

# Animal Communication (Bio32)

Spring 2014

<b>Instructor:</b>	Hannah ter Hofstede
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<b>Office Phone:</b>	646-8830
<b>Office Hours:</b>	Thu 9:00 - 10:30
<b>Class Meetings:</b>	Mon Wed Fri 11:15 – 12:20 LSC 105
<b>X-hours:</b>	Tue 12:00 - 12:50. Please keep these times available for course related activities (see course schedule below), including unscheduled lecture sessions as needed.
<b>Pre-Requisites</b>	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 behavior, and communication in particular, 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 Objectives

The objectives of this course are to...

1. Examine **how** animals communicate with each other: proximate questions about communication.  
The physical adaptations and constraints on generating and receiving signals in different sensory modalities (acoustic, visual, olfactory, and others)
2. Investigate the **evolutionary processes** that influence communication in animals.  
Issues related to decision-making, information, honesty, receiver psychology, sensory exploitation, and multimodal signals
3. Examine **why** animals communicate with each other: ultimate questions about communication.  
A look at the most common **contexts** for communication in animals (conflict, mating, social and interspecific interactions)
4. **Integrate** this information and these concepts in a look at **human** communication

## Text Book and Resources

**Text book:** Bradbury, JW and Vehrencamp, SL (2012) *Principles of Animal Communication*, 2nd ed. Sinauer Associates; Sunderland, Massachusetts.

The text book is not required, but it can be helpful as a supplementary source of information and alternative format for understanding the material covered in the lectures.

Companion website for the text book: <http://sites.sinauer.com/animalcommunication2e/index.html>

Here you can find the "web topics" and a list of the references cited in the textbook.

A copy of the text book is on reserve at the library (<http://www.dartmouth.edu/~library/reserves/>).

Articles that are required reading will be posted on canvas.

## Course Structure and Expectations

Course material will be delivered in lectures or by student-led presentations with discussions. Part I (Signal Modalities) and Part III (Signal Context) will cover background information necessary for understanding later concepts; therefore, these parts of the course will consist of lectures. I encourage you to ask questions or make comments at any time during these lectures and I hope these will often lead to class discussion. Part II (Signal Evolution) covers and integrates ideas that are best learned through discussion, and in this section of the course, students will be asked to prepare presentations that summarize review or opinion articles from the primary literature and to lead discussions of these papers (see "Evaluation" below for details). Part IV (Human Communication) will be a mix of lectures and discussions.

Students are expected to abide by the Dartmouth College *Academic Honor Principle*:

<http://www.dartmouth.edu/~reg/regulations/undergrad/acad-honor.html>

I encourage you to discuss course material with classmates in preparation for the presentations and exams. Keep in mind, however, that students must not give or receive help during exams and that the presentation and discussion questions 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: <http://www.dartmouth.edu/~acskills>

Research Center for Writing, and Information Technology: <http://www.dartmouth.edu/~rwit>

Student Accessibility Services: <http://www.dartmouth.edu/~accessibility>

Students with disabilities enrolled in this course and who may need disability-related classroom accommodations are encouraged to make an appointment to see me before the end of the second week of the term. All discussions will remain confidential, although the Student Accessibility Services office may be consulted to discuss appropriate implementation of any accommodation requested.

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 meet with me before the end of the second week of the term to discuss appropriate accommodations

## Evaluation

Evaluation will be based on three cumulative exams plus class presentations and discussions. Exams I & II will be held during class time (see course schedule below).

**Exams: Midterm I (20%), Midterm II (25%), Final (35%).** Each exam will consist of short and long answer questions. Although the exams will focus on the material covered since the previous exam, 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 exams will be cumulative.

**Presentations: (10%).** Each student will be assigned one article from the primary literature to summarize for the class in a short (10 min) presentation. This will be the introduction for the following student-led discussion of the paper. Detailed instructions for this assignment will be posted on canvas.

**Discussions: leading (5%), participating (5%).** For each article presented in class, another student will lead the discussion of the paper with the class. Therefore, each student will be discussion leader for one article, but not the same article as they present. Discussion leaders should prepare a list of thoughts and questions for the class that they can draw on to facilitate the discussion of the most interesting / controversial / confusing aspects of the article. Detailed instructions for this assignment will be posted on canvas.

### Important Dates:

**Midterm Exam I (20%):** In class Fri. Apr. 4 2014

**Presentations (10%):** In class Apr. 9-25, 2014

**Discussion leading (5%) & participation (5%):** In class Apr. 9-25, 2014

**Midterm Exam II (25%):** In class Wed. Apr. 30, 2014

**Final Exam (35%):** TBA

## Course Schedule:

Date	Topic		Readings
PART I: SIGNAL MODALITIES			
3/24/14	Lec 1	Introduction - Senders, receivers and signals	Chap 1
3/25/14	X-hour		
3/26/14	Lec 2	Acoustic signals	Chap 2 & 3
3/28/14	Lec 3	Visual signals	Chap 4 & 5
3/31/14	Lec 4	Chemical signals	Chap 6
4/01/14	X-hour	Presenting and leading discussions of papers	
4/02/14		Review session and question period for exam I	
4/04/14		Midterm Exam I	
PART II: SIGNAL EVOLUTION			
4/07/14	Lec 5	Signal evolution: background	
4/08/14	X-hour		
4/09/14	Lec 6	The concept of information in communication	Rendall et al. 2009; Seyfarth et al. 2010
4/11/14	Lec 7	Decision making / handicap principle	Valone 2006; Zahavi 1975
4/14/14	Lec 8	Honesty and deception in communication	Számadó 2011; Dawkins & Guilford 1991
4/15/14	X-hour		
4/16/14	Lec 9	Receiver Psychology	Guilford & Dawkins 1991; Miller & Bee
4/18/14	Lec 10	Sensory exploitation I	Ryan 1998
4/21/14	Lec 11	Sensory exploitation II	Rodríguez 2009; Shaw 1995; Christy & Backwell 1995
4/22/14	X-hour		
4/23/14	Lec 12	Multimodal signaling	Higham & Hibets 2013; Rowe & Halpin 2013
4/25/14	Lec 13	Communication in other organisms	Heil & Karban 2009; Keller & Surette 2006

Date	Topic	Readings
<b>PART III: SIGNAL CONTEXT</b>		
4/28/14	Lec 14	Reproduction I
4/29/14	X-hour	Review session and question period for exam II
4/30/14		<b>Midterm Exam II</b>
5/02/14	Lec 15	Reproduction II
5/05/14	Lec 16	Conflict I
5/06/14	X-hour	
5/07/14	Lec 17	Conflict II
5/09/14	Lec 18	Social signals I
5/12/14	Lec 19	Social signals II
5/13/14	X-hour	
5/14/14	Lec 20	Interspecific communication and eavesdropping
5/16/14	Lec 21	Communication networks: multiple senders and receivers
<b>PART IV: HUMAN COMMUNICATION</b>		
5/19/14	Lec 22	Human Communication I
5/20/14	X-hour	
5/21/14	Lec 23	Human Communication II
5/23/14	Lec 24	Language
5/26/14		<b>Memorial Day: no class</b>
5/27/14	X-hour	
5/28/14		Review session and question period for final exam
		<b>Final Exam</b>