

**Handbook of the
Honors Thesis Program
in Human Biology**



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Overview of the Human Biology Honors Program

Who is Eligible to do a Human Biology Honors Thesis?

Human Biology encourages all Humbio students with an excellent academic record and a strong desire to conduct research to write an honors thesis. There are a few basic requirements that must be met before you can officially enter the honors program:

You must

1. be a declared Humbio major.
2. have successfully completed the core sequence (2A/2B, 3A/3B, 4A/4B) with a 3.0 minimum GPA.
3. have acquired competence in methodology used in your research via either lab experience or a methodology course. *See a list of approved methodology courses in [Appendix 3](#)*
4. have a 3.2 minimum GPA at the time of entering the honors program, which must be maintained thereafter (students must have a minimum 3.2 GPA to graduate with honors). *Please note that letter grades received for independent research courses in other departments are not included in the required 3.2 GPA for the Human Biology Honors Program.*
5. have completed one quarter of research (or directed reading) with the faculty member who will be your honors adviser. (See also “*Who is on the [reading committee](#) and how do you choose them?*”)
6. have completed the three-part application to enter the Honors Program (a detailed description of your research plans, methods, and hypotheses which should be the result of working closely with your adviser).

DUE early February of junior year (see online calendar) – **Part A *Intention to Undertake Honors Research***

DUE March 1 of junior year – **Part B *Application to Undertake Honors Research***

[Both applications are available online](#), and details for Part B are given in [Appendix 1](#).

DUE early December of graduation year – **Part C, *Literature Review*** ([details](#)).

7. have approval from the [Human Subjects Committee](#) (IRB) if you plan to do research involving human subjects (interviewing people and using their responses, opinions or any data from individuals).
8. have evaluated your own pre-field readiness, if you plan to work off campus or overseas, by meeting the [guidelines](#) laid out by the UAR. UAR requires some coursework and other preparation before a student may be funded for some kinds of research.

Why do honors research at Stanford?

The process of doing successful research as an undergraduate changes the way you evaluate the growth of knowledge in the disciplines that comprise Human Biology. Participating in the generation of new knowledge is a chance to see how fields advance. Exploring a particular topic of interest in depth will enrich your undergraduate experience, in addition to improving your writing and speaking skills.

Completing an honors thesis leads to far more than the recognition of research experience in Human Biology from Stanford. Human Biology honors graduates usually consider the process of completing an honors thesis a highlight of their Stanford undergraduate experience. Undergraduate honors research provides you with the chance to explore new areas of interest and to satisfy your intellectual curiosity. Even more than the final product – the research thesis – it is the process of defining a question, focusing on alternate hypotheses, and designing the means to test ideas that adds a new dimension to undergraduate education. Critical formulation of research questions and analysis of data will change the way you evaluate research during future graduate or professional training.

There are a number of things to take into consideration before you begin work on an honors thesis. The rewards for doing a thesis are substantial, but they cost time and energy. If you don't want to focus on a specific area during your junior and senior years, doing a thesis may not be for you. Some of the research work may be very tedious—you will have to spend many hours running experiments, distributing surveys, or poring over data trying to make sense of them. If you are involved as a collaborator on an ongoing research project that is not your own, you may nevertheless gain valuable experience and possibly contribute to a publication without writing a thesis. Your research mentors will probably be able to give good advice to help you decide whether you would like to take on your own honors thesis project. Another way to imagine the process of doing an honors project is to take a look at the previous honors theses in the Student Advisers' office, and to read this handbook thoroughly.

How do you apply to the honors program?

You should apply to the honors program during the year before you plan to graduate. Normally, you would apply in **winter of the junior year**. Applications are considered by an honors committee of professors and other experts from the various fields represented in Human Biology. Decisions are made throughout the spring, and the committee may ask for revisions before a proposal can be accepted. Your ability to write a solid proposal depends on good advice from a committed research mentor.

By the time you apply for honors you will already have established a working relationship with a faculty member who will serve as your thesis adviser (first reader). The Honors committee will expect you to have worked with an adviser for at least one quarter before the first application deadline. You will also need to identify at least one other additional reader who can give you advice on your work and your writing. During the months before you apply to the honors program, you will need to work closely with your mentors to identify clear research questions and develop methods for testing them.

Applying to honors is a three-step process.

In the first step (**Part A**) students are expected to submit an ***Intention to Undertake Honors Research***, due in early February of the Junior year. Part A will include basic background

information about both student and mentors, as well as an abstract of the proposed research in 150 to 200 words.

Part B is the *Application to Undertake Honors Research*, due March 1st of the Junior year. The application requests information about your proposed research project, including hypotheses to be tested or questions to answer, data collection methodology, and potential significance of the results. For a detailed description of the required sections and content, see [Appendix 1](#).

The research adviser (First Reader) will need to submit a letter of support about the proposed honors project. Students accepted to pursue honors will be selected from the applicants based on the quality of their research proposal.

Part C, the final step in the application process, consists of the [Literature Review](#) of primary sources, in which students show their familiarity with the research literature relating to their thesis topic. It should be a scholarly review setting up the research question and showing familiarity with the major theories, constructs, and the empirical data that support them. It is meant to be more than an introduction to a published journal article—it is designed to demonstrate scholarship. The Literature Review should cite primary sources as well as reviews. The writing must be clear and concise. These reviews are generally 12-18 pages in length, although the exact length is influenced by your discipline and your first reader. Samples of good Literature Reviews (as the first chapter of completed theses) are available in the HumBio SA office. The literature review is evaluated by your first reader and provided to your second reader. You will also submit an electronic copy to the Honors Chair (Associate Director Katherine Preston, kpreston@stanford.edu).

Registering for honors units.

The maximum number of honors units that you may register for including “Research”—HB 193 (or “Special Projects”—HB 199) and “Honors”—HB 194, is *fifteen*. You should register for one unit for every 3 hours you intend to spend working on your research or writing your thesis. For example, if you plan to spend ten hours a week in the lab, you should register for 3 units. You register for HB 193 (research) or 194 (writing) *only* after you are admitted to Honors; you may however, register for either in more than one quarter. (Up to ten of the maximum 15 units for honors (193 + 194) may be under HB 194.) The grade for HB 194 is obtained after your thesis is submitted, following presentation at the Honors Poster Symposium.

You can also continue work on an honors thesis as a co-terminal Masters student. The co-terminal BA/MA or MS programs offered by a number of departments (Anthropology, Biology, Psychology, Sociology) allow students to work on a master’s degree during Senior year and graduate in five years with both a bachelor’s and master’s degree. Work on an honors thesis for Human Biology can, in certain cases, be extended into research for a master’s thesis, if you are accepted into one of the co-terminal degree programs. Talk with Honors Chair Dr. Katherine Preston if this is your plan.

Honors Program timeline

An updated calendar can be found on the HumBio Honors website. A detailed [timeline](#) is below.

Methodology Requirement

Students need to have methodological competence in the methods they will be using in their research. This means that

- if you plan to use *lab procedures* you should have learned the lab procedures prior to conducting your Honors research and have attended 6 months of lab meetings
- if you are conducting *anthropological field work* you should have learned field procedures
- if you are using *surveys or interviews* you should have taken a course on or otherwise acquired competence in designing, using and scoring these tools
- if you are planning to use *qualitative methods*, you should be knowledgeable about the use and coding of these methods and have taken a course in this area

To this end, students are required to show methodological competence relevant to their research by one of the following:

- at least six months' lab experience acquiring techniques related to those used in the thesis
- enrollment in or completion of a methodology course (see list in [Appendix 3](#))
- enrollment in anthropology pre-field seminar (and subsequently post-field seminar)
- a directed reading course on methodology, by petition and only in exceptional cases, where none of the above options is suitable

Since Human Biology is a very broad major, there are numerous courses that can meet the methodology requirement. [Methodology courses](#) are a minimum of 3 units and one quarter in duration. For a methodology course to satisfy the Humbio Honors requirement, it must meet for at least 3 hours a week for a full quarter.

Getting Started in Research

What is the range of research disciplines in Human Biology?

Human Biology is a unique interdisciplinary program. Humbio majors who want to do an honors thesis have many more options available than most other majors. Topics that people have explored in past Humbio theses range from gene expression in stem cells to the social interactions of pre-schoolers to the regulation of hormones in the brain. While not every topic would make a fitting Humbio honors thesis, the range of possibilities is even broader than the variety of lecture topics within the Core. It is wonderful to have so many options when thinking about a research question for a thesis. However, the sheer number of options can make it difficult to narrow down an area of interest. By working with the right faculty member you can transform a collection of exciting ideas into a well defined research question.

A list of award-winning theses can be found in [Appendix 2](#). You can browse all HumBio theses any time in the Student Adviser office.

How do you decide on a subject for your thesis?

Topics for honors theses may stem from any area of Human Biology. You may be exposed to an idea in the Core that you would like to pursue. You may see relationships between topics presented in different upper division courses. Questions from an environmental policy course may combine with a lingering thought from a marine biology course. Cases studied in medical

anthropology may tie in with a particular concept from human development. HB-REX research projects are often the starting point for very successful honors projects. In addition to the curriculum from your various courses, honors theses can evolve from personal experience or from your Human Biology internship.

You may choose to work in a topic related to your Area of Concentration (AC) within Human Biology, but your thesis topic need not be limited to your AC. Nevertheless, it is helpful to take the courses necessary to support your honors research as early as possible. See also, [Conducting research as an undergraduate.](#)

How do you find faculty to help with developing your thesis ideas?

The first step in your search is to identify people who teach or do research in the area you plan to research. Find out which faculty members share your specific interests. Look in *Explore Courses* for courses that interest you. The Medical School has a searchable [database](#) of faculty and research topics that includes non-medical faculty as well. Talk to your faculty adviser. She or he will know other faculty who might share your interests. The Student Advisers can also be a rich resource.

General advice for approaching faculty members. The typical faculty member is extremely busy teaching, doing research, writing articles and grants, and advising students. Faculty get more email messages every day than they can possibly answer, so they are likely to ignore or postpone messages from addresses they do not recognize. Therefore, *if* your first attempt to meet a faculty member is over email, be sure to give your message a very informative subject line. Keep your email short and sweet and be specific about your request. Be polite. Faculty should be addressed as “Professor.” Non-faculty with Ph. D. or M. D. degrees (such as Academic Staff or Lecturers) should be addressed as “Dr.” Use Stanfordwho to check the person’s affiliation.

Email is easy, but impersonal and indirect. You may have a better chance to meet with a potential mentor if you do some background research to discover whether the person is teaching this quarter and has office hours you can visit. Use *Explore Courses* and *Coursework* to find syllabi listing office hours or other useful information. Ask the Student Advisers if the person is in their database, which includes office hours for some faculty. Look for the faculty member’s website within her or his departmental page. If the person has an administrative assistant, try calling that person to make an appointment. For that matter, you can call the faculty member directly. Prepare what you would like to say, and simply pick up the phone. It is also acceptable to drop by a professor’s office and, if the door is open, ask for an appointment at a convenient time.

Before you sit down to meet with a potential research adviser for the first time, read at least one of her or his recent papers to learn more about the questions pursued by the research group. In fact, it’s a good idea to ask for a reading recommendation at the time you make the appointment. Don’t worry if you do not understand the paper completely. Make a list of questions to ask, including what papers you should read next. Think about what aspects of the group’s research most attract you. You should have a clear idea of what general topic you would like to explore before you go in to talk with professors. For example, knowing that you want to do something that focuses on the ability of Alzheimer’s patients to access language gives professors a much clearer idea of your interests than just “wanting to do something that has to do with neuropsychology.” Above all, be yourself, relax, and enjoy the chance to meet with someone about your ideas.

If you have been working with someone and want to continue, have a conversation with your mentor as soon as you think you may pursue honors work. S/he should have advice and ideas

for you. It is important to establish a pattern of comfortable and open communication before you begin your own project. Your adviser will start to see you as a colleague in training, and this is the stage at which you forge an important and potentially lasting professional relationship.

If you have had classes with someone whose work you find interesting, you should meet with the professor to discuss your ideas as soon as you think you may pursue honors work. The general advice given above certainly applies here. Although you may know the faculty member already and have access to office hours, you should still be prepared with ideas before your meeting. If this professor does not feel that s/he can advise your honors thesis, ask for the names of others who might be suitable.

If you have been developing an idea on your own and need guidance, then you are in a more difficult starting position than other beginning honors students. All students need help and advice when identifying their research questions and methods, so it is important to find a research mentor as soon as possible, and no later than the end of fall quarter junior year. If you have been developing your ideas on your own, you need to talk to your faculty adviser and to Honors Chair, Assoc. Director Katherine Preston as soon as you think you may pursue honors research. They can help you identify possible research mentors. You should also follow the general advice given above.

Very often students in this category are interested in questions that call for surveys or interviews of human subjects. Such research requires specialized qualitative or mixed methods that must be developed in close collaboration with an expert in the field. If your research includes qualitative or mixed methodology, you need to take a special methods course such as Humbio 82A, Humbio 127A, or Med 147. For others, see [Appendix 3](#). Because these projects can be more difficult to develop (and often involve international travel and IRB approval), you need to seek advice as early as possible. *Sophomore year is not too early.*

Who is on the reading committee and how do you choose them?

At a minimum you must have two readers, but many students benefit from a larger reading committee. The First and Second (and Third, etc.) Readers for your thesis have somewhat different roles in terms of their amount of involvement with your research.

The First Reader for your thesis – also called your research adviser, mentor, or PI – is typically more involved in the development and completion of your thesis research than the Second (and Third) Reader/s. Your First Reader should be someone knowledgeable about the specific subject of your thesis. Your First Reader is expected to serve as your main mentor throughout the process of conducting Honors research. In general the First Reader will spend more time going over the rough drafts of your thesis than the Second (and Third) Reader/s; the First Reader will ultimately assign the grade for the thesis. Although there is great diversity in the way in which faculty monitor students' progress, in most cases there are frequent meetings, especially in the early phases (choosing a topic, designing the study) and towards the end (analyzing data and writing the thesis). It is acceptable if the faculty mentor delegates day-to-day guidance to a post-doctoral fellow or an advanced graduate student. In that case, the post-doc or grad student should be named the Third (or Fourth) Reader. When research is conducted within an ongoing laboratory, students are expected to attend lab meetings regularly.

The role of the Second Reader is to give you feedback on the nearly-final draft of the research proposal and rough drafts of your thesis. The Second Reader should have research-based competence or be substantively very knowledgeable about the topic of your study, but s/he will play a less pivotal role in your research. Nonetheless, you should meet several times with your Second

Reader early in the research process and get approval of your research design and the written research proposal. Towards the end of the study the Second (and Third) Reader/s will read drafts of the thesis, and give timely feedback. The project is not finished until the Second Reader has signed off on the thesis. The Second Reader can work in the same field or in a different area from the First Reader, but in any case s/he should be another person who can provide advice if you run into problems with your research. Often a professor with a slightly different background can be valuable in helping you clarify your writing such that people unfamiliar with your topic would be able to read your thesis and understand it.

Your Third Reader is optional and may be your post-doc or graduate student mentor, a research mentor outside of Stanford, or another faculty member who has provided valuable guidance.

Two important requirements are these:

- 1) At least one of your readers (the First, Second or Third Reader) must be a Human Biology faculty member.** (Anyone listed in the Human Biology section of [Courses and Degrees](#) is officially affiliated with Human Biology.)
- 2) At least one of your first two readers must have significant research experience in your field.**

While you can approach virtually any professor for advice or suggestions about doing a thesis, the most important criterion is that *the professor is knowledgeable* about your topic and willing and able to give you close supervision. Especially for your First Reader, it is important to choose someone with whom you can get along and communicate honestly. No matter how brilliant or successful a professor may be, your experience working on your thesis will not be as rewarding if you do not enjoy being around your mentor. Pay attention to the way your mentor handles conflicts that come up in class. Look at how he or she treats you when you talk on an individual basis, and decide if you think this is a person who you could work with closely for an entire year. Becoming compatible with your First (and often Second) Reader can be a very valuable part of doing a thesis—make sure to choose someone whom you would want to get to know.

Conducting Research as a Stanford Undergraduate

Undergraduate research can be one of the most rewarding aspects of your Stanford experience. Fortunately, Stanford students have many opportunities to conduct research with some of the world's finest faculty. Moreover, the University has shown an extraordinary commitment to supporting student research through various programs funded through the VPUE.

At Stanford, student research projects often originate in a faculty member's existing research program. Faculty may suggest a defined project to an interested student, or a student may propose a new project sparked by ideas about ongoing work. This model usually leads to strong mentoring and provides excellent training in how to conduct research. Alternatively, some students develop their own questions based on outside interests, and they must [seek faculty guidance](#).

How do you identify a set of research interests?

Designing a research question or selecting a specific research area and ultimately developing working hypotheses takes time. There are many pathways that can lead you to your thesis topic. As you begin to consider questions for your thesis, it is essential to keep in mind your persistent interests. The topic that you choose will have to sustain your attention for more than an entire

academic year. Think about the courses whose readings or lectures have interested you the most, and then think about the questions that were raised by them. Consider the ideas that inspired you to do extra reading or look forward to going to lecture; they are the ones that you could (potentially) develop into good research questions for a thesis.

One way to brainstorm about an appropriate thesis question is by talking to TAs and professors within your chosen discipline about which topics they are currently researching. Reviewing reading from courses and looking through current research journals can also be helpful. Ask faculty for review articles in their areas of research expertise. Professors and TAs can give you a good idea of which journals might be the most helpful. Another good source of ideas are copies of Human Biology theses from past years, available for browsing in the SA office. See [Appendix 2](#) for a list of award-winning theses. After identifying a general area of interest it is essential to review the research literature to learn about existing work in this area.

How do you transform research interests into significant and testable questions?

Broad interests and general questions must be wrangled into the proper scope for an undergraduate thesis and transformed into testable questions. Good thesis questions have two important qualities: successfully answering them would constitute a contribution to the field; and answering them would be possible within the time available.

Contributing intellectually to a body of research is the goal of all academic researchers, and doing so is the basis for funding, reputation, and employment. There is also just a wonderful feeling when it happens. If you are currently working with a mentor, you probably already have a feel for the important questions in your field. Anyone can benefit, however, from reading recent publications in a particular area and review articles suggested by mentors. You can ask professors and graduate students and postdocs in the research group for the names of high-profile journals in the field. Floating your ideas by postdocs and graduate students can also be very helpful. Your questions might trigger a memory of the perfect paper to read or researcher to talk with.

As you read, pay close attention to the way authors justify their own research questions intellectually in the introductions to their papers. You will use these introductions to map out the terrain in your area. You will also draw on them as a model for your own proposal and thesis.

The appropriate scope for your research question lies somewhere between too broad to answer with one or two experiments and so narrow as to be trivial. It should also fall between too complicated or risky to complete in a year and so simple and unoriginal that it could be completed in a week. Those limits seem obvious, but beginning researchers do need to ask themselves how close their questions come to these limits. In some cases, the results of a thesis project will be important enough to be published on their own, and publication is a very reasonable goal. In some cases, getting data consumes so much time that the results of a substantial project might be published as one part of a larger lab effort. Certainly the question should be interesting enough and the proposed methods solid enough to warrant publication of the results, if the study works out as planned. No matter what ultimately happens to your data, you should feel that you have an intellectual investment in the project and that your work will produce a result that will be of interest to others in your field.

How do you design a study to test your questions?

Helping you design your study is perhaps the most important role of your faculty mentor. Before you begin, you should have adequate and appropriate training in the methods you will use.

Human Biology requires students to show they have been trained by taking a suitable [methodology course](#) or by working with their mentor for at least six months.

What are the requirements if you are planning to work with people, surveys, or questionnaires?

Working with human subjects could involve any of a number of procedures, such as asking them questions, observing their behavior in a lab or in the field, scanning their brains, or reading their medical records. All students who propose research involving human beings as subjects in any way must apply for institutional review and approval by Stanford's Human Subjects Panel (IRB). This is a crucial, obligatory step in preparing for such projects, and it is your responsibility to apply for approval before you begin research with human subjects. *Note that it is not possible to get retroactive approval of your research after you have already started to collect data.*

Your first step to getting approval is to talk with your research adviser. Some professors already have human subjects approval for a particular research program in their lab, and she or he may be able simply to add your name.

Your second step is to take the [Collaborative IRB Training Initiative \(CITI\)](#), which is required of all Stanford researchers working with human subjects: *“All new STANFORD investigators who use human subjects in their research activities will be required to take CITI initial training. Additionally, a CITI refresher course is required for all investigators who have not taken the previously required Human Subjects Tutorial within the last two years (Investigators include Protocol Directors and all research staff listed on the protocol application form).”*

If you need to submit an IRB protocol, begin here: <http://humansubjects.stanford.edu>. The IRB website provides many tutorials and examples, and the IRB managers are very responsive to questions.

How can you maintain a good relationship with your readers?

Clear communication is probably the most important thing in maintaining good relationships with your readers. Early on it is important to ask your readers about their preferences for communication. Some readers wish to communicate via email, while others prefer regular personal meetings. It is also important to discuss expectations for how often you want to meet to discuss progress on the thesis and the time table for collecting data and drafting the thesis.

Your responsibilities to your readers depend somewhat on the expectations laid down during your first few meetings. Generally, readers are very busy balancing many demands on their time, so it is best to clarify their expectations before you begin. If you are not sure what your readers expect, you should ask them. A respectful relationship between you and your readers depends on your ability to be dependable and communicate clearly and promptly with them. If you do experience conflict with your readers or other mentors, and you feel you need help dealing with it, you should feel free to talk with Honors Chair Dr. Katherine Preston or with Associate Dean of Undergraduate Research Dr. Brian Thomas. Either can provide confidential guidance should you need it.

If you are working in a lab or collaborative research group, you will probably be very involved in the daily life of the group. You should of course strive to be a good colleague to everyone in the group. This includes attending group meetings and taking part in other group

activities when invited. Be respectful of others' time and space. Remember that graduate students and postdocs are professional researchers, and you are sharing their workplace.

You may need to take active steps to keep your Second Reader involved in your research. Just because you haven't heard from her or him recently doesn't mean that s/he isn't interested. Be sure to ask for a brief meeting or simply send an email if you make an exciting discovery or have a setback. Invite your Second Reader to any presentations you may be giving to your primary research group. You do not need to demand much time to keep your Second Reader up to date.

What if your research topic changes after applying and acceptance to Honors?

Once an Honors application has been approved, the student is expected to complete the specific research described in the application. Minor adjustments are to be expected, and these should be made with the guidance and approval of the thesis readers. Please note that any substantive changes to the research topic or procedures must be approved by the First and Second readers and the Honors committee in order for the research to be eligible for Honors.

The Proposal

Below is a brief description of the proposal. You can view the actual forms on the honors portion of the Human Biology website, and a detailed description of the proposal in [Appendix 1](#).

The Intention to Undertake Honors Research (Part A)

The first step in applying to do honors research is to let the committee know that you plan to do so. The Intention (Part A) is due **the first week of February**. For this part, you will need to provide the names of your readers and submit an abstract of 150-200 words of your proposed research. There are a few other short questions about eligibility and preparation as well. This Intention allows the committee to start recruiting appropriate reviewers for the honors proposals when they are submitted a few weeks later.

The Application to Undertake Honors Research (Part B)

The second step in applying is to submit the full application, which includes the proposal. This proposal is essentially the same document you will submit if you apply for a Major Grant through UAR. Besides the proposal, you will answer some questions about the logistics of your research and your plans for working with your readers. Again, you can see this proposal on the Humbio website.

The proposal is organized much like the proposal you would send to a funding agency. It includes an abstract and an introduction providing background to the problem and the significance of the work. It also includes a detailed methods section. Although Humbio does not provide funding itself, we do ask you to submit a copy of the budget you submit to UAR. The abstract, introduction, and methods section should be around 6 to 8 pages long, but the best length will vary widely among projects. For detailed descriptions of each section, see [Appendix 1](#).

Timeline for research and writing the thesis

There is a wide range of starting points and individual variations in the scope of projects. As a result, the following suggestions are just guidelines, and not a strict time line. However, some

steps have fixed dates, such as applying for funds, turning in your thesis, and presenting in the Honors Symposium. See the online calendar for the current academic year's deadlines.

Sophomore Year

Autumn and Winter Quarters

- Take the Human Biology Core
- Get experience in a lab, if that is where your interests lie
- Take classes from professors in fields you find interesting
- Take a relevant statistics course

Spring Quarter

- Finish the Core
- Declare Human Biology as a major

Summer Quarter

- Try to complete your Internship or to participate in HB-REX, Human Biology's summer research experience.

Junior Year

Autumn Quarter

- Declare Human Biology as a major if you have not yet done so
- Narrow down research interests
- Get experience in a lab or research group or by working closely with a faculty member
- Decide on professors to ask to be your First and Second Readers
- Take research-oriented or methodology courses relevant to your research

Winter Quarter

- See online calendar for specific due dates.
- Settle on a topic and First and Second Readers, meet with readers on a frequent basis
- Review literature, generate hypotheses, select research methods and tools
- Finish up any stats or research methods classes
- Submit the Honors Program application, [Part A, Intention to Undertake Honors Research](#)
- Complete your Honors Program application, [Part B, Application to Undertake Honors Research](#) working closely with your readers. Focus on study design, selecting measures and generating hypotheses. Set up a time-line with your First Reader for collecting and analyzing data. (Your research application should be a polished research application plan—not a preliminary draft. Make sure you have completed all the information required.)
- If using [human subjects](#), learn what will be required to submit a protocol
- If you plan to apply for [research funding](#) through the UAR, be aware that *the deadline for Major Grants is in Winter quarter.*

Spring Quarter

- Submit Human Subjects protocol if needed.
- Apply for Summer Honors College if interested.

Summer Quarter

- Begin your honors research if possible

Senior Year

Autumn Quarter

- Enroll in research or directed reading course (HB 193 or HB 199), to get research credit
- Submit **Part C, Literature Review**

Winter Quarter

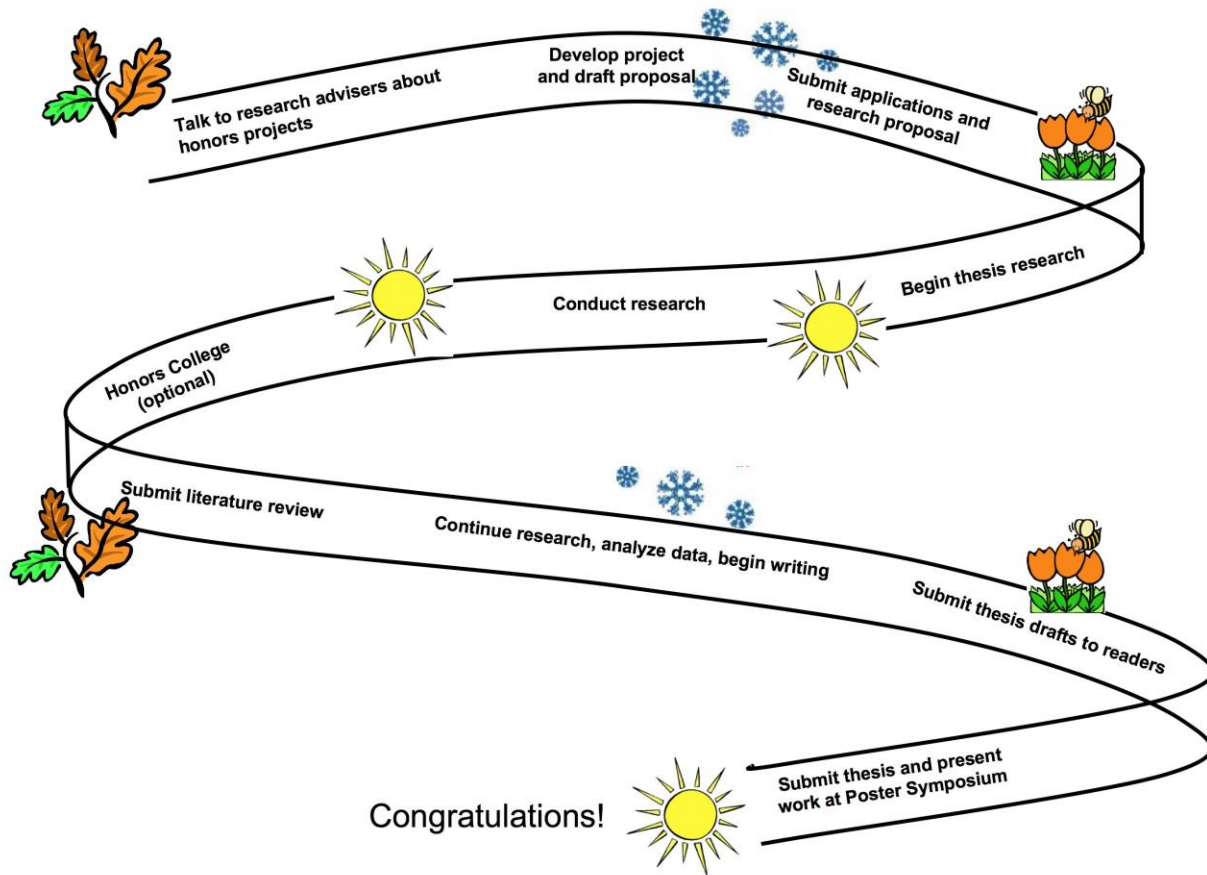
- Complete data collection and begin analysis (although this timing varies with discipline).
- Begin writing thesis no later than March.

Spring Quarter

- Finish writing thesis, allowing time for several drafts
- Work on Honors Poster Symposium presentation
- Have complete draft of your thesis done by the time of the Honors Symposium
- Turn in one unbound, signed copy of your thesis to the Student Services Coordinator in the Humbio office and submit an electronic copy to the Honors Director.

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The Literature review

The final step in applying for honors is to write a literature review, due in late fall quarter of the thesis year. The literature review is essentially an extended introduction to the thesis, providing background and putting the thesis project into context. Typically, the scope of the literature review for the Honors Program is broader than it would be for a journal article, simply because the target audience for the honors review is also broad. Students should aim to introduce their research topics to scientifically literate readers. At the same time, the review must be thorough and scholarly enough to express the significance of the particular thesis project within its subfield. Reviews normally range from 12 to 18 pages, including references.

A good literature review begins with a very brief description of the thesis project, to serve as a road map for the rest of the review. It continues with essential background information, followed by a discussion of the theoretical background and current state of research, which in turn leads into a more focused exploration of literature relevant to the specific thesis project. This last part is the most essential, because it allows a student to demonstrate command of the results, debates, and unanswered questions emerging from the current literature. Examples of strong literature reviews (as they appeared in the final thesis) are available from the SA office.

Thesis students submit a copy of the review to their first and second readers and an electronic copy to Lia Cacciari in the Student Services office (cacciari@) and Honors Chair Katherine Preston (kpreston@). *First readers must read and approve the literature review before a student can continue in the Honors Program.* First readers may send their approvals by way of a brief email to Lia Cacciari.

Resources at Stanford

How do you get funding for your research?

The office of UAR (Undergraduate Advising and Research) provides both [major and small grants](#) for undergraduate students to finance research. Many of the recipients of UAR Grants use the grants to fund work on honors theses. The major grants provide up to \$6,000 (in 2014) to spend on research related expenses, stipends, and living expenses, while the small grants provide up to \$1,500 for research expenses only. Applications are very competitive. See the UAR website (linked above) for due dates and specific guidelines. Applications for major grants are due in winter quarter, and applications for minor grants are due monthly throughout the year.

The UAR also provides conference grants for students who will present their work at a scientific meeting. For details see the main student grant page. *Consult with the Associate Director of HumBio before making travel plans.*

How do you get help with statistics?

Several classes are offered for undergraduates that provide a background in statistics and fulfill the statistics requirement for Human Biology. Finishing the statistics requirement is *strongly recommended before entering the Honors Program.* There is also a statistics consulting service at Sequoia Hall and at Sweet Hall. Please see the stats web page: <http://stat.stanford.edu/~consult/>.

How do you get help with writing?

For writing assistance you can draw on the [Hume Writing Center](#) or HumBio's in-house writing specialist. At the HWC, there are drop-in hours for consultations with peer writing tutors, and PWR tutors are available to students who would like to meet regularly with one professional.

The Library has helpful information on [Bibliographic Management Tools](#) (including Help and Support links).

Bing Summer Honors College

Bing Honors College as offered by the Program in Human Biology is a two-week September program designed to support students who are actively engaged in Honors Thesis work. In BHC, each student commits to making meaningful progress on her or his thesis, and to joining other students in creating a serious and supportive intellectual community.

BHC in Human Biology has four major goals:

1. to provide an opportunity for the student to make progress on his or her honors thesis, unfettered by other demands and with the mentorship of Human Biology Honors College faculty
2. to create a sense of community among Human Biology Honors program students
3. to help students learn and practice skills in written and oral communication of thesis research to a multidisciplinary audience
4. to deepen students' understanding of the nature of research in Human Biology

These goals are supported by a variety of activities led by HumBio Honors College faculty mentors or by the broader Bing Honors College faculty.

- Students receive free room and board for the duration of BHC. They will be housed on campus along with thesis students from other departments, where they will share meals and some BHC-wide programming.
- Human Biology participants will meet with their research mentors and Hum Bio Honors College faculty to set concrete goals for their time in Honors College and beyond.
 - All HumBio Honors College students will present a poster, make progress on their literature review, and create a calendar for completing thesis work.
 - According to their needs, students will commit to completing additional tasks during BHC, such as finishing the literature review, designing survey instruments, completing data collection, or learning to analyze data.
- Most days, HumBio students will attend group meetings where they will learn useful approaches to thesis writing, discuss key issues in research methodology, gather tips on poster design, and hone their skills in literature search tools (such as PubMed) and reference management software (e.g. EndNote and RefWorks).
- HumBio students will design and present a poster that describes their thesis work to date. They will receive design tips, technical guidance, and peer-critique before the final presentation in a mutually supportive setting.
- As students learn about each other's research, they will observe a range of research methodologies that reflect the diversity of projects possible within the Hum Bio Honors Program.

Completing Your Honors Thesis

Thesis format and organization

You may use any of a number of citation styles or section heading formats for your thesis, as long as you are consistent and follow a format used by journals or a particular academic discipline. If you plan to submit your research as a journal article, it is fine to use the format that is required by the professional journals to which you are submitting the work. If you do not have a target journal in mind, simply choose a well-regarded journal in your field and adopt its format. You may want to consider using a program such as End Note or RefWorks to organize your references. Your printed hard copy may be single- or double-sided and your figures may be integrated into the text or printed on separate pages. *Pages must be numbered*, however.

Although styles and formats may vary, the thesis has clearly defined sections:

Abstract of approximately 150-200 words

Introduction including a literature review (essentially based on your autumn Literature Review) and a clear statement of your hypotheses. The introduction to your thesis will be more detailed than an introduction to a published paper. The overall structure should be similar, however, so you can use papers in your field as models.

Methods giving a detailed account of what you did. Again, your methods section will probably be more detailed than the same section would be in a published paper. Your audience will be a bit broader than most readers of a specialty journal, so you will need to explain your methods.

Results including figures. Your readers will be able to help you design effective figures.

Discussion of the significance of your findings. Again, your readers will be able to help you interpret your results and place them into context.

A first draft of your thesis will be due to both First and Second Readers in mid-April. A final draft will be due in mid-May. A hard copy and an electronic copy will be due to Humbio in early June. See the honors calendar for exact dates.

Thesis length and quality

An adequate thesis will be **at least** 20 pages long, excluding appendices, references, etc. Even the most straightforward projects require a thorough literature review and methods section, taking up many pages. Theses based on more complex projects or qualitative studies will be longer than this.

Given that the typical honors project is completed within a year, we understand that research setbacks may be difficult to overcome within this short time. Unexpected problems are routine in research. Whether your data are ultimately solid or not, we do expect the *design* of the study to meet the “publishable” standards of the field. However, if the final results do not quite merit publication, you will not necessarily be denied honors. The final evaluation is up to the First and Second Readers. Your readers should always be aware of any problems you may be having, and you should consult with them before changing your protocol or making other major changes to your project.

In some happy cases, the results of a thesis project will be important enough to be published on their own, and publication is a very reasonable goal for all thesis students. In some cases, getting

data consumes so much time that the results of a substantial project might be published as one part of a larger lab effort. Ideally, your thesis will be a longer and more detailed version of a published paper, and you will be able simply to pare it down to something you could submit.

No matter what ultimately happens to your data, you should feel that you have an intellectual investment in the project and that your work will produce a result that will be of interest to others in your field.

The Human Biology Honors Poster Symposium

The Human Biology Honors Poster Symposium is held each May. All graduating thesis students use a poster as the basis for a short presentation of the thesis to an audience. Each presenter is allotted 10 minutes for presenting the work and fielding questions. Posters are presented throughout the day and grouped by research topic. The audience usually consists of faculty advisers, fellow students, family, and friends, and the atmosphere is supportive yet professional. The symposium is followed by a wine and cheese reception for students, advisers, friends, and family.

The program of the most recent Poster Symposium may be found [here](#).

Students graduating at a time other than spring will present at another time, as arranged with the readers and the Student Services office.

Poster design and printing

Human Biology will print your poster at no charge to you if it is submitted on time and in the right format. Posters should be submitted as Powerpoint or PDF files and uploaded to the [poster submission page](#). The deadline for submitting will be announced, but it is generally midnight Tuesday the week of the symposium.

Assoc. Director Katherine Preston will hold a workshop on poster design the week before posters are due. A funny and useful discussion of poster design and presentation can be found at Colin Purrington's site: <http://www.swarthmore.edu/NatSci/cpurri1/posteradvice.htm>

Instructions for making a poster in Powerpoint

1. Before you place any graphics or text on your slide, use "Page setup" to customize your poster to 48" wide by 36" high. You will make your poster on a single large slide.
2. Set the background color of your slide to something light colored, against which you can use dark text. Do not use white lettering on a dark background because it is difficult to read and expensive to print.
3. Use text boxes to create your text as you wish (according to good design principles, of course).
4. If you are using a Mac, import figures or images using Insert > Picture > From File. If you use an image from the internet, download it to your hard drive first rather than copying and pasting to avoid losing the image when the file is opened on a PC.
5. Save your file using your first initial and last name. A file named "HonorsPoster.pdf" will overwrite another "HonorsPoster.pdf" and likewise be overwritten by yet a later "HonorsPoster.pdf." Use your unique name to avoid being overwritten! Save as a PDF.
6. Your poster should be only 2 or 3 MB, and it cannot be greater than 8 MB. If your poster is larger than that, there is probably something going on with the images.

Instructions for formatting a PDF

1. The process of converting your file to a PDF will depend on your operating system and the program you used to make your file initially. Seek help from someone familiar with both.
2. The most important formatting detail to consider is the shape of your PDF document. Your PDF should have the same relative dimensions as your finished poster. For a 48" W X 36" H poster, the height should be 75% of the width.
 - a. The height of a normal page in landscape orientation is 77% of the width, very close to the ideal 75%. There will be a little extra white space along the right and left sides of the page, but this small amount of white is barely noticeable and you probably don't need to correct it.
 - b. If you find that you do have a lot of white margin, be certain that your poster is not distorted in one direction and use Preview (in Mac) or Adobe writer to crop the PDF to the desired size and export it again to the proper page size.

Preparing the presentation

An experiment is not complete until you have communicated its results to others. As a trained scientist, you must be able to share your research with others in a professional setting. Most Humbio honors students (and most scientists in general) seem to enjoy presenting their research in public. Although some people appear to be natural born speakers, it is an illusion, and all good presentations take practice.

Take advantage of the expertise in your research group and find a way to practice in front of your colleagues. It often helps to practice early, before you have memorized statements that you will end up changing. Take feedback with an open spirit and discuss your final presentation with your First Reader. Draw on other Honors students as well.

The Hume Center has an Oral Communications Program specifically with students like you in mind. You may meet with oral communication specialists (for free) individually or as part of a group. The Hume Center will go so far as to videotape you as you practice your presentation. Although you may wince to see how often you fidget or stammer, taping can help you become much more comfortable during your delivery. Learn more and sign up at <https://undergrad.stanford.edu/tutoring-support/hume-center/speaking>.

Graduation with Honors: The Final Checklist

Completion and Evaluation of the Thesis

Your First and Second Readers must turn in their evaluations of your thesis before you actually receive credit for your work through HB 194 and are cleared to receive honors. Humbio has two separate evaluation forms—one for each reader. The form for the First Reader has space for a paragraph or two evaluating your performance, and for entry of the grade. The form for the Second Reader is exactly the same but without a space for grade entry. Human Biology sends these forms to all the readers; however, it is a good idea to ask your readers if they have received the forms so that Student Services can resend them if needed.

Take the following steps to be sure you can graduate with your BAH:

1. Ensure that the cumulative number of units in *both* Research (193 or 199 in any department or program) and “Honors” 194 does not exceed 15 units. See [above](#) for details.
2. Present your work in the Honors Symposium or another pre-approved venue.
3. Provide an unbound, reader-signed copy of the final draft of your thesis to the Student Services Coordinator (Lia Cacciari).
4. Provide an electronic copy to the Honors Director (kpreston@stanford.edu)
5. Confirm that your Readers’ evaluation forms have been returned.

Once all of these things have been done, CONGRATULATIONS! You are ready to graduate with Honors in Human Biology! You made it.

Appendix 1: The Honors proposal

At the heart of the Application (Part B) lies the research description, which should include the elements listed below. If the student is also applying for a Major Grant, a second copy of the Hum Bio proposal should be submitted separately to the UAR by **their deadline**. The application must be written entirely by the student. In other words, the student must (temporarily) claim ownership of the problem, even while benefitting from the constructive feedback of mentors.

Honors thesis applications (Part B) and UAR proposals should include the following elements:

Abstract – (no more than 200 words) The abstract should include some background and justification for the research, a description of the general research approach, and a brief statement of the questions to be answered. This section corresponds to the “objective” in the UAR proposal.

Introduction – The introduction explains the significance of the proposed work by providing essential background to the topic and placing the proposed work clearly in the context of previous work. The significance of the work goes beyond the practical or humanitarian significance. *Your first reader can help you explain why your work would be of interest to professionals in the field from an academic point of view.*

The introduction should end with a *clear and specific* statement of the hypotheses to be tested or questions to be answered and an indication of the general methodological approach.

Methods – This section should describe the proposed research methods in enough detail to demonstrate that they are appropriate, adequate, and feasible. Sample sizes should be given, along with sampling protocols where appropriate. In the case of complicated experimental designs or multi-part projects, specific methods should be linked explicitly to the hypotheses they are designed to test. The methods section should include a brief description of proposed analytical approaches or statistical tests. It sometimes happens that in a methods section it makes sense to quote a grant application or a paper about a procedure, for example. In such a case quotes must be limited in length and the student must acknowledge using someone else's work (cite by name, put the material in quotes, etc).

Preparation and current status – The Human Biology application includes a series of questions about the applicant's preparation, coursework, research to date, and the faculty member's involvement with the student and the project. These questions can be answered directly in the application form for Human Biology, but they should be summarized in a paragraph or two for the UAR proposal. If the research involves human subjects, a copy of the IRB submission and approval letter should be attached once they are available.

Budget – Any budget submitted to UAR or another funding source should be included in the Human Biology application as well.

Letter of support – First readers will be asked to submit a letter of support both to the UAR and to HumBio. The UAR's process is in flux; however *readers will be prompted by email to submit a*

letter to the HumBio website. Letters are due to HumBio a week after the proposal is due.

Appendix 2: Examples of past honors theses

The Firestone Medal for Excellence in Undergraduate Research is awarded University-wide to graduating students for honors projects in engineering and the social, physical and natural sciences. Below are recent winners from Human Biology.

2014

Emily Liang: "Association between latent proviral characteristics and Immune activation in antiretroviral-treated HIV type 1-infected adults"; Catherine Blish & David Katzenstein, School of Medicine

Louise Lu: "Gut instincts: knowledge, attitudes, and practices regarding parasitic intestinal worms in rural China"; Scott Rozelle, FSI-FSE & Julie Parsonnet, School of Medicine

McKenzie Wilson: "Geospatial patterns of burn injury in Cape Town: GIS analysis of burn-related ambulance dispatches"; Timothy Stanton, BOSP & Bob Siegel, School of Medicine

2013

Michael Diaz: "Analyzing the psychophysiological correlates of posttraumatic growth in metastatic breast cancer patients"; David Spiegel, Firdaus Dhabhar, & Arianna Aldridge-Gerry, Psychiatry

Elise Geithner: "Medical Post-Traumatic Stress Disorder in pediatric intensive care patients at Lucile Packard Children's Hospital"; Lisa Medoff, Human Biology & Richard Shaw, Psychiatry
(Winner of the David M. Kennedy Honors Thesis Prize in the Social Sciences)

Stephen Matzat: "Quantitative MR assessment of hip articular cartilage damage in patients with femoroacetabular impingement"; Garry Gold, Radiology & Marc Safran, School of Medicine

2012

Vanessa Dang: "Uncovering glutamine metabolism as a part of MYC associated oncogene addiction in renal carcinoma"; Dean Felsher, Paul Fisher, Emelyn Shroff, School of Medicine. (Winner of the David M. Kennedy Honors Thesis Prize in the Natural Sciences)

Amy Showen: "Exploring South African farmwomen's healthcare access and utilization experiences to optimize National Health Insurance implementation"; Tim Stanton, BOSP, & Paul Wise, Pediatrics.

Jaqueline To: "Kiss2 development in a socially-regulated vertebrate reproductive system"; Russ Fernald & Caroline Hu, Biology.

2011

Autumn Albers: "Identifying the barriers to condom use in rural Papua New Guinea"; Cathy Heaney & Jennifer Wolf, Human Biology.

Lee Love-Anderegg: "Linking tree ecohydrology, drought seasonality, and forest mortality"; Joe Berry, Carol Boggs, & Rodolfo Dirzo, Biology. (Winner of the David M. Kennedy Honors Thesis Prize in the Natural Sciences)

Elisa Zhang: "Faster-ageing strain of *Nothobranchius furzeri* fish regenerates a greater length of tail tissue upon partial injury than slower-ageing strains do"; Anne Brunet, Genetics & Russ Fernald, Biology.

Appendix 3: Sample of approved methodology courses

Biology, BioMedical Sciences, Lab Sciences: Students conducting research in biology or biomedical sciences or other lab sciences can satisfy the methodology requirement by working for a minimum of six months in the adviser's laboratory and acquiring the research skills necessary for their research. Also, the Bio 44 series (BOTH Bio 44X and 44Y) covers lab techniques, write-ups, scientific methodology (hypothesis generation and testing), etc. in a range of biology fields.

Humbio 82A: *Qualitative Research Methodology* (Professor Jennifer Wolf). Goal is to develop knowledge and skills for designing and conducting qualitative research studies including purposes, conceptual contexts, research questions, methods, validity issues, and interactions among these facets. Each student designs a qualitative research study.

Humbio 82B: *Advanced Data Analysis in Qualitative Research* (Professor Jennifer Wolf). For students writing up their own qualitative research. Students prepare a complete draft presenting their own qualitative research study including results, with reports drafted section by section, week by week. Class provides feedback, guidance, support.

Humbio 127A: *Community Health: Assessment and Planning I*—Major determinants of health in a community. Working with community partners to identify health issues and plan programs and policies to prevent disease and promote health. Service learning component involving students in community health assessment techniques.

Humbio 127B: *Community Health: Assessment and Planning II*—Continuation of 127A. Service learning course with emphasis on conducting community health assessment and planning projects in collaboration with community-based organizations.

Anthro 93: *The Prefield Research Seminar* – Prepares you for anthropological research in the field. Following data collection, students should attend the *Anthropology Post Field Seminar* (Anthropology 94).

Comm 106: *Communication Research Methods* – Conceptual and practical concerns underlying commonly used quantitative approaches (experimental, survey, content analysis, and field research in communication).

Comm 135: *Survey Research Methods* – Describing Large Populations with Small Samples and Precise Measures. The science of survey methodology and principles of optimal survey design.

Comm 239: *Questionnaire Design for Surveys and Laboratory Experiments: Social and Cognitive Perspectives* – The social and psychological processes involved in asking and answering questions via questionnaires for the social sciences; optimizing questionnaire design.

Educ 151: *Introduction to Qualitative Research Methods and Qualitative Research Methods; Part 2* (Education 151B). Issues, ideas, and methods.

Educ 155: *Development of Measuring Instruments* – offers instruction for students planning to develop written or performance tests or questionnaires for research and evaluation.

Med 147: *Methods in Community Assessment, Evaluation and Research* – Pragmatic skills necessary for the design, implementation and analysis of structured interviews, focus groups, survey questionnaires and field observations; principles of community based participatory research.

Psych 110: *Research Methods and Experimental Design* – provides a general overview of the pertinent issues in conducting psychological research, from ethical issues, to design, to analyzing and writing up data.

Soc 180: *Introduction to Sociological Research* – How to design a sociological study.

Soc 180A: *Foundations of Social Science Research* – Formulating a research question, developing hypotheses, probability and non-probability sampling, developing valid and reliable measures, qualitative and quantitative data.

Soc 180 B: *Evaluation of Evidence* – Methods for analyzing and evaluating data in sociological research: comparative historical methods, ethnographic observation, quantitative analysis of survey data, experimentation, and simulation.

Soc 182: *Designing Surveys for Social Science Research* – Practical introduction to survey methods. Topics include causality, research design, sampling, and item and questionnaire format.

Soc 183: *Qualitative Methods in Social Science Research* – prepares students to design and implement their qualitative research projects, connecting research to theoretical concerns in the social sciences, formulating appropriate research strategies and project design.

MAPSS Methodology Courses: A listing of social science methodology courses can be found at MAPSS (Methods and Analysis Program in the Social Sciences): <http://stanford.edu/group/mapss>. You can enroll in either undergraduate or graduate courses (provided you have the professor's consent).

Other: If the course you wish to take in fulfillment of the methodology requirement is not listed above, please inform either Lia Cacciari (Student Services) or Professor Katherine Preston (Chair of Honors) and provide the description of the course for evaluation.

Or, if none of the above options are relevant to the skills needed for your research, you may petition the Chair of the Honors Committee to engage in a reading course on methodology with your research adviser. Students will be required to submit a reading list on methodology designed by their research sponsor (First Reader).

Appendix 4: People to know and links to follow

Student Services Officer Lia Cacciari

Graduation requirements, thesis binding, registering for honors units
Bldg 20, 21D cacciari@stanford.edu

Associate Director and Honors Chair Katherine Preston, PhD

Application submission, proposal reviews, relationships with mentors, thesis structure, poster symposium
Bldg 20, 22F kpreston@stanford.edu

Writing Specialist Shay Brawn

All aspects of writing, including the proposal, literature review, and thesis
Bldg 20, 22L by appointment brawn@stanford.edu

Program Manager Linda Barghi

Human subjects compensation
Bldg 20, 22D lindab@stanford.edu

Human Subjects (Institutional Review Board, IRB)

Required protocols for students working with human subjects

<http://humansubjects.stanford.edu/index>

For nonmedical protocols:

IRB 2 Manager (Nonmedical) Lauri Kanerva

650-723-2480 Lauri.Kanerva@stanford.edu

Undergraduate Advising and Research (UAR)

Small and Major grants for student research, relationships with mentors

<https://undergrad.stanford.edu/opportunities/research/get-funded/apply-uar-student-grants>

Sweet Hall, 650-723-2426 vpue-research@stanford.edu

Hume Center for Writing and Speaking

Oral communication tutoring for your symposium presentation

Building 250, Lasuen Mall

<https://undergrad.stanford.edu/tutoring-support/hume-center/see-tutor>

Appendix 5: Honors format checklist

- The file is named with your first initial and last name.
- The pages are numbered.
- The thesis is at least 20 double-spaced pages in length, including figures and acknowledgments but excluding references and appendices. (Median length is 40 pgs; mean length is between 45 and 50 pgs; the best length depends on your project).
- There is only a single column of text on each page.
- A table of contents lists the main thesis sections and corresponding page numbers.
- The main thesis sections are titled with section headings. Subheadings are optional.
- A title page lists the title, your name, and the names and professional titles of your readers next to spaces for their signatures.
- There is a consistent format for in-text citations and the list of references. The format should be standard, for example following instructions from a good journal in the field.
- The file has been checked for spelling errors.