

ANIMAL COMMUNICATION (BIOL 32)
Spring 2020

INSTRUCTOR:	Hannah ter Hofstede
OFFICE LOCATION:	Life Sciences Building 026
EMAIL:	Hannah.ter.Hofstede@Dartmouth.edu
OFFICE PHONE:	646-8830
OFFICE HOURS:	Online via Zoom: Thu 1:05-2:00 or by appointment
CLASS MEETINGS:	Online via Zoom: Mon Wed Fri 10:10-11:15
X-HOURS:	Online via Zoom: Thu 12:15-1:05. Please keep these times available for course related activities, including unscheduled lecture sessions as needed.
PRE-REQUISITES	One of Bio 12-16 or Psyc 6

COURSE DESCRIPTION

This is an intermediate level course that will examine how and why animals have evolved to communicate with one another. The study of animal communication is interdisciplinary because it integrates information about the physics of the signals to which animals respond, the neural basis of signal detection and processing, and the evolutionary mechanisms that can influence communication in animals. Course material will be delivered in lectures, posted articles and discussions throughout the term. Please see the schedule on pages 3-4 for dates and topics of lectures and discussions.

LEARNING OUTCOMES

By the end of this course, students should be able to:

- Explain the main reasons why animals communicate with each other and describe specific contexts.
- Demonstrate a basic understanding of the physics and neurobiology underlying communication using different sensory modalities.
- Demonstrate a fundamental understanding of the evolutionary processes involved in shaping animal communication.
- Apply this knowledge to make logical inferences about mechanistic or evolutionary processes involved in animal communication.
- Describe how the scientific method is used to gain knowledge, including the roles of hypotheses, predictions, and experimental design.
- Critically read and evaluate the primary literature in the field of animal communication and effectively communicate these ideas both verbally and in writing.
- Write a report demonstrating an in-depth understanding of a specific topic in animal communication with an effective synthesis of the scientific literature.

COURSE MATERIALS AND RESOURCES

Course materials will be available through the Canvas website (schedule, Powerpoint slides of the lectures, reading materials such as articles for discussions, and instructions for assignments). There is no required textbook for this course. Videos of each lecture will be made available within 24 hours after the class.

Lectures, class activities and discussions will be conducted online at the usual class time using the videoconferencing software Zoom. Please visit <https://dartmouth.zoom.us> for information on how to use Zoom and to log into your Zoom account using your Dartmouth credentials.

HONOR PRINCIPLE

During this course, it is expected that students will abide by the Honor Principle. The Dartmouth College Student Handbook (page iii) states "Fundamental to the principle of independent learning are the requirements of honesty and integrity in the performance of academic assignments, both in the classroom and outside. Dartmouth operates on the principle of academic honor, without proctoring of examinations. Students who submit work which is not their own or who commit other acts of academic dishonesty forfeit the opportunity to continue at Dartmouth." Students are encouraged to discuss course material with classmates in preparation for tests and class discussions. However, students must not give or receive help during quizzes and discussions and the independent project must be the results of the student's own independent work, not the result of a collaborative effort with others.

STUDENT NEEDS

Academic Skills Center: <https://students.dartmouth.edu/academic-skills>

Student Center for Research, Writing, and Information Technology: <https://students.dartmouth.edu/rwit>

Student Accessibility Services: <https://students.dartmouth.edu/student-accessibility>

Title IX Office (sexual respect website): <https://sexual-respect.dartmouth.edu/>

Students with disabilities who may need disability-related academic adjustments and services for this course are encouraged to contact me as early in the term as possible. Students requiring disability-related academic adjustments and services must consult the Student Accessibility Services office (Student.Accessibility.Services@Dartmouth.edu, 646-9900). Once SAS has authorized services, students must provide me with the SAS Services and Consent Form and/or a letter on SAS letterhead. As a first step, if students have questions about whether they qualify to receive academic adjustments and services, they should contact the SAS office. All inquiries and discussions will remain confidential.

Dartmouth is dedicated to establishing and maintaining a safe and inclusive campus where all have equal access to the educational and employment opportunities Dartmouth offers. We strive to promote an environment of sexual respect, safety, and well-being. In its policies and standards, Dartmouth demonstrates unequivocally that sexual assault, gender-based harassment, domestic violence, dating violence, and stalking are not tolerated in our community. Please note that, as a faculty member, I am obligated to share disclosures regarding conduct under Title IX with Dartmouth's Title IX Coordinator. Confidential resources are also available (see <https://sexual-respect.dartmouth.edu/reporting-support/title-ix-resources>).

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please contact me before the end of the second week of the term to discuss appropriate accommodations.

EVALUATION

For Spring term 2020, Dartmouth College has moved to a credit / no credit system instead of letter grades for all courses. All assignments and tests will be graded following the grading scheme described on page 3, and a final grade of 60% or higher is required to receive credit for the course.

Please communicate with me *before deadlines* if you have extenuating circumstances that are preventing you from making a deadline for graded course components. Exceptions will only be made for illness, a family emergency or unforeseen connectivity issues, and alternate arrangements for completing assignments and tests should be made in advance when possible. Without permission from the instructor, missed quizzes, discussions and presentations will receive a grade of zero. Late assignments, including components of the independent project, will be penalized at 10% per day.

EVALUATION (con't)

Evaluation will be based on four quizzes, five class discussions of the primary literature, and an independent project. See class schedule below and the Canvas website for due dates.

Quizzes (4 x 15% each, 60% of final grade): There will be four quizzes throughout the term, each worth 15% of the final grade. Each quiz will consist of short answer questions. Although the quizzes will focus on the material covered since the previous quiz, much of the information from earlier components in the course will be incorporated into the increasingly integrative material later in the course. In this sense, the quizzes will be cumulative. Quizzes will be completed through the Canvas website. *Students must complete at least 3 quizzes to receive credit for the course.*

Literature Discussions (5 x 3% each, 15% of final grade): Five class periods will consist of class discussions of review articles and original research papers on major topics in animal communication. An assignment worth 2% of the final grade will be due at the start of class on discussion dates and participation in discussions will be worth 1% of the final grade. Detailed instructions for discussion assignments and participation will be available on the Canvas website. *Students must participate in, and complete the assignment for, at least 3 of the 5 discussions to receive credit for the course.*

Independent Project (25% of final grade): A presentation and written analysis of a problem or question in animal communication of the student's choosing will be submitted at the end of the course. The project will have five components, three of which will be evaluated for the final grade: statement of research question, first draft of paper outline, paper outline (5% of final grade), presentation (5% of final grade), and written report (15% of final grade). Detailed instructions for each component will be available on the Canvas website. *Students must complete all graded components of the independent project (outline, presentation and written report) to receive credit for the course.*

COURSE SCHEDULE:

DATE	TOPIC	READINGS
Mon 3/30	Lec. 1: Course Introduction / What is communication?	
Wed 4/1	Lec. 2: The Nervous System: signal detection and recognition	
Thu 4/2	Lec. 3: Decision making and economic models	
Fri 4/3	Class discussion 1 (3%): Information	Rendall et al. 2009 Seyfarth et al. 2010
Mon 4/6	Lec 4: The scientific method and primary literature	
Wed 4/8	Lec. 5: Functions and contexts of communication	Davies & Halliday 1978, Chaverri et al 2010, Vincent 1995, Lessells et al 1991, Sillen-Tullberg 1985
Thu 4/9	Review session 1	
Fri 4/10	Quiz 1 (15%)	
Mon 4/13	Lec. 6: Acoustic signals	
Wed 4/15	Lec. 7: Visual signals Submit topic for independent project	
Thu 4/16	X-hour: no lecture	
Fri 4/17	Class discussion 2 (3%): Multimodal signaling	Higham & Hebets 2013 Secondi et al. 2015

COURSE SCHEDULE (con't):

DATE	TOPIC	READINGS
Mon 4/20	Lec. 8: Chemical signals	
Wed 4/22	Lec. 9: Short-range modalities	
Thu 4/23	Review session 2	
Fri 4/24	Quiz 2 (15%)	
Mon 4/27	Lec. 10: Reproduction 1	
Wed 4/29	Lec 11: Reproduction 2 Submit first draft of independent project outline	
Thu 4/30	Lec. 12: Evolutionary origins of signals	
Fri 5/1	Class discussion 3 (3%): Sensory exploitation	Shaw 1995 Rodríguez 2009
Mon 5/4	Lec. 13: Social signals	
Wed 5/6	Lec. 14: Communication networks	
Thu 5/7	Review session 3	
Fri 5/8	Quiz 3 (15%)	
Mon 5/11	Lec. 15: Guest lecture by graduate students in EEES	
Wed 5/13	Lec. 16: Conflict resolution Submit revised independent project outline (5%)	
Thu 5/14	Lec. 17: Interspecific communication and eavesdropping	
Fri 5/15	Class discussion 4 (3%): Honesty	Zahavi 1975 Dawkins & Guilford 1991
Mon 5/18	Lec. 18: Human communication	
Wed 5/20	Lec. 19: Language	
Thu 5/21	Review session 4	
Fri 5/22	Quiz 4 (15%)	
Mon 5/25	Memorial Day: no class	
Wed 5/27	Independent Project presentations (5%)	
Thu 5/28	Independent Project presentations (con't)	
Fri 5/29	Independent Project presentations (con't)	
Mon 6/1	Class discussion 5 (3%): Communication in other organisms	Heil & Karban 2009 Keller & Surette 2006
Wed 6/3	No class: Independent Project due (15%)	