

Class Information

Integrative Biology 198 – Neurozoology: Animal Brain's and the Environment

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Instructor of Record: Alan Shabel, PhD

Meeting time/place: Tuesdays, 6:30-8pm; 101 Moffitt

CCN: 33484

Class Description/Objectives

The brain is one of the most complex, diverse, and mysterious anatomies in the animal kingdom. Phylogenetic and ontogenetic processes that affect an animal's response to its environment can lead to dramatic variation in nervous system anatomy. The most elusive diseases that humans have to deal with involve the brain. Diseases such as Alzheimer's Disease are vastly misunderstood by the public (and by many scientists!) The human brain is, just as much as anything else in nature, a result of the patterns and processes of evolution. Understanding these patterns and processes, particularly how they affect the brain, is crucial for our understanding of brain disease. A zoological approach to neuroscience will help us understand these patterns and processes. This class will highlight some of the most extreme and exciting examples of brain anatomy, behavior, and cognition across the animal kingdom.

By the end of the class, you will be equipped to:

- Appreciate and assess the diversity in the biological foundations for complex behaviors and actions.
- Evaluate the evolutionary processes that lead to these structures.
- Understand how researchers approach questions in the intersecting fields of zoology and neurology.

The class is designed for all majors, freshman-senior who have an interest in animals, neurology, evolution, or nature as a whole.

Overview

Lecture

This class will have a combination of lectures intended to highlight the diversity of nervous systems across the animal kingdom as well as research lectures from scientists in the fields of neuroscience and zoology.

Homework

There will be weekly homework assignments intended to expose you to research in the intersecting fields of zoology and neurology. These will either be in response to articles or that week's research lecture.

Field trips/Essays

Throughout the semester there will be opportunities to go into the field to observe animals in their natural habitat. Some students may be unable to attend these, so students can opt to submit short essays that will prompt them to think about interesting topics in neurozoology.

Final assignment

There will be an option between a final exam or a final essay to demonstrate an understanding of the concepts covered in the class.

Requirements

To earn a “P” in this class, you need to earn a minimum of 125 points in the class. Here is how you can accumulate points:

Activity	Points	Notes
Attending class	5	There will be a sign in sheet going around class
Homework	3	See “Homework” below
Field trips	10	See “Field trips” below
Short essays	0-10	See “Essays” below
Final exam/essay	0-30	See “Final Assessment” below
Extra credit	There is no extra credit because there are many opportunities to get points. There will, however, be small opportunities beyond those listed here.	

During lectures, there is no need for technology so please keep laptops, phones, tablets, etc. away unless you choose to take notes on your laptop. Please do not be on facebook, checking email, or doing assignments for other classes. If you are having trouble balancing your schedule with other responsibilities, we can figure out a solution by emailing me ahead of time. During guest lectures, please refrain from any use of electronics.

As with any course at UC Berkeley, we will strictly adhere to the Academic Honesty Policy. Animals are fun to learn about and there are plenty of opportunities for you to pass this class. Don’t cheat. For more information, see <http://sa.berkeley.edu/conduct/integrity>.

You can check your grades throughout the semester on the course website.

Homework

Each lecture week, articles will be posted that are relevant to the class. You are asked to write a 1-2 paragraph response to the article. Briefly highlight points such as questions, methodology (including flaws), major findings, and larger implications. For those weeks with a research lecture, summarize the research interests of the presenter and discuss the larger implications of their work. These will be due at the beginning of class the following week by submitting it to the course website. You will get three points if you complete the assignment and show understanding of the material, zero if you do not. Late submissions will lose 1 point.

Field trips

A great way to understand these concepts (and nature in general) is to actually go into nature. You are free to attend any of the field trips. Some will require short walks/hikes but will require nothing strenuous or hazardous. Equipment will generally be pretty minimal (you will not be required to go and buy anything), but I will send out recommendations prior to each trip. Binoculars are a great investment and will greatly enhance your experience every time you go into nature. I personally use and recommend the Nikon Monarch 5 (8x42). You are not required to go on any field trips, but I highly recommend it. They are designed to be fun and frankly, are a really easy way to accumulate points. If you show up and contribute to the discussions on the field trip, you will receive full credit for that trip.

Make sure you fill out and submit the field trip waiver form posted on the course website. You will have to figure out your own transportation so try to find a friend with a car (feel free to bring people not in the class!) A field trip schedule will be posted by Week 3. Additionally, you are encouraged to organize with groups of people in the class to go out to sites outside of class field trips. We will award points for this in some circumstances. Please go with a group, email us before hand to make sure it is appropriate for course credit, and send me an email with a short write up about what you saw.

Essays

The essay should be 2 pages, times, 12pt font, 1.5-spaced. Please cite a variety of credible resources (using a common citation format of your choice – APA, MLA, Chicago...) You can do as many essays as you would like throughout the semester. We will accept them until 4/4/17. You will loose 2 points/day it is overdue.

Submit your essays by uploading them to the class bCourses website with Turnitin. Here are the prompts:

- Are humans the smartest animal? What does it mean to be “smart” in the animal kingdom?
- Why do we have brains? What kind of evolutionary pressures resulted in a brain? What kind of evolutionary pressures make a brain big?
- I just got a new puppy. As a neurozoologist, how would you train my new friend? Explain the neurological basis for my new friendship and his obedience.
- The brainstem and cerebellum are commonly referred to as the “reptilian brain”. Why is this? Should this be the case? Highlight and evaluate the rationale behind this nomenclature.

If you are uninspired by the above prompts, email me and we can figure out alternatives.

Final Assessment

You will have a choice between a multiple choice test and essay, both due at the end of the final exam period (meeting 14). To pass the class you need to submit this assignment. I do not intend to make the exam or essay any harder than the other, but everyone has strengths and may prefer one. If you show up to all the classes and have done the readings, this will be a piece of cake.

If you choose the essay, the prompt will be:

Alzheimer's Disease is the only major disease that has increased in frequency in the last decade. With an aging population, the Alzheimer's Association expects nearly 13.8 Million people to have AD in the US by 2050, costing \$1.1 Trillion. Based on things you have learned in this class why should funding still go to study animal brains?

The essay should be 4-5 pages, times, 12pt, 1.5 spaced. Please cite a variety of credible resources using a common citation format of your choice – APA, MLA, Chicago... The prompt is intended to be very open-ended so any approach or well-supported stance you take will be appropriate. Grades will be awarded based on your ability to use a wide-range of examples and tie them together using principles in evolutionary biology and zoology. Essays need to be uploaded to the course website by 8pm on April 25 (the end of the final exam period). No late essays will be accepted.

If you choose the exam, expect 30 questions that will cover key points from the readings and lectures. The questions will be a combination of multiple-choice, true-false, and short answer.

Where to Get Help

We are happy to answer any questions or concerns you have about the class. Feel free to email us at chrenberg@berkeley.edu, jaydenrobert@berkeley.edu, and ggschednel@berkeley.edu. We have no formal office hours, but we encourage individual meetings outside of class, particularly for those of you who are first- or second-year students figuring out your plans for your time here at Berkeley. Email us and we can set up a time!

If there are concerns you have that you feel cannot be settled by us, contact the instructor of record, Alan Shabel (shabel@berkeley.edu).