same as Social Ecology 166A-B-C and Statistics 100A-B-C. **(V)**

101E Introduction to Statistical Computing with SAS (4) W. Lecture, two hours; laboratory, two hours. Data definition, data acquisition, and data management using SAS procedures and commands. Statistical procedures available from the SAS Statistical Software Package. SAS/GRAPH procedures for producing statistical graphics. Prerequisites: completion of one year of statistics, or concurrent enrollment in Social Science 100C, or consent of instructor. Pass/Not Pass only. Same as Social Ecology 166E and Statistics 101.

166 Latino Social Movements and Organizations (4). An examination of social movement theories and organizational theories and research through an analysis of ways in which Latinos have organized to confront discrimination and secure full and fair participation in the labor market, education, politics, and other societal institutions. Same as Chicano/Latino Studies 140.

167 Chicano/Chicana Labor History (4). Examines origins of Latino/Latina labor from colonial period to present. Emphasis on the issues of race, culture, class, and gender. Focus on processes and institutions including: encomienda, migration, unions, informal economies, Bracero program, domestic work. Same as Chicano/Latino Studies 141. **(VII-A)**

170A Research Methods in the Social Sciences (4). Examines how interdisciplinary social science research questions are formulated and studies several research methods including: experimental method, quasi-experimental methods, survey research, field research, evaluation research, and meta-analysis. Parametric and non-parametric statistical methods are illustrated using the SPSS program. Prerequisites: Social Sciences 1A, 3A; 10A-B-C or equivalent; 12A and upper-division standing.

170B Philosophy of Culture (4). Introduction to philosophies of culture that have been formulated by philosophers, historians, anthropologists, and sociologists. Intended to provide an understanding of the cultural concept in order to study culture acquisition and the diverse culture of the U.S. **(VII-A)**

170C Work, the Economy, and Culture (4). Studies the economic fabric of societies relative to cultural institutions and activities. Relationships between global economy and national and international culture. Selected writers utilized in discussing class, race, gender, labor, and cultural processes in worldwide system of production and consumption. **(VII-B)**

170D Politics and Culture (4). Examination of the factors affecting the formation and structure of political/labor movements among racial/ethnic groups in the United States. Relationship of domestic movements to international developments is also analyzed.

170E Society and Culture (4). An introduction to the processes underlying stratification in American society with emphasis on race/ethic/class divisions. These processes also are examined in relationship to the works of major theorists such as Marx, Weber, and Durkheim. **(VII-A)**

170F History and Culture (4). An introduction to ethnohistory, focusing on the contributions of history to the interdisciplinary study of sociocultural systems. Empirical focus on the slave South, with intensive analysis of major secondary sources. **(VII-A)**

170G Language and Culture (4). Spoken and written language and its relation to thought and other forms of human culture: verbalization of morality, values, religion, aesthetics, and politics; problems interpreting ideological works in ancient and recent times; semantics and psychology of speech, image, gesture.

170H Religion and Culture (4). A survey of the major issues in the comparative study of religious beliefs and behavior of minority American cultures.

170P Philosophies and World Religions (4). A survey of the world's major philosophical traditions and religions and the ethical systems they have produced. The origins of these ethical systems and the fundamental principles upon which they are built. Examples: Kantian, Confucian, Judeo-Christian, and relativism. **(VII-B)**

171A Cultural Analysis of Literature (4). How the literature of minority American cultures can be studied as a cultural document. Focus on how culture affects the creation of literature.

171F Cultural Analysis of Visual Arts (4). Explores the relationships between visual arts and the culture and society of which they are a part. The works of nonliterate societies as well as those of the Western world are analyzed and compared. **(VII-A)**

172A American Culture (4). A survey of the historical development of dominant American culture and society; emphasis on a close reading of key cultural texts, with weekly text as a model of writing examining its use of language and rhetoric. Prerequisite: satisfactory completion of the lower-division writing requirement.

172B Afro-American Culture (4). A survey of the development of Afro-American culture with a focus on the United States. Topics include African and New World sources and contemporary forms of Afro-American social and cultural life. **(VII-A)**

172C Asian-American Culture (4). A survey of socio-political-economic dimensions of Asian-American people: their past, present, and future. **(VII-A)**

172D Law and Society in the Twenty-First Century (4). Examines the complex relationship between law, the social sciences, and modern society. Lectures explore such issues as the interplay between technology and constitutional rights, the impact of science on law, and the evolving roles of attorneys and judges. Same as Political Science 171F.

172E Native American Culture (4). An introduction to the history, evolution, ecology, and culture areas of North American Indians. Describes how Native Americans once were and why they were that way. A brief introduction to contemporary Native American culture is provided. **(VII-A)**

172F Latin American and Latino Cultures I (4). Surveys the history, social and economic conditions, gender issues, problems of economic and social development in Latin America and their relation to U.S. Latinos. Topics include the colonial experience, economic relations with the U.S., Latin American migration to the U.S. Same as Chicano/Latino Studies 165. **(VII-B)**

172G Latin American Culture II (4). Specific aspects of economic and cultural transactions between the United States and Latin America. Topics include: U.S.-sponsored economic models for Latin America; integration versus regionalization in economic policy; theories of dependency and imperialism; Initiative for the Americas; NAFTA. Prerequisites: Social Science 172F and consent of instructor.

173G Film Media and the Latino Community (4). Uses film as a resource for understanding contemporary issues and problems facing the Chicano/Latino community. (Does not study cinema as a genre.) Same as Chicano/Latino Studies 114. **(VII-A)**

173H History of Chicano Education (4). Examines the relationship between the development of the public education system and the Chicano community in the U.S. Same as Chicano/Latino Studies 131. **(VII-A)**

173I Perspectives on the U.S.–Mexican Border (4). Economic aspects of the historical development of the U.S.-Mexican border. The current economic situation in the Southwest and border areas as it affects both Mexico and the Latino/Chicano population is also examined. Same as Chicano/Latino Studies 160. **(VII-A)**

173J Chicano/Latino Experience: History, Society, and Culture in Autobiography (4). Examines how history, society, and culture are manifested in autobiography and studies how Chicano/Latino subjects have recorded their life experience before and during the twentieth century. Same as Chicano/Latino Studies 117. **(VII-A)**

173K Comparative Latino Populations (4). Provides foundation for understanding of Chicano/Latino Studies as an interdisciplinary field of inquiry. Focus on the history, arts, cultures of distinct (Mexican, Cuban, Puerto Rican, Central American) Latino communities. Topics include: precolonial history and culture, conquest, mestizaje, colonialism/neocolonialism, resistance. Same as Chicano/Latino Studies 103. **(VII-A)**

173L Latinos in a Global Society (4). Examines interconnections between diverse Latino groups in the U.S. and the effects of globalization on their social, cultural, political realities. Topics include: immigration, demographics, socioeconomic differentiation, familial relations, political protest/resistance, law and policy, and links to "homeland" issues. Prerequisite: Social Science 173K. Same as Chicano/Latino Studies 104. **(VII-A)**

175A Literature and Ethnicity (4). Examines the works of several American minority authors in order to discuss the relationship of ethnicity as a social phenomenon to literature. Same as Chicano/Latino Studies 113. **(VII-A)**

175B Ethnic and Racial Communities (4). Examines various theoretical analyses of race and ethnicity, particularly as they apply to Asian Americans. Also explores the relationship of Asian Americans to other racialized minorities in the U.S. Same as Asian American Studies 161. **(VII-A)**

176A Afro-Latin American Music (4). Musical culture of Afro-Latin American peoples, emphasizing Spanish-speaking Caribbean. Topics include: background in West Africa, the persistence of traditions in the Caribbean, the commercial music of the twentieth century, the connections between musical culture, religion, and the economy. Same as Chicano/Latino Studies 115C. **(VII-B)**

NOTE: Courses numbered 177–179 explore Asian American Studies.

177A Globalization, Diaspora, and Racialization (4). Studies the relationship between globalization and racialization and comparatively examines the racialization of Asians in the U.S. with the experiences of other Asians in the diaspora. Attention paid to the cultural expressions of racialization as creation, representation, adaptation, and resistance. Same as Asian American Studies 101. Formerly Social Science 178A. **(VII-A)**

177B Asian American Women (4). Examines the representations and experiences of Asian American women from diverse perspectives. Explores the commonalities and differences among various groups of Asian American women, with particular focus on history, culture, values, and family roles. Same as Asian American Studies 162. Formerly Social Science 178B. **(VII-A)**

177C Vietnamese American Women (4). Focuses on sociopolitical forces that have shaped the lives of Vietnamese American women, including colonization, militarization, dislocation, and diaspora. Examines how women negotiate their participation in the labor force, and issues of identity formation and cultural representation. Same as Asian American Studies 165. **(VII-A)**

177D Asian American Family (4). Examines the representations and experiences of Asian American families from diverse standpoints. Analyzes the similarities and differences among family structures with particular attention to cultural values, gender roles, and domestic violence. Same as Asian American Studies 133. **(VII-A)**

178C The Korean American Experience (4). Explores the factors that have distinctly shaped the Korean American experience, including patterns of racial domination, the profile of immigrant flow, immigrant roles in the urban political economy, politics in Korea, and the role of the church. Same as Asian American Studies 151C. **(VII-A)**

178D The Vietnamese American Experience (4). Studies the resettlement of Vietnamese in the United States following their exodus from Southeast Asia. Topics discussed include the Vietnam War, the 1975 evacuation, boat and land refugees, the shaping of Vietnamese communities, and Vietnamese American literature. Same as Asian American Studies 151D. **(VII-A)**

178E The Japanese American Experience (4). Studies the settlement of Japanese in Hawaii and the continental United States since the late nineteenth century. Topics covered include sugar plantations, development of rural Japanese America, World War II internment, post-War community development, and persistence of Japanese American identity. Same as Asian American Studies 151E. **(VII-A)**

178H Southeastern Asian American Experience (4). Analyzes experiences of refugees and immigrants from Cambodia, Laos, and Vietnam. Examines political and economic factors for their exodus and how they reconstruct their identities, families, and communities. Issues include educational experiences, public policies, social services, occupational options, homeland relations. Same as Asian American Studies 151H. **(VII-A)**

178J Chinese American Experiences (4). Analyzes the experiences of Chinese in the United States. Immigration, Chinese exclusion, racial and gender identity. Historical overview and contemporary issues covered. Same as Asian American Studies 151J. **(VII-A)**

178K Filipina/Filipino American Experience (4). Explores the experience of Filipina/Filipino Americans from the era of Spanish colonization of the Philippines to present-day community formations in the United States, with special emphasis on the twentieth century. Topics include colonialism, nation, migration, gender, and culture. Same as Asian American Studies 151K. **(VII-A)**

179 Special Topics in Asian American Studies (4). May be repeated for credit as topics vary. **(VII-A)**

181 Leadership in the Twenty-First Century (4). Students learn about theoretical and practical issues related to leadership and leadership development. Readings and assignments provide opportunity to learn of contemporary leadership theory, values, ethics and power, organizational development, gender and leadership, and cultural competence.

182A Exploring Society Through Photography (4). Students explore society through presentation, interpretation, and discussion of their own photographs. A few common exercises at the beginning of the quarter are followed by individual projects. Photography as social observation and the relation of photographs in an essay are stressed. Prerequisite: basic darkroom techniques or the digital equivalent. Same as Anthropology 176A and Sociology 114A.

183A International Studies Forum (2). A faculty-student forum featuring lecturers from a variety of institutions with discussion issues related to international studies. Pass/Not Pass only. May be taken for credit four times. Same as Humanities 183A and Social Ecology 183A. Formerly Social Science 184E.

183B Senior Seminar in Conflict Resolution (4). Designed for seniors (juniors may also enroll) who are pursuing the minor in Conflict Resolution and/or International Studies major. Provides a forum in which students will refine skills and theory in the study of cooperation and conflict, from local to global arenas. Same as Humanities 183B and Social Ecology 183B. **(VII-B)**

183C Senior Seminar in Conflict Resolution (4). Continuation of Social Science 183B. Students write a senior research paper. Prerequisite: Social Science 183B and satisfactory completion of the lower-division writing requirement. Same as Humanities 183C and Social Ecology 183C.

184D International Studies: Current Topics (2). Topics focus on the perspectives of academic disciplines that examine international issues, bilateral and multilateral relations, and issues related to regions or countries. Students choose seminar subjects, prepare opening remarks, and lead discussions with a faculty member or guest lecturer. Pass/Not Pass only. May be taken for credit four times as topics vary.

185 People in Society (4). Through readings about people in distinctly different societies throughout history, students learn concepts that cross the boundaries of the social science disciplines. Such themes as democracy, elitism, power, social class, race, gender are used as basis for discussion and writing. Prerequisite: satisfactory completion of the lower-division writing requirement.

186A-B-C HABLA: Language Intervention for Disadvantaged Children (4-4-4). Trains students (fall quarter) to deliver home visits (winter and spring) that promote school readiness among two–four year-olds from low SES and educational backgrounds. Covers fundamentals of child language, literacy, cognitive development; procedures, ethics of home visitation. Work with parents and children to create better home literacy and language environment. Prerequisites: must pass an interview by instructor, be fluent in English and one other language (Spanish most typically), must have experience with preschool children and be culturally sensitive. Same as Chicano/Latino Studies 191A-B-C and Psychology 144A-B-C.

187 Twenty-First-Century Graduate Education (2). Discussion of graduate and professional education in twenty-first century United States. Examines specific strategies for admission to postbaccalaureate programs and success in graduate study culture. Introduction to processes including planning and preparation, school selection, entrance examination preparation, submission of applications, writing personal statements. Prerequisite: upper-division standing or consent of instructor. Pass/Not Pass only.

188 Global Issues and International Perspectives (2). Primarily for students planning to study abroad. Weekly guest lectures, giving global perspectives on culture, politics, economics, women's roles, environmental issues, language, and history. In discussion sections participants study the particular area to which they are going, and learn how to conduct themselves while there. Pass/Not Pass only. Same as Social Ecology 188.

189A-Z Special Topics in Social Sciences (2 to 4). May be repeated for credit as topic varies.

H190A Honors Research Workshop (4). Student develops a 10–15-page prospectus of research for the honors thesis which includes: the research question, literature review, methods of investigation, and bibliography. Student selects a faculty mentor who will supervise thesis research and writing in winter and spring. Prerequisite: acceptance into the Honors Program for Social Science majors.

H190B Honors Thesis Research (4). The student initiates and completes data collection for the honors thesis. A faculty mentor provides supervision and feedback on thesis chapters. Prerequisite: Social Science H190A.

H190C Honors Thesis (4). The student completes, with the approval of the faculty mentor, an honors thesis containing: statement of the problem, literature review, research hypotheses, methods of investigation, results, discussion, and bibliography. Prerequisites: Social Science H190B and satisfactory completion of the lower-division writing requirement.

191 Graduate-Mentored Study in the Social Sciences (4). Offers a hands-on research experience while increasing awareness of the various disciplines in the social sciences and of the requirements of graduate school. Features graduate-mentored study under the supervision of the Associate Dean. Pass/Not Pass only. Prerequisite: identification of a graduate student (who is in good standing) as a mentor.

192 The Washington Seminar (4). Interdisciplinary seminar examines and explores unique aspects (e.g., governmental, cultural, political, the arts, historical, media related) of Washington, D.C. Core course mandatory for all participants in Washington D.C. Center Program. Prerequisite: selected for Washington D.C. Center Program. Same as University Studies 194.

193A-B-C Field Studies in Public and Community Service (4-4-4). Introduction to ethnographic research, field research, and the general fundamentals to making change in the community through scholarship. Students intern at nonprofit agencies (200 hours) to attain an understanding of social problems in local communities. Students apply theory to practice. Prerequisites: satisfactory completion of the lower-division writing requirement and consent of instructor. Open only to Social Science majors specializing in Public and Community Service.

194 Internships in Public and Community Service (4). A community service activity for students to make positive contributions to underserved and marginalized communities. The goal is to provide valuable service while enhancing the student's understanding of community agencies and service programs, with a connection between theory and practice. Prerequisites: satisfactory completion of the lower-division writing requirement and consent of internship coordinator. Open only to Social Science majors specializing in Public and Community Service. Pass/Not Pass Only. May be taken for credit twice.

195 Community Tutoring Internship (2) F, W, S. Students intern in local K-12 schools tutoring children in various subjects. They work jointly with teachers, help students with homework, provide leadership and college-bound workshops, serve as academic mentors. Class discussions on social inequalities in school systems, tutoring techniques, learning styles. Prerequisites: satisfactory completion of the lower-division writing requirement and consent of instructor. Pass/Not Pass only. May be taken for credit three times.

195A-B-C Educational Policy Field Studies (4-4-4) F, W, S. Students learn to integrate academic course work with experiential learning; to examine the effects of educational policy on urban and suburban schools; to discover the relationship between community service and personal academic interests; and to develop awareness about the challenges of public education.

196 Global Connect (2 or 4) F, W, S. Identifies factors of change that influence the twenty-first century. Students serve as mentors at high schools to introduce globalization issues through workshops and lectures. Prerequisites: must submit application and have a 3.0 or higher overall GPA. May be repeated for credit three times.

197 Professional Internship (2 to 4) F, W, S. Students apply classroom knowledge through research projects in nonprofit agencies (local, state, and government) and the private sector. They pose solutions to agency-posed questions. Students gain field experience through 50 hours (for 2 units) or 100 (for 4 units). Pass/Not Pass only. Prerequisites: satisfactory completion of the lower-division writing requirement and consent of the internship coordinator or faculty sponsor. May be repeated for credit for a total of 8 units.

198 Group Independent Study (2 to 4) F, W, S. Students participate in independent study under a written contract with a supervising UCI instructor. Prerequisite: consent of instructor and department chair. May be repeated for credit for a total of 12 units.

199 Individual Study (2 to 4) F, W, S. Opportunities to do research and learn new skills outside the normal classroom environment. Students participate in planned research and study activities under a written contract with a supervising UCI instructor. Prerequisites: upper-division standing; consent of instructor and department chair. May be taken for credit for a total of 16 units. Students may enroll for only one 199 each quarter.

DEPARTMENT OF SOCIOLOGY

4215 Social Science Plaza B; (949) 824-7637
Calvin Morrill, **Department Chair**

Undergraduate Program

Sociology studies societies and human groups. It examines social conflict and cooperation, and the organization of families, communities, workplaces, and nations. The program at UCI covers the breadth of the discipline while giving students opportunities to conduct independent research, to do an internship in the community, to participate in an Honors Program, and to take advantage of departmental opportunities in such areas as human services, diversity, international sociology, and business, economy, and society. All students take basic courses on social institutions, theory, and methods. Students then take more specialized courses such as Race and Ethnicity, Social Psychology, Sociology of Gender, or Chinese Society. Courses are enriched by ongoing faculty research on such topics as the work and family of immigrants to the U.S., economic change in Asia, the relation between women and men in different social classes and ethnic groups, and attitudes to sexual behavior.

In addition to developing students' ability to critically analyze and understand social patterns, the major is relevant to professional careers in high school teaching, social work, urban planning, law, business, public health, and government service. It also provides training for advanced graduate work in sociology.

REQUIREMENTS FOR THE BACHELOR'S DEGREE

University Requirements: See pages 56–60.

School Requirements: See page 430.

Departmental Requirements for the Major

School requirements must be met and must include 12 courses (48 units) as specified below:

A. Sociology 1 and either 2 or 3.

B. One course in methods (Sociology 110) and one course in theory selected from Sociology 120–129.

C. One course in research design and implementation (Sociology 180A; required for all majors). The second course in the sequence (Sociology 180B) is for students who pass the first course and wish to write a thesis.

D. Five courses selected from the following list of core courses, no more than two of which may be lower-division: Sociology 31, 41, 43, 44, 56, 62, 63, 135, 141, 144, 145, 156, 161, 164, 173, 174, 175B.

E. One additional upper-division Sociology course and one additional introductory course from another social science discipline.

Honors Program in Sociology

The Honors Program in Sociology is open to outstanding Sociology majors during their junior and senior year. To gain admission to the program, potential Honors students normally take Sociology courses in theory (Sociology 120), methods (Sociology 110), statistics (Sociology 10A-B-C) and at least two Sociology core courses. Students who receive an average grade of 3.5 or better in these courses are eligible for the Honors program. In addition, Honors students should have an average of 3.2 or better in all courses taken at UCI. Majors who are transfers may petition for entry into the program based on their grades from their former schools.

During their senior year, Honors Program students write a thesis, designed and carried out under faculty supervision. Projects normally entail some empirical analysis of sociological data. Students meet regularly in a two-quarter Honors seminar to design and carry out these projects, to exchange ideas, and to help analyze each other's work (Sociology H188A and H188B; satisfies Sociology major requirement C: Honors students do *not* have to take Sociology 180A). In addition, Honors students are required to attend between six to nine Sociology guest lectures and subsequent meetings to discuss relevant sociological issues. Upon successful completion of the program, students graduate with Honors in Sociology.

Sociology Minor Requirements

Requirements for the minor in Sociology are met by taking seven sociology courses (28 units) as specified below:

A. Sociology 1 and either 2 or 3.

B. One course in methods (Sociology 110) and one course in theory selected from Sociology 120–129.

C. In addition, students must either satisfy the School mathematics and computer science requirement (School requirement A), or take three courses (12 units) or equivalent in a single acceptable foreign language.

D. Three courses selected from the following list of core courses, no more than two of which may be lower-division: Sociology 31, 41, 43, 44, 56, 62, 63, 135, 141, 144, 145, 156, 161, 164, 173, 174, 175B.

Graduate Program

Participating Faculty

Edwin Amenta: Political sociology, comparative/historical sociology, quantitative methodology
Stanley Bailey: Race/ethnic/minority relations, religion, mass communications/public opinion
Nina Bandelj: Economy and society; organizations, formal and complex; cultural sociology
Frank Bean: International migration and U.S. migration, social demography, economic sociology, sociology of racial/ethnic groups
Susan K. Brown: Immigration, inequality, urban sociology
Carter Butts: Mathematical sociology, social networks
Francesca Cancian: Gender sociology of the family, caregiving
Philip Cohen: Social demography, stratification, race, class and gender
Katherine Faust: Social networks, research methods
Cynthia Feliciano: Race/ethnicity, education, immigration
David Frank: Environmental sociology, sexuality and homosexuality, education
Linton Freeman: Network models of social structure
Matthew L. Huffman: Social stratification, gender and racial inequality in the workplace, research methods
Jennifer Lee: Migration and immigration, race/ethnic/minority relations, urban sociology
David S. Meyer: Social movements, public policy, war and peace, political sociology
Calvin Morrill: Organizations, law and society, culture, youth, qualitative field methods
Joy Pixley: Family, stratification/mobility, aging/social gerontology
Francesca Athene Polletta: Culture, collective identity, civil rights, globalization, social movements
Jen'nan Read: Sex and gender, race/class/gender, religion
Belinda Robnett: Social movements, race and ethnicity, gender
Ruben G. Rumbaut: International migration, ethnic identity, health and mental health
David A. Smith: Urbanization, comparative historical sociology, political sociology, world-system analysis
David A. Snow: Collective behavior, social movements, social psychology, culture, qualitative methods
Judy Stepan-Norris: Sociology of work, political sociology, historical and comparative sociology, American society
Judy Treas: Population studies, sociology of aging, social stratification, sociology of family
Wang Feng: Demography, social change, economy and society

Affiliated Faculty

Robert H. Blanks: Systems neurobiology, medical outcomes assessment, complementary integrative medicine, health, wellness, quality of life assessment
Kenneth S. Chew: Social demography, urban sociology, family and life course studies
Kitty Calavita: Sociology of law, criminology, social deviance, immigration, and inequality
John Dombrink: Crime and criminal justice, deviance and social control
Gilbert Geis: Criminology/delinquency, deviant behavior/social disorganization, social control
Valerie Jeness: Links between deviance and social control, gender, social change
Jerome Kirk: Social organization, leisure/sports/recreation, methods
John Liu: Race/ethnic/minority relations; economy and society
Richard McCleary: Criminology/delinquency, environmental sociology, quantitative methodology
James Meeker: Law and society, criminology/delinquency, quantitative methodology
Henry Pontell: Criminal justice, sociology of law, medical sociology
Tonya Schuster: Social psychology, medical sociology, wellness research

The Department of Sociology offers a Ph.D. degree program in Sociology. The focus on research in social inequality reflects departmental faculty strengths. Particular emphases include gender, race/ethnicity, labor, social movements, family, migration, population, political economy, and states and global transformation. The program provides structured training in sociological theory, statistics, and qualitative and quantitative research methods. While the core of the program is sociological, it also includes an interdisciplinary component, incorporating links to anthropology, political science, history, criminology, and urban planning. Small entering cohorts ensure personalized attention for each student and provides them with greater access to professors, allowing for close mentorship relationships. Program faculty take diverse theoretical and methodological approaches to a variety of substantive issues, are committed to empirical research addressing central sociological issues, and are open to intellectual cross-pollination from cognate disciplines.

Graduate students have the opportunity to participate in a variety of interdisciplinary research units, including the Center for the Study of Democracy, the Center for Global Peace and Conflict Studies, and informal research groups in demography and labor studies. The Sociology Department is linked to Women's Studies and various ethnic studies programs, such as Asian American Studies, Chicano/Latino Studies, and African American Studies. Research and funding opportunities are also available through UC-wide programs like Pacific Rim Studies and the Humanities Research Institute located on the UCI campus.

ADMISSION

Students in the program come from diverse educational, ethnic, and social backgrounds, including a number from different countries and various regions of the United States. The deadline for applications to receive full funding consideration for fall admission is January 15. Students are admitted for winter and spring quarter only under exceptional circumstances. Admission is based on application materials and evidence of scholarly potential, including grade point average, GRE scores, statements of purpose, and letters of recommendation.

REQUIREMENTS

Students must complete a two-quarter proseminar, a course in research design, a three-quarter statistics sequence, one seminar each in classical and contemporary theory, an advanced sociological methodology course, and nine Sociology seminars selected in consultation with the student's advisor, in order to build competency in two areas of specialization in the discipline. Course work prepares students to complete an independent research project, which is presented in oral and written form during the winter quarter of their second year. Students must pass a formal evaluation at the end of their second year involving assessment of course work and the second-year research project and evaluation of teaching or research experience. Knowledge of one foreign language is required.

All required course work must be completed prior to advancement to candidacy. Students will normally advance to candidacy during the fourth year. The advancement-to-candidacy examination is based on field examinations in two broad areas of sociology and an oral defense of a dissertation research prospectus, contextualized in the appropriate literature and including a discussion of data collection and methods of analysis. In preparation, students usually take at least the required one quarter of the Dissertation Seminar course during the third year. After advancing to candidacy, students are expected to work in close consultation with their advisor and dissertation committee. Committee approval of a satisfactory dissertation follows a final oral defense of the document, which normally comes by the end of the sixth year. The maximum time for completion of the degree is eight years.

Feminist Studies Emphasis. A graduate emphasis in Feminist Studies also is available. Refer to the Women's Studies section of the *Catalogue* for information.

Courses in Sociology

LOWER-DIVISION

INTRODUCTORY COURSES

1 Introduction to Sociology (4). Major concepts and approaches to the study of society: social interaction, social differentiation, social control, social change, social institutions. **(III)**

2 International Sociology (4). Introduces international sociology by examining international social structures and processes. Attention to international migration to and from various countries around the world, and to theories and research about the determinants of international migration for both sending and receiving countries. **(III, VII-B)**

3 Introduction to Social Problems (4). Focuses on how institutional and organizational features of societies generate problems for people. Particular attention is directed at a set of problems related to political and economic inequality: poverty, racism, sexism, urban and population problems, the environment, the criminal justice system. **(III)**

METHODS

10A-B-C Probability and Statistics (4-4-4). An introduction to probability and statistics. Emphasis on a thorough understanding of the probabilistic basis of statistical inference. Emphasizes examples from sociology, anthropology, and related social science disciplines. Same as Anthropology 10A-B-C. Students who receive credit for Sociology 10A-B-C may not receive credit for Anthropology 10A-B-C, Psychology 10A-B-C, Social Ecology 13, or Social Science 9A-B-C or 10A-B-C. **(V)**

19 Special Topics: Methods (4). Prerequisites vary. May be repeated for credit as topic varies.

THEORY

23 Understanding Social Facts (4). Focus on perspectives toward the question of what constitutes sociological knowledge and processes through which competent investigators have built sociological arguments from data. Examination of several types of research techniques. **(III)**

29 Special Topics: Theory (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIAL PSYCHOLOGY

31 Introduction to Social Psychology (4). Studies sociological contributions to theory and research in social psychology, with focus on the social influences on personality, attitudes, beliefs, and behavior; socialization, human groups, and social interaction. Same as Psychology 78A. **(III)**

39 Special Topics: Social Psychology (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIAL STRUCTURE

41 Small Group Behavior (4). Deals with models for understanding behavior in small groups, including coalition formation, socialization, group norms and decision rules, leadership, conformity, group structure, and communication processes.

43 Urban Sociology (4). The nature, causes, and consequences of urbanization are examined along with its changing scale and complexity, demographic and ecological city growth patterns, the quality of life in urban areas, processes of decision-making in cities, and the bearing of sociological investigation on public policy concerns in contemporary urban society.

44 Populations (4). Demographic aspects of social/economic change. Considers the epidemiological transition to low mortality, the historical decline in Western family size, the baby boom, third-world family planning, changing marriage patterns, women's labor force participation, migration theories, and global aging. **(VII-B)**

49 Special Topics: Structures (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIAL INSTITUTIONS AND CULTURE

51 Asian American Family and Community (4). Briefly examines the history of different Asian American groups and provides an in-depth analysis of issues related to family composition, mate selection, changing gender roles, and intergenerational conflict.

55 Mass Media and American Society (4). Examines the social implications of the fundamental changes in the organization and structure of American mass media since World War II, including the demise of big-city newspapers, the rise of broadcast television, and the fragmentation of radio and magazine markets. Explores the potential implications of emerging technologies—cable, telecast, and direct broadcast satellite (DBS)—on American culture and institutions.

56 Society and Religion (4). A critical and personal examination of the varieties of religious and spiritual experiences human beings are undergoing in contemporary society. The role of conscious understanding and unconscious conditioning regarding religion and spirituality.

59 Special Topics: Social Institutions and Culture (4). Prerequisites vary. May be repeated for credit as topic varies.

AGE, GENDER, RACE, AND ETHNICITY

62 Marriage and Families (4). Sociological theories and research on marriage, kinship, intimacy, and divorce. Emphasis on comparing family patterns in different social classes, ethnic groups, and societies, and on relating family life to the economy and other social institutions. Topics include gender roles, child-rearing, historical change. **(III)**

63 Race and Ethnicity (4). Focuses on racial and ethnic relations in the United States and compares them with those found in other societies. Analyzes the conditions that favor either cooperation and integration or rivalry, tension, and conflict. Appraises strategies for reducing and resolving conflicts. **(VII-A)**

64A Social Psychology of Family and Close Relationships (4). Analysis of the social psychology of family life: close relationships, courtships, marriage and family interaction in American society; examination of processes of preparation for marriage, role differentiation, communication, conflict, integration and socialization within the family: the psychodynamics of family life.

65 Cultures in Collision: Indian–White Relations Since Columbus (4). An introductory survey of topics such as: indigenous religious belief and socio-political organization, stereotypic "images," intermarriage, the fur trade, Native leaders, warfare, and contemporary issues. Slides, films, and trips to local museums enhance student learning. Same as Anthropology 85A. **(VII-A)**

68A Immigration and the New Second Generation (4). Focusing on Asian, Latino, and Black immigrants, examines the generation's experience of straddling two cultures and growing up American. Covers topics such as assimilation, bilingualism, race relations, education, bicultural conflicts, interracial marriage, and multiracial identities. Same as Chicano/Latino Studies 65. **(VII-A)**

69 Special Topics: Age, Gender, Race, and Ethnicity (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIETIES AND SOCIAL INEQUALITY

74 Social Inequality (4). Theory, methods, and empirical findings of social stratification studies. Topics include whether inequality is inevitable, American social classes, public beliefs about fairness, payoffs to college education and successful parents, the feminization of poverty, the prestige of occupations.

75 Social Change (4). Comparison of various theories of social change from the classical formulations of Marx and Weber through contemporary functionalist, neo-evolutionary, political economy, and world system perspectives. Emphasis is macrosociological, focusing on processes of transformation affecting societies, nation-states, or the international system as a whole.

77 Social Change in East Asia (4). Introduction to comparative sociology focusing on social change in East Asia. Particular attention to macrostructural shifts in these societies such as economic development/underdevelopment, social inequality, political stability/instability, and rapid urbanization and population growth. **(VII-B)**

79 Special Topics: Societies and Social Inequality (4). Prerequisites vary. May be repeated for credit as topic varies.

UPPER-DIVISION

METHODS

110 Research Methods (4). Methods of data collection and analysis used by sociologists. Experimental methods, surveys, and interviews, field research and participant observation, demographic methods, historical and comparative approaches. Prerequisite when offered for upper-division writing: satisfactory completion of the lower-division writing requirement.

111 Community Research (4). Students formulate and carry out a study on intimate relationships and interpersonal networks. Focus on family, friendship, and community and how people create a supportive network of relations in modern society. Prerequisite: consent of instructor.

112A Practicum in Sociology (4). Hands-on research course. Students work together to apply sociological skills to class projects. Application of sociological theories to practical tasks. Use of multiple data collection methodologies (e.g., surveys, interviews, observations). May be taken for credit twice as topics vary.

114A Exploring Society Through Photography (4). Students explore society through presentation, interpretation, and discussion of their own photographs. A few common exercises at the beginning of the quarter are followed by individual projects. Photography as social observation and the relation of photographs in an essay are stressed. Prerequisite: basic darkroom techniques or the digital equivalent. Same as Anthropology 176A and Social Science 182A.

115A Oral History Interviewing (4). Provides detailed instruction on the oral history method including developing oral history projects, selecting research subjects, constructing an interview schedule/guide, oral history interviewing, transcribing the tapes, analyzing and writing up the results. Prerequisite: consent of instructor.

118A Seminar in Research Applications (4). Student research groups work closely with instructor to develop and carry out research on selected sociological topic(s). Students apply the logic of sociological research to gain understanding of the social world. Prerequisite: consent of instructor.

119 Special Topics: Methods (4). Prerequisites vary. May be repeated for credit as topic varies.

THEORY

120 Sociological Theory (4). What a theory of society is and is not. Historical and contemporary models, perspectives, and schools.

122 Games as Models of Social Phenomena (4). Games as analogies of social, economic, and political situations. The interaction of contingency plans. Games (situations) with no winner and/or loser. Technical definition and discussion of conflict, threat, stability. Paradoxes involved in defining "rational decision." Prerequisite: one year of college-level mathematics.

125 Introduction to Ethnomethodology (4). Examines the contemporary school of sociology known as ethnomethodology through both readings and field experiments. Focuses on how we routinely, unremarkably, massively accomplish ordinary everyday reality moment to moment through interaction. The works of Schutz, Garfinkel, Sacks, Schegloff, Heritage.

126 Critical Political Theory (4). Acquaints students with current political theories, critical of conventional thinking, which attempt to join political, economic, social, historical, linguistic, and philosophical concerns to questions involving the relationships between and among individuals, groups, and institutions in the society, economy, and polity. Prerequisite: upper-division standing. Same as Political Science 132A.

127 Nietzsche (4). The social, economic, and political philosophy of Nietzsche. Nietzsche's seminal ideas about knowledge and language and how these ideas have influenced contemporary thinking concerning these subjects. Same as Political Science 131D.

129 Special Topics: Theory (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIAL PSYCHOLOGY

135 Social Psychology of Networks (4). Review of network methods used in small group and organizational research. Discussion of social psychological literature relevant to the network of study of cognitive social structure, exchange and communication, identity negotiation, and social control. Case study of network datasets exemplifies research issues. Same as Psychology 178N. Formerly Sociology 162R.

136 Religious Traditions of Asian Americans (4). Introduction to the religious traditions of Asian Americans, the transplantation of religious institutions, the establishment of sacred spaces, the socialization of children, and the role of religion in the structuring of gender relations and family.

138 Business Decisions (4). Surveys normative and descriptive models of decision-making behavior, with an emphasis on organizational and policy contexts. Topics include rational choice theory, biases and heuristics, framing effects, and overconfidence. Management fads, panics, and herd behavior are also discussed.

139 Special Topics: Social Psychology (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIAL STRUCTURE

141 Organizations (4). How bureaucracies, formal organizations, and voluntary associations work, how and why they grow, and where they are going. History and structure of organizational rationality; dynamics of organized groups; behavior in organizations. The limits of bureaucratization and attempts to overcome these limits through decentralization. Same as Political Science 155C.

142 White-Collar Crime (4) W. Examines criminal activity in business and corporate enterprise, organizations, and the professions. Theories regarding the causes and control of white-collar and corporate crime are covered as well as the numerous definitions of these terms. Same as Criminology, Law and Society 142.

143 Social Networks and Social Support (4). Examines the manner in which behaviors and attitudes of individuals are affected by their network ties to others. How are peoples' opportunities and well-being increased or decreased by their social networks? What are the processes involved? Topics vary and may include studies in mental and physical health, job seeking, separation and loss, and aging.

144 Political Sociology (4). Includes an examination of the major theoretical approaches to political sociology, and the application of these ideas to the politics of advanced capitalist societies. Also considers stability and change in power structures.

145 Occupations and Professions (4). What makes some jobs satisfying and others boring? How does technology influence the workplace? What changes are coming in the U.S. job market? Sociology and psychology of occupations. Students interview workers and study aspects of their occupations. Prerequisite: upper-division standing.

146 States and Societies (4). Examines, over an extended historical period, the forces that drove the state into being, its nature and distinctive forms, and its variable and contingent relations with that other modern creation, "society."

147A Cities and Social Change (4). Focuses on comparative urban political economy and the way cities and urban process are linked to changes in the global system. Attempts to draw on a diverse interdisciplinary literature that includes sociology, geography, and urban planning. Prerequisite: upper-division standing and completion of lower-division writing requirement.

149 Special Topics: Structures (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIAL INSTITUTIONS AND CULTURE

152 Sociology and Psychology of the Arts (4). Explores the relationship between artists and the "art world" through which artistic activity is defined, supported, and consumed. Empirical studies in the plastic arts, performing arts, and literature are used to examine varieties of aesthetic expressions. Prerequisite: upper-division standing; authorization required.

153 Sociology of Science (4). Empirical studies of scientific activity, the growth of scientific disciplines, communication in science, and cognitive organization are used to explore the relationship of science, scientific communities, and society. Provides an overview of the literature and the directions of new research in the field. Prerequisites: upper-division standing; satisfactory completion of the lower-division writing requirement.

154 Medical Sociology (4). Current problems in the United States healthcare system and proposals for reform. Considers financial barriers to access, the problem of patient dumping, underinsurance affecting the middle class, prenatal and perinatal care, child services, preventative care and needs of the elderly, minorities, low-income people, and the undocumented. Prerequisite: upper-division standing.

155 Mass Communications (4). An examination of the origin, history, and functions of mass communications and its effect on social life.

156 Deviance (4). Perspectives on deviance and criminality in behavior, institution, community, and myth. The suitability of contemporary theories of deviant behavior. Same as Psychology 177D and Criminology, Law and Society C107.

157A Sociology of Education (4). Focuses on education as a social institution and as an agent of socialization. Education from cross-national perspectives, the formal organization of education, education and the family, education and social stratification, and education as a vehicle for examining and solving social problems.

158A Work and Family Issues (4). Historical trends in the relation of two social institutions. Contemporary challenges facing businesses and families in the U.S. and abroad. Changing gender relations in home and workplace. Corporate policies and family adaptions to employment. Production of household goods and services. Prerequisite: upper-division standing.

158B Work and Employment Relations (4). Sociological and economic theories of labor markets. Workers' job search methods, recruitment strategies used by employers, and their consequences. Structural changes in the labor market and the employment relationship. Models of discrimination and introduction to employment discrimination law.

158C Money, Work, and Social Life (4). Sociological perspective on issues related to money and work. Consumption practices and lifestyles, jobs and organizations, issues of money in intimate relations, marriage, and households, illegal work, discrimination, economic globalization are discussed. Prerequisite: when offered for upper-division writing, satisfactory completion of the lower-division writing requirement.

159 Special Topics: Social Institutions and Culture (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIAL INEQUALITY MODULE

161 Sociology of Gender (4). Explores the complex processes contributing to the social construction of gender and sexuality in the U.S. with particular attention to the intersection of gender, race, ethnicity, sexuality, and class; and evaluates how men and women are differentially constituted in the family, education, work, politics, media, and language. Prerequisite when offered for upper-division writing: satisfactory completion of the lower-division writing requirement. **(VII-A)**

162A Race, Class, and Gender (4). Examines race/ethnicity, class, and gender from both a macro-sociological and a micro-sociological perspective.

162B Race and Gender Inequality at Work (4). Examines a specific subset of research in social inequality: gender and racial inequality in employment contexts.

163A Sociology of Sexual Assault (4). Examines the causes and consequences of sexual assault including rape, incest, and child molestation, and efforts to eliminate sexual assault. Explores the impact of gender, media, and "rape culture." Analyzes the effects of assault on victims and paths to recovery.

164 Sociology of Age (4). Introduction to sociology of age, aging, and the aged. Problems posed by aging population. Life course transitions. How social organizations influence the life course. Work, health, family in later life. Prerequisite: upper-division standing.

165A Social Inequality: Anthropological Perspectives (4). Concrete anthropological and sociological studies from across the world, including the United States, are compared to give perspectives on social status, power, economic differences, race, ethnicity, and gender. Prerequisite: one course in Anthropology, Economics, Political Science, or Sociology. Same as Anthropology 121H. **(VII-B)**

166A Sociology of Childhood (4). The child's place in society historically, cross-nationally, and in the contemporary United States. Childhood socialization, social class, and ethnic variation are addressed, as well as social problems and recommendations for social policy regarding children.

167A Racial and Ethnic Relations in the United States (4). Examines central questions and issues in the field of race and ethnicity; the emergence, maintenance, and consequences of the ethnic and racial stratification system in the United States; the future of racial and ethnic relations; and relevant public policy issues. Prerequisite: satisfactory completion of the lower-division writing requirement. Same as Chicano/Latino Studies 148.

168 Sexism and Power (4). Sexism may be seen as a particular form of socially constructed power which creates and maintains gender differences as relations and practices of structured inequalities. Males and females are objects constructed in a powered language dominated and controlled by males to their positional and distributional advantage. Prerequisite: upper-division standing. Same as Political Science 134J.

169 Special Topics: Age, Gender, Race, and Ethnicity (4). Prerequisites vary. May be repeated for credit as topic varies.

SOCIETIES AND SOCIAL INEQUALITY

170A Vietnam War (4). Examines social structures and social changes in Vietnamese and U.S. societies through the study of the Vietnam War.

170B U.S. War on Terrorism (4). Analyzes the United States war on terrorism by focusing on terrorism, the U.S. wars in Afghanistan and Iraq, and changes in police powers throughout the Patriot Act, as well as the political leadership which directs the war.

170C African American Protest Movements (4). Examines the work of major African American Marxist individuals and organizations in the twentieth century. Their theories of racism, capitalism, and their developed practices are covered.

171 Environmental Sociology (4). Examines society's changing relationship to the natural world. Delineates different models of "nature" and then explores their institutional roots, the social responses they have generated, and their implications for social inequality.

172E Basic Societal Issues (4). For students who have serious concern about peace, economic justice, the environment, or the future of human society generally. Attempts to provide an understanding of the fundamental issues underlying such social problems; fundamental alternatives available for attempting to cope with them. Same as Political Science 132E. Students may not receive credit for both Sociology 72/Political Science 32A and Sociology 172E/Political Science 132F.

172F American Society (4). Seminar examines recent trends in U.S. institutions such as family, community, labor, economy, media, schools, religion, criminal justice, medicine, politics, popular culture. Special attention to race, immigration, childhood, aging. Cross-national comparisons.

173 Social Stratification (4). Sources, functions, and dynamics of the unequal distribution of wealth, prestige, knowledge, and power in American and other societies.

174 Social Movements and Collective Behavior (4). A survey of models of collective action drawn from sociology, economics, psychology, and political science. Focus on areas such as social movements, strikes, crowd psychology, cults, fads, fashions, public opinion, and symbolic and mythical elements in collective culture. Prerequisite: Economics 1, Political Science 6A, or Sociology 1. Same as Political Science 156D.

175A Korean Society and Culture (4). Introductory background to the social and cultural forces that affect the lives of the Koreans, including those in the United States. Considers traditional values and contemporary issues within a historical framework. Same as Anthropology 163K and East Asian Languages and Literatures 130. **(VII-B)**

175B Comparative Societies: China (4). Chinese society from 1949 to present. Social change in the context of political control and ideological considerations. Focus on the power structure, political decision processes, and ideological legitimation, and interplay with the Chinese community and culture. **(VII-B)**

175C Japanese Society (4). Cultural, social, and psychological features of Japanese society. Early feudalism in Japan to deviance in modern-day Japan. Comparisons made with the United States with main focus on Japan and its complexities.

176 Social Policy (4). Comparison of theoretical perspectives on the role of the state in contemporary society and an examination of the gender, racial-ethnic, and class dimensions of social policy. Particular focus on social welfare, labor, health policies, and policies on sexual violence.

178 Sociology of Peace and War (4). Describes various commonly accepted but often erroneous notions of the causes and consequences of war and deterrence. Major theories concerning the sources of war in international and intranational social systems. The modes, techniques, and outcomes of efforts to restrict, regulate, and resolve international conflicts.

179 Special Topics: Societies and Social Inequality (4). Prerequisites vary. May be repeated for credit as topic varies.

RESEARCH AND HONORS

NOTE: Students are reminded that each quarter of a sequential course (i.e., Sociology 180A-B, H188A-B) must be taken in order.

180A-B Sociology Majors Seminar (4-4). Students learn sociology by doing it. A modest-sized research project is planned and implemented by each student. Prerequisite: Sociology 110. Limited to Sociology majors only.

182 Sociology Issues Seminar (2). Drawing on experts from campus and community, explores various sociological questions, findings, approaches through lectures and discussion. Students select seminar topics, prepare opening remarks, lead discussion with faculty member, guest lecturer. May be taken for credit four times as topics vary.

185A Sociology Internship (4). Designed for Sociology majors who have a working knowledge of sociological methods and theory. Students secure a field placement with the help of the instructor and mutually agreed upon sponsor. The sponsor provides a field experience for the student.

H188A-B Honors Research and Thesis (4-4). Focuses on the design and implementation of individual research projects undertaken by senior Sociology majors. Writing projects consist of a proposal and paper on some empirical research. Prerequisites: consent of instructor and honors status.

189 Special Topics: Honors Sequence (4). Prerequisites vary. May be repeated for credit as topic varies.

197 Field Study (4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

198 Directed Group Study (4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

199 Independent Study (1 to 4). Prerequisite: consent of instructor. May be repeated for credit as topic varies.

GRADUATE

202A Proseminar I in Sociology and Social Relations (1). Introduces first-year graduate students in Sociology and Social Relations to the current research interests of Sociology faculty, as well as to other aspects of graduate life at UCI and to the profession of sociology more generally. Prerequisites: graduate standing, consent of instructor.

202B Proseminar II in Sociology and Social Relations (4). Focus is on second-year research projects, design, development, data gathering, analysis, and preparing both oral and written presentations of the results. Students learn new analytic and writing skills, gain experience with the research process, and become socialized about professional standards, customs, and institutions. Prerequisites: graduate standing, consent of instructor.

210A Classical Social Theory (4). Examines the development of classical sociological theory through the writings of Karl Marx, Emile Durkheim, Max Weber, Georg Simmel, and George Herbert Mead. Prerequisites: graduate standing; consent of instructor. Same as Social Science 253N.

210B Contemporary Social Theory (4). Familiarizes students with twentieth-century developments in social thought that have influenced sociological research, suggesting "what is living and what is dead" in the "classics" and offering an overview of the main outlines of recent sociological theorizing. Prerequisites: graduate standing, consent of instructor. Same as Social Science 253R.

219 Special Topics: Theory (2 to 4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit as topics vary.

220A Research Design (4). Data collection, organization, and analysis in ethnographic or quasi-experimental settings, including interviewing, participant observations, behavior observations, and questionnaires. Research design issues include sampling, longitudinal research, and comparative research. Emphasis on the integration of qualitative and quantitative data. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 223A/Social Science 255A. Sociology 220A and Sociology 265 may not both be taken for credit.

221A-B-C Graduate Statistics I, II, III (4-4-4). Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model. Prerequisites: graduate standing, consent of instructor. Same as Social Science 255M-N-P and Anthropology 210A-B-C.

222A Comparative and Historical Methods (4). Topics include the logic of comparative and historical analysis techniques and the examination of exemplar works in representative problem areas. Prerequisites: graduate standing, consent of instructor. Same as Social Science 256M.

225A Analysis of Relational Data (4). A practicum in social networks data analysis focusing on the special problems raised by data sets that embody relations. Log-linear and quadratic assignment procedures are stressed along with multidimensional scaling and other representational models. Prerequisites: graduate standing, consent of instructor. Same as Anthropology 222A and Social Science 201G, 241C, and 256A.

226A Methods of Demographic Analysis (4) S. Introduces basic demographic methods used in social science and public health research. Topics include sources and limitations of demographic data; components of population growth; measures of nuptiality, fertility, mortality, and population mobility projection methods; and demographic models. Prerequisite: graduate standing or consent of instructor.

227A-B Seminar in Ethnographic and Qualitative Field Methods (4-4). Comprehensive and critical discussion of the traditions of qualitative fieldwork; detailed examination of the collection, coding, analysis, and presentation of ethnographic/qualitative field data; and close mentoring of student projects culminating in an original research paper. In-Progress grading. Prerequisite: graduate standing.

228A-B-C Dissertation Seminar (4-4-4) F, W, S. Research design, problem conceptualization, and advanced data analysis in the area of social relations. Emphasis on methods of analysis in ethnography, cross-cultural research, and quasi-experimental research. Prerequisites: graduate standing, consent of instructor. Same as Social Science 250X-Y-Z.

229 Special Topics: Methods (2 to 4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit as topics vary.

230A Race and Ethnicity (4). An examination of central questions and issues in the field of race and ethnicity through a critical analysis and discussion of the principal theoretical perspectives and paradigms that have framed much of the scholarship in the area. Prerequisites: graduate standing, consent of instructor. Same as Social Science 253V.

231A Theory and Methods in Asian American Studies (4). Examines major theoretical and methodological issues in Asian American Studies. Topics include the social construction of race and identity, the intersection with class and gender, and the relationship between quantitative and qualitative approaches in research methodologies. Prerequisite: graduate standing.

232A Gender, Family, and Community (4). Analyzes theory and research on family and community relations from the perspective of gender. Feminist theories of family power relations, caring in family and community settings, women and men as caregivers in the family and workplace, grass-roots organizing for family and community issues. Prerequisites: graduate standing, consent of instructor. Same as Social Science 253H.

234 Ethnic America (4). Examines critically the meaning and measurement of ethnicity, race, and nation in sociological theory and research. Theories of ethnicity are explored, along with empirical studies of the construction of ethnic and pan-ethnic identities in historical and contemporary contexts. Prerequisite: graduate standing.

239 Special Topics: Social Inequality (2 to 4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit as topics vary.

240A Social Movements (4). A survey of the field of Social Movements, oriented around critical themes in the major theoretical traditions and contemporary exemplars. Prerequisites: graduate standing, consent of instructor. Same as Social Science 253J.

241A Political Sociology (4). Begins with an examination of the three major orientations to the State (Pluralist, Elitist, and Class). Next considers current topics in political sociology including the Welfare State, the New Deal, political behavior, social movements, participation, and democracy. Prerequisites: graduate standing, consent of instructor. Same as Social Science 253I.

249 Special Topics: Political Sociology and Social Movements (2 to 4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit as topics vary.

252A Global Urbanization (4). Examines the spread of cities worldwide in the twentieth century. What are the political and economic causes of this process? What are the social-cultural, political, economic effects? How is contemporary urbanization liked to global restructuring of other kinds? Prerequisites: graduate standing, consent of instructor. Same as Social Science 254J and Urban and Regional Planning U273.

259 Special Topics: Global Studies and Comparative Development (2 to 4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit as topics vary.

261A Age, Generations, and the Life Course (4). Age is a central organizing principle of individual lives, social institutions, and human populations. Considers how age is socially defined and how developmental transitions between ages (i.e., growing up and growing older) are accomplished. Prerequisites: graduate standing, consent of instructor. Same as Social Science 253E.

262A Populations (4). Introduces the interrelationships between population and social organization. Considers measurement and explanation of historical and contemporary trends in birth rates, death rates, migration, and marriage and divorce. Case material is drawn primarily from the U.S. and other industrialized nations. Prerequisite: graduate standing or consent of instructor. Same as Social Sciences 253F.

264 Immigrant America (4). The study of the causes and consequences of international migration has become one of the most vital fields of sociological theory and research. Examines principal theoretical perspectives and empirical research on contemporary immigration flows and the processes of incorporation. Prerequisite: graduate standing.

265 Demographic and Social Analysis (DASA) (4). Data collection, organization, and analysis in population studies and demography. Research design issues include sampling, longitudinal research, and comparative research. Prerequisites: graduate standing, consent of instructor, and enrollment in DASA program. Students may not receive credit for both Sociology 265 and Sociology 220A/Anthropology 223A/Social Science 255A.

269 Special Topics: Social Demography (2 to 4). Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

270 Organizational Theory (4). Examination of theoretical approaches for analyzing the origins, operations, and consequences of complex organizations. Prerequisites: graduate standing, consent of instructor.

272A Work and Industrial Relations (4). Explores the nature, causes, and results of workplace conflict in American Society. Considers topics such as "American Exceptionalism," sex segregation in the workplace, strikes and the role of unions in American society. Prerequisites: graduate standing, consent of instructor. Same as Social Science 253U.

279 Special Topics: Social Organizations and Institutions (2 to 4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit as topics vary.'

280 Analysis of Social Network Data (4). Overview and application of methods for analyzing social network data. Topics include: data structures, visualization, graph theory, centrality, subgroups, positions, blockmodels, local properties, and statistical models. Social network analysis software is used to analyze a range of examples. Prerequisite: graduate standing.

281 Introduction to Social Network Analysis (4). Designed to provide a broad overview of social network analysis. At the same time, students have an opportunity to delve deeply into applications of the network approach in their individual areas of interest. Prerequisite: graduate standing.

289 Special Topics (2 to 4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit as topics vary.

290 Dissertation Research (1 to 12). Prerequisites: graduate standing, consent of instructor. May be repeated for credit.

299 Independent Study (4). Prerequisites: graduate standing, consent of instructor. May be repeated for credit.

GRADUATE PROGRAM IN SOCIAL SCIENCE

In addition to the departmental graduate programs, the School offers the M.A. degree in Social Science with a concentration in Demographic and Social Analysis and the Ph.D. degree in Social Science with a concentration in Mathematical Behavioral Sciences. Each program is administered by a different group of faculty.

Graduate Concentration in Demographic and Social Analysis

Participating Faculty

Hoda Anton-Culver: Epidemiology and preventive medicine
M. Victoria Basolo: Urban politics, regionalism, public choice, interorganizational relationships
Frank Bean: Migration and immigration, immigrants' welfare and demographic behavior
Marlon G. Boarnet: Urban economics, urban planning, urban economic development
Michael Burton: Economic anthropology, ecological anthropology, gender
Kitty C. Calavita: Sociology of law, criminology, social deviance, immigration, and inequality
Leo R. Chavez: International migration, Latin American immigrants, medical anthropology
Kenneth S. Chew: Social and historical demography
Philip Cohen: Social demography, inequality, race, and work
C. David Dooley: Community psychology, epidemiology, economic change
Katherine Faust: Social networks, research methods
Susan Greenhalgh: Political economy, feminism/gender, politics of reproduction, critical demography
Bernard N. Grofman: Mathematical models of collective decision making, formal democracy theory, politics of small groups
Matt L. Huffman: Organizations, work, gender inequality
Mireille Jacobson: Health economics, drug policy, labor economics
Jennifer Lee: Migration and immigration, race/ethnic/minority relations, urban sociology
John M. Liu: Race/ethnic/minority relations; economy and society
Richard Matthew: International relations, environmental policy, ethics
Richard McCleary: Criminal justice, research methodology, statistics
Robert Newcomb: Social statistics, methodology
Gary Richardson: Economic history, immigration in historical perspective
Rubén G. Rumbaut: International migration, the "1.5" Generation, comparative race and ethnic relations, structural inequality; identity, health, and mental health
David A. Smith: Urban sociology, comparative sociology, political sociology
William C. Thompson: Psychology and law, criminal justice, human judgment and decision making
George Tita: Criminology, community context of violence, urban youth gangs, homicide studies
Judith Treas: Population studies, sociology of aging, sociology of family
Wang Feng: Demography, social change, economy and society

Douglas L. White: Cross-cultural research, mathematical anthropology, social networks
Susan K. Wierzbicki: Immigrants' settlement patterns and social networks; the effect of affirmative-action law on college enrollment in Washington State; demographic change in U.S. suburbs over the last three decades

The M.A. in Social Science with a concentration in Demographic and Social Analysis offers specialized training in the research skills to address practical problems confronting society, business, government, and the nonprofit sector. The concentration emphasizes the Pacific Rim and issues defining Southern California's population, such as immigration, changing household and family structure, racial and economic inequalities, and the impact of local and regional population growth. Informed by the interdisciplinary field of demography, the program draws on faculty and courses in the Schools of Social Sciences and Social Ecology.

ADMISSION

Students who wish to complete the program in one year are generally admitted to the program in the fall quarter. Students must hold a B.A. or B.S., normally in a social science or related field, and should have had at least four units of undergraduate statistics or equivalent mathematics courses. Students must meet the general admission requirements for graduate studies, which include official transcripts of all college course work, Graduate Record Examination scores for tests taken within the past five years, and three letters of recommendation. Applicants whose first language is not English must also take the Test of English as a Foreign Language (TOEFL) and achieve a score of 550 or higher on the paper-based test or 213 or higher on the computer-based test.

REQUIREMENTS

The M.A. requires 36 units of study and an oral exit examination. All students must complete 20 units of required courses which include one course in research design, one in demographic methods, one in populations, and two in statistics. In addition, students must complete 16 units of elective courses in population issues or research methods. No more than four units may be internship, independent study, directed readings, or thesis courses (to prepare for the oral examination). One or two electives may be upper-division undergraduate courses, with the remainder being graduate courses. All courses must be completed with a grade of B or better.

The M.A. in Social Science with a concentration in Demographic and Social Analysis may also be awarded to Ph.D. students who complete the necessary requirements.

Graduate Concentration in Mathematical Behavioral Sciences

Participating Faculty

Aldo Antonelli: Non-standard set theories, logical foundations of game theory and applications to distributed artificial intelligence
Pierre F. Baldi: Bioinformatics/computational biology; probabilistic modeling/machine learning
Jeffrey Barrett: Philosophy of science, philosophy of physics
William Batchelder: Mathematical models, measurement, and cognitive processes
John P. Boyd: Mathematical anthropology and systems theory
Myron Braunstein: Visual perception and computer applications
Scott D. Brown: Mathematical models of reaction time and practice
David Brownstone: Econometrics and industrial organization
Michael Burton: Economic anthropology; gender, family, and households; cognitive anthropology; Africa, Oceania
Charles F. Chubb: Visual perception, psychophysics
Carol Cicerone: Visual perception and the physiological bases of visual perception, with emphasis on human color vision and retinal mechanisms of sensitivity regulation
Linda Cohen: Political economy, social choice, government regulation and government policy toward research and development
Rui J. P. de Figueiredo: Mathematical foundations of neural networks, contextual feedback models for automated image understanding
Barbara Dosher: Memory, information processing, perception
Michael D'Zmura: Vision research, virtual reality
Jean-Claude Falmagne: Mathematical psychology
Katherine Faust: Social networks, research methods
Linton C. Freeman: Network models of social structure
Michelle Garfinkel: Macroeconomic and monetary theory
Amihai Glazer: Public choice, especially concerning commitment problems
Bernard N. Grofman: Mathematical models of collective decision making, formal democratic theory, sequential decision making, politics of small groups
Donald Hoffman: Artificial intelligence approaches to human and machine vision, recovery of three-dimensional structure from image motion, visual recognition of objects by their shape
Tarow Indow: Mathematical models in visual space, color space, and human memory
Geoffrey Iverson: Cognitive science and mathematical models
L. Robin Keller: Decision analysis, risk analysis, problem structuring, management science
Natalia L. Komarova: Mathematical modeling of biology and language; nonlinear waves
Igor Kopylov: Microeconomic theory, decision theory, and game theory
R. Duncan Luce: Mathematical behavioral science
Penelope Maddy: Philosophy of mathematics, philosophy of logic
Michael McBride: Microeconomics, game theory, and political economy
Louis Narens: Measurement, logic, and metacognition
Robert Newcomb: Statistical and research methods for the social sciences
Dale Poirier: Econometrics, both theoretical and empirical, specializing in Bayesian econometrics
A. Kimball Romney: Experimental and psychological anthropology
Donald G. Saari: Mathematics and application of dynamical systems to social sciences
Stergios Skaperdas: Economic theory, political economy
Brian Skyrms: Philosophy of science, metaphysics
Kenneth A. Small: Urban economics, transportation economics, discrete-choice econometrics, energy
Padhraic Smyth: Statistical pattern recognition, probabilistic learning, information theory
George Sperling: Vision, perception, information processing
Hal Stern: Bayesian methods, model diagnostics, statistical computing
Mark Steyvers: Computational models of memory, reasoning, and perceptions
Carole J. Uhlaner: Comparative political participation, formal models of political behavior
Christian Werner: Mathematical geography
Douglas White: Social networks, longitudinal social demography
Charles E. Wright: Skill acquisition and generalization, human motor behavior, visual attention, Virtual Reality Laboratory
John I. Yellott: Mathematical psychology and vision perception
Hong-Kai Zhao: Applied mathematics in physics, engineering, imaging science, and computer vision

The concentration in Mathematical Behavioral Sciences offers a program of interdisciplinary and mathematical approaches to the study of human behavior, providing high levels of training in current mathematical modeling and in mathematics and software use and programming. The program is administered by an interdisciplinary group of faculty. Within the concentration, two optional emphases are available: Social Networks; and Games, Decisions, and Dynamical Systems. Specific requirements are detailed below.

ADMISSION

Admission to the concentration in Mathematical Behavioral Sciences requires evidence of appreciable mathematical skill and knowledge. As an absolute minimum, a candidate should have taken one full year of calculus, including calculus of several variables, and one course in linear algebra, and should also provide evidence of additional mathematical depth. This depth can be manifested in a number of different ways including, but not restricted to, an undergraduate degree in mathematics or physical science, a high score on the mathematics portion of the GRE, or a strong undergraduate minor in mathematics. In addition, students should have some exposure to a behavioral science field. Especially useful is some experience with behavioral science modeling.

Those students interested in either the emphasis in Social Networks or the emphasis in Games, Decisions, and Dynamical Systems should make this clear in their application. A student is free at any time after admission to move into or out of either emphasis, but will be subject to the requirements in effect at the time of original admission to the concentration in Mathematical Behavioral Sciences.

GENERAL REQUIREMENTS

Four major classes of requirements must be fulfilled. Since a number of options are available, the student will, in consultation with an advisor, develop a plan of study.

Quantitative/Mathematical. To be completed by the end of the third year: (1) one course each in analysis beyond calculus, abstract algebra beyond linear algebra, and logic; and (2) two quarters of mathematical statistics, with calculus as a prerequisite and covering the fundamentals of probability and random variables.

A list of courses eligible for satisfying the Quantitative/Mathematical requirement is available online at http://www.imbs.uci.edu/NEWphdprogram.html.

Language/Computer. All students must be sufficiently familiar with various computer programs and languages to be able to conduct serious research in their field of interest and must submit either proposed courses or some demonstration of competency as part of their plan of study. In addition, students must either (1) attain proficiency in reading social science technical publications in one foreign language with a substantial relevant technical literature or (2) demonstrate proficiency in computer programming considerably beyond that of the standard computer requirement. Because of the continually changing nature of computer languages and software, the conditions for fulfilling this additional computer expertise requirement is left to the judgment of the faculty subcommittee on computers of the Ph.D. program.

Substantive Minor. Students are expected to develop considerable expertise in some substantive field and in the application of models to it. This requires the completion of three courses at the upper-division or graduate level that do not necessarily entail extensive modeling, and three courses or seminars in which the primary thrust is mathematical modeling.

Research Papers and Colloquia. At the end of the second year, a 10–20-page paper reporting original research or a penetrating analysis of some subtopic of Mathematical Behavioral Science (or either Social Networks, or Games, Decisions, and Dynamical Systems with a formal or mathematical component) is expected. An oral presentation will be given to faculty and graduate students. Two faculty members are assigned to read and evaluate the paper and talk.

Students are required to take for credit four quarters of the Mathematical Behavioral Sciences Colloquium, Social Science 211A-B-C, during their first three years. Although not a formal requirement, students are expected to attend the Colloquium on a regular basis whenever in residence.

Time to Degree. Students must advance to candidacy in their fourth year. The normal time for completion of the Ph.D. is six years. The maximum time permitted is seven years.

Emphasis in Social Networks

The requirements for the emphasis in Social Networks are the same as the general requirements noted above, with the following exceptions:

Students may choose to complete the first part of the Quantitative/Mathematical requirement with one course each in discrete mathematics, graph theory, and logic.

Social Networks students are required to attend about 75 percent of the Mathematical Behavioral Sciences Colloquia, including all that are designated as Social Networks colloquia, and also must attend occasional colloquia, usually of local faculty and graduate students, which are separate from the general Mathematical Behavioral Sciences Colloquia.

Emphasis in Games, Decisions, and Dynamical Systems

The requirements for the emphasis in Games, Decisions, and Dynamical Systems are the same as the general requirements noted above, with the following exceptions:

Students must complete eight graduate courses emphasizing game theory, decision theory, or dynamical systems. Examples of such courses are: Economics 243A (Game Theory); Economics 270A-B-C (Seminar in Public Choice I, II, III); Social Science 241B (Network Theories of Social Structure); Anthropology 289A (Networks and Social Evolution); Anthropology 289B (Cognition, Technology, and Genes); and Anthropology 289C (Dynamical Processes). These courses will count toward the Substantive Minor requirement.

Students are required to attend about 75 percent of the Mathematical Behavioral Sciences Colloquia, including all that are designated as Games, Decisions, and Dynamical Systems colloquia, and must also must attend occasional colloquia, usually of local faculty and graduate students, which are separate from the general Mathematical Behavioral Sciences Colloquia.

Master of Arts Degree

The M.A. degree is awarded to UCI Ph.D. students who complete necessary requirements or to students currently enrolled in a Ph.D. program (or equivalent) at another institution who are directly admitted for graduate study leading only to the master's degree at UCI. Such applicants must provide evidence that their Ph.D. program agrees to this one-year arrangement. Requirements include the submission of a petition to the Graduate Committee along with a proposed plan of study consisting of 36 units of relevant Mathematical Behavioral Science courses, normally including the core requirement in mathematical statistics, and the satisfactory completion of a comprehensive examination.

Graduate Courses in Social Science

SOCIAL SCIENCES

201A Descriptive Multivariate Statistics I (4). Mathematical tools to organize and illuminate the multivariate methods. Multiple regression analysis, multi-dimensional scaling, and cluster analysis. Statistical computing via MDS(x), DMDP, and SPSS. Students must enroll in the laboratory section which meets on Wednesdays. Prerequisite: Social Science 100A-B-C or equivalent. Satisfactory/Unsatisfactory grading only. Same as Information and Computer Science 238A, Social Ecology 290A, and Management 290X.

201B Descriptive Multivariate Statistics II (4). Presentation of the principal methods of multivariate statistics including criteria for appropriate use and the interpretation of resulting measurements. Computer exercises are used to demonstrate concepts. Prerequisite: Social Science 201A. Same as Information and Computer Science 238B, Social Ecology 290B, and Management 290Y.

201C Sampling Techniques and Estimation Methods (4). A review of confidence interval estimates derived from simple random samples is followed by a representation of techniques for improving the precision of such estimates under the constraints of feasibility, cost, and time. Methods for dealing with bias and nonsampling errors are also considered. Outside speakers. Prerequisites: Social Science 100A-B-C or equivalent. Same as Social Ecology 290C and Management 290Z. Satisfactory/Unsatisfactory only.

201D Introduction to Biostatistics (2). An introduction to the principles and methods of biostatistics with application to the health sciences. Statistical concepts, terminology, and techniques employed in health science research to analyze data and report such analysis. Articles from health science research literature are used for illustration. Prerequisite: graduate standing or consent of instructor.

201G Analysis of Relational Data (4). A practicum in social networks data analysis focusing on the special problems raised by data sets that embody relations. Log-linear and quadratic assignment procedures are stressed along with multidimensional scaling and other representational models. Prerequisites: graduate standing; consent of instructor. Same as Anthropology 222A, Social Science 241C and 256A, and Sociology 225A.

209A-Z Special Topics in Mathematical Social Science (4). Current research in Mathematical Social Science. Topics vary.

211A-B-C Mathematical Behavioral Sciences Colloquium (2-2-2). Weekly reports and colloquia by faculty, students, and visitors. Satisfactory/Unsatisfactory only. May be repeated for credit.

SOCIAL NETWORKS

241B Network Theories of Social Structure (4). Explores communicative, social, political, economic, and other flows of behavior using foundational network concepts and measures such as centrality, group, role, pattern, and system. Defines social structure, processes that generate structures, and behavioral consequences of structural rather than individual dispositional properties. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 222B.

241C Analysis of Relational Data (4). A practicum in social networks data analysis focusing on the special problems raised by data sets that embody relations. Log-linear and quadratic assignment procedures are stressed along with multidimensional scaling and other representational models. Prerequisites: graduate standing; consent of instructor. Same as Anthropology 222A, Social Science 201G and 256A, and Sociology 225A.

249A Special Topics in Social Networks (4) F, W, S. Current research in Social Networks. Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

SOCIOLOGY AND SOCIAL RELATIONS

PROSEMINARS AND COLLOQUIA

250R-S-T Current Research in Social Relations (1.3-1.3-1.4) F, W, S. Research seminar in which a number of Social Relations faculty members present and discuss their current research. Prerequisite: graduate standing or consent of instructor.

250X-Y-Z Social Relations Dissertation Seminar I, II, III (4-4-4) F, W, S. Research design, problem conceptualization, and advanced data analysis in the area of social relations. Emphasis on methods of analysis in ethnography, cross-cultural research, and quasi-experimental research. Prerequisites: graduate standing, consent of instructor. Same as Sociology 228A-B-C.

COGNITIVE ANTHROPOLOGY AND THE STUDY OF CULTURE

251A Anthropology and History (4). An examination of the complex, long-standing relationship between anthropology and history. Themes include: history, culture, and colonialism; history and the power to represent; nostalgia and the uses of the past in struggles over "national history." Prerequisite: graduate standing or consent of instructor. Same as Anthropology 230A.

252G Structuralism and Post-Structuralism (4). Traces recent theoretical discussions and arguments over the philosophical and historical "subject" from structuralist decenterings toward the characteristically "post-structuralist" contemporary concern with the historical and political constitution of subjectivities and subject positions. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 247A.

FAMILY AND GENDER

253A Family and Life History (4). Interdisciplinary and comparative work in family and life history. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 221A.

253E Age, Generations, and the Life Course (4). Age is a central organizing principle of individual lives, social institutions, and human populations. Considers how age is socially defined and how developmental transitions between ages (i.e., growing up and growing older) are accomplished. Prerequisites: graduate standing, consent of instructor. Same as Sociology 261A.

253F Populations (4). Introduces the interrelationships between population and social organization. Considers measurement and explanation of historical and contemporary trends in birth rates, death rates, migration, and marriage and divorce. Case material is drawn primarily from the U.S. and other industrialized nations. Prerequisites: graduate standing, consent of instructor. Same as Sociology 262A.

SOCIAL STRUCTURE, SOCIAL ORGANIZATIONS, AND SOCIAL NETWORKS

253H Gender, Family, and Community (4). Analyzes theory and research on family and community relations from the perspective of gender. Feminist theories of family power relations, caring in family and community settings, women and men as caregivers in the family and workplace, grass-roots organizing for family and community issues. Prerequisites: graduate standing, consent of instructor. Same as Sociology 232A.

253I Political Sociology (4). Begins with an examination of the three major orientations to the State (Pluralist, Elitist, and Class). Next considers current topics in political sociology including the Welfare State, the New Deal, political behavior, social movements, participation, and democracy. Prerequisites: graduate standing, consent of instructor. Same as Sociology 241A.

253J Social Movements (4). A survey of the field of Social Movements, oriented around critical themes in the major theoretical traditions and contemporary exemplars. Prerequisites: graduate standing, consent of instructor. Same as Sociology 240A.

253N Classical Social Theory (4). Examines the development of classical sociological theory through the writings of Karl Marx, Emile Durkheim, Max Weber, Georg Simmel, and George Herbert Mead. Prerequisites: graduate standing; consent of instructor. Same as Sociology 210A.

253R Contemporary Social Theory (4). Familiarizes students with twentieth-century developments in social thought that have influenced sociological research, suggesting "what is living and what is dead" in the "classics" and offering an overview of the main outlines of recent sociological theorizing. Prerequisites: graduate standing, consent of instructor. Same as Sociology 210B.

253U Work and Industrial Relations (4). Explores the nature, causes, and results of workplace conflict in American society. Considers topics such as "American Exceptionalism," sex segregation in the workplace, strikes and the role of unions in American society. Prerequisites: graduate standing, consent of instructor. Same as Sociology 272A.

253V Race and Ethnicity (4). An examination of central questions and issues in the field of race and ethnicity through a critical analysis and discussion of the principal theoretical perspectives and paradigms that have framed much of the scholarship in the area. Prerequisites: graduate standing, consent of instructor. Same as Sociology 230A.

THIRD WORLD DEVELOPMENT AND SOCIAL CHANGE

254A Transnational Migration (4). The immigrant experience will be examined in order to explore how specific theoretical issues are examined empirically. These issues include ethnic enclave formation, gendered differences in migration and settlement, class differences, the migration of indigenous groups, identity formation, and issues of representation. Same as Anthropology 235A.

254E Economic Anthropology (4). Classic and contemporary theory in economic anthropology. Case studies from Latin America (primarily Mexico and the Andes), Africa, and the Pacific. Substantive topics include non-market exchange, markets and marketplaces, households, gender, management of common property (fisheries, pastoral lands, forests), labor, development, and change. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 240A.

254F The Politics of Ethnography (4). Explores the way that ethnographies are linked to wider contexts within which they are produced. Through examination of recent critiques of ethnographic writing, and a series of cases, shows how ethnography is bound up with the politics of representation. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 242A.

254H Seminar in Political Anthropology (4). Explores anthropological approaches to politics. Covers a range of issues and topics including: theories of culture, power, and hegemony; approaches to colonial and post-colonial relations of global inequality; and ethnographic approaches to the modern state. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 245A.

254J Global Urbanization (4). Examines the spread of cities worldwide in the twentieth century. What are the political and economic causes of this process? What are the social-cultural, political, economic effects? How is contemporary urbanization linked to global restructuring of other kinds? Prerequisites: graduate standing, consent of instructor. Same as Sociology 252 and Urban and Regional Planning U273.

254K Gender and Globalization (4). Teases out gender implications of transformations in global culture and political economy. By examining processes such as globalization of production and investment, spread of religious fundamentalisms, and extension of mass media throughout the world, maps out terrain for future ethnographic and theoretical work. Same as Anthropology 234B.

254L Approaches to Globalization (4). Historical and contemporary approaches to the world economy, emphasizing anthropological questions of culture, power, identity, inequality. Examines "neo-imperialism," "late capitalism," accumulation, global markets, urban space, the state, business and policy globalization discourse, "local" responses to and instantiations of the "global." Prerequisite: graduate standing or consent of instructor. Same as Anthropology 248A.

254M Law, Colonialism, and Nationalism (4). Origins and spread of law in colonial and nationalist contexts: law's role in constituting and policing difference. Recent theoretical approaches; property in things and people; human and indigenous rights; "customary" law; legal foundations of nationalism; resistance to/through law; globalization. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 246B.

METHODS AND STATISTICS

255A Research Design (4). Data collection, organization, and analysis in ethnographic or quasi-experimental settings, including interviewing, participant observations, behavior observation, and questionnaires. Research design issues include sampling, longitudinal research, and comparative research. Emphasis on the integration of qualitative and quantitative data. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 223A/Sociology 220A. Students may not receive credit for both Social Science 255A and Sociology 265.

255C Grant and Proposal Writing (4). Focuses on production, critique, and revision of student research proposals. A practical seminar designed to improve student proposals, help students through the application processes, and increase students' chances of obtaining support for their research. Prerequisite: graduate standing or consent of instructor. Same as Anthropology 225A.

255M-N-P Graduate Statistics I, II, III (4-4-4). Statistics with emphasis on applications in sociology and anthropology. Examines exploratory uses of statistical tools in these fields as well as univariate, bivariate, and multivariate applications in the context of the general linear model. Prerequisites: graduate standing, consent of instructor. Same as Sociology 221A-B-C and Anthropology 210A-B-C.

OTHER METHODOLOGY AND STATISTICS

256A Analysis of Relational Data (4). A practicum in social networks data analysis focusing on the special problems raised by data sets that embody relations. Log-linear and quadratic assignment procedures are stressed along with multidimensional scaling and other representational models. Prerequisites: graduate standing; consent of instructor. Same as Anthropology 222A, Social Science 201G and 241C, and Sociology 225A.

256M Comparative and Historical Sociological Methods (4). Topics include the logic of comparative and historical analysis techniques and the examination of exemplar works in representative problem areas. Prerequisites: graduate standing, consent of instructor. Same as Sociology 222A.

SPECIAL TOPICS IN SOCIAL RELATIONS

259A Special Topics in Social Relations (1 to 4). Prerequisite: graduate standing or consent of instructor. May be repeated for credit as topics vary.

MULTICULTURAL / INTERNATIONAL

272A Origin and Evolution of Marxist Social Thought (4). Focuses on the genesis and evolution of Marxist social thought. The "systemic" method of Marx and Engles to questions of economic production and reproduction is compared and contrasted with modern world-system grand visions, feminist-theoretic approaches, and postmodern critiques. Prerequisites: undergraduate course in political theory or equivalent: graduate standing or consent of instructor.

274E-F Colloquium: Hispanic-American Culture I, II (4-4). The history and cultural background of contemporary Americans of Latin-American descent. Introduces students to major works in history, social sciences, and the arts that are essential for understanding this aspect of the U.S. socio-historical development. Prerequisite: graduate standing or consent of instructor.

289 Special Topics in Social Science (4) F, W, S. Current research in Social Science. Topics vary. May be repeated for credit.

SPECIAL COURSES IN SOCIAL SCIENCE

290 Dissertation Research (4 to 12) F, W, S. May be repeated for credit. Prerequisite: consent of instructor.

291 Directed Reading Examination Preparation (4) F, W, S

298 Self-Directed Study (1 to 12) Summer. May not be applied toward residency requirements or toward total units required for a degree. May be repeated for credit. Prerequisite: graduate standing.

299 Independent Study (4) F, W, S. May be repeated for credit.

399 University Teaching (4-4-4) F, W, S. Limited to Teaching Assistants.

COLLEGE OF HEALTH SCIENCES

Thomas C. Cesario, M.D., **Dean**

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World Wide Web: http://www.com.uci.edu/

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Andrew Reikes, M.D. University of California, San Diego, *Associate Clinical Professor of Medicine (Internal Medicine, Endocrinology, and Primary Care)*
Bernard Reimer, M.D. University of Minnesota, *Assistant Clinical Professor of Orthopaedic Surgery*
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Rachel E. Reitan, M.D. University of Wisconsin, *Assistant Clinical Professor of Obstetrics and Gynecology*
Charles E. Ribak, Ph.D. Boston University, *Professor of Anatomy and Neurobiology and of Biological Sciences*
Monica Rivera, M.D. Charles Drew University, *Division Director of Ultrasound and Assistant Clinical Professor of Radiological Sciences*
Jorge Rivero, M.D. Universidad Peruana Cayetano Heredia (Peru), *Associate Clinical Professor of Family Medicine (Family Medicine, Geriatrics, and Primary Care)*
Dante Roa, Ph.D. Florida State University, *Assistant Clinical Professor of Radiation Oncology*
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W. Edward Robinson, M.D., Ph.D. Vanderbilt University, *Associate Professor of Pathology and of Microbiology and Molecular Genetics in Residence*
Daniel Robitshek, M.D. Oral Roberts University School of Medicine, *Associate Clinical Professor of Medicine (Hospitalist Program and Internal Medicine)*
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Irwin A. Rose, Ph.D. University of Chicago, *Professor of Physiology and Biophysics in Residence*
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Steven Ross, M.D. University of Southern California, *Clinical Professor of Orthopaedic Surgery*
James Roum, M.D., Ph.D. University of California, Irvine, *Associate Clinical Professor of Medicine (Hospitalist Program and Pulmonary/Critical Care Medicine)*
Lloyd Rucker, M.D. University of Kentucky, *Associate Dean, School of Medicine, and Clinical Professor of Medicine (General Internal Medicine and Primary Care)*
Scott Rudkin, M.D. University of California, Irvine, *Assistant Clinical Professor of Emergency Medicine*
Roxanne Ruzicka, M.S. Medical College of Virginia, *Assistant Clinical Professor of Pediatrics*
Terra Safer, M.D. University of California, Los Angeles, *Assistant Clinical Professor of Medicine and Pediatrics (General Internal Medicine and Primary Care)*
Hamid M. Said, Ph.D. University of Aston (England), *Professor of Medicine (Gastroenterology, Nephrology), Physiology and Biophysics, and Pediatrics in Residence*
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Curt A. Sandman, Ph.D. Louisiana State University, *Professor of Psychiatry and Human Behavior in Residence*
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Scott Sasse, M.D. University of Wisconsin, *Assistant Professor of Medicine (Pulmonary/Critical Care) in Residence*
Jon Sassin, M.D. St. Louis University, *Professor Emeritus of Neurology*
Catherine S. Sassoon, M.D. Gadjah Mada University School of Medicine (Indonesia), *Professor of Medicine (Pulmonary) in Residence*
Anthony M. Savo, M.D. University of Vermont, *Assistant Clinical Professor of Surgery (Transplantation)*
Steven L. Schandler, Ph.D. University of Southern California, *Adjunct Professor of Psychiatry and Human Behavior*
Peter L. Schnall, M.D. Stanford University, M.P.H. Columbia University, *Clinical Professor of Medicine (Occupational/Preventative)*
Steven S. Schreiber, M.D. Albany Medical College, *Professor of Neurology and of Anatomy and Neurobiology in Residence*
Carl Schultz, M.D. University of California, Irvine, *Professor of Clinical Emergency Medicine*
Christina Schwindt, M.D. St. Louis University, *Assistant Clinical Professor of Pediatrics (Allergy/Immunology)*

Varun Sehgal, Ph.D. University of Florida, *Assistant Clinical Professor of Radiation Oncology*

Michael E. Selsted, M.D., Ph.D. University of California, Los Angeles, *Department Chair and Professor of Pathology, Professor of Microbiology and Molecular Genetics and of Pharmacology, and Warren L. Bostick Chair in Pathology*

Bert L. Semler, Ph.D. University of California, San Diego, *Chair of the Department of Microbiology and Molecular Genetics and Professor of Microbiology and Molecular Genetics and of Biological Sciences*

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OVERVIEW

The UCI College of Health Sciences, established in 2004, includes the newly recognized Program in Public Health and the Program in Pharmaceutical Sciences, in addition to the well-established School of Medicine.

The Program in Pharmaceutical Sciences, established in 2003, plans to develop a curriculum focusing on the strengths required to prepare students for professional positions in the pharmaceutical production, control, and development sectors of the pharmaceutical and biotechnology industry or for graduate studies in pharmaceutics, medicinal chemistry, pharmacology, analytical chemistry, medicine, and pharmacy. Collaborative interdisciplinary research will be supported by joint faculty appointments shared with other UCI departments. Proposals for undergraduate and graduate programs are currently under development. Interested students should contact the Program in Pharmaceutical Sciences for up-to-date information; telephone (949) 824-0174.

The Program in Public Health, established in 2003, plans to develop core strengths in essential areas of the field, including health services and clinical policy research, biostatistics and quantitative/qualitative methods, clinical sciences, epidemiology, behavior/interdisciplinary sciences, and environmental sciences. Collaborative interdisciplinary research will be supported by joint faculty appointments shared with other UCI departments. Proposals for undergraduate and graduate programs are currently under development. Interested students should contact the Program in Public Health for up-to-date information; telephone (949) 824-0174.

Detailed information about the School of Medicine follows.

SCHOOL OF MEDICINE

Thomas C. Cesario, M.D., **Dean**
Irvine Hall
Admissions and Outreach: (949) 824-5388
World Wide Web: http://www.com.uci.edu/

The UCI School of Medicine became part of the University of California in 1965. Prior to this time it was known as the California College of Medicine which traces its roots to a private institution founded in 1896.

Mission Statement

The UCI School of Medicine is dedicated to advancing the knowledge and practice of medicine for the benefit of society. This mission is achieved through programs of excellence in:

Education: The School of Medicine is committed to provide educational programs of the highest quality to medical students, M.D./Ph.D. and M.D./M.B.A. students, residents, fellows, allied health, graduate academic students, practicing physicians and other health care professionals. Educational programs are offered along the continuum of medical education with programs in undergraduate, graduate, and continuing medical education. These programs emphasize the most current knowledge in the health sciences and reflect the changing practice of medicine. Further, the School of Medicine's educational programs are designed to stimulate lifelong self-learning and critical inquiry and to exemplify those human values necessary to fulfill the professional commitments of a career in the health sciences.

Research: Excellence in research is an essential feature of the School of Medicine. Therefore, the School is committed to develop and maintain research programs in the health sciences which seek to advance basic scientific knowledge and the prevention, diagnosis, and treatment of human illness.

Clinical Care: Recognizing its responsibility to meet the educational needs of students and the diverse needs of the patient community, the School of Medicine is committed to programs of clinical excellence across the spectrum of patient care disciplines.

Service to the Public: As a publicly assisted institution, the School of Medicine is committed to serve the community as a vital resource of expertise and knowledge. The School further serves the public through the training of health professionals whose backgrounds reflect California's ethnic and cultural diversity and whose professional careers address California's health care needs.

Health Sciences Complex

The Health Sciences Complex is a 121-acre site that houses UCI's medical school facilities. Twenty-nine acres have been developed to provide space for teaching, research, and patient care as well as offices for departmental administration.

The School's basic science instructional programs are located in modern, well-equipped, medical sciences buildings. These units provide space for first- and second-year classes, lecture halls (including the Dr. S. Jerome and Judith D. Tamkin Student Lecture Hall), offices and laboratories for various basic and clinical departments, and a student center. Other buildings house the School's administration, laboratories, and student center.

In addition, the 40,000-square-foot Plumwood House is devoted to basic research in the fields of neurological disorders, diagnostic systems and reagents, and industrial bioreactors. In this facility, faculty from the Department of Biological Chemistry share laboratory space with corporate researchers.

Outpatient services are available on campus through the Louis A. and Helen C. Gottschalk Medical Plaza and the Beckman Laser Institute. The Plaza capitalizes upon the broad range of diagnostic and therapeutic programs of the School as well as the extensive clinical expertise of the faculty. The facility offers primary care and specialty services including: obstetrics and gynecology, pediatrics, dermatology, ophthalmology, cardiology, orthopaedics, gastroenterology, and neurology. Special programs in diabetes, multiple sclerosis, Alzheimer's disease, and inflammatory bowel diseases also are available. The Plaza also houses the Lon V. Smith Eye Clinic, which offers the latest in diagnostic health care for eye diseases, including computerized refraction analysis, glaucoma diagnosis, and ultrasound analysis of eye disorders. In addition, the Plaza is home to the Susan Samueli Center for Integrative Medicine Clinic, where acupuncture and traditional herbal medicine complements traditional Western health care procedures.

Housing one of the world's leading programs in medical laser technology, the UCI Beckman Laser Institute offers state-of-the-art treatment for cancer and dermatological conditions. The Institute specializes in the development and application of laser and other optical technologies for the diagnosis and treatment of disease.

BIOMEDICAL RESEARCH CENTER

UCI's Biomedical Research Center (BRC) is a landmark public-private collaboration between UCI and businesses involved in biomedical, biotechnological, and health care services. The Center will enable UCI researchers and participating companies to work alongside one another, combining basic science, clinical study, and product development to find new approaches to the diagnosis and treatment of disease. The William J. Gillespie Neuroscience Research Facility, the first of several BRC buildings, is the home of a core group of prominent scientists investigating the causes and cures for neurological disorders, including Alzheimer's disease, Parkinson's disease, schizophrenia, and spinal cord injury. The second building is the Robert R. Sprague Family Foundation Hall, where scientists work to reveal the role of genetics in cancer treatment and prevention. The third building, the Dottie and George Hewitt Research Hall, is home to a state-of-the-art General Clinical Research Center and internationally recognized investigators studying infectious diseases, molecular medicine, immunology, and complementary and alternative medicine.

CHAO FAMILY COMPREHENSIVE CANCER CENTER

The Chao Family Comprehensive Cancer Center is the only National Cancer Institute-designated facility in Orange County and one of only 39 such centers in the country. Overall, more than 100 faculty members at the Cancer Center are involved in several major research programs, encompassing everything from basic research that looks at how cancer cells grow to bone marrow transplantation. Located at UCI Medical Center in Orange, the 56,000-square-foot facility provides an ideal setting for the practice of all the basic and clinical subspecialties involved in adult and pediatric oncology, including the application of the latest techniques for diagnosis and management of patients with cancer.

J. EDWARD BERK HALL MEDICAL EDUCATION CENTER

The School of Medicine opened a Student Training Center in J. Edward Berk Hall. Offering state-of-the-art training, the center was developed to teach and assess the clinical skills of medical students, residents, M.D.s, and other health care professionals in an environment that simulates an actual clinical setting. Participants are monitored and videotaped to evaluate their clinical performance related to obtaining a medical history, conducting an appropriate physical examination, and developing treatment management plans. All clinical practice examinations (CPX) and other clinical assessments are also done here.

The Student Training Center is a 2,850-square-foot high-tech facility which incorporates the latest and best innovations in interactive medical instructional technology, as well as eight clinical examination rooms with video cameras, a video monitor control station, a clinical skills laboratory, faculty development conference areas, a computer learning laboratory, interactive learning technology including "HARVEY" and UMedic, a student lounge, and a separate waiting area for actual and standardized patients.

UCI MEDICAL CENTER

UCI Medical Center, located in the City of Orange, is a 453-licensed-bed, comprehensive medical care center. It is the principal clinical facility of the School of Medicine operated by the University. The medical faculty of the School of Medicine, together with the medical resident-physician staff, provide the professional care. Services are provided in medicine, surgery, obstetrics and gynecology, pediatrics, psychiatry, family medicine, dermatology, pathology, radiology, physical medicine and rehabilitation, ophthalmology, neurology, anesthesiology, orthopedics, geriatrics, oncology, neurosurgery, otolaryngology, and radiation oncology.

UCI Medical Center also has cardiac, pediatric, neonatal, respiratory, burn medical-surgery, and neurosciences intensive care units and more than 90 specialty outpatient clinics. It is the designated countywide Level I trauma center. UCI Medical Center is building a new university hospital, planned for completion in early 2009. The seven-story hospital will have 191 beds, 13 operating rooms, and an interventional procedure room. Additionally, private patient rooms will allow family members to stay overnight. For more information about the new hospital, visit http://www.ucihealth.com/newhospital.

UCI FAMILY HEALTH CENTER–SANTA ANA

The UCI Family Health Center–Santa Ana is a state-of-the-art primary care facility, conveniently located near the Santa Ana Civic Center. The Center has two missions—health care delivery and medical education.

As a community clinic, the Family Health Center's multilingual physicians and staff are committed to providing quality healthcare to patients, including the medically underserved. It provides primary care services to people of all ages including family medicine, preventive care for children and adults, and specialty care in pediatrics and obstetrics and gynecology.

As an integral part of the UCI School of Medicine, the Family Health Center provides educational and training opportunities for medical and nurse practitioner students, including the UCI Family Medicine and Obstetrics and Gynecology residency training programs.

UCI FAMILY HEALTH CENTER–ANAHEIM

The UCI Family Health Center–Anaheim provides care for more than 20,000 outpatient visits annually and training programs for resident physicians in primary care, general internal medicine, and general and adolescent pediatrics. There are additional programs in gynecology, dermatology, general surgery, podiatry, neurology, ophthalmology, optometry, orthopedics, psychiatry, and multispecialty faculty practice. The Center provides training for medical students in their primary care, general pediatric, adolescent medicine, and geriatric medicine rotations and electives.

AFFILIATED HOSPITALS AND CLINICS

Additional major teaching and research programs of the School of Medicine are conducted at the Long Beach Veterans Affairs Medical Center (LBVAMC) and at Memorial Medical Center, Long Beach. Other academic programs are conducted in affiliation with San Bernardino County Medical Center, Fairview Developmental Center (Costa Mesa), Kaiser Foundation Hospital (Anaheim, Bellflower, and Riverside), Children's Hospital of Los Angeles, Metropolitan State Hospital (Norwalk), The City of Hope Medical Center (Duarte), Rancho Los Amigos Hospital (Downey), Western

Medical Center (Tustin/Santa Ana), the Kern Medical Center (Bakersfield), Clínica Sierra Vista (Lamont), Presbyterian (Newport Beach), Fountain Valley Hospital and Medical Center, Children's Hospital of Orange County, and the Orange County Health Care Agency/Public Health Clinic.

School of Medicine Alumni Relations

The UCI School of Medicine is an outgrowth of what began in 1896 as the Pacific College of Osteopathy (PSO). Some years later it became the College of Osteopathic Physicians and Surgeons, which then evolved into the California College of Medicine in 1962 and subsequently joined the UC system in 1965. The Office of Alumni Relations provides programs and services for nearly 4,000 alumni of the School as well as for students. From financial support to Honor's Night awards, mentorship to reunions, the Office of Alumni Relations seeks to provide a cornerstone from which students and alumni can benefit from their relationships to one another and in so doing, strengthen the School of Medicine.

THE M.D. PROGRAM

Admissions

All inquiries regarding the UCI School of Medicine's admission programs and procedures should be directed to:

University of California, Irvine
School of Medicine
Office of Admissions and Outreach
Berk Hall 802
Irvine, CA 92697-4089

Telephone: (949) 824-5388 or (800) UCI-5388
World Wide Web: http://www.ucihs.uci.edu/admissions

The UCI School of Medicine is a member of the American Medical College Application Service (AMCAS). All students who seek entrance to the UCI School of Medicine must complete the AMCAS application. AMCAS application information is available at http://www.aamc.org/students/amcas/start.htm. Applications must be submitted between June 1 and November 1 of the year preceding anticipated admission.

SELECTION FACTORS

The UCI School of Medicine seeks to admit students who are highly qualified to be trained in the practice of medicine and whose backgrounds, talents, and experiences contribute to a diverse student body. The Admissions Committee carefully reviews all applicants whose academic record and MCAT scores indicate that they will be able to handle the rigorous medical school curriculum. Careful consideration is given to applicants from disadvantaged backgrounds (i.e., disadvantaged through social, cultural, and/or economic conditions). In addition to scholastic achievement, attributes deemed desirable in prospective students include leadership ability and participation in extracurricular activities, such as clinical and/or medically related research experience, as well as community service.

Information provided by the AMCAS application is used for preliminary screening. Based on decisions reached by the Admissions Committee, applicants may be sent a secondary application. Applicants receiving a secondary application are requested to submit additional materials which include a minimum of three letters of recommendation, supplemental information forms, and a nonrefundable application fee of $60. Upon further review by the Admissions Committee, approximately 500 of those applicants receiving a secondary application will be interviewed. Regional interviews are not available. Preference is given to California residents and applicants who are either United States citizens or permanent residents. The UCI School of Medicine does not accept transfer students.

The UCI School of Medicine participates in the Western Interstate Commission for Higher Education (WICHE) Professional Student Exchange Program for applicants from certain western states without medical schools.

REQUIREMENTS FOR ADMISSION

Students can be considered for admission to the School of Medicine if they meet the following requirements:

1. A minimum of three years (90 semester units) of undergraduate course work is required, including a minimum of one full-time year at an accredited U.S. college or university. A baccalaureate degree is strongly recommended but not required. Candidates for admission may submit community college credit only to the extent granted on transfer to a four-year college or university. For purposes of evaluation, letter or numerical grades are preferred for course work, particularly for the required subjects listed below. Final enrollment into the first-year class at the School of Medicine is contingent upon evidence of satisfactory completion of all requirements with a grade of C or higher and of all courses listed as in progress at the time of application. Failure to meet the requirements or falsification of information are grounds for rejection or dismissal.
2. Completion of the following college course requirements prior to matriculation:

Subject	Comments	Semester Units
Biology	Courses must include a minimum of one semester or two quarters of upper-division biology, excluding botany.	12
General Chemistry		8
Organic Chemistry		8
Physics		8
Biochemistry	One semester or two quarters. On the quarter system, a quarter of biochemistry must be taken in combination with either an additional quarter of biochemistry, molecular biology, or genetics.	4
Calculus:	One semester or one quarter of calculus is required.	4

   Applicants are strongly encouraged to have completed their basic science requirements at the time of application. No specific major is required, however, demonstrated ability in the sciences is of great importance. In addition, applicants are advised to take advantage of the intellectual maturation afforded by a well-rounded liberal arts education. English, the humanities, and the social and behavioral sciences are considered particularly important. The following courses are also recommended but not required: molecular biology, cell biology, genetics, vertebrate embryology, psychology, and Spanish.
3. The Medical College Admission Test (MCAT) is required. An officially certified test score must be received by the Admissions and Outreach Office before the candidate's application can be considered. Applicants applying to the fall 2006 entering class must have taken the MCAT no earlier than April 2003 and no later than August 2005. MCAT information is available on the World Wide Web: http://www.aamc.org/students/mcat/start.htm.

OUTREACH

Outreach efforts coordinated by this office are designed to meet the challenges of California's changing demographics and to contribute to the School of Medicine's goal of achieving a broad spectrum of diversity in the student population, and ultimately, in the medical profession. A goal of this office is to build a pipeline of potential candidates for medical school and recruit students from socio-economically disadvantaged groups who have a desire to serve in the medically underserved communities in California. To reach this goal, programs are developed and implemented for students in high school, community colleges, and four-year undergraduate institutions. Examples include a Postbaccalaureate Re-applicant Program, a Premedical Postbaccalaureate Enhancement Program, Premedical Conferences, Summer Outreach Programs, a PreEntry Program, and CampMed, which is targeted at high school students interested in a health sciences career. In addition, there is support for student-initiated projects and outreach efforts emanating from medical student organizations. Outreach staff conduct academic advising, develop liaisons with general campus student services and academic departments, and facilitate workshops.

Medical Student Advisor System

The School's formal advisor system includes basic science advisors, clinical science advisors, and career specialty advisors.

Basic Science Advisors

Leslie M. Thompson, Ph.D., Chair (949) 824-6756

There are 12 basic science advisors. Six advisors are assigned on an every other year rotational basis to each incoming class and follow that class through their basic science years. The basic science advisors meet on a monthly basis to review students' academic progress, and to initiate interventive programs for students in academic difficulty and at academic risk. They also serve as a source of support and guidance for first- and second-year medical students.

Clinical Science Advisors

Lloyd Rucker, M.D., Chair (949) 824-4609
Associate Dean Curricular Affairs

The Clinical Science Advisors (CSA) combine teacher, advisor, and mentor into a single individual. By starting in the teaching role, the CSAs develop mentoring relationships with students that carry over into their role as advisor. When fully involved, each CSA will work with groups of eight–ten students from the second-, third-, and fourth-year classes, roughly 27 students in total. Students and CSAs first meet during the second year when the CSA serves as the facilitator for the problem-based learning small groups of the Patient-Doctor course. Toward the end of the second year, CSAs begin to provide scheduling and career advice for their students. In the third year, the faculty meet with students in groups and individual sessions to provide further career advice, to monitor progress in the third year, and to advise students about fourth year schedules. In the fourth year, advisors monitor the students' schedule for progress and review any requested changes.

Peer Review and Peer Counseling Program

Michael Prislin, M.D., Chair (949) 824-5932
Associate Dean Student Affairs

The School of Medicine has an informal peer review process, aimed at early detection and assistance for medical students who are experiencing difficulty such as professional conduct problems, suspected impairment, violation of the honor code, or violation of any University policy, regulation, or rule. The Peer Review Committee is comprised of two representatives from each class, the student body co-presidents, and two advisory faculty members. The committee operates within guidelines set jointly by the School of Medicine administration and the student body. Cases involving serious professional misconduct are referred to the Dean's Office. The Peer Review Committee conducts hearings and may impose sanctions or provide assistance to the student.

Medical Scholars Program

Geraldine Codd (949) 824-3415
Academic Skills Coordinator

The Medical Scholars Program (MSP), a student-driven effort, is an innovative, collegial study support program which was implemented in the fall of 1993. This program benefits all students in the School of Medicine and provides a special sense of community for first-year students. A great deal of the informal knowledge concerning medical school is communicated through the components of MSP. Small groups of first-year students are led by second-year co-leaders who develop clinically relevant case-based problems for discussion covering material learned in first-year basic science courses. Fourth-year students serve as co-leaders for similar groups of second-year students. First-year discussion groups meet every other week, and groups for second-year students meet once per month. First- and second-year students also receive MSP study packets, which contain test questions and answers from the previous year, and are distributed prior to each examination.

Another component of MSP is designed to meet the needs of students as they face the challenges and transitions of their third year. During their various clerkships, third-year students are assisted in four basic areas by fourth-year students: oral examinations, presentation of cases, written examinations, and clinical skills. These fourth-year students not only share their knowledge of the subjects, but also share information about appropriate study material, and what to emphasize in studying for their various test experiences. Both third- and fourth-year students benefit from participating in this program.

Medical Scientist Training Program (M.D./Ph.D.)

Alan Goldin, M.D., Ph.D., Chair (949) 824-5264

Exceptionally well-qualified students interested in careers in academic medicine and with demonstrated research accomplishments may be considered for admission to the Medical Scientist Training Program (MSTP). Students in this program pursue a combined curriculum for an M.D. degree from the School of Medicine and a Ph.D. degree from any of the graduate programs at UCI. The program requires a minimum of seven years for completion, and students holding either degree are not eligible for MSTP. Additional information is available from the MSTP Coordinator's Office, (949) 824-5264; e-mail: mstp@uci.edu; World Wide Web: http://www.mstp.uci.edu/.

Applicants must submit a supplementary application (available from the School of Medicine Office of Admissions) to the Medical Scientist Training Program when they are submitting their secondary application information to the School of Medicine. Students accepted into the program have the option of pursuing graduate study in any of the graduate programs at UCI. Although a specific graduate department need not be chosen at the time of admission, students are expected to have selected a field for their graduate studies. Financial support in the form of a fellowship, which includes a stipend as well as tuition and fees, is provided. Applicants not accepted into MSTP may be considered separately for admission to the School of Medicine.

M.D./M.B.A. Degree Program

Maria Chandler, M.D./M.B.A. Faculty Advisor (949) 824-7133

The M.D./M.B.A. program requires five or six years for completion. It is aimed at individuals who are exceptional in ability and motivation and who seek a career as physicians with major responsibility for administration and management in health care organizations and institutions. Students in this program pursue a combined curriculum for an M.D. degree from the School of Medicine and an M.B.A. degree from The Paul Merage School of Business.

Students must be currently enrolled in the M.D. program in order to apply to the combined M.D./M.B.A. program. During their second or third year of medical school, interested students submit an application to The Paul Merage School of Business Admissions Committee, after review by the School of Medicine. Final acceptance to the program is granted by The Paul Merage School of Business, and M.B.A. course work begins following completion of the student's third year of medical school. Students should be aware that enrollment in the M.D. program does not guarantee acceptance into the M.B.A. program.

The MCAT, along with the completion of three years of medical school training in good standing and passage of USMLE Step 1, currently serve as a waiver for the GMAT entrance examination usually required for application to the M.B.A. program. The total number of units required to graduate from each program separately are satisfied in the M.D./M.B.A. program.

Program in Medical Education for the Latino Community (PRIME-LC)

Alberto Manetta, M.D., Director (949) 824-7136

A carefully selected group of students from diverse backgrounds and with superior academic credentials, proven commitment to service, and solid conversational Spanish will be considered for acceptance to the Program in Medical Education for the Latino Community (PRIME-LC) at the UCI School of Medicine. PRIME-LC responds to the increasing demand for physician-leaders who are culturally and linguistically competent to address the health care delivery, research, and policy needs of underserved Latino communities in California. The program spans all three components of medical training: undergraduate (medical school), graduate (residency program), and continuing medical education (post-residency). PRIME-LC residency experiences are designed to enhance the medical school training. Although students are free to enter any residency of their choice, program graduates are encouraged to enter primary care areas such as Family Medicine, Pediatrics, Internal Medicine, and Obstetrics and Gynecology, or Emergency Medicine or Psychiatry. A placement office will help PRIME-LC-trained physicians find employment including leadership roles in health care, academia, and advocacy.

The PRIME-LC supplemental application is part of the UCI School of Medicine secondary application and must be completed to be considered for acceptance. Applicants selected for faculty and student interviews are required to undertake a third interview in Spanish to evaluate conversational skills and commitment to service. Financial support is available in the form of scholarships, loans, and loan repayment programs. Applicants not accepted into PRIME-LC may be considered separately for admission to the regular School of Medicine M.D. program. For more information about PRIME-LC, call (949) 824-7136; e-mail: primelc@uci.edu; World Wide Web: http://www.ucihs.uci.edu/PRIMELC.

The M.D. Curriculum

The UCI medical curriculum continues to meet the changing needs of medical education within all four years of instruction. Indeed, the School of Medicine faculty views curriculum development as a continual process and feels that medical education and teaching innovations must be encouraged and supported. The curriculum is designed to encourage medical students to become participants in their education process, to be active rather than passive learners, to become lifelong learners, and to use cooperative and team-learning principles.

UCI is dedicated to the nurturing of humanistic, caring physicians with top-notch clinical expertise and skills. The School strives for this through a curriculum that is not only anchored in the science of medicine but also provides meaningful experiences in the humanistic dimensions of medicine. In this context, the faculty endeavors to provide students with experiences in areas such as communications and empathy, ethics and professionalism; diversity awareness; and cultural sensitivity and medical humanities. The faculty also feels that the curriculum should strive to integrate basic and clinical sciences by bringing substantial clinical material into the early phases of medical education.

The School has achieved vertical integration of the curriculum with the development of a series of "Patient-Doctor" courses. The Patient-Doctor courses are longitudinal multidisciplinary experiences broadly designed to prepare students for their future careers in medicine through the application of experiential and self-directed learning principles. First- and second-year students begin to prepare for their clerkships through clinical exposures featuring standardized patients and clinical tag-along experiences. These courses also utilize small group learning sessions to reinforce core concepts of patient-physician interactions and introductory clinical reasoning skill development. During the Advanced Patient-Doctor course (years three and four) students explore many of the crucial issues first presented during the introductory Patient-Doctor course. During this segment greater emphasis is placed on advanced skill acquisition and more mature professional role development.

To satisfy the requirement for the M.D. degree, each medical student must successfully complete the full curriculum. Students must also pass both Step 1 and Step 2 of the United States Medical Licensing Examination (USMLE) and successfully pass a Clinical Practice Examination (CPX) prior to graduation.

An ongoing academic monitoring program is coordinated by the Office of Student Affairs, which identifies students early who might be experiencing academic difficulty and provides them with resources to successfully complete their course work. Faculty advisors are assigned to students during their first and second years. Students have advisory sessions with M.D. faculty prior to the scheduling of their third- and fourth-year course work. A Learning Resources Program is available to provide tutorial assistance and study skills training. USMLE reviews are also provided.

CURRICULAR POLICIES

The curricular policies of the School of Medicine are the responsibility of the faculty committees on Curriculum and Educational Policy and on Promotions and Honors. A listing of these policies, as well as information regarding registration, rules and regulations, grading procedures, and requirements for academic advancement, are contained in the *School of Medicine Handbook,* which is available on the World Wide Web at http://www.ucihs.uci.edu/medstudents/studentaffairs/.

First and Second Years: Basic Science and Preclinical Course Work

First Year	Second Year
Anatomy and Embryology	Epidemiology and Biostatistics
Medical Biochemistry	Clinical Pathology
Histology	Topics in Medicine
Neuroscience	General and Systemic Pathology
Physiology/Pathophysiology	Medical Pharmacology
Medical Genetics	Medical Microbiology
Patient-Doctor	Patient-Doctor
Patient, Doctor, and Society	
Molecular and Cell Biology	
Immunology	

Third- and Fourth-Year Requirements[1]	
Inpatient Medicine	Radiology
Ambulatory Medicine	Intensive Care Unit
Surgery	Emergency Medicine
Obstetrics and Gynecology	Substance Abuse
Pediatrics	Advanced Patient-Doctor
Psychiatry	Electives
Family Medicine	
Senior Subinternship[2]	
Neuroscience	

[1] The sequence of third and fourth years varies.
[2] Prerequisite: Inpatient and Ambulatory Medicine.

Curricular Description

FIRST-YEAR CURRICULUM

Anatomy and Embryology

The structure of the human body is taught in Anatomy and Embryology. Emphasis is placed on normal structure as it relates to function, with consideration of abnormal structures that may be revealed in a clinical setting. Anatomy is taught through a regional approach, with an emphasis on laboratory dissections and demonstrations, augmented by lectures, radiographic films, discussions, and clinical correlate material. The course includes a detailed consideration of the embryologic aspects of human development. *(Medicine 500A-B)*

Medical Biochemistry

Medical Biochemistry for first-year medical and graduate students. Presents the biochemistry relevant to human health and disease that forms part of the foundation of modern medical practice. This course provides students with a fundamental understanding of the principles of biochemistry and metabolism and their relationship to medicine. It covers basic enzymology and the structure and function of proteins. The metabolism of carbohydrates, lipids, amino acids, purines, and pyrimidines is presented in the context of modern medicine. *(Medicine 522)*

Histology

Histology is designed to provide students with knowledge of the cellular and subcellular bases of medicine. Emphasis is placed on normal structure as a basis for function, with consideration of abnormalities of structures in clinical cases. Lectures and independent study address how cells are formed, how cells are combined to form tissues, and how tissues are combined to form organs. *(Medicine 503A-B)*

Immunology

Immunology covers the cellular and molecular basis of immune responsiveness and the roles of the immune system in both health and disease. The material is presented in lectures and clinical correlates, as well as in a set of printed core notes. Also included are a number of Patient-Oriented Problem Solving (POPS) sessions in which participation is required. *(Medicine 544)*

Neuroscience

The objective of this course is to provide students with the fundamental concepts, vocabulary, and learning strategies to attain a level of proficiency in basic integrative neurosciences so that they will develop an understanding in the clinical neurosciences throughout their careers as physicians. The course is integrative in the sense that the underlying knowledge of molecular, cellular, physiological, developmental, and neuroanatomical organization of the nervous system is brought together in each lecture block with clinical themes and examples in lectures, and which is further reinforced by clinical correlates given by clinicians. There are four major blocks of lectures and clinical correlates in the course and these are tested in the four tests, respectively. The first is the Introductory group which includes neural development and overview of regional neuroanatomy, cellular, molecular, and physiological basics, the neurological examination, and neuroradiology. The second group of lectures is devoted to Motor Systems. The third group is on the Sensory Systems. The fourth is on Higher Cerebral and Integrative Systems. The course emphasizes knowledge of the nervous system using lessons from clinical neuroanatomy, systems neurosciences, and regional and developmental neuroanatomy. The course uses the Blumenfeld text, Haines atlas, wet lab handouts, and the Neurosyllabus CD, which are all geared toward mastering this multiple strategy to the study of the human nervous system. *(Medicine 502A)*

Medical Genetics

Medical Genetics reviews the basic principles of human genetics related to disease. Assessment of patterns of genetic risk, screening for genetic diseases, and cytogenetic and biochemical diagnosis are presented. Utilization of the human gene map and DNA sequence information for molecular genetic diagnosis are discussed. Students apply principles of human genetics in evaluating risk for fetal malformations, cancer, and neurodegeneration. Students are introduced to the use of genetic databases and bioinformatics. Approaches to treatment of genetic diseases are presented. Legal, ethical, and social aspects of diagnosis and management of genetic disease are discussed. *(Medicine 511)*

Patient, Doctor, and Society

The Patient, Doctor, and Society (PDS) course is a multidisciplinary required course for first-year medical students. The PDS course is designed to introduce students to content themes that are important for a student's professional development as a physician and health care provider. It provides students with a foundation in interviewing techniques (in preparation for the more advanced Patient-Doctor courses) as well as with the basic knowledge, skills, and attitudes necessary to obtain competence in clinical medicine. The course serves as the primary introduction to the clinical experiences of years one, two, and beyond. *(Medicine 545)*

Epidemiology and Biostatistics

This course provides medical students with an exposure to the necessary tools for critically evaluating the medical literature in relationship to study design and analysis. It provides overall training in study design, methods, and analysis of medical and epidemiologic data and focuses on four major content areas in epidemiology: infectious disease epidemiology; cancer epidemiology; occupational and environmental epidemiology; and genetic epidemiology.

Patient-Doctor

This course begins in the first year and continues to the end of the second year. Students participate in six organ/system-based interview and physical diagnosis modules in small groups with two faculty facilitators. The educational objectives of the modules center on communication skills, physical diagnosis skills, decision-making, and professionalism. The student's first-year education is rounded out with participation in other real patient-based activities in clinical settings.

The second-year students continue to develop their patient interviewing and physical examination skills in a more independent environment and within a clinical setting. Students spend one half-day per week participating in Clinical Service Experiences, which are designed to provide students with real patient experience and exposure to the different fields of medicine. Students continue with an in-depth study of the content theme areas they were exposed to during the first year by participating in monthly problem-based learning sessions directed by their faculty mentor. Midway through their second year, students have their clinical skills tested through a Skills Appraisal Examination, which is a practical examination. *(Medicine 519A–F)*

Physiology/Pathophysiology

This course consists of lectures and clinical correlates covering the classical concepts of vertebrate physiology, with emphasis on the function of normal tissues in humans. Specific topics related to neurophysiology, cardiovascular, respiratory, renal, gastrointestinal, endocrine, exercise, and sexual physiology are presented. Prerequisite: Biochemistry. *(Medicine 543A-B)*

Molecular and Cell Biology

The molecular and cellular mechanisms responsible for cell division, DNA, RNA, and protein biosynthesis are emphasized. The pathways for molecular signaling and the development of multicellular organisms are described including abnormal developmental states such as cancer. The future of molecular medicine, including recombinant DNA technology, will be a major focus of the course. This course will provide students with an understanding of the fundamental principles of molecular and cell biology, along with an understanding of the application of morphological and molecular relationships to problems of the human body. *(Medicine 523)*

SECOND-YEAR CURRICULUM

Clinical Pathology

This course consists of lectures and laboratories covering the areas of hematology, blood bank, clinical chemistry, and microbiology. It provides students with a foundation for understanding the pathogenesis of a variety of disease states, as well as a foundation for the proper use of the laboratory for diagnosis and optimum patient management. Prerequisite: first-year curriculum. *(Medicine 509A-B)*

Topics in Medicine

A case approach is used to integrate basic science concepts, pathology, pharmacology, and physical diagnosis as they pertain to an introduction to clinical medicine. The objective of the course is to ease the transition from basic science to the clinical clerkships by lecture-based case presentations and discussions. The course is a major link between pre-clinical and clinical studies. The student should learn to analyze the pathophysiology of symptom presentation, understand the rationale of treatment, and consider differential diagnoses. An organ system approach is utilized in integration with basic Clinical Pathology and Clinical Pharmacology. Concurrent enrollment in the Clinical Pathology course or its previous completion is required. Prerequisite: first-year curriculum. *(Medicine 515A-B-C)*

General and Systemic Pathology

This course deals with basic causes, mechanisms, and consequences of disease processes and with some applications of these considerations to clinical medicine. After an introduction to general types of disease processes, these processes are studied further as they affect specific organs and organ systems. Prerequisite: first-year curriculum. *(Medicine 508A-B-C)*

Medical Microbiology

This course deals with the biochemical and genetic properties of infectious agents, activities of toxins, chemotherapy, and the biochemistry and genetics of antibiotic resistance. The course includes in-depth studies of the biology of bacteria, fungi, parasites, and viruses. Prerequisite: first-year curriculum. *(Medicine 507A-B)*

Medical Pharmacology

This course covers the various classes of drugs that are used in medicine, particularly those used in specific or symptomatic treatment of disease states. Drugs of abuse are also covered. Emphasis is on the mechanisms of action of drugs at the organ and system level and on their use in medicine. The course includes lectures that illustrate pharmacologic principles, supplemented by small group problem-solving sessions. Prerequisites: Biochemistry and Physiology. *(Medicine 517A-B-C)*

THIRD- AND FOURTH-YEAR CURRICULUM

Obstetrics and Gynecology Clerkship

During this eight-week clerkship, students are taught an introduction to reproductive physiology and clinical obstetrics and gynecology. Practical experience is obtained throughout the rotations of labor and delivery, gynecology, and the outpatient clinic. In addition, students have an elective choice between gynecologic oncology, high-risk obstetrics, and gynecologic surgery. Required third-year rotation. *(Medicine 524)*

General Surgery Clerkship

The General Surgery clerkship provides students, as members of the surgical team, with an opportunity to study surgical patients in outpatient and hospital settings. Students acquire surgical knowledge, as well as develop skills in taking surgical histories and conducting physical examinations. Emphasis is placed on the clinical evaluation, pathogenesis, diagnosis, and treatment of surgical diseases. Students spend six weeks on general surgery (three weeks each at UCI and LBVA Medical Centers) and one week on one of the subspecialties (urology, ENT, orthopaedics, or plastic surgery). *(Medicine 526)*

Inpatient and Ambulatory Medicine Clerkship

The clerkship occurs in a highly structured clinical environment in both in-patient and ambulatory settings. Students gradually assume responsibility for the care of patients, thereby enhancing their clinical, diagnostic, and procedural skills. Clinical vignettes, bedside teaching, and standardized patients serve to round out the experience. Required third-year rotation. *(Medicine 527A, 527B)*

Pediatrics Clerkship

The pediatrics clerkship serves as an introduction to general pediatrics. Students rotate on the pediatric inpatient service, pediatric ambulatory settings, and the newborn nursery. Exposure to subspecialty clinics is also included. During the clerkship, students refine their knowledge and skills in obtaining accurate historical data, performing physical examinations with pediatric patients, and developing appropriate diagnosis and management plans. *(Medicine 528)*

Psychiatry Clerkship

This six-week clinical clerkship provides an opportunity for hands-on experience in the process of recognizing, diagnosing, and treating mental illness using the latest neuropharmacological advances in brain research as well as more traditional psychotherapeutic approaches. Each student participates fully in patient care, clinical teaching, and conferences. There are several choices of clinical settings for the rotation, including adult in-patient psychiatry, child/adolescent inpatient psychiatry, consultation psychiatry/emergency psychiatry, geriatrics, and a variety of ambulatory experiences. The sites include the UCI and LBVA Medical Centers where different patient populations are available. A required lecture series is presented on Wednesday afternoons at the UCI Medical Center. *(Medicine 529)*

Family Medicine Clerkship

This clerkship matches students with a family physician for a four-week block. Students are assigned to a UCI clinic for four weeks where the principles of family medicine and primary care practice are taught. Emphasis is placed upon exposing students to the 25 most common health care problems seen in Family Medicine. Students are exposed to the principles of community health and epidemiology, as practically applied in an ambulatory care setting. They develop an awareness of the current health care delivery environment, including issues such as health care costs and the lifestyle of a family physician. Prerequisites: successful completion of the first- and second-year curriculum. *(Medicine 597)*

Substance Abuse

This two-week course provides an opportunity to directly observe and learn the principles of substance abuse treatment. Students also attend therapeutic groups, 12-step meetings, and family intervention sessions, as well as didactic sessions and small group discussions. Sites include the Betty Ford Center, Hoag Hospital, and the LBVA Medical Center. A reading list is provided to students at all sites. *(Medicine 675A)*

Intensive Care Unit

This is a four-week rotation offered at UCI, LBVA, and Long Beach Miller's Children Hospital. ICU is offered in medicine, surgery, and pediatrics. Students function as subinterns, becoming integral members of the ICU team, and serve as primary caregivers under supervision. *(Medicine 605B, 630K, 633M, 660S, or 685U)*

Neuroscience Clerkship

UCI students are required to take the neuroscience clerkship during either their third or fourth year. Extramural students may take the course as an elective during their final-year curriculum. The clinical neurosciences clerkship emphasizes the development of student skills in neurological examination as well as the medical and surgical management of patients with brain, nerve, and muscle disease. *(Medicine 532)*

Radiology Clerkship

The core clerkship consists of daily clinical film conferences, didactic lectures, and ACR file learning laboratory. Radiology teaching file and slide and book materials are available teaching instruments in radiology. Radiology conferences interrelate general medicine, surgery, and radiology. Emphasis is given to correlate clinical findings and use of imaging modalities for problem-solving and diagnosis and treatment, including an understanding of the risk/cost/benefit ratio involved in daily clinical practice. *(Medicine 533)*

Senior Subinternship

Students spend four weeks as subinterns during which time they carry the full ward responsibility of an intern on one-half the number of patients usually carried by an intern. The subinternship is designed to improve clinical competence and to prepare the students for the challenges and demands of the internship. Students may choose between subinternships in medicine, surgery, or pediatrics. *(Medicine 536, 537, 538, or 539)*

Emergency Medicine

The objectives of the Emergency Medicine clerkship are to introduce students to principles of acute care medicine while caring for acutely ill and injured patients. Students have the opportunity to evaluate patients, expand their directed history and physical making skills, create a broad differential diagnosis, and formulate effective testing and treatment strategies. Active participation in patient care and procedural skills are emphasized and encouraged. The course consists of experiences in direct patient care, assigned readings from emergency medicine references, weekly conferences, and an end-of-rotation final examination. *(Medicine 630D)*

Advanced Patient-Doctor

The Advanced Patient-Doctor course is a two-week required course that all fourth-year students take during the month of March. The students prepare presentations for their peers and faculty that integrate basic science and clinical science. The course also prepares the students for residency and provides them with an opportunity to obtain ACLS certification. *(Medicine 535)*

ELECTIVES

Depending upon their particular interests, needs, and goals, students may take a variety of elective courses consisting of at least 30 contact-hours per week during the third and fourth years. Electives must be approved by the clinical faculty advisor and the department chair. Students may take up to 20 weeks of their fourth-year course work (core/electives) at institutions other than UCI.

A listing of elective courses and descriptions can be found on the World Wide Web at http://www.com.uci.edu/meded/Elective/index.htm.

All questions regarding the curriculum, electives, or matters of records should be directed to:

University of California, Irvine
School of Medicine
Office of Educational Affairs
Berk Hall 802
Irvine, CA 92697-4089

General information/records: (949) 824-6138; scheduling: (714) 456-8462; curriculum: (949) 824-4609.

Office of Educational Affairs

Alberto Manetta, M.D., Senior Associate Dean	(949) 824-5798

The Senior Associate Dean for Educational Affairs, in cooperation with the Academic Senate faculty, has responsibility for administrative oversight of the educational program leading to the M.D. degree, the postgraduate residency programs, and continuing medical education programs provided for practicing physicians and allied health personnel. The Senior Associate Dean also has administrative oversight responsibility for the Office of Admissions and Outreach. The Office of Curricular Affairs provides services for the M.D. program which include curriculum development, implementation, management, and evaluation. The Office of Student Affairs provides student support services which include academic advisement, learning skills counseling, psychological counseling, career counseling, and student records, and coordinates additional services offered through general University offices which include housing, student health, and disabled student services.

Student Affairs

Michael Prislin, M.D., Associate Dean	(949) 824-8358
Barbara Lutz, Registrar, Director	(949) 824-5283
Marianne Ross, Ph.D., Counseling Psychologist	(949) 824-4621
Geraldine Codd, Academic Skills Coordinator	(949) 824-3415
Marie Nubia-Feliciano, Student Affairs Officer	(949) 824-5932

The mission of the Office of Student Affairs is to create an environment within the School of Medicine community that fosters student attainment of the School of Medicine educational objectives. This is accomplished through assuring that student participation in the educational program occurs in a manner consistent with School of Medicine policies and regulations, and through the provision of support services that facilitate optimal student participation in the educational program. To accomplish the educational assurance mission, the Office of Student Affairs disseminates information regarding academic policies and regulations, provides administrative and executive support for the faculty committee on Promotions and Honors, and facilitates the institutional recognition of student achievement through the conduct of various School of Medicine events. To accomplish the educational support mission, the Office of Student Affairs provides academic, personal, psychological, career, and financial counseling; academic skills assessment and learning resources support, student wellness programs, student facilities support, initiatives to enhance the learning environment, and support for a variety of student organizations and informal activities.

Financial Aid

James Miles, Director (949) 824-6476

The UCI School of Medicine Financial Aid Office provides financial assistance and financial counseling services to entering and continuing medical students. The office secures, manages, and provides funds in the form of scholarships, grants, and loans to assist in meeting students' educational expenses.

The office coordinates financial aid application materials; tracks documents needed to complete an application; reviews and evaluates information provided by applicants; awards financial aid programs; and conducts research to determine basic educational expense budgets. It also provides students with information on policies and procedures, cost of attendance, and eligibility criteria.

In providing counseling services, the office advises students, reviews their individual circumstances, and provides financial assistance within financial aid program guidelines. It presents financial aid workshops for prospective and enrolled students to enhance their knowledge about financial aid programs and the application process, provides debt management counseling, and conducts entrance and exit interviews.

Curricular Affairs

Lloyd Rucker, M.D., Associate Dean, Curricular Affairs (714) 456-7539

This office provides support related to curricular issues for the School of Medicine, departments, faculty, and students; initiates curriculum review and innovation to meet the challenges of contemporary medical education; establishes and reviews the objectives of the School of Medicine and ensures individual courses are teaching to meet the objectives; serves as facilitators of new programs and curriculum and supports working committees during curriculum development; facilitates and monitors curriculum content theme integration; and maintains records on course materials and grading policies. This office is responsible for curriculum documentation for review by the Curriculum and Educational Policies committee; the collection of course evaluations by students; maintaining accurate information on core and elective curriculum; and assessing the success of the current programs.

Medical Academic Computing Center

Claudiu Dan, Director (949) 824-1215

The Medical Academic Computing Center was established to facilitate student use of computers and to further educational objectives by providing medical instructional software which is integrated into the curriculum. The center also provides access to Internet resources and productivity applications, and is equipped with 45 computers (Macintosh and PCs), all networked locally and to the Internet. Students benefit by using the multimedia capabilities of the computers for anatomical visualization and self-evaluation, and the instructional software which is currently used in numerous courses, including Histology, Pathology, Genetics, and Anatomy. Students do much of their course write-ups in the center, where they have access to word processing programs and printers. Students also use the center to access their e-mail, the World Wide Web, and the many online medical information resources now available.

Continuing Medical Education

Gerald A. Maguire, M.D., Associate Dean	(949) 824-6039
Bonnie Caroll, Director	(949) 824-9163
Elena Gilliam, Regularly Scheduled Conference Manager	(949) 824-4220
Janet Gavin, CME Systems Coordinator	(949) 824-9162
Annette Mahnke, CME Coordinator	(949) 824-6039

The Office of Continuing Medical Education provides educational activities to physicians and other health care professionals that reinforce basic medical knowledge; impart updated information on clinical practice and health care delivery; introduce new ideas, skills, and technology; and disseminate pertinent research findings in order to improve the quality of the health care that is delivered by the participants.

Graduate Medical Education

Kirk A. Keegan, Jr., M.D.	(714) 456-3526
Nancy Koehring, Director, Postgraduate Medical Education and Community Programs	(714) 456-3526

The UCI School of Medicine Graduate Medical Education Training Programs attract medical students from prestigious medical schools nationwide. UCI offers 42 ACGME-approved residency and fellowship training programs. There are approximately 600 residents and fellows in these training programs. UCI Medical Center, the Veteran's Affairs Medical Center, Long Beach and Long Beach Memorial Medical Center are the integrated training sites for the residency programs. Other affiliations such as Kaiser Anaheim, Kaiser Riverside, Western Medical Center, City of Hope, Children's Hospital Los Angeles, and Rancho Los Amigos offer additional residents training in specialized fields.

POSTGRADUATE EDUCATIONAL PROGRAMS

Residency Programs

The School of Medicine and its affiliated hospitals offer approximately 615 residency positions in almost all areas of medicine. Training levels range from first-year residencies through seventh-year-level subspecialty fellowships. Inquiries about specific programs should be directed to the Program Director as listed in the *Directory of Residency Training Programs,* published each year by the American Medical Association, or to the chair of the appropriate School of Medicine department.

All residency programs meet the formal standards of the Accreditation Council for Graduate Medical Education and the appropriate specialty boards. UCI adheres to the Health Professions Educational Assistance Act of 1976, P.L. 94-484, Section 709, regarding shared-schedule residency training positions.

Residents in all programs rotate to the UCI Medical Center at some time. Residents in anesthesiology, dermatology, diagnostic radiology, medicine, neurology, ophthalmology, pathology, surgery, physical medicine and rehabilitation, radiation oncology, family medicine subspecialties of medicine, orthopaedics, otolaryngology, urology, and psychiatry also rotate to the Long Beach Veterans Affairs Medical Center (LBVAMC). Residents in medicine, medicine subspecialities, anesthesiology, radiation oncology, psychiatry, obstetrics and gynecology, ophthalmology, pathology, pediatrics, physical medicine and rehabilitation, and surgery also rotate to the Memorial Hospital Medical Center (MHMC), Long Beach. Residents may also spend periods of time at other affiliated hospitals and clinics.

ANESTHESIOLOGY

The Anesthesiology Residency Program offers training for residents at the postgraduate PG-2 to PG-4 levels. The residents spend three years in intensive clinical anesthesia training at LBVAMC and UCI Medical Center, with a one-month rotation at Children's Hospital of Los Angeles, a month of cardiac anesthesia and a month of obstetric anesthesia at Cedars-Sinai Medical Center (Los Angeles), and a month of neuro anesthesia at UCLA. Training is offered in general anesthesia, regional anesthesia, cardiac anesthesia, pediatric anesthesia, trauma anesthesia, neurosurgical anesthesia, anesthesia for all other surgical subspecialties, dental anesthesia, obstetric anesthesia, intensive care, respiratory therapy, and treatment of pain syndromes and outpatient anesthesia. Residents in their fourth postgraduate year may elect to take three to six months of subspecialty training in obstetrical anesthesia, critical care medicine, pediatric anesthesia, pain management, cardiac anesthesia, or research.

DERMATOLOGY

The Department of Dermatology offers a three-year accredited residency which has nine residents: three first-year, three second-year, and three third-year. It is a combined program between UCI Medical Center and Long Beach Veterans Administration Medical Center and is directed by Gary Cole, M.D., Chief of Dermatology Services at LBVAMC. First-year residents are stationed at LBVAMC; second-year residents spend four months in the Dermatopathology Laboratory at UCI Medical Center, four months on the ward there, and four months in research. Third-year residents rotate the Chief Resident position at UCI Medical Center and LBVAMC. They spend four months in a private practice environment at UCI, Kaiser, and Med Partners HMO programs. Additional participation includes the UCI Student Health Service, private practice offices of faculty, and the Beckman Laser Clinic.

EMERGENCY MEDICINE

The Emergency Medicine residency was established in 1988 and has full accreditation by the Residency Review Committee. The program has 18 residents, six for each of three post-graduate years. The UCI Medical Center Emergency Department is a high-acuity, Level I Trauma Center, treating over 47,000 patients annually. Fifteen board-certified emergency medicine faculty provide 24-hour patient care and supervision of residents and medical students. The Department of Emergency Medicine is active in public affairs, community service, and research in the areas of prehospital care, instructional methods, health policy, critical care technology, and infectious disease, among others.

FAMILY MEDICINE

The mission of the Family Medicine Residency Program is to train family physicians to succeed in a contemporary practice environment and to deliver high-quality medical care to a culturally and socioeconomically diverse patient population. This fully accredited program boasts 30 residents and offers training in a variety of settings. The residents' continuity clinic is located in the largest community clinic in Orange County, and many of the inpatient rotations are completed in a community hospital, Western Medical Center, where Family Medicine residents are the only residents in the hospital. At the same time, rotations at UCI Medical Center are invaluable in terms of teaching and interactions with other specialties. A distinguished faculty of over 30 physicians works closely with the residents, enhancing the training atmosphere.

GERIATRICS

The Geriatrics Fellowship is a comprehensive one-year training program that has been accredited since 1991, providing eligibility for a Certificate of Added Qualifications (CAQ) in Geriatrics. Fellows receive training at UCI Medical Center as well as affiliated sites, including the Veterans Administration Medical Center (VAMC), and alternative community care environments for seniors. Fellows have longitudinal experiences in high-quality skilled nursing facilities, assisted living facilities, a comprehensive, multidisciplinary assessment program, and primary care practices. Clinical training in geropsychiatry is provided in a 17-bed geropsychiatry unit located at UCI Medical Center, as well as in an outpatient setting.

INTERNAL MEDICINE

The Internal Medicine Residency Program has two tracks: the traditional categorical track, which is a broad-based primary care-oriented training program, and a one-year preliminary track. Within the traditional program there is a special research pathway which encompasses two or three years of internal medicine and two years of research. Residents spend their time at the UCI Medical Center and LBVAMC. They may also rotate to Memorial Medical Center, a private hospital in Long Beach. The traditional program presents a comprehensive, three-year curriculum in general medicine. Teaching is done primarily by full-time faculty within the Department of Medicine.

Subspecialty fellowships are offered in basic and clinical immunology, cardiology, endocrinology and metabolic diseases, gastroenterology, hematology/oncology, infectious diseases, nephrology, pulmonary/critical care diseases, and rheumatology.

NEUROLOGY

The Neurology Residency Program emphasizes the education and training of neurologists to meet the clinical needs of their patients by using both traditional methods and new techniques, some of which have been developed at the UCI Medical Center. Training takes the form of graded responsibility for inpatient care, regular outpatient clinical responsibilities, and rotations in associated neurological specialties. The Department strongly believes that an understanding of basic research methods is essential for the training of clinicians who will deal with the diversity of clinical problems in modern neurology. Thus, during the three-year training program, residents have the opportunity to participate in a variety of ongoing basic and clinical research projects within the Department.

OBSTETRICS AND GYNECOLOGY

This four-year program provides a solid foundation of reproductive pathophysiology in the obstetric, gynecologic, endocrinologic, and oncologic aspects of women's health care. Based on this foundation, training continues with progressive resident responsibility for operative and medical management and surgical techniques. While predominantly clinical in scope, the program is strongly flavored by academic and research exposure. Training is provided in general obstetrics and gynecology with rotations in the subspecialties of perinatology, oncology, and endocrinology. There are six resident positions available each year in this four-year training program.

OCCUPATIONAL MEDICINE

This residency program is offered by the Division of Occupational Medicine, Department of Medicine. It is intended for physicians who are seeking certification by the Board of Preventive Medicine. A prerequisite to participation is a minimum of one year of post-graduate clinical training in a primary care discipline. The objective of the Program is the training of physicians in the fields of occupational medicine and industrial medical care. The resident is provided an academic foundation in occupational medicine, industrial hygiene, environmental toxicology, and epidemiology, in addition to practical experience in preventive medicine as it is applied to employed persons. This two-year program includes didactic training and clinical and field experience in occupational health and safety. Upon completion of training, the resident is qualified to enter the specialty practice of occupational medicine in an industrial setting, in private practice, in a government agency, or in an academic institution.

OPHTHALMOLOGY

The three-year Ophthalmology Residency Program provides extensive clinical experience in conjunction with yearly basic research projects. The Department focuses on the total care of the patient, and training in a broad spectrum of disease and/or injury is coupled with an increasing level of responsibility in patient management. Surgical experience is provided in the full range of ophthalmic subspecialities, and residents also receive instruction and practical application in the newest laser surgical techniques as well as the use of state-of-the-art diagnostic equipment.

ORTHOPAEDIC SURGERY

The Department of Orthopaedic Surgery Residency Program is a four-year training program which follows an internship year in the Department of Surgery. The program is designed to provide exposure and experience in all areas of orthopaedics including trauma, reconstructive and joint replacement surgeries, pediatric orthopaedics, spine surgery, sports medicine, foot surgery, and rehabilitation. It is structured for maximum resident participation and minimizes private hospital rotations. The program's teaching hospitals include UCI Medical Center, LBVAMC, Children's Hospital of Orange County, Rancho Los Amigos Hospital in Downey, and Kaiser Permanente Medical Center in Anaheim. There are four resident positions available each year.

OTOLARYNGOLOGY—HEAD AND NECK SURGERY

The Department of Otolaryngology—Head and Neck Surgery offers a four-year residency program providing extensive clinical experience in conjunction with an academic approach to resident research projects. One year of general surgery training is required. The four-year program provides a breadth of training in otological surgery, head and neck surgery, facial plastic surgery, and nasal and paranasal sinus surgery. Residents receive an extensive clinical experience at UCI Medical Center, Children's Hospital of Orange County, and Kaiser Foundation Hospital–Anaheim.

This training is targeted to be of the caliber necessary for young surgeons to embark upon an academic career. This training is excellent for those going into private practice as well.

PATHOLOGY

The Department of Pathology and Laboratory Medicine offers a residency training program covering all areas of anatomic and clinical pathology. The program is affiliated with Memorial Medical Center, Long Beach and LBVAMC. The training for the combined anatomic and clinical pathology program consists of four years of training in both anatomic and clinical pathology. The first three years consist of a core program providing exposure to each of the subspecialty areas of clinical pathology as well as surgical pathology, autopsy pathology, and cytopathology. Ample opportunities for research and teaching exist for individuals planning on an academic career. Excellent preparation is also provided for individuals planning on a career in forensic pathology or private practice in a community hospital.

PEDIATRICS

The Pediatric Residency Program emphasizes the interrelationship of patient care, didactic teaching, and research in the training of the pediatric resident physician. The focus of the Department is on the total care of the child from birth through young adulthood. A strong clinical and educational foundation is provided through experiences in a broad spectrum of disease and/or injury as well as training in biosocial pediatrics, preventive health care, and community resources.

The program offers variety and depth due to the diversity of the Department's two major teaching hospitals—the UCI Medical Center and the Miller Children's Hospital (located at Memorial Hospital Medical Center, Long Beach). The faculty at these institutions provide a comprehensive teaching program in general pediatrics and cover the full range of pediatric subspecialties. The care of children seen through the two hospitals represents a cross-section of racial, cultural, and socioeconomic groups from a local population of more than 2.5 million. Thus, pediatric residents are exposed to a wide range of problems presented in settings ranging from intensive care to supervised office-based practice.

PHYSICAL MEDICINE AND REHABILITATION

The Department of Physical Medicine and Rehabilitation offers a three-year residency for applicants who have completed a one year internship. The focus is on the diagnosis and comprehensive treatment and care of patients with neuromusculoskeletal or cardiopulmonary disabilities, from newborns to the elderly. Residents are also involved in research and medical student teaching.

PSYCHIATRY

The Psychiatry Residency Program is a four-year program that fosters individuality, academic excellence, and broad patient experience. The core curriculum includes basic seminars, adult inpatient and outpatient psychiatry, child psychiatry, medicine, neurology, emergency psychiatry, consultation and liaison psychiatry, forensic psychiatry, psychopharmacology, and substance abuse. Residents spend time at the UCI Medical Center, private facilities, LBVAMC, and Long Beach Memorial Medical Center, all of which provide a broad base and mix of experience in psychopathology. A wide variety of elective courses and experiences are available in this flexible, eclectic program. All residents are expected to complete a research project of high quality prior to completion of the program.

PULMONARY AND CRITICAL CARE MEDICINE

The Pulmonary and Critical Care Medicine Fellowship program is designed to train clinicians so that they are best able to serve patients and health care providers in their communities. In addition, this program is designed to provide selected individuals with specific research career opportunities in academic pulmonary and critical care medicine in the areas of expertise of the division. The specific educational objectives of this program are: (1) to provide a solid educational experience in general pulmonary and critical care medicine (PCCM) that will prepare physicians to reliably and competently serve their communities; (2) to provide medical students, residents, and ancillary health care providers with tools necessary for a fundamental understanding of the diagnosis, prevention, and treatment of pulmonary and critical care illnesses. A major component of this objective is met through the participation of PCCM fellows in educational endeavors such as lectures, in-services, and proactive communication; and (3) to develop processes that enhance the education and understanding of simple and complex pulmonary and critical care issues by the general public in the context of cultural diversity. The hospitals offer a wide variety of opportunities to interact with patients from diverse cultural and economic backgrounds. The cultural diversity of the medical staff and patients enhances the educational process, opening the minds of PCCM fellows to cultural differences and service-oriented practices.

RADIOLOGICAL SCIENCES (DIAGNOSTIC RADIOLOGY)

The Department of Radiological Sciences has 22 residents training for certification in diagnostic radiology. The program is based at the UCI Medical Center and integrated with LBVAMC, and MHMC. Residents rotate through all three institutions.

The objectives of the program are (1) to provide individuals with a solid background in all modalities of imaging, (2) to provide an atmosphere conducive to research and to encourage opportunities for residents to participate in research work with physicians and scientists, and (3) to provide elective periods in which residents can work in given areas of the Department to increase their expertise or work on research projects during their residency training.

The residency program includes specialized training in interventional radiology, ultrasonography, nuclear medicine, computerized tomography, magnetic resonance imaging, and spectroscopy, as well as opportunities to participate in major research programs conducted in the Department. All residents are encouraged to complete at least one major paper during the program.

Candidates are accepted only at the postgraduate-2 level for a four-year program. Fellowships are available for an additional year in specialized areas following the successful completion of the residency. The newest technologies in the field of radiological sciences are available at UCI Medical Center and the School's affiliated institutions.

RADIATION ONCOLOGY

The Residency Training Program in Radiation Oncology is designed to prepare suitably qualified applicants for academic and clinical practice careers in radiation oncology. Candidates enter a four-year program which includes clinical experience, didactic lectures, and integrated research experience. Unique opportunities exist for training in the use of interstitial and intracavitary treatment using radionuclides and specially designed applicators. An elective rotation may be taken in related branches of medicine (e.g., medical oncology, surgical pathology, gynecologic oncology) or at other radiation oncology departments. The Program includes rotations at three participating hospitals: UCI Medical Center, LBVAMC, and MHMC.

SURGERY

The philosophy underlying all aspects of surgical training is that surgery is best learned, taught, and practiced as applied clinical physiology. Operative techniques and applied anatomy receive appropriate attention. Major portions of clinical experience, teaching, conferences, research, and patient care are oriented toward understanding and correcting disordered human biology. The surgical specialty involves more years of training than other medical disciplines due to the breadth of diseases and complexity of pathophysiology involved in surgery. The Department offers residencies in general surgery, plastic surgery, and urology.

UROLOGY

The Department of Urology Residency Program is a four-year training program which follows a one-year internship in the Department of Surgery. The residency program provides training in all aspects of urologic disease. The residents receive extensive training in open and endoscopic procedures, laparoscopy and other minimally invasive techniques, urologic pathology, uroradiology, and management of non-operative urologic conditions. The program's training hospitals include UCI Medical Center, VA Long Beach Health System, Kaiser Permanente Anaheim, and Long Beach Memorial. Following the formal residency training, residents are required to join the faculty as clinical instructors for one year. The Urology Department encourages and supports both clinical and basic science research.

GRADUATE ACADEMIC PROGRAMS

The School of Medicine's basic medical science departments of Anatomy and Neurobiology, Biological Chemistry, Microbiology and Molecular Genetics, Pathology, and Physiology and Biophysics participate jointly with the School of Biological Sciences in offering graduate instruction leading to the M.S. and Ph.D. degrees in Biological Sciences. The Department of Community and Environmental Medicine and the Department of Pharmacology offer M.S. and Ph.D. programs. In addition, the Department of Pediatrics offers an M.S. degree in Genetic Counseling.

Application materials may be obtained by contacting the individual graduate programs or the:

University of California, Irvine
Office of Research and Graduate Studies
120 Administration Building
Irvine, CA 92697-3175
(949) 824-6761

World Wide Web: http://www.rgs.uci.edu/

Anatomy and Neurobiology

364 Medical Surge II; (949) 824-6050
E-mail: anatomy@uci.edu
World Wide Web: http://www.ucihs.uci.edu/anatomy/index.html
Leonard Kitzes, **Acting Department Chair**

Faculty

Aileen J. Anderson: Mechanisms of neurodegeneration and inflammation after central nervous system injury
Tallie Z. Baram: Developmental neurobiology of excitation and excitotoxicity; CNS mechanisms of stress response
Robert H. Blanks *(Emeritus):* Vestibular physiology and anatomy
Ralph A. Bradshaw: Growth factor action; signal transduction; protein processing
Anne L. Calof: Developmental neurobiology; molecular mechanisms of neurogenesis and programmed cell death
James H. Fallon: Neuronal growth factors and neurotransmitter interactions
Christine M. Gall: Regulation of neuronal gene expression; neurotropic factors
Roland A. Giolli, *Department Vice Chair:* Experimental neuroanatomy; visual system
Hans S. Keirstead: Axon and myelin regeneration following spinal cord injury
Herbert P. Killackey: Developmental neuroanatomy; somatosensory system
Leonard M. Kitzes: Auditory system physiology and development
Frances M. Leslie: Effects of drugs of abuse on central nervous system development
Diane K. O'Dowd: Regulation of neuronal excitability; development of functional synaptic connections
Charles E. Ribak: Changes in the neural circuitry in the epileptic brain
Richard T. Robertson: Developmental neurobiology; forebrain development
Martin A. Smith: Cellular and molecular mechanisms of synapse formation
Ivan Soltesz: Molecular and cellular neurobiology
Oswald Steward: Mechanisms of recovery from CSN injury
John E. Swett *(Emeritus):* Peripheral nervous system, spinal cord, pain mechanisms
Ji Sze: Molecular neurobiology; gene expression in *C. Elegans*
John H. Weiss: Mechanisms of neural degeneration
Fan-Gang Zeng: Auditory prostheses

Research programs in the Department of Anatomy and Neurobiology focus on the neurosciences. Faculty interests range across the broad field of neuroscience research, including cellular and molecular neurobiology, mechanisms of development, experimental neuroanatomy, structure and function of sensory and motor systems, and response to injury and regeneration. The Department maintains facilities for electron microscopy, laser confocal microscopy, and computer-based imaging and informatics. Students performing graduate work in the Department are encouraged to become proficient in multiple areas of neuroscience using interdisciplinary techniques.

The Department offers graduate training in neuroscience under the auspices of the School of Biological Sciences in the Neurobiology track of the combined program in Molecular Biology, Genetics, and Biochemistry (MBGB). The program offers the Ph.D. degree in Biological Sciences. In concert with several other departments, a combined neuroscience core curriculum has been developed which includes course offerings in systems neurobiology, neurophysiology, and cellular, molecular, and developmental neurobiology. These courses may be taken as complete or partial fulfillment of the elective requirements of the Ph.D. program.

The Department also participates in the Interdepartmental Neuroscience Program. Students who select a focus in Neuroscience and a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year. Students are required to attend departmental seminars and participate in the Department's Journal Club. The dissertation research topic is chosen by the student in consultation with the research advisor. The majority of the third and fourth years are devoted to research. By the end of the third year, students take their advancement-to-candidacy examination by presenting and defending a proposal for specific dissertation research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Course descriptions may be found in the School of Biological Sciences section.

Biological Chemistry

Building D, Room 240, Medical Sciences I; (949) 824-6051
Suzanne B. Sandmeyer, **Department Chair**

Faculty

Bogi Andersen: Transcriptional regulation in Epithelial tissues
Pierre Baldi: Computation biology, bioinformatics, probabilistic modeling, machine learning
Rainer K. Brachmann: Cancer genetics, chromatin and transcriptional regulation, tumor suppressor gene p53
Jefferson Y. Chan: The role of CNC-bZIP transcription factors in oxidative stress response and the genesis of cancer
Phang-Lang Chen: Signal transduction in response to DNA damage and tumor genesis
Xing Dai: Transcriptional control of cellular differentiation in mice
Peter Kaiser: Cell cycle regulation by ubiquitin
Eva Y.-H. P. Lee: Breast cancer and DNA damage checkpoint control
Wen-Hwa Lee: Molecular cancer genetics, mainly the mechanism of tumor suppressor gene functions, cancer progression and novel therapy
Ellis R. Levin: The plasma membrane estrogen receptor (ER) and its effects on the biology of estrogen action
Steven Lipkin: Cancer genetics and genomics
Haoping Liu: Signal transduction, cell cycle regulation, hypha development in yeast
Calvin S. McLaughlin: Functional genomic analysis
Frank L. Meyskens: Carcinogenesis and molecular biology of melanoma and chemoprevention of human cancer
Robert K. Moyzis: Human genomics and complex neurogenetic disorders
Masayasu Nomura: RNA polymerase I; nucleolus and ribosome synthesis; nuclear structure and function
Suzanne B. Sandmeyer: Retrovirus-like elements in yeast
Robert E. Steele: Evolution of multicellular animals and their genomes
Leslie M. Thompson: Molecular/biochemical analysis of skeletal dysplasias and Huntington's disease
Paul Vrana: Genetics, control and evolution of genomic imprinting, growth control and placental development
Douglas C. Wallace: Molecular and mitochondrial medicine and genetics
Kyoko Yokomori: Chromosome structure organization and its role in genome function and stability

Faculty research interests in the Department of Biological Chemistry are in the structure and function of chromosomes, signal transduction and its role in cell growth control, regulation of gene expression (transcription, protein synthesis, and protein localization), and the molecular basis of development. Genome sequencing projects are making it possible for faculty to exploit information learned about gene function in model organisms for understanding human disease processes. Students are exposed to technical expertise in all facets of current research in molecular biochemistry from protein chemistry to genetic engineering and gene mapping. Currently, researchers in the Department are using new DNA array technology and bioinformatics to understand global changes in gene expression in response to the environment.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin thesis research in the second year. Students are required to attend and participate in the departmental research seminars. In addition, students are required to complete three advanced-level graduate courses subsequent to entering the Department's Ph.D. concentration. In the third year, students take the advancement-to-candidacy examination for the Ph.D. degree by presenting and defending a proposal for specific dissertation research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Course descriptions may be found in the School of Biological Sciences section.

Environmental Toxicology

10 Faculty Research Facility; (949) 824-8642
Ronald C. Shank, **Department Chair**

Faculty

Dean B. Baker: Environmental medicine and clinical toxicology; epidemiology; clinical effects of heavy metals, pesticides, and hazardous waste
Stephen C. Bondy: Neurotoxicology; biochemical changes in membranes resulting from toxic exposures
Arezoo Campbell: Role of environmental and endogenous toxins in promoting innate immune responses in the brain; delineation of the signaling pathways involved and the role of environmental agents in the pathogenesis of neurodegenerative disorders
Jefferson Y. Chan: Chemical pathology of tissue injury with focus on the oxidative stress response in cells exposed to toxic xenobiotics
Derek Dunn-Rankin: Laser and optical diagnostics in practical systems, optical particle sizing; droplet formation and vaporization in high-pressure environments
Jonathon E. Ericson: Distribution of social ecology (environmental health science; archaeological chemistry), sources and extent of environmental lead exposure leading to prevention and diagnosis of childhood lead poisoning
Chenyang (Sunny) Jiang: Application of molecular techniques to detect human pathogenic bacteria and viruses in aquatic environments; coastal water quality microbiology
Michael T. Kleinman: Uptake and distribution of inhaled toxic materials in the respiratory tract; effects of air pollutants on cardiopulmonary function
Charles E. Lambert: Toxicology of chemicals in the workplace; industry and regulatory toxicology; risk assessment, risk management, and risk communication
Ulricke Luderer: Reproductive and developmental toxicology
Calvin S. McLaughlin: Biochemical toxicology and regulation of protein synthesis; mechanisms of action of mycotoxins including trichothecenes
Betty H. Olson: Environmental microbiology and water chemistry; public policy issues in environmental toxicology
Kathryn E. Osann: Cancer epidemiology; biostatistics
Robert F. Phalen: Biophysics, aerosol science, and inhalation toxicology; toxicity of mixtures of particles and gases, lung defenses, and particle deposition in airways.
J. Leslie Redpath: Studies on the chemical and physical modification of radiation damage aimed at basic research in carcinogenesis
Ronald C. Shank: Biochemical mechanisms in toxic tissue injury with emphasis on chemical carcinogenesis; application of tools of molecular biology to study cytotoxicity

The Department of Community and Environmental Medicine provides graduate training in environmental toxicology and offers the M.S. and Ph.D. degrees in Environmental Toxicology. The program in Environmental Toxicology provides students with the knowledge and skills necessary and appropriate to teach and/or conduct basic and applied research programs in inhalation/pulmonary toxicology, environmental carcinogenesis, biochemical neurotoxicology, chemical pathology, phototoxicity, toxicology of natural products, and toxicokinetics.

Toxicology involves scientific study of the entry, distribution, biotransformation, and mechanism of action of chemical agents harmful to the body. The program interprets environmental toxicology as the study of the effects and mechanisms of action of hazardous chemicals in food, air, water, and soil, in the home, workplace, and community, and considers experimentally and theoretically such diverse research problems as: (1) new scientific approaches to toxicological evaluation of environmental chemicals such as air and water pollutants, food additives, industrial wastes, and agricultural adjuvants; (2) mechanisms of action in chemical carcinogenesis and mutagenesis; (3) the molecular pathology of tissue injury in acute toxicity; and (4) scientific principles involved in extrapolating from laboratory animal data to expected effects on human health in environmental exposures.

Students entering the program have varied backgrounds, including chemistry, biology, and physiology. The curriculum is based on a foundation of basic and health sciences with applications of scientific principles to environmental problems. Formal course work is enriched by a strong commitment to student-professor interaction throughout the program. An important and integral part of the learning process is an early and intensive involvement of the student in ongoing original research projects in environmental toxicology, especially inhalation/pulmonary toxicology, chemical carcinogenesis, biochemical toxicology, chemical pathology, and neurotoxicology.

In addition to meeting the general admission requirements set by the Office of Research and Graduate Studies, applicants must be admitted by an Admissions Committee composed of faculty members from the Department of Community and Environmental Medicine. Candidates are selected on the basis of a balanced evaluation of the following criteria: (1) prior scholastic performance, including a consideration of grade point average, course load, nature of courses taken, and college attended; (2) recommendations by professors and others; (3) scores on the Graduate Record Examination; the Subject Test in either Biology or Chemistry is strongly recommended; (4) an interview by the Admissions Committee, when feasible; and (5) experience in undergraduate research. The applicant must have received a bachelor's degree in a biological or physical science, in a premedical curriculum, or have an acceptable equivalent. Applicants with a bachelor's degree in engineering may qualify for admission into the program if they have had sufficient training in biology and chemistry.

Undergraduate preparation of applicants should include six quarter units in general biology, zoology, bacteriology, or anatomy; 12 quarter units in mathematics, including calculus through vector analysis and differential equations; 12 quarter units of chemistry, including four quarter units of organic chemistry; 12 quarter units of physics, including optics; and four quarter units in molecular biology or biochemistry. Outstanding applicants who lack one or two of these prerequisites may be given an opportunity to take the required course(s) either before admission or during the first year in the graduate program; in such circumstances, none of these undergraduate courses may be used to satisfy the program elective or core course requirements. Upper-division or graduate science courses may be considered as substitutes for the above prerequisites by the Admissions Committee.

The graduate core curriculum for the Ph.D. degree includes Environmental Toxicology 201, 206A-B, 207, 298A-B-C, and 16 units from an approved elective pool. This pool consists of Environmental Toxicology 202, 204, 208, 212, 220, 230; Physiology 206A-B; Anatomy 203A-B; Molecular Biology and Biochemistry 203, 204; and Developmental and Cell Biology 231B. Ph.D. students must also fulfill comprehensive examination, qualifying examination, teaching, and research dissertation requirements. The normal time for advancement to candidacy is three years. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Requirements for the M.S. degree may be satisfied in one of two ways: Under Plan I, students complete the core program (Environmental Toxicology 201, 206A-B, 207, 298A-B, 299A-B-C, and eight units from the approved elective pool) with an average grade of B or better, and, under the direction of a faculty advisor, prepare a thesis that is acceptable to the thesis committee. Under Plan II, students complete the core program (Environmental Toxicology 201, 206A-B, 207, 290A-B-C, 298A-B-C, and eight units from the approved elective pool) with an average grade of B or better, prepare a scholarly paper based on individual study in an area of toxicology under the supervision of a faculty member, and satisfactorily pass the written comprehensive examination.

Opportunities for individual training and independent research experience exist in inhalation and pulmonary toxicology, atmospheric chemistry and aerosol science, chemical carcinogenesis, neurochemistry, biochemical toxicology, toxicology of naturally occurring compounds, chemical pathology, environmental microbiology, and environmental chemistry.

Research grants and contracts are available to support qualified students as research assistants.

GRADUATE COURSES IN ENVIRONMENTAL TOXICOLOGY

201 Principles of Toxicology (4) F. Problem solving to demonstrate principles of toxicology; quantitative dose-response relationship; toxicant-target (receptor) interaction emphasizing interspecies differences in Ah receptor and dioxins; complete *in vivo* metabolism of xenobiotics by mammalian systems; integration of organ responses to toxic agents.

202 Environmental Toxicology (4) W. Analysis of real problems involving toxic chemicals and the human food, air, and water supplies, occupational exposures, and life styles. Formal problems will be considered by small groups of students and discussed by the class. Prerequisite: Toxicology 201.

203 Immunotoxicology I (4). Introduction to the basic concepts of immunotoxicology and the role of environmental toxins in mediating suppression or stimulation of the immune response.

204 Neurotoxicology (4) F, even years. The effects of various harmful chemicals upon nervous system function. Emphasis given to the molecular events underlying neurological damage and to the relation of such processes to basic mechanisms of neurobiology.

206A-B Target Organ Toxicity (6-6) F, W. Analysis of responses occurring in twelve organ systems of humans exposed to environmental chemicals at toxic levels; distinctive cellular and tissue structure and physiological function; toxicological responses discussed in terms of phenomena, mechanisms of action, and methods of study. (Kleinman, Said)

207 Experimental Design and Interpretation of Toxicology Studies (2) F. Introduction to methods of structuring toxicology experiments and analyzing data including experimental design, data distributions, sample sizes, hypothesis testing, linear regression, analysis of variance, multiple comparison testing, and non-parametric tests.

208 Experimental Molecular Toxicology (4) S. Experimental techniques in mutagenesis research including detection of DNA damage and repair in DNA fragments and genes, in microbial and mammalian systems, and in transgenic mice. Methods for screening and sequence analysis of mutations generated by genotoxins.

212 Inhalation Toxicology (4) S, odd years. The principles and practice of laboratory inhalation toxicology. Topics include aerosols, gases, respiratory tract structure and function, lung defenses, aerosol deposition exposure techniques, characterization of exposure atmospheres, experimental designs, animal models, and regulations and guidelines.

220 Industrial Toxicology (4) F. Analysis of responsibilities toxicologists have in industry, including product safety, generating material safety data sheets, animal testing, ecotoxicological testing, risk/hazard communication, and assisting industrial hygienists and occupational physicians; emphasis on interdisciplinary nature of industrial toxicology and communication skills. Prerequisite: Environmental Toxicology 206A-B.

221 Toxicology in Pharmaceutical and Medical Devices (3). Examines the role of toxicology in evaluating the safety of medical devices and pharmaceuticals within the various regulatory schemes in the U.S. and E.U. Emphasis placed on preclinical toxicity testing programs. Prerequisite: Environmental Toxicology 201, 206A-B, or consent of instructor.

290 Independent Study in Environmental Toxicology (4) F, W, S. With consent from a faculty member who will supervise the program, a student may receive credit for individual study in some area of toxicology, culminating in the completion of a scholarly paper on the subject. May be repeated for credit as the topics vary.

297 Advanced Topics in Occupational Toxicology (2) F, W, S. Discussions with clinical and research faculty in environmental toxicology and occupational medicine on current toxicology problems in the workplace and critical review of current publications in the field. Journal club/seminar format.

298A-B-C Environmental Toxicology Seminar (2) F, W, S. Presentation and discussion of current research problems and issues by students, postdoctoral fellows, faculty, and guests, covering the broad research and policy areas of environmental toxicology. Open to Environmental Toxicology graduate students only.

299 Research Problems (1 to 12) F, W, S. Research work for the M.S. thesis or Ph.D. dissertation.

Genetic Counseling

City Tower, Suite 800, UCI Medical Center; (714) 456-5789
Ann P. Walker, **Graduate Program Director**

Faculty

James Bartley: Genetic metabolic diseases
Maureen Bocian: Heterogeneity and variability in genetic diseases; characterization of new syndromes; neurofibromatosis; skeletal dysplasias
José A. Camacho: Genetic metabolic diseases
Suzanne Cassidy: Natural history and management of genetic syndromes; Prader-Willi, Angelman, and Marfan syndromes
Pamela Flodman: Genetic epidemiology; human genome informatics; genetic counseling and risk perception
Kathryn Steinhaus French: Prenatal genetic diagnosis
John Jay Gargus: Genetic metabolic diseases; molecular genetics of cell membrane disorders
Taosheng Huang: Genetics of cardiovascular malformations; Holt-Oram syndrome
Steven Lipkin: Molecular genetics of colon cancer; clinical cancer genetics
Robert Moyzis: Chromosome structure and gene expression; human telomere and centromere organization and function
Vincent Procaccio: Mitochondrial and molecular medicine
Roxanne Ruzicka: Prenatal genetic diagnosis; risk assessment and counseling for hereditary cancers
Moyra Smith: Gene linkage and mapping in neurogenetic disorders including autism; mutation analysis and genotype-phenotype correlation in tuberous sclerosis
M. Anne Spence: Genetic epidemiology, quantitative genetics; linkage and mapping
Ann P. Walker: Genetic counseling in hereditary cancer and late-onset diseases; genetics education; genetics services delivery; ethical, cultural, and public policy issues in genetics
Douglas Wallace: Mitochondrial genetics, evolutionary biology and metabolic disease

The Division of Human Genetics in the School of Medicine's Department of Pediatrics offers a Master of Science degree program in Genetic Counseling. Most graduates of the program join academic or hospital-based genetics teams providing clinical services, teaching, and research. Others work for local, state, or federal genetics programs, for commercial genetics laboratories, on genetic research studies, or in education. The graduate program is fully accredited by the American Board of Genetic Counseling.

Division faculty and staff are engaged in teaching, research, and patient service. Clinical activities center on diagnostic evaluation, management, and genetic counseling for genetic disorders, birth defects, and developmentally disabling conditions. Faculty research interests include: gene mapping and linkage analysis using molecular and quantitative methods; characterization and management of malformation and chromosomal syndromes; counseling for late-onset genetic conditions—including familial cancers and neurogenetic disorders; factors causing chromosome abnormalities and congenital malformations; cancer genetics and cytogenetics; psychosocial and cultural issues associated with genetic conditions, birth defects, prenatal diagnosis, and genetic tests; genetic screening and genetic services delivery; and ethical and public policy issues in genetics.

During the six to eight academic quarters of the program, students complete a sequence of core courses covering medical, quantitative, biochemical, molecular, and cancer genetics; teratology, embryology, and development; cytogenetics; counseling theory; research methods; ethical issues; and community resources. All courses are taught by Division faculty specifically for students in the program. Experiential professional training occurs concurrently with formal course work in a variety of clinics at the UCI Medical Center and satellite facilities, in the prenatal diagnosis program, in the cytogenetics and molecular genetics laboratories, and in various community agencies. Students participate in these and other divisional and departmental professional and educational activities such as lectures, seminars, journal club, Pediatrics and Obstetrics and Oncology Grand Rounds, cytogenetics conferences, and various research, counseling, and patient management conferences throughout the program. While not required, some students choose to arrange optional clinical rotations at other academic, private, or commercial genetics units.

Degree requirements include a minimum of 75 quarter units, completion of a research thesis that should be publishable, and demonstration of appropriate professional skills in genetic counseling. The program director serves as faculty advisor to students. Teaching and supervision of professional experiential training are shared by all Division faculty and staff, who frequently review student progress. In the second year, development of professional skills can be individualized according to the trainee's needs and interests. Successful completion of the program fulfills the curricular and clinical training requirements for eligibility to sit for examination by the American Board of Genetic Counseling.

Recommended undergraduate preparation includes course work in the biological and behavioral sciences—particularly in genetics, biochemistry, molecular biology, psychology, and human development. Course work in statistics is desirable. Fluency in Spanish or a Southeast Asian language confers a considerable advantage. Extracurricular or employment experiences that provide evidence of the student's maturity, interpersonal skills, and promise as a genetic counselor figure prominently in the admissions decision. References should speak to these qualities as well as to the academic qualifications of the applicant. The GRE General Test and Writing Assessment are required. Subject Test scores in any area will also be considered if they are available. Since there is no GRE code for the Department of Pediatrics, applicants should use the UCI institution code: R4859.

Applications are accepted for the fall quarter only and must be complete by February 1. Because of keen competition for places in the program, a two-stage admissions process is employed. Following initial review of applications by the faculty admissions committee, approximately one-fifth of applicants are invited for interviews, which are usually conducted during March and April. If invited, it is greatly to the candidate's advantage to have an on-site interview, although in difficult circumstances it may be possible to arrange an out-of-town interview with a program graduate or a traveling faculty member. Any candidate planning to be in the Southern California area in March or April is encouraged to inquire in advance regarding the likelihood of an interview. Final selection from the interviewed candidates occurs in late April or early May. Five or six students are usually admitted each year.

GRADUATE COURSES IN GENETIC COUNSELING

200A Introduction to Medical Genetics and Cytogenetics (4) F. Lecture, three hours. Covers current concepts regarding mitosis, meiosis, the cell cycle, and chromosome ultrastructure and function. Clinical disorders caused by chromosomal aneuploidy, duplication, and deletion, and principles of Mendelian, chromosomal, and multifactorial and nontraditional inheritance are presented and illustrated.

200B Genetic Screening, Prenatal Development, and Human Teratology (4) W. Lecture, three hours. Principles and techniques of prenatal, neonatal, and carrier screening. Infertility, pregnancy, and delivery. Normal and abnormal prenatal growth and development. Reproductive and fetal effects of drugs, radiation, infections, and other environmental factors. Prerequisite: Genetic Counseling 200A.

200C Human Genetic Disorders (4) S. Lecture, three hours. Inheritance, diagnosis, natural history, management, and counseling considerations for commonly encountered genetic diseases, birth defects, and dysmorphic syndromes. Prerequisites: Genetic Counseling 200A and 200B.

200D Disorders Due to Inborn Errors of Metabolism (4) F (even years). Lecture, three hours. Aspects of biochemistry and metabolism are reviewed with special emphasis on genetic abnormalities which lead to inborn errors of metabolism. Diagnostic procedures, heterozygote detection, treatment, counseling issues, and prenatal diagnosis are reviewed. Prerequisite: 200A or consent of instructor.

200E Molecular Genetics (4) S. Lecture, three hours. The derivation of different types of DNA probes and DNA libraries, restriction endonuclease polymorphisms, assignment of genes to chromosomes, and genetic linkage. Particular emphasis is placed on the use of recombinant DNA technologies and genetic linkage analysis for diagnosis of human genetic disease. Prerequisite: 200A, 200D, or consent of instructor.

200F Quantitative Genetics (2) S. Lecture, one and a half hours. Quantitative aspects of human genetics, including population studies, segregation analysis, linkage, mapping, and genetic risk determination. Corequisite or prerequisite: Genetic Counseling 200A.

200G Hereditary Cancer Counseling (4) W (odd years). Lecture, three hours. Issues in genetic counseling for cancer. Cancer biology; genetic mechanisms and environmental influences in carcinogensis; tumor pathology; cancer gene mapping; epidemiology. Features natural history, diagnosis, prevention, surveillance, and management of heredity cancers. Psychosocial, ethical, legal aspects of cancer risk assessment. Prerequisites: Genetic Counseling 200A, 200B.

200L Cytogenetics Laboratory (4) F. Laboratory, 10 hours/week. A practicum introducing methods of specimen collection, short-term lymphocyte and bone marrow culture, long-term fibroblast and amniocyte culture, harvesting and slide preparation, chromosome staining, microphotography, and darkroom techniques. Microscopic chromosome analysis, photographic karyotyping, and the appropriate use of cytogenetic nomenclature are emphasized. Open only to Genetic Counseling students.

201A Introduction to Genetic Counseling (4) F. Through directed readings, observing patient evaluations, role playing, and conducting intake interviews, students are introduced to the process of diagnosis, management, and counseling for genetic disease. Psychosocial issues, interviewing techniques, pedigree construction, clinical photography, and various other skills are addressed. Open only to Genetic Counseling students.

201B Clinical Rotation I (4) W. Tutorial and fieldwork. Provides extensive supervised experience in history taking, interviewing, and psychosocial assessment in the clinical genetics setting. Students independently perform telephone, office, and home-visit intake interviews, participate in counseling, and present cases at patient management conferences. Open only to Genetic Counseling students.

201C Clinical Rotation II (4) S. Tutorial and fieldwork. Provides further supervised experience in genetic counseling, case management, clinic administration and organization, and the use of community resources. Emphasis is on sharpening counseling skills and on developing a professional identity and code of ethics. Open only to Genetic Counseling students.

201D Prenatal Diagnosis Counseling (4) S. Tutorial and fieldwork. A practicum with extensive supervised experience in prenatal diagnosis counseling which provides the student with the opportunity to conduct genetic counseling sessions semi-independently and to further develop clinical skills. Open only to Genetic Counseling students. Prerequisites: 200A, 200B, and 200C.

202A Counseling in Human Genetics: Theory and Methods (3) S. Lecture and discussion, two hours. Theoretical approaches, counseling models and methods, and bio-psychosocial assessment strategies are examined in the context of genetic counseling. Contract-setting, working alliance, the use of self and evaluation methods. Beginning counseling and peer supervision skills are practiced in class. Open only to Genetic Counseling students.

202B Community Resources (2) F. Seminar and activity, two hours. Lectures, guest speakers, and community visits acquaint the genetic counselor with public and private health care and funding agencies, parent support and advocacy groups, and other resources available to assist individuals and families confronted with genetic disorders, developmental disabilities, and birth defects. Open only to Genetic Counseling students.

202C Ethical Issues in Human Genetics (2) S (odd years). Lecture and discussion, two hours. Explores major social, legal, and ethical issues in genetic counseling including those arising in genetic screening, prenatal diagnosis, informed consent, privacy and confidentiality, rights of the disabled, new genetic and reproductive technologies, treatment, and access to services. Prerequisite: consent of instructor.

203 Child Development for Genetic Counselors (4) S (alternate years). Overview of normative human development from conception through adolescence. Impact of genetic disease and/or developmental disability at various stages of cognitive, perceptual, motoric, social, and emotional development. Family dynamics and issues of separation/individuation, sexual identity formation, and teen pregnancy issues. Open only to Genetic Counseling students. Formerly Genetics 203A and 203B.

204A, B, C Professional Skills Development (4, 4, 4) F, W, S. Hones and augments existing competencies in genetic counseling through ongoing clinical experiences. Students develop skills in use of computers for genetics applications, provision of community and professional education, and clinic administration. Further experience in genetics laboratories or specialty clinics may be elected by students. Open only to Genetic Counseling students.

295 Master's Thesis Research and Writing (4 to 8) F, W, S. Tutorial. Under the supervision of one or more faculty members, the student designs and conducts a research project or completes a case report. A problem in the cytogenetics, biochemical, clinical, psychosocial, or behavioral areas of medical genetics may be investigated. Prerequisite: consent of instructor.

Microbiology and Molecular Genetics

Building B, Room 240, Medical Sciences I; (949) 824-5261
Bert L. Semler, **Department Chair**

Faculty

Hoda Anton-Culver: Epidemiology studies
Ruslan D. Aphasizhev: Molecular parasitology and biochemistry of RNA editing
Alan G. Barbour: Microbial pathogenesis and ecology of infectious diseases
Victoria Camerini: Pathways of intestinal T cell development
K. George Chandy: Potassium channels; structure, function and therapeutics
Dennis D. Cunningham: Proteases and protease nexins: regulation of neural cells
Michael Demetriou: The molecular biology and glycobiology of T cell dysfunction in organ-specific autoimmunity
Alan L. Goldin: Molecular analysis of ion channels and their roles in human diseases
Sidney H. Golub: Immunology of human cancer; science policy and ethics
George A. Gutman: Potassium channel and immunoglobulin super-family genes
G. Wesley Hatfield: Computational biology, effects of DNA topology on gene expression
Klemens J. Hertel: Regulation of gene expression by alternative splicing
Anthony A. James: Genetic manipulation of insect vectors; control of transmission of dengue and malaria
Janos K. Lanyi: Structure and function in bacterial Rhodopsins
Masayasu Nomura: RNA polymerase I; nucleous and ribosome synthesis; nuclear structure and function
Andre Oullette: Mechanisms of innate immunity in the mammalian intestinal epithelium
W. Edward Robinson: Molecular pathogenesis of lentivirus infection and drug discovery against HIV
Suzanne Sandmeyer: Retrovirus-like elements in yeast
Rozanne M. Sandri-Goldin: Regulatory functions of a post-transcriptionally acting herpes virus protein
Michael E. Selsted: Innate immunity mediated by phagocytic leukocytes and mucosal epithelium
Bert L. Semler: Replication and translation of picornavirus RNAs; RNA-protein and protein-protein interactions
Eric J. Stanbridge: Tumor suppressor genes and oncogenes in human cancer
Ming Tan: Bacterial pathogenesis; gene regulation in Chlamydia
Marian L. Waterman: WNT signaling in cancer and lymphocytes

The Department of Microbiology and Molecular Genetics provides advanced training to individuals interested in the regulation of gene expression and the structural and functional properties of proteins encoded by these genes. The research in the Department covers a wide range of topics with special emphasis on: bacterial gene expression and pathogenesis, viral gene expression and host interactions, nuclear-cytoplasmic transport, eukaryotic gene expression, mRNA splicing, editing, and processing, cancer genetics, ion channel expression and function, genomics, and bioinformatics.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the MBG&B program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

Participation in the Department's seminar series and completion of at least one advanced topics course per year for three years are expected of all students. In their third year, students take the advancement-to-candidacy examination for the Ph.D. degree by presenting and defending a proposal for specific dissertation research. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Course descriptions may be found in the School of Biological Sciences section.

Experimental Pathology

Building D, Room D440, Medical Sciences I; (949) 824-6574
Michael E. Selsted, **Department Chair**

Faculty

Rainer K. Brachmann: Cancer genetics; chromatin and transcriptional regulation; tumor suppressor gene p53
Jefferson Y. Chan: Regulation of genes associated with oxidative stress
K. George Chandy: Molecular biology and structure of ion channels; novel therapeutic agents
Luis M. de la Maza: Chlamydia trachomatis vaccines and sexually transmitted diseases
Robert A. Edwards: Mucosal immunology, inflammatory bowel disease, G-proteins, prostaglandins, and chemokines
Agnes Henschen-Edman: Protein structure, function, post-translational modification; fibrinogen
Taosheng Huang: Molecular basis of genetic diseases in human
Anthony A. James: Malaria parasite development; genetic manipulation of insect vectors
John J. Krolewski: Signal transduction pathways regulating the growth and death of normal and neoplastic cells
J. Lawrence Marsh: Regulation of growth factor signaling in patterning, regeneration and oncogenesis
Edwin S. Monuki: Cerebral cortex development and disease
Andre Ouellette: Mechanisms and regulation of innate immunity in mammalian epithelia
Ellena M. Peterson: Chlamydia vaccine development
W. Edward Robinson: Pathogenesis of retrovirus infections; molecular mechanisms of integration
Michael K. Samoszuk: Eosinophils in human disease
Michael E. Selsted: Molecular effectors of mammalian innate immunity
Andrea J. Tenner: Innate immunity; the roles of complement and phagocytes in health and disease
Ping Wang: Molecular hormone actions in the normal and diseased heart

The Department of Pathology and Laboratory Medicine offers a Ph.D. in Biological Sciences with a concentration in Experimental Pathology. The graduate program emphasizes experimental approaches to better understand the molecular and cellular mechanisms of disease. Students work in laboratories studying topics ranging from infectious processes such as cryptococcosis and the acquired immune deficiency syndrome to innate immunity, including studies on granulocytes and antimicrobial peptides. The principal areas of research investigated by faculty in the Experimental Pathology concentration range from developmental neurobiology to cancer, including prostate cancer.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

Experimental pathology makes extensive use of both animal models of human disease and studies on human tissues from human subjects. Therefore, the curriculum is heavily weighted on experimental models, including animal models, of human disease. The didactic teaching components of the track are supplemented by a twice-monthly Pathology research conference, in which postdoctoral fellows and graduate students present "research in progress" seminars. This seminar series allows trainees the opportunity to gain invaluable experience in presenting their research to other scientists and provides a mentoring process through which students gain insights from diverse scientific viewpoints.

Students must advance to candidacy during their third year. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Course descriptions may be found in the School of Biological Sciences section.

Pharmacology and Toxicology

360 Medical Surge II; (949) 824-8246
Sue P. Duckles, **Department Chair (Interim)**
Frances M. Leslie, **Graduate Program Director/Advisor**

Faculty

James D. Belluzzi: Brain substrates and pharmacology of reward; characterization and development modulation of nicotine and cocaine reinforcement; abuse potential of tobacco smoke constituents
Olivier Civelli: Molecular biology of G protein-coupled receptors; search for novel neurotransmitters and neuropeptides; pharmacological and behavioral characterizations of the novel neurotransmitters and neuropeptides
Sue Piper Duckles: Pharmacology and physiology of vascular smooth muscle; regulation of cerebral circulation, impact of gender and gonadal steroids on vascular function
Frederick J. Ehlert: Muscarinic receptor coupling mechanisms; functional role of muscarinic receptor subtypes; pharmacological methods of analysis
Kelvin W. Gee: Pharmacology of allosteric modulators of the $GABA_A$ receptor, selective modulation of $GABA_A$ receptor subtypes
Diana N. Krause: Cerebrovascular regulation and pharmacology; vascular effects of gonadal hormones; melatonin receptors
Frances M. Leslie: Effects of drugs of abuse on the developing brain
Hans-Peter Nothacker: Physiology, pharmacology and signal transduction of novel G protein-coupled receptors; discovery of novel ligand-receptor systems ("orphan" GPCRs)
Daniele Piomelli: Biochemistry and pharmacology of the endogenous cannabinoid and other lipid signaling systems
Ralph E. Purdy: Vascular neurotransmitter receptors, second messengers and signal transduction; cardiovascular effects of microgravity
Rainer K. Reinscheid: Isolation of natural ligands for so-called "orphan" G protein-coupled receptors and their physiological functions; neurobiology of anxiety and stress behavior
Larry Stein: Neurochemistry of reward, punishment, and long-term memory
Qun-Yong Zhou: Neurobiology of prokineticins and prokineticin receptors

The Department of Pharmacology offers the M.S. and Ph.D degrees in Pharmacology and Toxicology. The Department is engaged in a broad scope of research activity, and faculty research interests include the mechanisms of action and effects of drugs on the nervous system and on behavior, on skeletal muscle, heart and blood vessels, and on basic processes in these tissues.

Prerequisites for admission include a background in the physical and biological sciences which includes courses in mathematics, physics, chemistry, and biochemistry, including laboratory experience. The Graduate Record Examination and Subject Test in Biology or Chemistry are required. Primary emphasis in the Department is placed on the Ph.D. degree program.

The graduate core program includes Pharmacology 241A-B, 252, 254, 255, 256, and 257, quarterly participation in Pharmacology 298, and any additional elective courses assigned by faculty advisors. The major additional requirement for the Ph.D. is the satisfactory completion and oral defense of a dissertation based on original research carried out under the guidance of a faculty member. All candidates for the Ph.D. degree are required to engage in research activities throughout the course of their academic programs. This requirement applies to all students whether or not they are compensated for such services. An appointment as a research assistant is awarded on the basis of scholarship and not as compensation for services rendered. Before advancing to candidacy each student must pass a written qualifying examination to determine the student's competence in pharmacology or pharmacology and toxicology. The full-time student is expected to pass the written qualifying examination by the eighth quarter and the oral qualifying examination for the Ph.D. by the eleventh quarter. The normal time for advancement to candidacy is three years. All requirements for the Ph.D. degree should be completed within five years, and the maximum time permitted is seven years. For more information, contact the Graduate Advisor, Department of Pharmacology.

The Department also participates in the Interdepartmental Neuroscience Program, described in the School of Biological Sciences section of the *Catalogue.* Students who select a focus in Neuroscience and a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

GRADUATE COURSES IN PHARMACOLOGY AND TOXICOLOGY

210 Chemical Neuroanatomy (4). Lecture, two hours; seminar, two hours. Organization of the nervous system, especially with respect to chemical identity of elements, for students of pharmacology. Major cell types, methods of study, ultrastructure, synaptic organization of functionally defined systems, localization of chemically defined cells and receptors, and brain development.

241A-B Medical Pharmacology and Therapeutics (6-6) F, W. Lecture and seminar, eight hours. Principles of pharmacology and in-depth study of drug action. Pharmacokinetics and pharmacodynamics: absorption, distribution and metabolism, general principles of action and receptor concepts. Discussion of major drug classes: molecular mechanism of action, physiological consequences of administration, and clinical use. Prerequisites: Physiology and Biophysics 206A-B and Molecular Biology and Biochemistry 210A.

252 Neurotransmitter and Drug Receptors (6) W. Lecture, three hours; seminar, three hours. Ligand gated ion channels, G protein linked receptors, receptor tyrosine kinases, ligand regulated transcription factors, their signaling mechanisms, trafficking and physiological responses. Analysis of receptor properties by pharmacological methods, radioligand binding, and molecular biology.

254 Methods in Pharmacology (4) F. Lecture, four hours; laboratory, eight hours. Receptor analysis: bioassay measuring contraction, calcium mobilization, second messenger responses; operant conditioning: whole animal, single neuron; radioligand binding; quantitative autoradiography; immunocytochemistry; in situ hybridization for analysis of mRNA; Western and Northern analysis; transgenic mouse knock in and knock out techniques. Prerequisite: consent of instructor.

255 Chemical Transmission (4) S. Lecture, two hours; seminar, two hours. Mechanisms underlying chemical signaling processes in the brain and periphery. Molecular biology, signal transduction, transmitter synthesis and inactivation, pharmacology of integrative function and behavior. Prerequisite: consent of instructor.

256 Experimental Design for Pharmacologists (1) F, W, S. Lecture, one hour; discussion, one hour; laboratory, one hour. Population and sample statistics, hypothesis testing, analysis of variance, nonparametric statistics, experimental design, power, and the use of statistical computer software. Prerequisite: Pharmacology 252 or consent of instructor.

257 Ethics in Research (1) F, W, S. Lecture, one hour; discussion, one hour. Ethical conduct in research including data handling, authorship, conflict of interest, animal rights, handling of misconduct. Prerequisite: Pharmacology 299 or consent of instructor. May be taken for credit two times.

271A, B Molecular Physiology and Disease (4, 4). F of even years, 271A; F of odd years, 271B. Introduces students to concepts of molecular physiology and pharmacology related directly to human diseases. Prerequisite: consent of instructor. Same as Physiology 271A, B and Pathology 271A, B.

298 Seminar (2) F, W, S. Presentation and discussion of current problems and methods in teaching and research in pharmacology, toxicology, and therapeutics.

299 Research (1 to 12) F, W, S

Physiology and Biophysics

Building D, Room D340, Medical Sciences I; (949) 824-5863
Janos K. Lanyi, **Department Chair**

Faculty

Nancy L. Allbritton: Signal transduction by second messengers and protein kinases
Kenneth M. Baldwin: Developmental, hormonal, and exercise factors regulating striated muscle gene expression
Ralph A. Bradshaw: Structure and function of polypeptide growth factors and their receptors; mechanisms of protein turnover
Michael D. Cahalan: Ion channels and Ca^{2+} signaling in the immune system
Vincent J. Caiozzo: Cellular and molecular mechanisms regulating the mechanical properties of skeletal muscle
K. George Chandy: Molecular biology of ion channels and their role in immune cells
J. Jay Gargus: Molecular analysis of membrane signaling proteins
Alan L. Goldin: Molecular biology of neural channels and receptors
George A. Gutman: Molecular and evolutionary studies of immunoglobulin and ion channel genes
Harry T. Haigler: Structure, function, and topography of annexin calcium binding proteins on membranes
James E. Hall: Biophysics of membrane channels, gap junctions and water channels
Lan Huang: Developing and employing mass spectrometry-based proteomic approaches for study of signal transduction networks, identification of protein complexes and characterization of their post-translational modifications
Frances A. Jurnak: Macromolecular crystallography; biochemical and structural studies of a model G protein; EF-Tu; structure/function of plant virulence factors
Janos K. Lanyi: Transport, structure, and energy coupling in bacteriorhodopsin and halorhodopsin
Shin Lin: Cellular and molecular biophysics of proteins involved in membrane-associated cytoskeletal functions and signal transduction
Kenneth J. Longmuir: Intracellular metabolism, sorting, and transport of lipid in mammalian cells; membrane fusion
John A. Longhurst: Integrative biology and sensory signaling systems important in cardiovascular regulation; central neural regulation of autonomic outflow inactivation of cardiac afferents and the influence of electroacupuncture
Hartmut Luecke: Protein crystallography; structure and function of membrane-associated proteins
Alexander McPherson: X-ray diffraction analyses of enzymes, viruses; antibodies and protein-nucleic acid complexes; crystallization methods; microgravity crystallization
Thomas L. Poulos: Protein crystallography; protein engineering; heme enzyme structure and function
Irwin A. Rose: Studies on the mechanism of two enzymes: fumarase and glyoxalase III
Hamid M. Said: Cellular and molecular mechanisms and regulation of intestinal and renal vitamin transporters
Christopher Sims: Development and application of innovative technologies for biomedical research and clinical applications
Ivan Soltesz: Plasticity and modulation of inhibitory synaptic neurotransmission
Bruce J. Tromberg: Optical spectroscopy of tissues and cells
Nosratola D. Vaziri: Vascular biology and role of nitric oxide and reactive oxygen species in regulation of blood pressure; molecular basis of lipid disorders
Larry E. Vickery: Molecular chaperones and protein folding; protein engineering
Ping H. Wang: Molecular actions of insulin-like growth factor I (IGF) in cardiac muscle; complications of diabetes
Stephen H. White: Protein folding in membranes; peptide-bilayer interactions; membrane structure

The Department of Physiology and Biophysics offers research opportunities in the molecular biophysics of membranes and proteins, ion channels and signal transduction, endocrinology, molecular and cell biology, developmental neurobiology, and exercise physiology.

The Department offers graduate study under the auspices of the School of Biological Sciences and in conjunction with the program in Molecular Biology, Genetics, and Biochemistry (MBGB), which is described in a previous section. Students admitted into the combined program who select a research advisor in the Department begin following the departmental requirements for the Ph.D. at the beginning of their second year.

The faculty conducts quarterly reviews of all continuing students to ensure that they are maintaining satisfactory progress within their particular academic program. Students participate in a literature review course designed to strengthen research techniques and presentation skills, and attend the weekly Department colloquium. Students advance to candidacy during the third year; each student presents a seminar on a topic assigned by the formal candidacy committee. Following the seminar, the committee examines the student's qualifications for the successful conduct of doctoral dissertation research. Each student must submit a written dissertation on an original research project and successfully defend this dissertation in an oral examination. Interdisciplinary dissertation research involving more than one faculty member is encouraged. The normal time for completion of the Ph.D. is five years, and the maximum time permitted is seven years.

Several faculty in the Department are also members of the graduate program in Protein Engineering, which is described in the School of Biological Sciences section.

Course descriptions may be found in the School of Biological Sciences section.

Radiological Sciences

101 The City Drive South, Route 140
Orange, CA 92868; (714) 456-6595
Fong Tsai, **Department Chair**

Faculty

Zang-Hee Cho: Multidimensional imaging; NMR tomography, and positron emission tomography
Fred Greensite: Magnetic Resonance Imaging; quantitative electrocardiography
Anton N. Hasso: Magnetic Resonance Imaging of the brain, spine, head, and neck; high-resolution Computed Tomography applications in imaging
Joie P. Jones: Ultrasonic tissue characterization; ultrasonic imaging; general applications of ultrasound technology; the propagation and scattering of ultrasonic pulses in inhomogenous media; biological effects of ultrasound; acoustical microscopy
Sabee Molloi: Digital radiography; application of digital subtraction angiography to cardiac imaging; digital image processing; coronary artery flow measurement
Orhan Nalcioglu: Imaging physics with specific applications to digital radiography, CT, NMR tomography, and magnetic resonance spectroscopy
J. Leslie Redpath: Cellular and tissue radiobiology including mechanisms of chemical modification of radiation damage; oncogenic cell transformation; genetic aspects of cellular sensitivity
Werner Roeck: Engineering aspects of radiographic imaging systems; digital radiography; x-ray tube design
Fong Tsai: Endovascular treatments of acute stroke

Admission to the M.S. and Ph.D. degree programs in Radiological Sciences is not available until further notice. However, courses in Radiological Sciences continue to be offered.

GRADUATE COURSES IN RADIOLOGICAL SCIENCES

201A-B Fundamentals of Biomedical Imaging Systems (4-4) F, W. Lecture, three hours. Physical principles and methods of biomedical imaging systems. Linear systems, random processes, projection imaging, computed tomography, x-rays, nuclear medicine, ultrasound, optical imaging, NMR, EEG, MEG imaging and impedance tomography.

203 Engineering Principles of Radiographic Systems (2) F. Laboratory, six hours. Laboratory in the engineering aspects of radiographic systems and equipment. Prerequisite: consent of instructor.

240 Introduction to Radiation Biology (4) W. Lecture, three hours. An introduction to radiation biology at the molecular, cellular, and tissue level. Relevance of radiation biology to radiation therapy, diagnostic radiology, nuclear medicine, and ultrasound.

252 Principles of Radiation Protection (4) S. Lecture, three hours. Natural and artificial sources of radiation exposure; guides for radiation protection.

255 Laboratory in Radiation Detection and Protection (2) S. Laboratory, six hours. Laboratory in the detection, measurement, and protection of radiation.

260A-B-C-D Principles of Medical Imaging (4-4-4-4) F, W, S. Lecture, three hours. The application of various imaging techniques and principles of physics and engineering to medicine. Prerequisites: Radiological Sciences 201A-B and 203.

265A-B-C-D Laboratory in Medical Imaging (2-2-2-2) F, W, S. Laboratory, six hours. Laboratory involving the various imaging techniques used clinically or under development.

267 Electronics for Nuclear Magnetic Resonance Instrumentation (2) W. Laboratory, six hours. Laboratory involving the electronic details of NMR imaging.

270A-B Physical Acoustics (4-4) F, W. Lecture, three hours. The physical principles of acoustics and mechanical radiation, especially at ultrasonic frequencies. Topics include radiation fields; propagation in layered media; generation and detection of acoustical waves; ultrasonic propagation in gases, liquids and solids; nonlinear acoustics; environmental, architectural, underwater and medical acoustics; physical models of tissue. Prerequisite: consent of instructor.

272 Detection and Dosimetry of Ionizing Radiation (4) S. Lecture, three hours. Principles and methods of ionizing radiation detection; measurement of energy and intensity; instruments and techniques. Physical basis of radiation dose measurement; exposure and absorbed dose in tissue; dose, dose rate and microdose distributions, and biological effectiveness.

288 Principles of Radiopharmaceuticals (3) F. Lecture, two hours. Production of medical radioisotopes, including generator systems. Chemistry, labeling techniques, quality control, and pharmacology of radiopharmaceuticals. Prerequisite: consent of instructor.

290 Seminar in Radiological Sciences (2) F, W, S. Seminar, two hours. Directed review and discussion of recent advances in areas of current interest. Presentations are given by students, faculty, and invited speakers.

292 Independent Study (variable) F, W, S. Individual study or research under the direction of a faculty member.

295A-B-C Clinical Workshop in Radiological Sciences (2-2-2) F, W, S. Laboratory, six hours. Clinical experience in the various areas of radiological sciences including general diagnosis, nuclear medicine, ultrasound, MRI, and interventional vascular work.

APPENDIX

University Officers

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

Regents Ex Officio

Governor of California and President of The Regents: Arnold Schwarzenegger
Lieutenant Governor of California: Cruz Bustamante
Speaker of the Assembly: Fabian Núñez
State Superintendent of Public Instruction: Jack O'Connell
President of the Alumni Associations of the University of California: Richard E. Rominger
Vice President of the Alumni Associations of the University of California: Eric G. Juline
President of the University: Robert C. Dynes

Appointed Regents[1]

Richard C. Blum (2014)
Judith L. Hopkinson (2009)
Odessa P. Johnson (2012)
Joanne Kozberg (2010)
Sherry L. Lansing (2010)
David S. Lee (2006)
Monica Lozano (2013)
George M. Marcus (2012)
John J. Moores (2009)
Gerald L. Parsky (2008)
Norman J. Pattiz (2014)
Peter Preuss (2008)
Frederick Ruiz (2016)
Tom Sayles (2006)
Paul Wachter (2016)
Adam Rosenthal (July 1, 2005–June 30, 2006)

Regents-Designate[2]

to be announced
to be announced

[1] Regents, except ex-officio Regents and the student Regent, are appointed by the Governor to 12-year terms commencing on March 1. Ex-officio Regents serve by virtue of their elected or appointed positions; the student Regent is appointed by the Regents to a one-year term commencing on July 1.

[2] One-year terms expiring June 30.

Faculty Representatives to The Regents

Clifford Brunk
John Oakley

Principal Officers of The Regents

General Counsel and Vice President–Legal Affairs: James E. Holst
Treasurer of The Regents and Vice President–Investment: David H. Russ
Secretary of The Regents: Leigh Trivette

OFFICE OF THE PRESIDENT

President of the University: Robert C. Dynes
Provost and Senior Vice President–Academic Affairs: M. R. C. Greenwood
Senior Vice President–Business and Finance: Joseph P. Mullinix
Senior Vice President–University Affairs: Bruce B. Darling
Vice Provost–Academic Initiatives: Julius Zelmanowitz
Vice Provost–Research: Lawrence Coleman
Vice President–Agriculture and Natural Resources: W. R. Gomes
Vice President–Budget: Lawrence C. Hershman
Vice President–Clinical Services: William H. Gurtner
Vice President–Educational Outreach: Winston C. Doby
Vice President–Financial Management: Anne C. Broome
Vice President–Health Affairs: Michael V. Drake
Vice President–Laboratory Management: S. Robert Foley

CHANCELLORS

Chancellor at Berkeley: Robert J. Birgeneau
Chancellor at Davis: Larry N. Vanderhoef
Chancellor at Irvine: *to be announced*
Chancellor at Los Angeles: Albert Carnesale
Chancellor at Merced: Carol Tomlinson-Keasey
Chancellor at Riverside: France A. Córdova
Chancellor at San Diego: Marye Anne Fox
Chancellor at San Francisco: J. Michael Bishop
Chancellor at Santa Barbara: Henry T. Y. Yang
Chancellor at Santa Cruz: Denice Dee Denton

UCI OFFICERS

Chancellor: *to be announced*
Executive Vice Chancellor: Michael R. Gottfredson
Vice Chancellor, Administrative and Business Services: Wendell C. Brase
Vice Chancellor, Planning and Budget: Roy E. Dormaier
Vice Chancellor, Research, and Dean, Graduate Studies: William H. Parker
Vice Chancellor, Student Affairs: Manuel N. Gómez
Vice Chancellor, University Advancement: Thomas J. Mitchell
Executive Director, Medical Center: Ralph W. Cygan

UCI DEANS AND CHAIRS OF INDEPENDENT ACADEMIC UNITS

Dean, Claire Trevor School of the Arts: Nohema Fernández
Dean, School of Biological Sciences: Susan V. Bryant
Dean, The Henry Samueli School of Engineering: Nicolaos G. Alexopoulos
Dean, School of Humanities: Karen R. Lawrence
Dean, Donald Bren School of Information and Computer Sciences: Debra J. Richardson
Dean, The Paul Merage School of Business: Andrew J. Policano
Dean, School of Physical Sciences: Ronald J. Stern
Dean, School of Social Ecology: C. Ronald Huff
Dean, School of Social Sciences: Barbara A. Dosher
Dean, College of Health Sciences, and Dean, School of Medicine: Thomas C. Cesario
Dean, Continuing Education: Gary W. Matkin
Dean, Division of Undergraduate Education: *to be announced*
Vice Chancellor, Research, and Dean, Graduate Studies: William H. Parker
Chair, Department of Education: David A. Brant

UCI ADMINISTRATORS

Assistant Chancellor: Barbara Davidson
Assistant Vice Chancellor, Communications: Susan Menning
Director, Intercollegiate Athletics and Campus Recreation: Robert S. Chichester
Associate Executive Vice Chancellor, Academic Personnel: Herbert P. Killackey
Assistant Vice Chancellor, Academic Personnel: Patricia L. Price
Associate Executive Vice Chancellor, Academic Planning: Michael P. Clark
Assistant Executive Vice Chancellor: Michael R. Arias
Director, Office of Equal Opportunity and Diversity and Title IX/ Sexual Harassment Officer: Kirsten Quanbeck
University Librarian: Gerald J. Munoff
University Ombudsman: Kathleen Canul
Associate Vice Chancellor, Administrative and Business Services: David L. Tomcheck
Associate Vice Chancellor and Campus Architect: Rebekah Gladson
Assistant Vice Chancellor, Administrative Computing Services: Mark S. Askren
Assistant Vice Chancellor/Controller, Accounting and Fiscal Services: Richard A. Andrews
Assistant Vice Chancellor, Facilities Management: Paige Macias
Assistant Vice Chancellor, Human Resources: Gail Brooks
Associate Vice Chancellor, Budget: Sandra K. Campbell
Associate Dean, Graduate Studies: Janelle Reinelt
Assistant Vice Chancellor, Administration and Research Program Services: Mark W. Warner
Assistant Vice Chancellor, Research Administration: Christina K. Hansen

Assistant Vice Chancellor, Technology Alliances: David G. Schetter
Assistant Vice Chancellor, Counseling and Health Services: Thomas A. Parham
Assistant Vice Chancellor, Enrollment Services: Juan Francisco Lara
Assistant Vice Chancellor, Student Housing: William J. Zeller
Dean of Students: Sally K. Peterson
Associate Vice Chancellor, University Advancement: Michael L. House
Assistant Vice Chancellor, Alumni Relations, and Executive Director, UCI Alumni Association: Jorge Ancona
Assistant Vice Chancellor, Community and State Government Relations: Elizabeth A. Toomey
Assistant Vice Chancellor, Resource Planning and Administration of University Advancement: Richard Lynch

For a complete list of UCI administrators, please refer to the *University of California Telephone Directory* or the *UCI Campus and Medical Center Directory.*

University Professors

One of the highest honors that can be bestowed on UC faculty, the title "University Professor" is reserved for scholars of international distinction who are recognized and respected as teachers of exceptional ability. The purpose of the University Professorship is to recognize the special talents of outstanding scholars and teachers.

Francisco J. Ayala, UCI
J. Michael Bishop, UCSF
E. Margaret Burbidge, *Emerita,* UCSD
Shu Chien, UCSD
Alexandre J. Chorin, UCB
Marvin L. Cohen, UCB
Michael Cole, UCSD
Robert B. Edgerton, UCLA
Emory Elliott, UCR
Sandra M. Faber, UCSC
Arturo Gómez-Pompa, UCR
M. Frederick Hawthorne, UCLA
Richard M. Karp, UCB
Yuan T. Lee, *Emeritus,* UCB
Frank H. Shu, *Emeritus,* UCB
S. Jonathan Singer, *Emeritus,* UCSD
Neil J. Smelser, *Emeritus,* UCB
Gabor A. Somorjai, UCB
Charles H. Townes, *Emeritus,* UCB
Ming T. Tsuang, UCSD
John R. Whinnery, *Emeritus,* UCB
Hayden V. White, *Emeritus,* UCSC

UCI Faculty Distinctions

UCI NOBEL LAUREATES

Nobel Prize in Chemistry, 2004
Irwin Rose, *Professor of Physiology and Biophysics in Residence*

Nobel Prize in Chemistry, 1995
F. Sherwood Rowland, *Research Professor of Chemistry and Earth System Science, and Bren Chair*

Nobel Prize in Physics, 1995
Frederick Reines, *UCI Distinguished Professor Emeritus of Physics* (d. 1998)

UCI ENDOWED CHAIRS

Arnold and Mabel Beckman Chair in Laser Biomedicine
Michael W. Berns, *Professor of Surgery, Developmental and Cell Biology, and Biomedical Engineering*

Grace Beekhuis Bell Chair in Biological Chemistry
Masayasu Nomura, *Professor of Biological Chemistry, Microbiology and Molecular Genetics, and Biological Sciences*

Warren L. Bostick Chair in Pathology
Michael E. Selsted, *Department Chair and Professor of Pathology and Professor of Microbiology and Molecular Genetics and of Pharmacology*

Donald Bren Professors, The Donald L. Bren Endowment
Francisco J. Ayala, *University Professor of Biological Sciences*
Thomas J. Carew, *Department Chair and Professor of Neurobiology and Behavior*
Paolo Casali, *Director of the Center for Immunology and Professor of Molecular Biology and Biochemistry and of Medicine*
Michael T. Clegg, *Professor of Biological Sciences and of Ecology and Evolutionary Biology*
Sheldon Greenfield, *Professor of Medicine (General Internal Medicine and Primary Care)*
Wilson Ho, *Professor of Physics and Chemistry*
Ramesh C. Jain, *Professor of Information and Computer Sciences*
Wen-Hwa Lee, *Professor of Biomedicine and Biological Chemistry*
F. Sherwood Rowland, *Research Professor of Chemistry and Earth System Science*
Douglas C. Wallace, *Professor of Ecology and Evolutionary Biology and of Biological Chemistry*

Conexant-Broadcom Endowed Chair in the Center for Pervasive Communications and Computing
Ender Ayanoglu, *Professor of Electrical Engineering and Computer Science*

Edward A. Dickson Emerti Professors
Harold W. Moore, *Professor Emeritus of Chemistry*
Spencer C. Olin, *Professor Emeritus of History*

Lawrence K. Dodge Endowed Chair in Integrative Biology
John Longhurst, *Professor of Medicine (Cardiology), Physiology and Biophysics, Pharmacology, and Biomedical Engineering*

Walter B. Gerken Chair in Enterprise and Society
Richard B. McKenzie, *Professor of Management and Economics*

Robert Gumbiner Chair in Health Care Management
Paul J. Feldstein, *Professor of Management, Economics, and Social Ecology*

Hasso Brothers Endowed Chair in Radiological Sciences
Fong Tsai, *Department Chair of Radiological Sciences and Professor of Clinical Radiology*

Clifford and Elaine Heinz Chair in the Economics and Public Policy of Peace
Martin C. McGuire, *Professor of Economics and Management*

Roger W. and Janice M. Johnson Chair in Civic Governance and Public Management
Martha Feldman, *Professor of Social Ecology, Management, Sociology, and Political Science*

Fred Kavli Chair in Earth System Science
Michael Prather, *Professor of Earth System Science*

Irving H. Leopold Chair in Ophthalmology
George Baerveldt, *Department Chair and Professor of Clinical Ophthalmology*

William J. Link Chair in Biomedical Engineering
Steven C. George, *Department Chair and Professor of Biomedical Engineering*

Dorothy J. Marsh Chair in Reproductive Biology
Philip J. DiSaia, *Chief of Gynecology and Gynecologic Oncology and Professor of Obstetrics and Gynecology and of Radiation Oncology*

Della Martin Chair in Psychiatry
William E. Bunney, Jr., *Department Co-Chair of Psychiatry and Human Behavior and UCI Distinguished Professor of Psychiatry and Human Behavior and of Pharmacology*

National Science Foundation "ADVANCE" Term Chairs
Ellen R. M. Druffel, *Professor of Earth System Science*
Chuu-Lian Terng, *Professor of Mathematics*

Eric L. and Lila D. Nelson Chair in Neuropharmacology
Olivier Civelli, *Professor of Pharmacology and of Developmental and Cell Biology*

Nichols Clinical Neuroscience Chair
Claudia Kawas, *Professor of Neurology and of Neurobiology and Behavior*

The Robert and Marjorie Rawlins Chair in Music
David Brodbeck, *Department Chair and Professor of Music*

Ronald W. Reagan Endowed Chair in Geriatrics
Laura Mosqueda, *Director of the Program in Geriatrics and Professor of Clinical Family Medicine (Family Medicine, Primary Care, and Geriatrics)*

Reeve-Irvine Chair in Spinal Cord Injury Research
Oswald Steward, *Director of the Reeve-Irvine Research Center and Professor of Anatomy and Neurobiology and of Neurobiology and Behavior*

The Henry Samueli Endowed Chair
William A. Sirignano, *Professor of Mechanical and Aerospace Engineering and of Chemical Engineering and Materials Science*

The Henry Samueli "Turing" Chair in Computer Systems Design
Daniel D. Gajski, *Director of the Center for Embedded Computer Systems and Professor of Electrical Engineering and Computer Science and of Computer Science-Systems*

The Henry Samueli "von Karman" Chair of Aerospace Engineering
Satya N. Atluri, *Director of the Center for Aerospace Research and Education, Interim Director of the Center for Systems Engineering in Biotechnology, Director of the Center for Computational Modeling in Engineering, and Professor of Mechanical and Aerospace Engineering*

Danette (Dee Dee) Shepard Chair in Neurological Studies
Tallie Z. Baram, *Professor of Pediatrics, Neurology, and Anatomy and Neurobiology*

Ted and Janice Smith Family Foundation Endowed Chair in Information and Computer Science
Debra J. Richardson, *Dean of the Donald Bren School of Information and Computer Sciences and Professor of Informatics*

Robert R. Sprague Chair in Brain Imaging
Steven G. Potkin, *Director of the Brain Imaging Center and Professor of Psychiatry and Human Behavior*

Taco Bell Chair in Information Technology Management
Kenneth L. Kraemer, *Director of the Center for Research on Information Technology and Organizations and Professor of Management and Informatics*

Teller Family Chair in Jewish History
Daniel Schroeter, *Professor of History*

Edward and Vivian Thorp Chair in Mathematics
Karl C. Rubin, *Professor of Mathematics*

Thomas T. and Elizabeth C. Tierney Chair in Peace Studies
Patrick Morgan, *Professor of Political Science*

Claire Trevor Dean's Endowed Chair, Claire Trevor School of the Arts
Nohema Fernández, *Dean of the Claire Trevor School of the Arts and Professor of Music*

Claire Trevor Professors in the Arts
Robert Cohen, *Professor of Drama*

Donald McKayle, *Graduate Choreography Advisor, Artistic Director of UCI Dance, and Professor of Dance*

UC Presidential Chair
Peter M. Rentzepis, *Professor of Chemistry and of Electrical Engineering and Computer Science*

Drew, Chace, and Erin Warmington Chair in the Social Ecology of Peace and International Cooperation
Helen Ingram, *Professor of Social Ecology and Political Science*

UCI CHANCELLOR'S FELLOWS

Alice Fahs, *UCI Chancellor's Fellow and Associate Professor of History*
Anthony D. Long, *UCI Chancellor's Fellow and Associate Professor of Ecology and Evolutionary Biology*
Hartmut Luecke, *UCI Chancellor's Fellow and Professor of Molecular Biology and Biochemistry and of Physiology and Biophysics*
Daniele Piomelli, *UCI Chancellor's Fellow and Professor of Pharmacology*
Heidi Tinsman, *UCI Chancellor's Fellow and Associate Professor of History*

UCI CHANCELLOR'S PROFESSORS

Kei Akagi, *UCI Chancellor's Professor of Music*
Imran S. Currim, *UCI Chancellor's Professor of Management*
Eva Y.-H. P. Lee, *UCI Chancellor's Professor of Developmental and Cell Biology and of Biological Chemistry*
Peter Li, *UCI Chancellor's Professor of Mathematics*
Penelope Maddy, *UCI Chancellor's Professor of Logic and Philosophy of Science and of Mathematics*
Marc J. Madou, *UCI Chancellor's Professor of Mechanical and Aerospace Engineering and of Biomedical Engineering*
Steven Mailloux, *UCI Chancellor's Professor of Rhetoric*
Shaul Mukamel, *UCI Chancellor's Professor of Chemistry*
Kenneth L. Pomeranz, *UCI Chancellor's Professor of History and of East Asian Languages and Literatures*
Thomas L. Poulos, *Director of the Irvine Research Unit in Macromolecular Structure and UCI Chancellor's Professor of Molecular Biology and Biochemistry, Physiology and Biophysics, and Chemistry*
Gabriele Schwab, *UCI Chancellor's Professor of Comparative Literature*
Brook Thomas, *UCI Chancellor's Professor of English*

UCI DISTINGUISHED PROFESSORS

William E. Bunney, Jr., *Department Co-Chair of Psychiatry and Human Behavior, UCI Distinguished Professor of Psychiatry and Human Behavior and of Pharmacology, and Della Martin Chair in Psychiatry*
David Easton, *UCI Distinguished Research Professor of Political Science*
Elizabeth F. Loftus, *UCI Distinguished Professor of Psychology and Social Behavior, Criminology, Law and Society, and Cognitive Sciences*
R. Duncan Luce, *UCI Distinguished Professor Emeritus of Cognitive Sciences and Economics*
David B. Malament, *UCI Distinguished Professor of Logic and Philosophy of Science*
Ricardo Miledi, *UCI Distinguished Professor of Neurobiology and Behavior and of Molecular Biology and Biochemistry*
J. Hillis Miller, *UCI Distinguished Research Professor of English and Comparative Literature*
Ngugi wa Thiong'o, *Director of the International Center for Writing and Translation and UCI Distinguished Professor of English and Comparative Literature*
Larry E. Overman, *UCI Distinguished Professor of Chemistry*
Donald G. Saari, *Director of the Institute for Mathematical Behavioral Sciences and UCI Distinguished Professor of Economics and Mathematics*
Henry Samueli, *UCI Distinguished Adjunct Professor of Electrical Engineering and Computer Science*
Masanobu Shinozuka, *Department Chair and UCI Distinguished Professor of Civil and Environmental Engineering*
Brian Skyrms, *UCI Distinguished Professor of Logic and Philosophy of Science and of Economics, and Director of the Minor in the History and Philosophy of Science*
Soroosh Sorooshian, *UCI Distinguished Professor of Civil and Environmental Engineering and of Earth System Science*
George Sperling, *UCI Distinguished Professor of Cognitive Sciences and of Neurobiology and Behavior*
Eric J. Stanbridge, *UCI Distinguished Professor of Microbiology and Molecular Genetics and of Biological Sciences*

SCHOOL OF MEDICINE DISTINGUISHED PROFESSOR

J. Edward Berk, *Distinguished Professor Emeritus of Medicine (Gastroenterology)*

UCI FACULTY MEMBERSHIP IN MAJOR U.S. LEARNED SOCIETIES

American Academy of Arts and Sciences: 33
American Association for the Advancement of Science: 84
American Philosophical Society: 6
American Physical Society: 31
American Psychological Association: 20
National Academy of Engineering: 7
National Academy of Sciences: 20
National Academy of Sciences–Institute of Medicine: 4

UCI ACADEMIC SENATE DISTINGUISHED FACULTY

Distinguished Faculty Award for Research

2004–05: Donald G. Saari, *Departments of Economics and Mathematics,* "The Evolving Role of Mathematics in the Social and Behavioral Sciences"
2003–04: Zang-Hee Cho, *Departments of Radiological Sciences, Psychiatry and Human Behavior, and Biomedical Engineering,* "Positron Tomograph —The Brain Machine"
2002–03: Penelope Maddy, *Department of Logic and Philosophy of Science and of Mathematics,* "Second Philosophy"
Larry E. Overman, *Department of Chemistry, "Making Molecules"*
2001–02: Brian Skyrms, *Department of Logic and Philosophy of Science,* "The Stag Hunt"

2000–2001: Masayasu Nomura, *Department of Biological Chemistry and of Microbiology and Molecular Genetics, and Grace Beekhuis Bell Chair in Biological Chemistry,* "Toward Understanding the Synthesis of Ribosomes, the Cellular Machinery for Making Proteins"
1999–2000: George Sperling, *Department of Cognitive Sciences and of Neurobiology and Behavior,* "Modeling Human Motion Perception"
1998–99: Walter M. Fitch, *Department of Ecology and Evolutionary Biology,* "Getting the Flu Before It Gets You"
1998: Donald McKayle, *Department of Dance,* "The Symbolic Language of Dance"
1998: Peter M. Rentzepis, *Department of Chemistry,* "The Making of a Molecular Computer"
1997: David Easton, *Department of Politics and Society*
1996: John J. Wasmuth, *Departments of Biological Chemistry, Pediatrics, and Psychiatry and Human Behavior*
1995: Chen S. Tsai, *Department of Electrical and Computer Engineering,* "The Versatile Photon: Express Messenger of the Information Superhighway"
1994: R. Duncan Luce, *School of Social Sciences,* "Mathematical Psychology: an Oxymoron or Not?"
1993: Eric Stanbridge, *Department of Microbiology and Molecular Genetics,* "Cancer and Our Genes: the Seeds of Our Own Destruction"
1992: J. Hillis Miller, *Department of English and Comparative Literature,* "Thinking Like Other People"
1991: A. Kimball Romney, *Department of Anthropology,* "Cultural Consensus and Social Intelligence"
1990: Lyman W. Porter, *Graduate School of Management,* "Organizations and Their Employees: How Sound Are the Marriage Contracts"
1989: Norman Rostoker, *Department of Physics,* "Research on Future Energy Sources"
1988: Robert W. Taft, *Department of Chemistry,* "Attempts to Understand and Treat the Loves and Hates of Organic Molecules"
1987: Carl W. Cotman, *Department of Psychobiology,* "The Self-Repairing Brain: Implications for Alzheimer's Disease"
1986: Donald Heiney, *Department of English and Comparative Literature,* "Fiction: The Double Domain of the Nineteenth-Century Crisis"
1985: James L. McGaugh, *Department of Psychobiology,* "Making Memories"
1984: John Johnston, *Department of Economics,* "Economists and Their Crises"
1983: Murray Krieger, *Department of English and Comparative Literature,* "Words About Words About Words: The What and Why of Literary Theory"
1982: Kivie Moldave, *Department of Biological Chemistry,* "The Fault, Dear Brutus, Lies Not in the Stars but in Our Genes"
1981: Gilbert L. Geis, *School of Social Ecology,* "The Crime Intervenor: Samaritan or Superman?"
1980: Jaime E. Rodríguez, *Department of History,* "Down from Colonialism: Mexico's Nineteenth-Century Crisis"
1980: Seymour Menton, *Department of Spanish and Portuguese,* "Many years later, as he faced the firing squad, Colonel Aureliano Buendia was to remember that distant afternoon when his father took him to discover ice." (Gabriel Garcia Marquez, *One Hundred Year of Solitude*)
1979: Frederick Reines, *Department of Physics,* "The Neutrino: From Poltergeist to Particle"
1978: Arthur J. Marder, *Department of History,* "Bravery Is Not Enough: The Rise and Fall of the Imperial Japanese Navy, 1941–45"
1977: F. Sherwood Rowland, *Department of Chemistry,* "Chemistry and the Environment"
1976: H. Colin Slim, *Department of Music,* "The Prodigal Son at the Whores: Music, Art, and Drama"

Distinguished Mid-Career Award for Research

2004–05: Svetlana Jitomirskaya, *Department of Mathematics,* "Behind the Hofstadter's Butterfly: The Competition Between Order and Chaos"
2003–04: Nancy L. Allbritton, *Departments of Physiology and Biophysics, Biomedical Engineering, and School of Biological Sciences,* "Mapping the Circuitry of Cells"

Distinguished Faculty Award for Teaching

2003–04: Roy M. Fujitani, *Department of Surgery,* "Matters of the Heart"
2002–03: Mark P. Petracca, *Department of Political Science,* "Politics, Pedagogy, and Passion: Persistent Paradoxes"
2001–02: Roxane Cohen Silver, *Department of Psychology and Social Behavior,* "Thinking Critically About Coping with Life's Traumas"
2000–2001: Gabriele Schwab, *Department of English and Comparative Literature and Director of the Critical Theory Institute,* "Imaginary Ethnographies: The Boundaries of the Human"
1999–2000: Ermanno Bencivenga, *Department of Philosophy,* "Teaching: A Cost/Benefit Analysis"
1998–99: Alberto Manetta, *Senior Associate Dean of the College of Medicine and Professor of Obstetrics and Gynecology,* "Medical Education for the Twenty-First Century"
1998: William R. Schonfeld, *Dean of the School of Social Sciences,* "The Ivory Tower: Relic from the Past or Ambition for the Future"
1997: Medhat A. Haroun, *Department of Civil and Environmental Engineering,* "Earthquakes and California: Are We At Risk and What Are We Doing About It?"
1996: Lynn Mally, *Department of History,* "Seeing Through History: Visual Evidence in Teaching"
1995: Imran S. Currim, *Graduate School of Management,* "Consumer Choice"
1994: Michael P. Johnson, *Department of History,* "The Politics of Teaching"
1994: Philip J. DiSaia, *Department of Obstetrics and Gynecology,* "The Aging Woman"
1993: Gary W. Evans, *School of Social Ecology,* "The Improvement of Teaching in the University Environment"
1992: James H. Mulligan, *Department of Electrical and Computer Engineering,* "The Quest for Excellence in Educating Engineering Professionals"
1991: Thomas A. Standish, *Department of Information and Computer Science,* "A Grand Challenge Problem for Education: Empowering Graduating Seniors to Write Well"
1990: Robert T. McIver Jr., *Department of Chemistry,* "Those Marvelous Machines: The Role of Scientific Instruments"
1989: John C. Rowe, *Department of English and Comparative Literature,* "Crisis and Criticism in the Humanities"
1988: James N. Danziger, *Department of Politics and Society,* "Knowing Noes and Wise Whys"

Daniel G. Aldrich Jr. Distinguished University Service Award

2004–05: Sue Piper Duckles, *Department of Pharmacology*
2003–04: R. Duncan Luce, *Departments of Cognitive Sciences and Economics*
2002–03: Janice Gudde Plastino, *Department of Dance*
2001–02: William R. Schonfeld, *Dean of the School of Social Sciences,* "The Legacy of Daniel G. Aldrich Jr.: Leadership, Integrity, Honesty, and Commitment"
2000: Charles A. Lave, *Department of Economics*
1999: Arnold Binder, *Department of Criminology, Law and Society*
1998: Warren L. Bostick, *Department of Pathology*
1997: James N. Danziger, *Department of Political Science and Dean of Undergraduate Education*
1997: Ellen Greenberger, *Department of Psychology and Social Behavior*
1996: Dennis J. Aigner, *Dean of the Graduate School of Management*
1995: Michael Butler, *Former Dean of Undergraduate Studies, Director of the UCI Farm School, and Department of Cognitive Sciences*
1994: Leslie W. Rabine, *Department of French and Italian and Program in Women's Studies*
1993: Murray Krieger, *Department of English and Comparative Literature*
1993: J. Edward Berk, *Department of Medicine*
1992: Louis A. Gottschalk, *Department of Psychiatry and Human Behavior*
1991: Spencer C. Olin, *Department of History*
1991: Julius Margolis, *Department of Economics*

Distinguished Assistant Professor Award for Research

2004–05: Jonathan Lee Feng, *Department of Physics and Astronomy,* "The Dark Universe"
2003–04: Qun-Yong Zhou, *Department of Pharmacology,* "A Gut Feeling for Time"
2002–03: Leslie M. Thompson, *Department of Psychiatry and Human Behavior and of Biological Chemistry,* "Huntington's Disease: Approaches for Therapies"
2001–02: Michael B. Dennin, *Department of Physics and Astronomy,* "Foams and Patterns: The Physics of Shaving Cream and Stripes"
2000–2001: Richard A. Leo, *Department of Criminology, Law and Society*
1999–2000: Wang Feng, *Department of Sociology*
1998–99: Panagiota Daskalopoulos, *Department of Mathematics*
1998–99: William M. Maurer, *Department of Anthropology*
1997–98: Judith Stepan-Norris, *Department of Sociology*
1997–98: Keith A. Woerpel, *Department of Chemistry*
1996–97: Liisa H. Malkki, *Department of Anthropology*

1996–97: Susan E. Trumbore, *Department of Earth System Science*
1995–96: Ann Blair, *Department of History*
1995–96: Kei-Yeung (Sunny) Siu, *Department of Electrical and Computer Engineering*
1994–95: Alec Stone, *Department of Political Science*

Distinguished Assistant Professor Award for Teaching

2004–05: David P. Kirkby, *Department of Physics and Astronomy*, "The Musical Universe"
2004–05: George E. Tita, *Department of Criminology, Law and Society*, "The Advantages of Having 'Spaced Out' Friends: The Socio-Spatial Dimensions of a High-Crime Place"
2003–04: Justin L. Tobias, *Department of Economics*, "Encouraging Students to Regress"
2002–03: Sharon Block, *Department of History*, "Thinking About Rape in Early America"
2001–02: Bryan Reynolds, *Department of Drama*, "Performing Transversally: Reimagining Shakespeare and the Critical Future"
2000–2001: William M. Maurer, *Department of Anthropology*
1999–2000: Steven C. George, *Department of Chemical and Biochemical Engineering and Materials Science*
1999–2000: Claire Jean Kim, *Interdisciplinary Program in Asian American Studies and Department of Political Science*
1998–99: Kristen M. Day, *Department of Urban and Regional Planning*
1998–99: Keith A. Woerpel, *Department of Chemistry*
1997–98: Stanley B. Grant, *Department of Civil and Environmental Engineering*
1996–97: Rhona Berenstein, *Program in Film Studies*
1995–96: Etel Solingen, *Department of Politics and Society*
1994–95: Julia Reinhard Lupton, *Department of English and Comparative Literature*

Principles of Community

UCI is a multicultural community of people from diverse backgrounds. Our activities, programs, classes, workshops, lectures, and everyday interactions are enriched by our acceptance of one another, and we strive to learn from each other in an atmosphere of positive engagement and mutual respect.

Our legacy for an increasingly multicultural academic community and for a learning climate free from expressions of bigotry is drawn from the United States and California Constitutions, and from the charter of the University of California which protects diversity and reaffirms our commitment to the protection of lawful free speech. Affirmation of that freedom is an effective way of ensuring that acts of bigotry and abusive behavior will not go unchallenged within the University. Tolerance, civility, and mutual respect for diversity of background, gender, ethnicity, race, and religion are as crucial within our campus community as are tolerance, civility, and mutual respect for diversity of political beliefs, sexual orientation, and physical abilities. Education and clear, rational, and vigorous challenges are positive responses to prejudice and acts of bigotry.

The University's nondiscrimination policy, in compliance with applicable federal and state law, covers treatment in University programs and activities as well as admission and employment. UCI expects all those affiliated with it to adhere to the letter and the spirit of University nondiscrimination policies and related federal and state laws. Information concerning these policies is available on the World Wide Web at http://www.ucop.edu/.

Allegations of physical abuse, threats of violence, or conduct that threatens the health or safety of any person on University property or in connection with official University functions will be investigated promptly and, where found to exist, appropriate actions will be taken in accordance with University policy.

All who work, live, study, and teach at UCI are here by choice and, as part of that choice, should be committed to these Principles of Community which are an integral part of the guidelines by which the University community can successfully conduct its affairs.

Student Conduct and Discipline

Students enrolling in the University are expected to assume an obligation to conduct themselves in a manner compatible with the University's function as an educational institution. A handbook is available which sets forth standards of conduct expected of UCI students. *University of California Policies Applying to Campus Activities, Organizations, and Students* lists rules concerning conduct and related matters, as established by the policies of the Regents and the President of the University and also incorporates campus regulations. Copies are available from the Dean of Students, located in the UCI Student Center; the University Ombudsman, located in 437 Administration Building; and on the World Wide Web at http://www.dos.uci.edu/judicial/uci_policy.html.

Academic Honesty

The UCI Academic Senate Policies on Academic Honesty were approved by the Irvine Division on June 2, 1988. Revised December 12, 1996; October 12, 2000; and November 21, 2002.

A. PREAMBLE

The University is an institution of learning, research, and scholarship predicated on the existence of an environment of honesty and integrity. As members of the academic community, faculty, students, and administrative officials share responsibility for maintaining this environment. It is essential that all members of the academic community subscribe to the ideal of academic honesty and integrity and accept individual responsibility for their work. Academic dishonesty is unacceptable and will not be tolerated at the University of California, Irvine. Cheating, forgery, dishonest conduct, plagiarism, and collusion in dishonest activities erode the University's educational, research, and social roles. They devalue the learning experience and its legitimacy not only for the perpetrators but for the entire community.

B. RESPONSIBILITIES

All members of the academic community have a responsibility to ensure that scholastic honesty is maintained.

Faculty have primary responsibility for:

1. Upholding and enforcing universitywide principles of academic honesty and integrity and explaining clearly these principles including any qualifications which may be operative in the classes they are teaching.
2. Minimizing opportunities for academic misconduct in their courses.
3. Confronting students suspected of academic dishonesty in a way that respects student privacy.
4. Affording students accused of academic misconduct the right to appeal any resulting disputes to disinterested parties for hearing and resolution.
5. Assigning an appropriate grade to a student who engages in academic dishonesty.
6. Reporting all instances of academic dishonesty to appropriate Associate Deans.
7. Protecting the anonymity of any student reporting an incident of academic dishonesty to the extent permitted by due process required for the accused and other legal requirements.

Students have responsibility for:

1. Refraining from cheating and plagiarism.
2. Refusing to aid or abet any form of academic dishonesty.
3. Notifying professors and/or appropriate administrative officials about observed incidents of academic misconduct. The anonymity of a student reporting an incident of academic dishonesty will be protected.

C. WHAT IS ACADEMIC DISHONESTY?

Academic dishonesty applies equally to electronic media and print, and involves text, images, and ideas. It includes but is not limited to the following examples:

Cheating

1. Copying from others during an examination.
2. Communicating exam answers with other students during an examination.
3. Offering another person's work as one's own.
4. Taking an examination for another student or having someone take an examination for oneself.
5. Sharing answers for a take-home examination or assignment unless specifically authorized by the instructor.
6. Tampering with an examination after it has been corrected, then returning it for more credit.
7. Using unauthorized materials, prepared answers, written notes or information concealed in a blue book or elsewhere during an examination.
8. Allowing others to do the research and writing of an assigned paper (including use of the services of a commercial term-paper company).

Dishonest Conduct

1. Stealing or attempting to steal an examination or answer key from the instructor.
2. Changing or attempting to change academic records without proper sanction.
3. Submitting substantial portions of the same work for credit in more than one course without consulting all instructors involved.
4. Forging add/drop/change cards and other enrollment documents, or altering such documents after signatures have been obtained.
5. Intentionally disrupting the educational process in any manner.
6. Allowing another student to copy off of one's own work during a test.

Plagiarism

Plagiarism is intellectual theft. It means use of the intellectual creations of another without proper attribution. Plagiarism may take two main forms, which are clearly related:

1. To steal or pass off as one's own the ideas or words, images, or other creative works of another.
2. To use a creative production without crediting the source, even if only minimal information is available to identify it for citation.

Credit must be given for every direct quotation, for paraphrasing or summarizing a work (in whole, or in part, in one's own words), and for information which is not common knowledge.

Collusion

Any student who knowingly or intentionally helps another student perform any of the above acts of cheating or plagiarism is subject to discipline for academic dishonesty.

D. PROCEDURES FOR DEALING WITH INCIDENTS OF ACADEMIC DISHONESTY

Many, perhaps most, incidents of academic dishonesty involve accusations which are based on clear evidence and which are not contested by the accused student. In such cases, if the infraction is relatively minor and there is no indication that the accused student has previously been involved in such incidents, it is most appropriate that the matter be resolved between the student and the faculty member. When this occurs, it is nevertheless important that a written report of the incident be filed to ensure that penalties assessed are commensurate with the offense and that repeated infractions be detected and dealt with appropriately.

More serious incidents and repeat offenses which call for stronger disciplinary action, may result in campuswide sanctions, in addition to the actions imposed by a faculty member. In such cases, these sanctions, as described in Section 105.00 of the *Policies Applying to Campus Activities, Organizations, and Students,* will be administered by the Academic Associate Deans or the Office of the Dean of Undergraduate Education or Graduate Studies.

Finally, whenever an accusation of academic dishonesty or a grade given by a faculty member is contested by an accused student, the student has recourse for mediation of the dispute. Processes for mediation, resolution, and/or an investigation may be requested by the student or the Associate (Undergraduate or Graduate) Dean of the faculty member's school through the Office of the Ombudsman. In incidents where a campuswide sanction has been imposed, the student can request a hearing with the appropriate Committee on Academic Honesty which will be convened by the Office of either the Dean of Undergraduate Education or the Dean of Graduate Studies, depending on the status of the accused student.

The procedures outlined here are designed to institute a system that recognizes that many cases of academic misconduct are best resolved between the student and faculty member involved, while it provides for appropriate record keeping and handling of serious and repeated offenses and guarantees a fair hearing to a student who has received a campuswide sanction.

Authority of Faculty Members

When a faculty member has evidence of student academic dishonesty, the faculty member must present the evidence to the student in a private meeting or communicate with the student by some other means. The faculty member must initiate this communication with the student within 15 calendar days of discovering evidence of academic dishonesty and evaluating the relevant work. The faculty member then may follow up with one or more of only the following actions:

1. To issue a reprimand to the student with letter of explanation to the student's file.
2. To require repetition of the questionable work or examination with letter of explanation to the student's file.
3. To reduce the grade to an 'F' or zero, if appropriate, on the questionable work or examination with written notification to the student and a letter of explanation to the student's file.
4. To assign the student a failing grade in the course or otherwise lower the grade in the course with a letter of explanation to the student's file.

It is essential that any such action be reported in writing to the student in a letter from the faculty member. Copies of this letter must also be sent to (a) the Associate Dean of the faculty member's school, (b) the Associate Dean of the student's school, who will maintain a file of cases of academic misconduct involving students enrolled in that school, and (c) the Office of the Dean of Undergraduate Education or Dean of Graduate Studies, as appropriate. The faculty member is strongly encouraged to consult with the Associate (Undergraduate or Graduate) Dean of his or her school before the letter is drafted. Reference to (or a copy of) the UCI Academic Senate Policies on Academic Honesty should be included in the letter. If action (4) is taken, the faculty member is responsible for making certain that the failure is recorded by the Registrar on the student's permanent academic record. Careful documentation of the incident must be maintained by the faculty member in the event that his or her actions in the case should later be subject to review.

Responsibilities of the Academic Associate Deans

1. The Associate (Graduate or Undergraduate) Dean of either the accused student's school or of the faculty member's school may impose campuswide sanctions. Sanctions imposed by Associate Deans are final unless the student requests a hearing within 15 calendar days of notification. The 15-day period starts from the time the Associate Dean has notified the student of the discipline or has notified the student of the hearing and appeal process by providing a copy of this policy, whichever comes later. It is recommended that each case be brought to a final resolution within 90 days of instruction.
2. The Associate Dean (or equivalent official) of each school is responsible for maintaining confidential records concerning academic dishonesty of students enrolled in that school. All letters reporting faculty-imposed academic penalties for academic misconduct will be included in these files.
3. The Associate Dean of the accused student's school will be responsible for identifying all incidents which represent repeated offenses by a student and may impose a campuswide sanction because of repeat offenses.
4. Associate Deans are required to notify the student of the hearing and appeal process and provide the student a copy of this policy or explicitly refer the student to it. If an Associate Dean suspects grounds for a grievance involving discrimination, the student should be referred to Part 3 of *The Manual of the Irvine Division of the Academic Senate,* "Student Academic Grievance Procedures" (which is limited to allegations of discrimination).
5. In those classes where academic dishonesty continues to be a problem and the faculty member or another university official has already been approached by the student(s) from the class, the Associate Dean will consult with the appropriate faculty member to address the problem.
6. Students who have on file recorded acts of academic dishonesty, as defined by the *Policies Applying to Campus Activities, Organizations, and Students,* may be excluded by the Associate Deans from consideration for academic honors at graduation. Exclusion from consideration for honors is not for the purposes of this policy to be considered a campuswide sanction. Students excluded from such consideration under this policy therefore are not eligible to request a formal hearing.
7. In those situations where a campuswide sanction is imposed and the student requests a hearing, the Associate Dean will forward to the Committee on Academic Honesty the materials which led him or her to impose the sanction. In addition, the Associate Dean will appear before the Committee to discuss the case upon request of the Committee.

Student Hearings

When any student accused of academic dishonesty wishes to contest an action by a faculty member, the student may, within a 15-day period, request mediation by writing to the Associate Dean of the faculty member or to the Ombudsman. However, it should be understood that all grades are ultimately the responsibility of faculty. The period is 15 calendar days and starts from the time the Associate Dean has notified the student of the discipline or has notified the student of the hearing and appeal process by providing a copy of this policy, whichever comes later.

When a campuswide sanction is imposed, the affected student may, within 15 days of notification, request a hearing before the Committee on Academic Honesty. Students considering a hearing in response to campuswide sanctions for alleged academic misconduct are urged to contact the Associate Dean of their academic school and/or the University Ombudsman concerning possible sources of advice and assistance. Students should be advised regarding the grounds for appeal as specified in section 103.11 of the *Policies Applying to Campus Activities, Organizations, and Students.*

Role of the Ombudsman

The services of the Ombudsman may be requested at any time by the student, the faculty member, or the Associate Dean. The role of the Ombudsman is to assist in conflict resolution, mediate the dispute, perform an informal investigation of the case, and clarify policies and procedures for anyone involved.

In those incidents where imposition of a campuswide sanction is a consideration and the student has requested a hearing, the case will be referred to the Office of the Ombudsman by the Dean of Undergraduate Education or the Dean of Graduate Studies, as appropriate. An investigation may be conducted by the Ombudsman who will then confer with the Associate Dean and the accused student. However, the findings of the Ombudsman will not be forwarded to the Committee on Academic Honesty. The case may be referred by either the student or the Ombudsman to either the Dean of Undergraduate Education or the Dean of Graduate Studies, as appropriate, who will be responsible for convening the Committee on Academic Honesty.

Students should always be informed by the Associate Dean of their school of their right to secure the assistance of the Ombudsman in understanding and addressing the problem or issue.

Role of the Deans of Undergraduate Education and Graduate Studies

Whenever an incident of academic misconduct is referred to the Office of the Dean of Undergraduate Education or the Dean of Graduate Studies by the student or the Ombudsman, a representative of the appropriate offices will meet with the student and, if requested, explain the process and arrange the time and place of a hearing before the appropriate (Undergraduate or Graduate) Committee on Academic Honesty. The appropriate Dean will maintain a record of all cases of academic dishonesty reported by the respective Associate Deans.

Formal resolution by the appropriate Committee on Academic Honesty may result in the imposition by the Dean of Undergraduate Education or the Dean of Graduate Studies of one or more of the sanctions described in section 105.00 of the *Policies Applying to Campus Activities, Organizations, and Students,* including suspension or dismissal from the University.

E. COMMITTEE ON ACADEMIC HONESTY

1. Jurisdiction of the Committees on Academic Honesty

There will be two Committees on Academic Honesty. One Committee will hear cases of campuswide sanctions on undergraduate students while the other will hear graduate student cases. The Committees can reduce, affirm, or increase sanctions.

2. Composition of the Committees on Academic Honesty

The Committees on Academic Honesty will be standing administrative committees composed of two faculty, two students, and a representative of either the Dean of Undergraduate Education or Dean of Graduate Studies, as appropriate. Terms of faculty members will be two years. One faculty member will be appointed annually by either the Dean of Undergraduate Education or Graduate Studies, as appropriate for the particular committee. To ensure continuity, terms will be staggered; during the first year of operation only, one faculty member will be appointed for a one-year term. One additional faculty member will be appointed to serve as an alternate to each of the Committees. The two students shall serve for one year and will be appointed by either ASUCI or AGS as appropriate to the specific committee. One additional student member will be appointed to serve as an alternate to each of the Committees.

3. Role of the Associate Dean

The Associate Dean will forward to the committee the evidence which led to his or her decision to impose the campuswide sanction. In addition, the Associate Dean will appear before the Committee to comment on the case if the Committee wishes.

4. Hearings

a. If the student requests a hearing, the Dean of Undergraduate Education or the Dean of Graduate Studies shall schedule a hearing of the case before the appropriate Committee. Written notice must be given to the parties involved regarding the date, time, and place of the hearing.
b. The chair will be elected by the membership of the committee. The chair will rule on all questions of procedure, the admission or exclusion of evidence, and the need to call witnesses for additional testimony. Hearings shall be held in accordance with generally accepted standards of procedural due process.
c. Hearings will be closed unless the parties involved agree to an open hearing. Every effort must be made by all parties to maintain confidentiality during the process.
d. Hearings shall be held following the provisions in sections 103.11. (5, 6, and 8) of the *Policy on Student Conduct and Discipline* in the *Policies Applying to Campus Activities, Organizations, and Students,* except that the role of the Dean of Students shall be filled by the Dean of Undergraduate Education or Graduate Studies, depending on the status of the student.

5. Report of the Committee on Academic Honesty

After the hearing the Committee shall arrive at a decision. When a decision is reached, the student and the appropriate Academic Associate Dean will be informed of the judgment.

6. Final Appeal

If the campuswide sanction is upheld by the Committee, the report of the Committee and all supporting evidence can be sent for a final level of review at the request of the student. If the accused student is an undergraduate, the case will be reviewed by the Dean of Graduate Studies. If the accused student is a graduate student, the case will be reviewed by the Dean of Undergraduate Education. This final review process can only result in decreasing the sanctions imposed on the student or leaving them unchanged. There are no further appeals or processes.

7. Implementation

Once the judgment has been rendered the Dean of Undergraduate Education or Graduate Studies will implement the judgment in the form of a letter to the student as well as initiate any other necessary administrative actions.

F. MAINTENANCE OF DISCIPLINARY RECORDS

Records relating to academic dishonesty will be maintained by the Associate Deans and the Offices of the Deans of Undergraduate Education and Graduate Studies to promote consistency of penalties for a given offense and to ensure appropriate action against repeat offenders. Records will normally be destroyed after five years, unless the Associate Dean determines in any particular case that there is good reason to extend the period of retention. In order to ensure that minor and nonrecurring infractions do not negatively impact a student's career beyond UCI, any student may petition to the Associate Dean of his or her academic school to have relevant academic disciplinary records expunged after the record is two years old or upon graduation, whichever comes first. The Associate Dean has sole authority to consider and to grant or deny such petitions. The University will release a student's disciplinary records to potential employers, governmental agencies, other educational institutions, or other organizations or individuals only if authorized to do so by the student in question or if compelled by law. Any record expunged by the Associate Dean will also be erased in the Dean of Undergraduate Education or Graduate Studies Offices.

ADDITIONAL INFORMATION

This policy is intended to focus solely on issues related to academic dishonesty. Certain details of the implementation of procedures specified here can be found in the UCI publication *Policies Applying to Campus Activities, Organizations, and Students,* available free of charge from the Office of the Ombudsman, located in 437 Administration; the Office of the Dean of Students, located in the UCI Student Center; and on the World Wide Web at http://www.dos.uci.edu/judicial/uci_policy.html.

Anti-Hazing Compliance

The State of California and the University of California have expressly and repeatedly asserted their opposition to hazing and preinitiation activities which do not contribute to the positive development and welfare of the individuals involved. In January 1988, the Education Code of the State of California was modified to reflect changes to the State's anti-hazing statute. In accordance with the revised Education Code, students are advised of the following:

Education Code 32050

As used in this article, hazing includes any method of initiation or preinitiation into a student organization or any pastime or amusement engaged in with respect to such an organization which causes, or is likely to cause, bodily danger, physical harm, or personal degradation or disgrace resulting in physical or mental harm, to any student or other person attending any school, community college, college, university, or other educational institutions in this state; but the term "hazing" does not include customary athletic events or other similar contests or competitions.

Education Code 32051

No student, or other person in attendance at any public, private, parochial, or military school, community college, college, or other educational institution, shall conspire to engage in hazing, participate in hazing, or commit any act that causes or is likely to cause bodily danger, physical harm, or personal degradation or disgrace resulting in physical or mental harm to any fellow student or person attending the institution.

The violation of this section is a misdemeanor, punishable by a fine of not less than one hundred dollars ($100), nor more than five thousand dollars ($5,000), or imprisonment in the county jail for not more than one year, or both.

Education Code 32052

Any person who participates in the hazing of another, or any corporation or association which knowingly permits hazing to be conducted by its members or by others subject to its direction or control, shall forfeit any entitlement to State funds, scholarships, or awards which are enjoyed by him, by her, or by it, and shall be deprived of any sanction or approval granted by any public educational institution or agency.

Copies of Sections 32050 through 32052 as well as UCI's policies regarding hazing are available from the Office of the Dean of Students, UCI Student Center. See Appendix F on the World Wide Web at http://www.dos.uci.edu/judicial/uci_policy.html.

Campus Safety and Security

The UCI Police Department (UCIPD) is responsible for the safety and security of the UCI campus as well as properties owned, controlled, or occupied by the University. UCIPD and UCI administration make continual efforts to reduce crime on campus and at the Medical Center. The following information is excerpted from the *Crime Awareness Bulletin,* which is published annually in September and distributed to new and continuing students, as well as to faculty and staff, at both the campus and the Medical Center.

CRIME PREVENTION

The UCI Police Department's Crime Prevention Unit offers ongoing educational programs and presentations to the campus community. With the assistance of the Community Service Officers and Patrol Division, the Crime Prevention Unit teaches prevention and awareness about drugs and alcohol, domestic violence, sexual assault, identity theft, property and auto theft, workplace violence, and personal safety including the RAD (Rape Aggression Defense) Program for women and radKIDS (Resisting Aggression Defensively) for children. For more information or to schedule a presentation, call (949) 824-7181 or visit http://www.police.uci.edu. Monthly crime prevention tips are also available on the Web site.

SAFETY TIPS

Day and night, no matter where you go, you should be aware of your surroundings, should exercise good common sense, and should use safety precautions as you would elsewhere. Theft is the most common security problem. Property theft is preventable if you keep your personal belongings (backpack, laptop computer, cellular phone) in sight, within arm's length, or secured in a locked place. Students living on campus should keep their doors locked at all times. Faculty and staff should keep valuables locked up while they are in their workplace. The last person to leave a laboratory or building should lock the doors. Report the presence of unknown visitors or suspicious persons to the UCI Police Department or UCI Medical Center Security as soon as possible.

Use the UCI Safety Escort Service (949-824-SAFE) if you are out at night, don't walk alone—walk in pairs, and learn the location of the Emergency Call Boxes (Blue Light Phones).

EMERGENCY CALL BOXES (BLUE LIGHT PHONES)

Both the campus and the Medical Center have emergency call boxes (Blue Light Phones). Use them to report emergencies, crimes, suspicious persons or activities, accidents, safety hazards, and to call for a Safety Escort.

The campus has 57 Blue Light Phones scattered around the ring mall and in parking structures and lots. (See the campus map for locations.) The blue light on the box easily identifies them, and the boxes detect all sounds within a 15-foot radius. To use the phone, just push the button located on the front of the call box. You are then automatically connected to the UCI Police Department. The Medical Center has 21 emergency call boxes located throughout the complex and in the southeast corner of the Manchester parking lot. These phones are connected to the UCIPD dispatcher.

SUBSTANCE ABUSE POLICIES

UCI is designated a drug-free environment, and only under certain conditions is the consumption of alcohol permitted. The sale, manufacture, distribution, or possession of any controlled substance is illegal under both state and federal laws. Such laws are strictly enforced by UCIPD. All members of the UCI community–students, faculty, and staff–who violate these laws are subject to disciplinary action, criminal prosecution, fines, and imprisonment.

Sales, consumption, and the furnishing of alcohol on the UCI campus are restricted by UCI's Alcohol Policy and California State law and are controlled by the California Department of Alcohol and Beverage Control (ABC). However, ABC and UCIPD share enforcement of alcohol laws on campus. It is unlawful to sell, furnish, or give alcohol to a person under the age of 21 years (this includes the Anthill Pub & Grille). The possession of alcohol by anyone under 21 in a public place, or in a place open to the public, is illegal. It is also a violation of UCI's Alcohol Policy for anyone under the age of 21 to consume or possess alcohol in any public or private housing area on campus. Students and employees found violating alcohol/substance policies or laws could be subject to sanctions by the University.

WEAPONS POLICY

It is a serious violation of the law to possess a firearm on University property. Section 626.9 of the California Penal Code makes it a felony to bring or to possess a firearm on the grounds, or within buildings (including private residences) of the University of California, without the written permission of the Chancellor or the Chancellor's designee.

Please report to the UCI Police Department anyone who has stated that they have a gun on campus or who has made a threat to use a firearm on campus. You can ask to be anonymous when reporting.

TO REPORT AN INCIDENT

To build a safe community UCIPD needs your help. If you become suspicious about unknown visitors or someone's actions appearing unusual for the time and place, call UCIPD. They will assess the situation and take the appropriate action. Please report crimes; you can ask to be anonymous.

On campus, dial 9-1-1 or (949) 824-5222 for a police, medical, or fire emergency. For non-emergency police services dial (949) 824-5223. The UCI Police Department's campus office is open 24 hours a day and is located on the ground floor of the Public Services Building, at the corner of East Peltason and Pereira Drives.

At the Medical Center, dial 9-1-1 or (714) 456-5222 for a police emergency, (714) 456-6123 for a fire or medical situation. The Medical Center Security office is located in Building 2 adjacent to the Emergency Department's ambulance ramp.

Crimes occurring off campus should be reported immediately to the city/state law enforcement agency where the crime occurred.

UCI CRIME STATISTICS

Pursuant to the Federal Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act of 1999, the University of California, Irvine annually makes available to all students, faculty, and staff statistics on the reported occurrences of criminal activity on and off campus and at the UCI Medical Center.

The University of California, Irvine's annual security report includes statistics for the previous three years concerning reported crime that occurred on campus, in certain off-campus buildings owned and controlled by UCI, at the UCI Medical Center, and on public property within or immediately adjacent to and accessible from the campus and Medical Center. The report also includes institutional policies concerning alcohol and drug use, crime prevention, the reporting of crimes, sexual assault, and other matters. To obtain a copy of this report go to the UCI Police Department Web site at http://www.police.uci.edu/studentright.html, or visit the Department in person.

UCI Police Department
150 Public Services Building
Irvine, CA 92697
(949) 824-5223
Crime Prevention Unit: (949) 824-7181

Computer- and Network-Use Policy

The University of California, Irvine (UCI) provides computing resources and worldwide network access to members of the UCI electronic community for legitimate academic and administrative pursuits to communicate, access knowledge, and retrieve and disseminate information. All members of the UCI community (faculty, staff, students, and authorized guests) sharing these resources also share the rights and responsibilities for their use.

Rights and Responsibilities

Worldwide, open-access electronic communication is a privilege and continued access requires that users act responsibly. Users should be able to trust that the products of their intellectual efforts will be safe from violation, destruction, theft, or other abuse. Users sharing computing resources must respect and value the rights and privacy of others, respect the integrity of the systems and related physical resources, and observe all relevant laws, regulations, and contractual obligations. Users are responsible for refraining from acts that waste resources, prevent others from using them, harm resources or information, or abuse other people. To help protect files, users are responsible for setting passwords appropriately and for keeping passwords confidential by not giving them to another person.

Most UCI-owned computers are under the control of a system administrator or lab manager. These administrators are expected to respect the privacy of computer system users. However, UCI computer system administrators may access user files or suspend services on the systems they manage without notice as required to protect the integrity of computer systems or to examine accounts that are suspected of unauthorized use, misuse, or have been corrupted or damaged. This includes temporarily locking vulnerable accounts, removing hung jobs, reprioritizing resource intensive jobs, and such.

Many UCI departments have their own computing and networking resources and policies. When accessing computing resources, users are responsible for obeying both the policies described here and the policies of other departments. Student responsibilities are also described in the *University of California Policies Applying to Campus Activities, Organizations, and Students.* In addition, all users are responsible for obeying policies of off-campus network services accessed using UCI resources.

Examples of Misuse

Examples of misuse include, but are not limited to:

- Knowingly running or installing on any computer system or network, or giving to another user, a program intended solely for the purpose of damaging or placing excessive load on a computer system or network. This includes, but is not limited to, computer viruses, Trojan horses, worms, bots, flash programs, or password cracking programs.
- Attempting to circumvent data protection schemes or uncover security loopholes without prior written consent of the system administrator. This includes creating and/or running programs that are designed to identify security loopholes and/or intentionally decrypt secure data.
- Using computers or electronic mail to act abusively toward others or to provoke a violent reaction, such as stalking, acts of bigotry, threats of violence, or other hostile or intimidating "fighting words." Such words include those terms widely recognized to victimize or stigmatize individuals on the basis of race, ethnicity, religion, sex, sexual orientation, disability, and other protected characteristics.
- Posting on electronic bulletin boards or Web pages materials that violate the University's codes of conduct (faculty, student). This includes posting information that is slanderous or defamatory in nature or displaying graphically disturbing or sexually harassing images or text in a public computer facility or location that are in view of other individuals.
- Attempting to monitor or tamper with another user's electronic communications or reading, copying, changing, or deleting another user's files or software without the explicit agreement of the owner.
- Violating terms of applicable software licensing agreements or copyright laws.
- Using campus networks to gain, or attempt to gain, unauthorized access to any computer system.
- Using a computer account or obtaining a password without appropriate authorization.
- Facilitating or allowing use of a computer account and/or password by an unauthorized person.
- Employing, either directly or by implication, a false identity when using an account or other electronic resources. This includes sending unauthorized mail that appears to come from someone else.
- Performing an act without authorization that will interfere with the normal operation of computers, terminals, peripherals, networks, or will interfere with others' ability to make use of the resources.
- Using an account for any activity that is commercial in nature not related to work at UCI, such as consulting services, typing services, developing software for sale, advertising products, and/or other commercial enterprises for personal financial gain.
- Deliberately wasting computing resources, such as playing games (for example, MUDS or IRC) while someone else is waiting to use the computer for UCI-related work, sending chain letters, spamming, treating printers like copy machines, storing or moving large files that could compromise system integrity or preclude other users' right of access to disk storage, and the like.

Consequences of Misuse

Misuse of computing, networking, or information is unacceptable, and users will be held accountable for their conduct. Serious infractions can result in temporary or permanent loss of computing and/or network privileges and/or Federal or State legal prosecution. Appropriate corrective action or discipline may be taken in conformance with applicable personnel policies, student policies, collective bargaining agreements, and procedures established by the Academic Senate. California Penal Code, Section 502 makes certain computer abuses a crime, (such as illegal reproduction of software protected by U. S. copyright law) and penalties can include a fine and/or imprisonment. Files may be subject to search under proper authorization.

Minor infractions of this policy, such as poorly chosen passwords, overloading systems, excessive disk space consumption, are typically handled internally to the department in an informal manner. More serious infractions such as abusive behavior, account invasion or destruction, attempting to circumvent system security, and the like are handled formally through the Office of the Dean of Students or by other appropriate officials.

Contact Information

For additional information, contact Network & Academic Computing Services (E2130 Engineering Gateway Building) by calling (949) 824-2222, or by sending e-mail to nacs@uci.edu.

Salary and Employment Information

	Degree Level of Graduates		
Field of Study	Bachelor's	Master's	Doctorate
	Average Annual Salary *		
Arts	$ 31,992	$ —	$ —
Biological Sciences	29,629	39,000	39,416
Computer Science	41,589	60,457	74,598
Engineering	47,935	57,573	64,677
Humanities	30,858	33,049	43,881
Management	—	55,470	68,896
Physical Sciences	37,275	44,763	54,989
Social Sciences	30,348	32,281	44,616

* Source: A national survey conducted by the National Association of Colleges and Employers, representing the average range of offers as of fall 2004 throughout the country. It should be noted that a wide variation in starting salaries exists within each discipline based on job location, type of employer, personal qualifications of the individual, and employment conditions at the time of job entry.

Student Records

The University of California campuses maintain various types of records pertaining to students; some are maintained for academic purposes; others, such as medical records, are maintained for other specific purposes. Student records —that is, those pertaining to students in their capacity as students—include but are not limited to academic evaluations, transcripts, test scores and other academic records, general counseling and advising records, disciplinary records, and financial aid records. At UCI, an "applicant" becomes a "student" at the time of submission of the Statement of Intent to Register form.

The disclosure of information from student records is governed in large measure by the Federal Family Educational Rights and Privacy Act of 1974, by the State of California Education Code, and by University policy and procedures implementing these laws which protect the student's right of privacy, provide safeguards for the confidentiality of student records, and permit students access to their own records.

Pursuant to the Federal Family Educational Rights and Privacy Act of 1974 and the University of California Policies Applying to the Disclosure of Information from Student Records, students at the University have the following five rights:

1. to inspect and review records pertaining to themselves in their capacity as students;
2. to inspect records maintained by the campus of disclosure of personally identifiable information from their student records;
3. to seek correction of their student records through a request to amend the records or a request for a hearing;
4. to file complaints regarding alleged violation of the rights accorded students by the Federal Act with the Family Policy Compliance Office, U.S. Department of Education, 400 Maryland Avenue S.W., Washington, D.C. 20202-5920; World Wide Web: http://www.ed.gov/policy/gen/guid/fpco/index.html;
5. to have withheld from disclosure, in the absence of their prior consent for release, personally identifiable information from their student records, with exceptions as noted in the University student records policies.

NOTE: *There are instances in which information can be disclosed without prior written consent of the student. University officials may require access to student records in the course of the performance of their assigned duties. Further, confidential information can be disclosed without prior written consent of the student (a) in connection with conditions of certain financial aid awards; (b) when the campus is complying with a judicial order or subpoena; and (c) when authorized federal or State officials are conducting an audit or evaluation of federally supported educational programs. There are also other situations in which the University is required to disclose information. See* University of California Policies Applying to Campus Activities, Organizations, and Students *for a list of exceptions.*

Normally, the campus *will release* the following as personally identifiable information which can be made public:

Student's name;

Photo;

Address (e-mail, local, and/or permanent) and telephone numbers;

Date and place of birth;

Major field of study, dates of attendance, number of course units in which enrolled, degrees and honors received;

Grade level;

Enrollment status, e.g., undergraduate or graduate, full-time or part-time;

Most recent previous educational institution attended;

Participation in officially recognized activities, including intercollegiate athletics;

Name, weight, and height of participants on intercollegiate University athletic teams.

However, students have the right to refuse to permit any or all of these categories to be designated public information with respect to themselves. (See the NOTE above.)

If a student requests that information from his or her records not be regarded as public information, then the information will not be released to anyone without the written consent of the student. The student should be aware of the important implications of exercising this right. For example, if a request is made to withhold from disclosure a student's name and degrees and honors received, the campus cannot release for publication information on any honors received by the student, such as election to Phi Beta Kappa, and cannot include the student's name and degree earned in the campus commencement program without the written consent of the student. Similarly, if a request is made to withhold from disclosure a student's name and dates of attendance, a student's status as a student cannot be verified for potential employers without the written consent of the student. Further, if a student's last instruction to the campus was to withhold from disclosure the degree granted to that student and the date on which the degree was conferred, that information cannot be confirmed for a third party in connection with the appointment of that graduate to a new position or in connection with an honor that individual received without the written consent of the student.

Students wishing to restrict release of public information should contact the Registrar's Office for instructions on how to do so. Questions regarding the rights of students under the University policies and the federal law should be directed to the University Ombudsman, 437 Administration.

It is extremely important for each student to keep the Registrar's Office currently informed as changes to personal data occur to assure that accurate and complete records are maintained.

Students are informed annually of their rights under the University's student records policies and the federal Act. Copies of the Act and University and campus policies are available for review in the Reference Room, Langson Library. In addition, University policies are published in *University of California Policies Applying to Campus Activities, Organizations, and Students,* copies of which are available in the Office of the Dean of Students and on the World Wide Web at http://www.dos.uci.edu/judicial/uci_policy.html.

Types and locations of major student records maintained by the campus are listed in the following table; consult the Campus Directory or building directories for room numbers.

Type of Record	Location of Record	Responsible Official
School, department, or program	*Administrative office for particular unit*	*Dean, Chair, or Director*
Admissions—Undergraduate	Administration	Director, Admissions and Relations with Schools
Admissions—Graduate	*Administration*	*Dean, Graduate Studies*
Admissions—School of Medicine	Med. Sci. I	Director, Admissions
Career Center	Student Services I	Director, Career Center
Child Care Services	Early Childhood Education Center	Director, Child Care Services
Counseling	Student Services	Director, Counseling Services
Dean of Students	Administration	Dean of Students
Disability Services	Disabled Student Center	Director, Disability Services
Education Abroad Program	Student Services II	Coordinator, EAP
Financial Aid	Administration	Director, Financial Aid
Financial Services (Cashier, Collections)	Administration	Manager, Financial Services
Housing	Housing Administrative Services	Director, Housing
International Center	Berkeley Place	Director, International Center
Learning and Academic Resource Center	Fourth Floor, Social Science Tower	Director, Learning and Academic Resource Center
Ombudsman Services	*Administration*	*University Ombudsman*
Parking	Public Services Facility	Parking Supervisor

Placement Testing Office	Student Services II	Director, Testing Office
Registrar— Graduate/Undergraduate School of Medicine	 Administration Med. Sci. I	 Registrar Assistant Deputy Registrar
Relations with Schools	Administration	Director, Admissions and Relations with Schools
Student Academic Advancement Services	Student Services II	Director, Student Academic Advancement Services
Student Conduct	Humanities Trailer Complex	Dean of Students
Student Health	Student Health Center	Director, Student Health
Summer Session	University Extension	Director, Summer Session
Undergraduate Education	Administration	Dean, Undergraduate Education
University Extension	University Extension	Dean, Continuing Education
Veterans		Coordinator, Veterans Student Services
Incidental Records (minutes of various committees, copies of correspondence in offices not listed above, and other records not listed)	Administration	Vice Chancellor Student Affairs, or other Student Affairs officials (for conduct issues, could be Dean of Students, Dean of Undergraduate Education, or Dean of Graduate Studies)

Subject Abbreviations

The following abbreviations are used in the *Schedule of Classes* and on student transcripts to indicate course designations.

Prefix	Long Name
AFAM	African American Studies
ANATOMY	Anatomy and Neurobiology
ANTHRO	Anthropology
ARABIC	Arabic
ART HIS	Art History
ARTSHUM	Arts and Humanities
ART STU	Art Studio
ARTS	Arts Interdisciplinary
ASIANAM	Asian American Studies
BIO SCI	Biological Sciences
BIOCHEM	Biological Chemistry
BME	Biomedical Engineering
CAMPREC	Campus Recreation
CBEMS	Chemical and Biochemical Engineering and Materials Science
CHC/LAT	Chicano/Latino Studies
CHEM	Chemistry
CHINESE	Chinese
CLASSIC	Classics
COM LIT	English and Comparative Literature
CRITISM	Criticism
CRM/LAW	Criminology, Law and Society
CSE	Computer Science and Engineering
DANCE	Dance
DEV BIO	Developmental and Cell Biology
DRAMA	Drama
E ASIAN	East Asian Languages and Literatures
EARTHSS	Earth System Science
ECO EVO	Ecology and Evolutionary Biology
ECON	Economics
EDU ABR	Education Abroad
EDUC	Education
EECS	Electrical Engineering and Computer Science
ENGLISH	English and Comparative Literature
ENGR	Engineering
ENGRCEE	Engineering, Civil and Environmental
ENGRCHE	Engineering, Chemical
ENGRECE	Engineering, Electrical and Computer
ENGRMAE	Engineering, Mechanical and Aerospace
ENGRMSE	Engineering, Materials Science
ENV TOX	Environmental Toxicology
ENVIRON	Environmental Analysis and Design
FLM&MDA	Film and Media Studies
FRENCH	French
GENETIC	Genetic Counseling
GERMAN	German
GREEK	Greek
HEBREW	Hebrew
HISTORY	History
HUMAN	Humanities
HUMARTS	Humanities and Arts
I&C SCI	Information and Computer Science
INTL ST	International Studies
IN4MATX	Informatics
ITALIAN	Italian
JAPANSE	Japanese
KOREAN	Korean
LATIN	Latin
LINGUIS	Linguistics
LIT JRN	Literary Journalism
LPS	Logic and Philosophy of Science
M&MG	Microbiology and Molecular Genetics
MATH	Mathematics
MGMT	Management
MGMT EP	Management EMBA – Executive MBA
MGMT FE	Management FEMBA – Fully Employed MBA
MGMT HC	Management HEMBA – Health Care MBA
MOL BIO	Molecular Biology and Biochemistry
MUSIC	Music
NET SYS	Networked Systems
NEURBIO	Neurobiology and Behavior
PED GEN	Pediatrics
PHARM	Medical Pharmacology
PHILOS	Philosophy
PHY SCI	Physical Science
PHYSICS	Physics
PHYSIO	Physiology
POL SCI	Political Science
PORTUG	Portuguese
PSY BEH	Psychology and Social Behavior
PSYCH	Psychology
RAD SCI	Radiological Sciences
RUSSIAN	Russian
SOC SCI	Social Science
SOCECOL	Social Ecology
SOCIOL	Sociology
SPANISH	Spanish
STATS	Statistics
TAGALOG	Tagalog
TOX	Toxicology
UNEX	University Extension
UNI AFF	University Affairs
UNI STU	University Studies
URBPLAN	Urban and Regional Planning
VIS STD	Visual Studies
VIETMSE	Vietnamese
WOMN ST	Women's Studies
WRITING	Writing

UCI Six-Year Graduation Rates by Sex and Ethnicity

FALL 1998	All Entering Freshmen			All Entering Athletically Aided Freshmen		
Sex and Ethnicity	**Entered**	**Graduated**	**Grad. Rate**	**Entered**	**Graduated**	**Grad. Rate**
Men						
Nonresident Alien	16	14	87.5%	*	*	*
African American	15	11	73.3%	*	*	*
American Indian	*	*	*	*	*	*
Asian	703	548	78.0%	*	*	*
Hispanic	131	89	67.9%	*	*	*
Other/Unknown	176	134	76.1%	*	*	*
White	263	211	80.2%	*	*	*
Total	**1,304**	**1,007**	**77.2%**	**17**	**9**	**52.9%**
Women						
Nonresident Alien	26	23	88.5%	*	*	*
African American	51	34	66.7%	*	*	*
American Indian	15	9	60.0%	*	*	*
Asian	860	730	84.9%	*	*	*
Hispanic	201	161	80.1%	*	*	*
Other/Unknown	183	145	79.2%	*	*	*
White	308	243	78.9%	*	*	*
Total	**1,644**	**1,345**	**81.8%**	**14**	**8**	**57.1%**
Total Entering Freshmen						
Nonresident Alien	42	37	88.1%	*	*	*
African American	66	45	68.2%	*	*	*
American Indian	15	9	60.0%	*	*	*
Asian	1,563	1,278	81.8%	*	*	*
Hispanic	332	250	75.3%	*	*	*
Other/Unknown	359	279	77.7%	*	*	*
White	571	454	79.5%	*	*	*
Total	**2,948**	**2,352**	**79.8%**	**31**	**17**	**54.8%**

*Categories with fewer than six students are not shown separately.

NOTE: UPHSS, Department of Education credential students, and visitors are excluded. UCI high school matriculants graduating at another UC campus are included.

Source: OASIM Student Tracking System, 1-2005 updates.

UCI Six-Year Graduation Rates of Freshmen Who Received Athletically Related Financial Aid

FALL 1998 ENTERING FRESHMEN

	MEN			WOMEN		
	Entered	Graduated	Grad. Rate	Entered	Graduated	Grad. Rate
Total	**17**	**9**	**52.9%**	**14**	**8**	**57.1%**

Student categories are: Nonresident Alien, African American, American Indian, Asian, Hispanic, Other/Unknown, and White. Athletically related financial aid categories are: Basketball, Track/Cross Country, and Other and Mixed Sports. Because these categories have fewer than six students, they have not been shown separately.

NOTE: UPHSS, Department of Education credential students, and visitors are excluded.

Source: OASIM Student Tracking System, 1-2005 updates.

Nondiscrimination Policy Statements

Student-Related Matters. The University of California, in accordance with the applicable Federal and State law and University policy, does not discriminate on the basis of race, color, national origin, religion, sex, gender identity, pregnancy[1], disability, age, medical condition (cancer-related), ancestry, marital status, citizenship, sexual orientation, or status as a Vietnam-era veteran or special disabled veteran. The University also prohibits sexual harassment. This nondiscrimination policy covers admission, access, and treatment in University programs and activities.

Employment Practices. The University of California, in accordance with applicable Federal and State law and University policy, prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, gender identity, pregnancy[1], physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or status as a covered veteran[2]. This policy applies to all employment practices, including recruitment, selection, promotion, transfer, merit increase, salary, training and development, demotion, and separation.

In addition, it is the policy of the University to undertake affirmative action, consistent with its obligations as a Federal contractor, for minorities and women, for persons with disabilities, and for covered veterans. The University commits itself to apply every good faith effort to achieve prompt and full utilization of minorities and women in all segments of its workforce where deficiencies exist. These efforts conform to all current legal and regulatory requirements, and are consistent with University standards of quality and excellence.

Inquiries regarding the University's nondiscrimination policy may be directed to: Kirsten Quanbeck, Director/Title IX Officer, UCI Office of Equal Opportunity and Diversity, 4500 Berkeley Place, Irvine, CA 92697-1130; eod@uci.edu; telephone (949) 824-5594.

1 Pregnancy includes pregnancy, childbirth, and medical conditions related to pregnancy or childbirth.

2 Covered veterans are special disabled veterans, recently separated veterans, Vietnam-era veterans, or any other veterans who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized.

About the Catalogue

Catalogue Information, Design, and Production Coordination

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Office of Academic Affairs
Campuswide Honors Program
Undergraduate Research Opportunities Program

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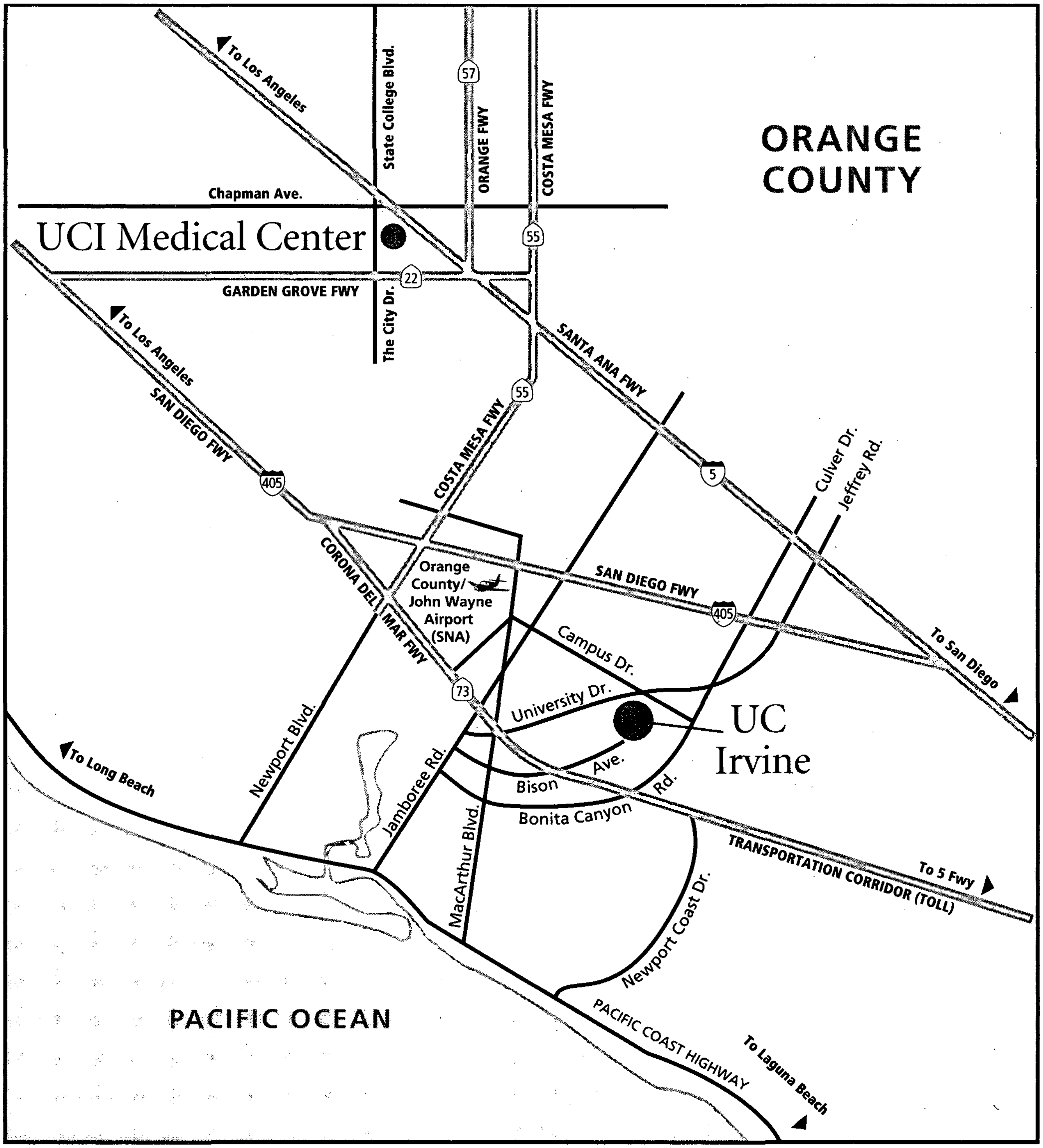

Directions to UCI

405 FREEWAY

From the North
Exit at Jamboree Rd.
Right on Jamboree Rd.
Left on Campus Dr.
Right on West Peltason Dr. into UCI

From the South
Exit at University Dr.
Left on University Dr.
Left on Campus Dr.
Right on West Peltason Dr. into UCI

5 FREEWAY

From the North
Take 5 South to 55 South to 73 South
Exit at Bison Ave.
Left on Bison Ave. into UCI

From the South
Take 5 North to 405 North
Exit at University Dr.
Left on University Dr.
Left on Campus Dr.
Right on West Peltason Dr. into UCI

73 FREEWAY

From the North
Exit at Bison Ave.
Left on Bison Ave. into UCI

From the South (toll)
Exit at Bison Ave.
Right on Bison Ave. into UCI

55 FREEWAY

From the North
Take 55 South to 73 South
Exit at Bison Ave.
Left on Bison Ave. into UCI

From the South
Take 55 North to 73 South
Exit at Bison Ave.
Left on Bison Ave. into UCI

UCI Medical Center
101 The City Drive
Orange, CA 92869

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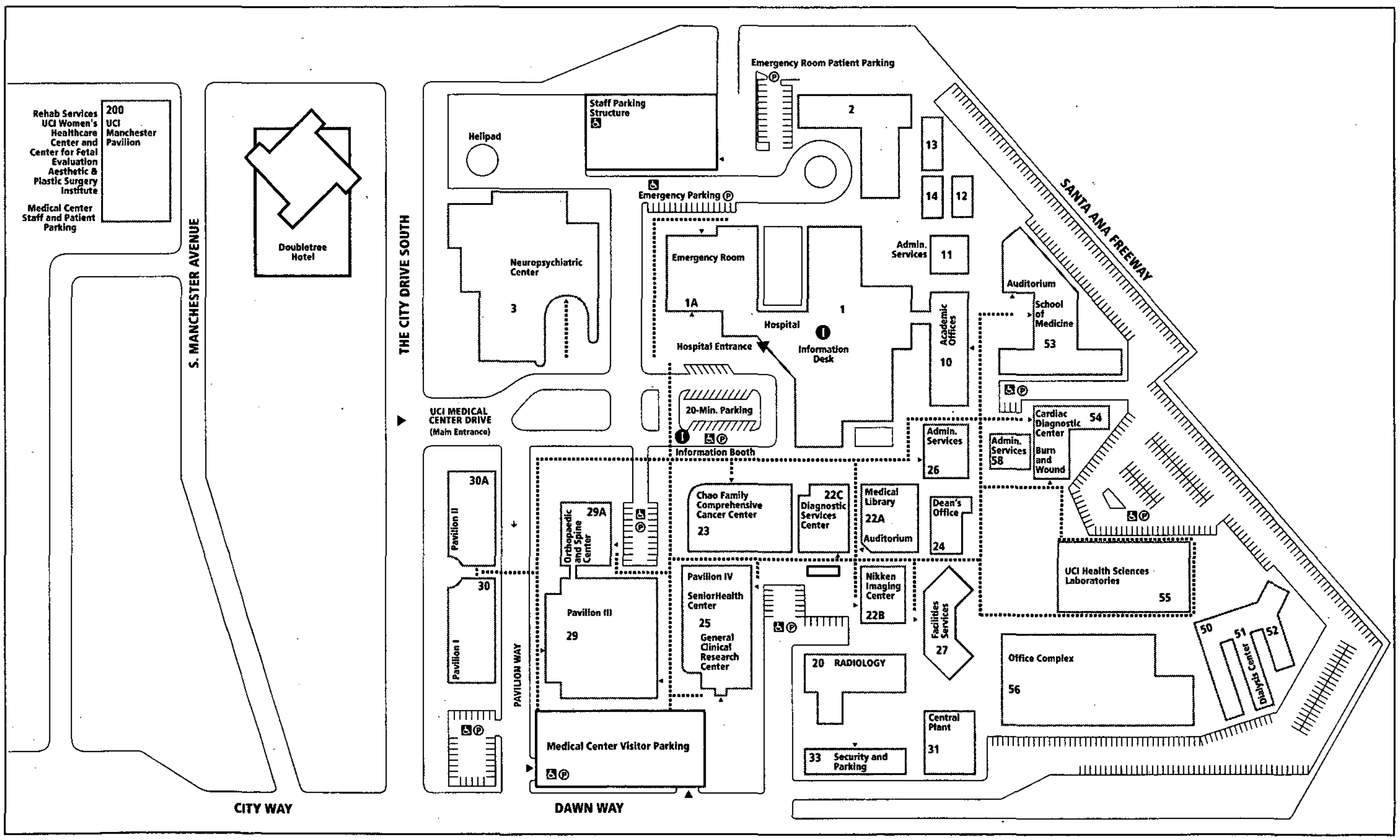

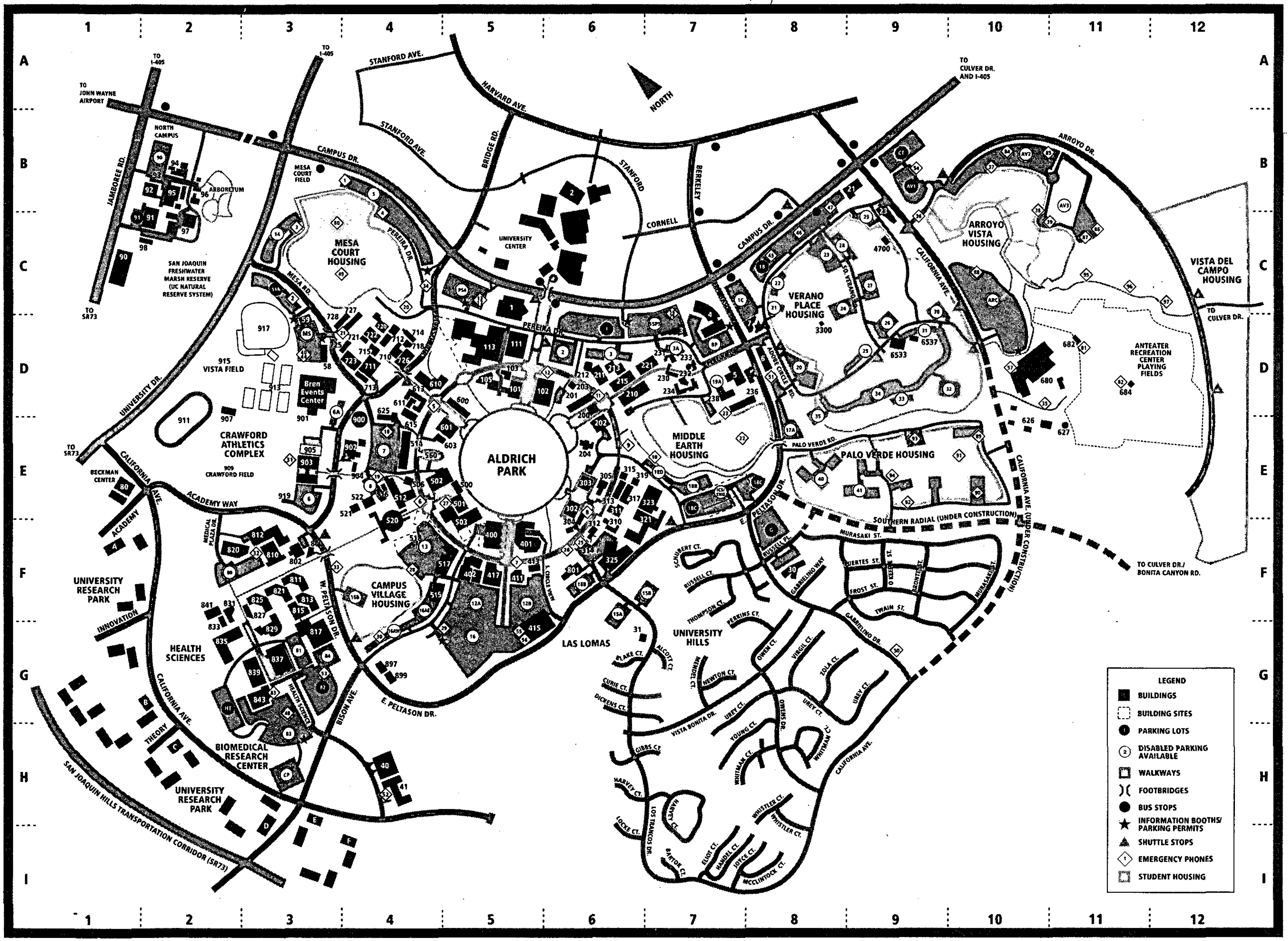
ALDRICH PARK
MESA COURT HOUSING
UNIVERSITY CENTER
VERANO PLACE HOUSING
ARROYO VISTA HOUSING
VISTA DEL CAMPO HOUSING
ANTEATER RECREATION CENTER PLAYING FIELDS
MIDDLE EARTH HOUSING
PALO VERDE HOUSING
CRAWFORD ATHLETICS COMPLEX
VISTA FIELD
Bren Events Center
CAMPUS VILLAGE HOUSING
LAS LOMAS
UNIVERSITY HILLS
UNIVERSITY RESEARCH PARK
HEALTH SCIENCES
BIOMEDICAL RESEARCH CENTER
SAN JOAQUIN FRESHWATER MARSH RESERVE (UC NATURAL RESERVE SYSTEM)
NORTH CAMPUS
ARBORETUM
BECKMAN CENTER
CAMPUS DR.
PEREIRA DR.
STANFORD AVE.
HARVARD AVE.
BRIDGE RD.
STANFORD
CORNELL
BERKELEY
CALIFORNIA AVE.
ARROYO DR.
UNIVERSITY DR.
JAMBOREE RD.
ACADEMY WAY
E. PELTASON DR.
W. PELTASON DR.
BISON AVE.
MESA RD.
PALO VERDE RD.
SOUTHERN RADIAL (UNDER CONSTRUCTION)
CALIFORNIA AVE. (UNDER CONSTRUCTION)
MURASAKI ST.
GABRIELINO DR.
INNOVATION
THEORY
SAN JOAQUIN HILLS TRANSPORTATION CORRIDOR (SR73)
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NORTH
LEGEND
BUILDINGS
BUILDING SITES
PARKING LOTS
DISABLED PARKING AVAILABLE
WALKWAYS
FOOTBRIDGES
BUS STOPS
INFORMATION BOOTHS/ PARKING PERMITS
SHUTTLE STOPS
EMERGENCY PHONES
STUDENT HOUSING

Building/ABBREVIATION/ Map Coordinate/Building Number

Buildings

Housing Complexes

University Research Park

UCI Communications Office, April 2005

Claire Trevor School of the Arts

School of Biological Sciences

Department of Education

The Henry Samueli School of Engineering

School of Humanities

Donald Bren School of Information and Computer Sciences

Interdisciplinary Studies

The Paul Merage School of Business

School of Physical Sciences

School of Social Ecology

School of Social Sciences

College of Health Sciences

Correspondence Directory

University of California, Irvine, CA 92697
Campus directory assistance: (949) 824-5011
Speech and hearing impaired persons: TDD (949) 824-6272

World Wide Web: http://www.uci.edu/

Office	Location	Telephone (949)
Admissions		
School of Medicine	802 Medical Education Building	824-5388
Graduate	120 Administration Building	824-4611
Undergraduate Admissions and Relations with Schools	204 Administration Building	824-6703
Associated Students	200 UCI Student Center	824-5547
Bookstore	UCI Student Center	824-BOOK
Campus Tours	Administration Building Second Floor Lobby	824-2719
Career Center	100 Student Services I	824-6881
Dean of Students	101 Humanities Trailer Complex	824-5181
Disability Services Center	100 Disability Services Building	824-7494
Financial Aid and Scholarships	102 Administration Building	824-8262
Housing	209 Administration Building	824-7247
International Center	3800 Berkeley Place	824-7249
Registrar	215 Administration Building	824-6124
Student Health	Student Health Center	824-5301
Summer Session	UCI Extension	824-5493
Transfer Student Services	204 Administration Building	824-6703
UCI Medical Center	101 The City Drive South Orange, CA 92868	(714) 456-7890
Veterans Services	100 Gateway Commons	824-6477
Vice Chancellor Student Affairs	405 Administration Building	824-7985

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