ANIMAL COMMUNICATION
ESPM C156/IB C145

Instructor: Damian Octavio Elias
Office Hours: Tuesday, 1-2pm (https://berkeley.zoom.us/j/97056685733) or by appointment
Email: doelias@berkeley.edu

Lecture: M-W-F 3:10 - 4:00 pm
Location: Dwinelle 219

Course Description:

Communication is central to the lives of most, if not all animals. How and why animals communicate is thus central to understanding the ecology, behavior, neurobiology, and evolution of animal systems. This course will focus on understanding the basic principles driving the communication system of species, drawing together topics ranging from the physical properties of the environment, physiology of sensory systems, animal behavior and ecology. Of particular focus will be to understand the vast diversity of animal communication systems and myriad of ways that animals have evolved to communicate with one another.

THE COURSE SYLLABUS IS SUBJECT TO CHANGE.

Course Objectives:

The objective of the course is to gain a deeper appreciation and understanding of animals by examining and discussing animal communication. Through the course, we will focus on many different kinds of animals aiming to understand how the particular natural, life, and evolutionary history of an animal as well as an individual's sensory physiology and physical environment drives a dizzying amount of diversity. We will attempt to explore animal centered perspectives by critically evaluating the animal communication literature as well as how our human perspectives influence how we study, interpret, and conceptualize animal bodies, senses, and behavior. Guiding objectives include:

(1) To understand the different physical environments of different animals
(2) To understand variation in the way different animals sense and perceive the world
(3) To understand how Western science is used to conceptualize an animals internal world and their social interactions
(4) To explore different ways of thinking about animals, animal interactions, and an animals internal world using creative approaches
(5) To question simplistic interpretations of animal behavior and interrogate how human-centered perspectives and assumptions shape how we view animals

(6) To learn about the diversity of ways animals communicate with each other and what this can tell us about the diversity of the natural world and evolutionary processes

One of my guiding principles and one that I would like that this class reflect is an appreciation of the "scientific sublime" and how the tools of science can be used to understand the wonder that surrounds us. The feeling of the "sublime" is inclusive, as many of us have been moved by particular experiences. My goal is that participants in the class will be able to see the wonder around us through the lens of western science. The diversity of animal life can show us how much is possible and how there is no "normal" and instead, variation, resilience and adaptation are key features of life.

Textbook

Principles of Animal Communication, 2nd Edition, Bradbury and Vehrencamp Sinauer Publishing.

This textbook is ***not required*** but provides useful background material and further readings. Students interested in graduate school will find this textbook as a great resource.

Attendance and participation

This course is designed to be in person. As such, I expect you to attend class as much as possible even though all lectures and lecture slides will be posted online. I will not be taking attendance but if possible, do encourage in person attendance (when possible).

Access

If you require accommodations, please notify me as soon as possible, and as regularly as you need to. Additionally, please notify me if my attempts to make the lecture material accessible falls short of your learning needs. We all learn best in different ways and it is my goal to accommodate different learning styles/needs as much as I can.

If you need official accommodations, you may register with the Disabled Students Program (dsp.berkeley.edu).

Here is a list of additional resources:

- The Student Learning Center (https://slc.berkeley.edu/);
- Be Well Cal (https://uhs.berkeley.edu/node/56)
- The many programs for "non-traditional students" clustered under CE3: https://ce3.berkeley.edu/. and the Basic Needs Hub, where you can find information on resources for meeting food, housing, financial and conflict resolution needs: http://basicneeds.berkeley.edu/Links to an external site.
- You may be eligible for money to buy groceries via calfresh.berkeley.edu or our Food Assistance Program. If you are in need of food immediately, please visit our UC Berkeley Food Pantry at https://pantry.berkeley.edu/.

Late Policy

You are expected to submit all assignments on time. You will generally have an additional week to submit an assignment but please try to keep on top of your assignments. If circumstances arise that

prevent you from submitting an assignment on time please contact me to make accommodations. I am happy to work with you and understand that situations arise from time to time.

Academic Integrity

Reusing text or ideas from someone else's work (including your own) without appropriate reference is plagiarism. You must compose your own original assignments in this class even if it is a group assignment (unless otherwise stated). Plagiarism will result in a 0 grade for that assignment and potential further disciplinary action. For additional information on plagiarism and self-plagiarism see: http://www.lib.berkeley.edu/instruct/guides/citations.html#Plagiarism and http://gsi.berkeley.edu/teachingguide/misconduct/prevent-plag.html

Using Machine Learning

While we strongly advise against relying on LLM (Large Language Models such as ChatGPT) for assignment purposes due to their current limitations which are particularly stark in STEM fields, we acknowledge their potential to enhance your writing and aid in skill development. If you opt to utilize them for assistance, it is mandatory to submit the text prompts that guided the generation of your assignments as an addendum to your assignment

Policy on Sexual Violence and Harassment

Sexual violence, harassment, and bullying will not be tolerated. If your behavior perpetuates harm class (whether in-person or on-line), you may be removed from the class temporarily or permanently, or from the University. If you or someone you know experiences sexual violence or harassment, there are options, rights, and resources, including assistance with academics, reporting, and medical care. Visit survivorsupport.berkeley.edu or call the 24/7 Care Line at 510-643-2005. If you have questions about sexual harassment policies or complaint resolution processes, visit https://ophd.berkeley.edu

Grading

In efforts to be transparent, I will use alternate assessments of your learning this semester. People learn in different ways and my goal is to acknowledge this and build into the course a diversity of ways to assess understanding of the course material. The final course grade will be based on 600 points.

300 points will be allotted to three midterms (including final). The midterms will consist of a combination of short answer and multiple choice questions. For the short answer portion, students will be allowed to select 4/6 questions to answer. Students will be allowed to "reanswer" one short answer question after the midterm is graded for the first two midterms (details to be announced later). Note that this will not be available for the final exam. For the final, students will have the option of selecting between a midterm (see above), a creative project, or a 10 page essay on a topic (topic must be approved by the instructor). For the creative project, students will need to write a statement that ties their creation to specific lecture material or ideas (however this manifests!). Evaluation rubrics for the essay and creative project will be posted at a later time.

150 points will be allotted to weekly assignments through the academic semester. Weekly assignments will be simple and meant to be an opportunity to demonstrate your knowledge and engagement in the course material. Details of weekly assignments will vary but consist of some combination of current literature and/or YouTube searches, podcast or program summaries, art projects, etc.

100 points will be allotted to four assignments (25 points each). Students will be asked to select and breakdown the primary literature and asked to demonstrate their understanding of a specific paper which may include discussing gaps in their knowledge. Flexibility will be given to the student as to the approach they want to take for these assignments. Classroom will be "flipped" for these assignments. Students will be asked to select and read a primary paper before class and class time will be spent discussing and starting the assignment.

50 points will be allotted to a final reflection assignment where students will be asked to assess how they thought they did in the course and their understanding of the material. If students complete this assignment, they will receive the full 50 points.

THE COURSE SCHEDULE IS SUBJECT TO CHANGE.

Date	*Module*	*Topic*	*Textbook readings*
1/17/2024	*Introduction to communication*	*Course introduction and community guidelines*	
1/19/2024	*Bioacoustics*	*Introduction to animal communication*	*Chapter 1*
1/22/2024	*Bioacoustics*	*Acoustics 1*	*Chapter 2*
1/24/2024	*Bioacoustics*	*Acoustics 2*	*Chapter 2*
1/26/2024	*Bioacoustics*	*Acoustics 3*	*Chapter 2*
1/29/2024	*Bioacoustics*	*Sender bioacoustic mechanisms 1*	*Chapter 2*
2/31/2024	*Bioacoustics*	*No Class - Sender bioacoustic mechanisms remote lecture*	*Chapter 2*
2/2/2024	*Bioacoustics*	*No Class*	
2/5/2024	*Bioacoustics*	*Receiver physiology 1*	*Chapter 3*
2/7/2024	*Bioacoustics*	*Receiver physiology 2*	*Chapter 3*
2/9/2024	*Bioacoustics*	*Receiver physiology 3*	
2/14/2024	*Bioacoustics*	*Primary Literature discussion*	
2/16/2024	*Bioacoustics*	*Midterm 1 (remote)*	
2/19/2024	*Presidents Day*	*No Class*	
2/21/2024	*Guest Lecture*	*Erin Brandt – U Chicago*	
2/23/2024	*Visual Communication*	*Light 1*	*Chapter 4*
2/26/2024	*Visual Communication*	*Sender visual production mechanisms 1*	*Chapter 4*
2/28/2024	*Visual Communication*	*Sender visual production mechanisms 2*	*Chapter 4*
3/1/2024	*Visual Communication*	*Receiver optics and visual physiology 1*	*Chapter 4*
3/4/2024	*Visual Communication*	*Receiver optics and visual physiology 2*	*Chapter 5*

3/6/2024	*Visual Communication*	*Color Vision*	*Chapter 5*
3/8/2024	*Visual Communication*	*Color Vision*	*Chapter 5*
3/11/2024		*TBD*	
3/13/2024	*Visual Communication*		*Chapter 5*
3/15/2024	*Visual Communication*	*Primary Literature Discussion*	
3/18/2024		*Midterm 2*	
3/20/2024	*Chemical signals*	*Chemical signals 1*	*Chapter 6*
3/22/2024	*Chemical signals*	*Chemical signals 2*	*Chapter 6*
3/25/2024	*Spring Break*	*No Class*	
3/27/2024	*Spring Break*	*No Class*	
3/29/2024	*Spring Break*	*No Class*	*Chapter 6*
4/1/2024	*Chemical signals*	*Primary Literature Discussion*	
4/3/2024	*Chemical signals*	*TBD*	
4/5/2024		*TBD*	
4/8/2024	*Signal Evolution*	*Signal Design 1*	*Chapter 8,10*
4/10/2024	*Signal Evolution*	*Signal Design 2*	*Chapter 8,10*
4/12/2024	*Signal Evolution*	*Signal Honesty 1*	*Chapter 10*
4/15/2022	*Signal Evolution*	*Signal Honesty 2 (Remote)*	*Chapter 10*
4/17/2022	*Animal signals*	*Mating signals 1 (Remote)*	*Chapter 12*
4/19/2022	*Animal signals*	*Mating signals 2 (Remote)*	*Chapter 12*
4/22/2022	*Animal signals*	*TBD*	
4/24/2022	*Animal signals*	*Aggressive signals 1*	*Chapter 11*
4/26/2022	*Animal signals*	*Aggressive signals 2*	*Chapter 11*
4/29/2022	*Animal signals*	*Social integration signals 1*	*Chapter 13*
5/1/2022	*Animal signals*	*Social integration signals 2*	*Chapter 13*
5/3/2022	*Animal signals*	*Primary Literature Discussion*	