

Animal Communication: Biology 382, Spring 2017

Class Time: Tuesday 7:00-10:00 pm; OH A62

Contact Info: Megan D. Gall; OH A52; megall@vassar.edu; phone: x7115

Drop in office hours: Tuesday 1:30-4. If you want to reserve some time to meet with me, you can also make an appointment using the link on Moodle.

Course Materials

Text: No required textbook, although I very strongly recommend ***Principles of Animal Communication*** by Jack Bradbury and Sandra Vehrencamp if you are interested in the subject. This is a book I still use regularly. It will also be a great resource in the class. The second edition is available on Amazon (new) for about a hundred dollars. We will mostly be reading primary literature. Be sure to check Moodle – readings will be posted as PDFs. I have provided references on the schedule here, but that may change during the semester.

Course Description:

All animals use communication to navigate interactions with other individuals. At its most basic animal communication is a feedback loop. Senders produce signals which travel through the environment and are picked up by a receiver. The reception of the signal changes the behavior of the receiver through neural and hormonal changes; this, in turn, changes the behavior of the sender. In this course we will discuss (1) how animal signals are produced, transmitted, and received; (2) how information transfer has evolved and been optimized; (3) how animals use communication in mate attraction, social integration, and predator-prey interactions; and (4) the controversy surrounding the definition of communication. Animal communication is a highly interdisciplinary field and we will explore the chemical and physical properties of signals, as well as the mathematical models, neural and hormonal control, and the ecological and evolutionary underpinnings of animal communication. This course will also examine animal communication in the wild and thus some self-scheduled field work will be required.

Course Goals:

1. Understand and explain the fundamental principles of animal communication.
2. Learn research techniques that are used in modern animal communication research.
3. Critically analyze and discuss information from primary literature.
4. Convey information about animal communication in written and oral formats at a high level.
5. Become comfortable not knowing the answer - scientists investigate the unknown!

GRADING

Participation in discussion / mini assignments	30
Research participation and write-ups (3)	15
Review Paper (includes outline, annotated bibliography)	40
Two Peer Reviews of Manuscripts	10
Citizen Science Project and/or Web Design	5
Total	100

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TENATIVE SCHEDULE (note: the class schedule will be available via Moodle. It will be updated as needed to reflect any changes to the schedule). Please double check readings on Moodle, as they may change from our original plan.

Week	Class Session	Papers for Class Discussion
Week 1	Introduction to Animal Communication Signals vs. Cues; Signal Evolution	Bradbury and Vehrencamp (Ch1 and Chapter 10)
Week 2	Acoustic Signal Production Chickadee Songs and Calls	Ficken 1978; Charrier et al 2004; Bostwick and Prum 2005; Clark 2008
Week 3	Levels of Variation in Acoustic Signals	Mammen and Nowicki 1981; Zuk et al. 2001; Reby and McComb 2003; Hahn et al. 2013
Week 4	Producer Coding Scheme** (Acoustic Signals)	Morton 1977; Seyfarth 1980; Baker and Becker 2002; Templeton et al. 2005
Week 5	Receiver Perception and Eavesdropping	Schwartz and Gerhardt 1989; Enquist and Arak 1993; Endler and Basolo 1998; Avey et al. 2008; Magrath et al. 2015
Week 6	Visual Signals *Annotated Bibliography Due	Menill et al. 2003; Lignon and McGraw 2013; Lignon and McGraw 2016; Hutton et al. 2015
Week 7 and Week 8	SPRING BREAK	NO CLASS
Week 9	Project Chickadee Web Design / Citizen Science Design Session *Review Paper Outline Due	Come prepared to work on our website and citizen science project (pictures of work in the field, birds, videos, text for the website, etc.).
Week 10	Multivariate and Multimodal Signals**	Partan and Marler 1999; Cooper and Goller 2004; Taylor et al. 2007; Taylor et al. 2008; Baugh et al. 2008
Week 11	Mate Attraction and Courtship	Kodric-Brown 1989; Greene et al. 2000; Gerhardt 2000; Mennill et al. 2002; Woodcock 2005
Week 12	Environmental Signals *Review Paper Due	Radford and Ridley 2006; Stevens et al. 2008; Abbott and Dukas 2009; Welbergen and Davies 2009
Week 13	Conflict Resolution Peer Review Due Friday by 5	Otter et al. 2002; Jennings et al. 2004; Mennill and Ratcliffe 2004; Anderson et al. 2007;
Week 14	Social Integration**	Beecher et al. 1981; Otter and Ratcliffe 1996; Buesching et al. 2003; Hankison and Morris 2003
Week 15	Communication Networks *Review Paper Revision Due Friday by 5	Templeton and Greene 2007; Foote et al. 2008; Petit et al. 2009; Akcay et al. 2010

** Dates when field experience reflections are due.

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Class Participation / Preparation

We will spend a great deal of time discussing ideas in this course; therefore, participation is critical for full engagement in the course. I expect each student will attend and engage actively and thoughtfully in discussion and activities. You may make up one class session (see make up policy below) with an excused absence. For each additional class you miss your maximum possible grade will be lowered a partial letter grade.

Lab/Field Work Participation

In order to better understand how we investigate animal communication you will have a chance to participate in research that is ongoing in the Gall lab. There will be four different types of research experiences during the semester. Everyone will participate in banding and capturing birds on two occasions. You will write a 1-2 page reflection on this experience (more below). You should also choose one of the following project to to participate in: (1) recording and analyzing bird vocalizations (2) recording and analyzing social dominance interactions or (3) recording and analyzing data about auditory processing. For each of these research experiences there will be two kinds of sessions you should attend – the data collection session (two each) and the data analysis sessions (two each). For each of these experiences, you should write a 2-3 page reflection on what techniques you learned, how they were applied to the questions we are asking, and the relationship between our readings and your research experience. **NOTE:** I will try to provide a wide range of times in order to accommodate as many schedules as possible. If you are unable to make one of these research sessions, please consult with me on how to make up this experience. More information about how to sign up for a time slot and where to meet will be provide in class. Students that go above and beyond will be rewarded.

Citizen Science Project / Web Design

We want to let the public know what we are doing and hopefully get people involved in our research. We will spend one of our class period designing a citizen science project and website for project chickadee so that people can get involved. To prepare for this class period, you should be documenting your experiences in the field with pictures and videos that we can put on the website. You should also be using your time developing your review paper to determine how best to explain to the public what we are working on. We'll work in small groups to design different parts of this project.

Review Paper

The major assignment for the semester will be a review paper aimed at scientific peers. The possible topics for your review paper can be found on Moodle. The review paper should highlight major or competing hypotheses in the field, describe the data supporting different hypotheses, and outline areas for future research. These areas of future research should be well described, including possible experiments that could be done to answer these questions. We will model our review papers after those published in the journal *Animal Behaviour*. This review should be extremely well cited. Any ideas that are not your own should have a reference. This may result in more references that you are typically used to. There will be two assignments prior to turning in your paper – an Annotated Bibliography and a Review Outline.

Annotated Bibliography

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The annotated bibliography is a great way to summarize the literature. A strong annotated bibliography will have a table of contents, so you know where to find each reference. The body of the bibliography will be formatted such that you have a full citation, formatted for our journal (*Animal Behaviour*), followed by approximately 1 paragraph describing the major findings in the paper (the results – not the intro or discussion!) and how this paper might be useful in formulating your ideas for your review paper. I expect you to have at least 20 references in your annotated bibliography and at least 10 should be papers that we did not discuss in class. Students that go above and beyond will be rewarded.

Review Paper Outline

The outline should be formatted with the major headings you expect to have in your final review. Under each major heading should be any sub-headings. Below these sub-headings you will use full sentences to describe the major ideas that will be in each paragraph in that section. It is a good idea at this point to show what references will be put in which section. Any further ideas can be elaborated on with bullet points.

Peer-Review of Manuscript and Response to Reviewers:

Journal editors ask other scientists to review papers to ensure that they are high quality. Each student will have to act as a reviewer on two papers. You will evaluate (1) the originality, (2) the strength of the arguments, (3) the potential impacts to the field, and (4) the clarity of thought in your two assigned papers. When you hand in your final draft of your paper, you will need to respond to the reviews that you receive. This is how the actual publication process works.

Make up policy

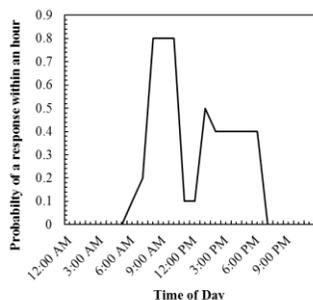
You will only be allowed to make up one class session for which you have an excused absence by completing a summary of the papers that we read for that class session. This must be turned in within one week of the class session that was missed. Additional class absences will only be allowed in extreme circumstances.

Late Policy: There will be a 5% penalty for each 24 hour period that an assignment is turned in late.

Originality and Attribution

You are responsible for following the procedures detailed in the handbook, Originality and Attribution: A Guide for Student Writers at Vassar College. If you have any questions about attribution, you must see me well before an assignment is due. When in doubt CITE!

E-mail Policy (Monday through Friday):



Phones should not be used in class. Phone use may result in the loss of participation points. Laptops are allowed in class, but I reserve the right to ban their use on an individual or class basis if they are being used for non-class activities (e-mail, facebook, etc.) or distracting other students. I prefer you bring printed papers, as this facilitates discussion.

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ACCOMMODATIONS:

Academic accommodations are available for students registered with the Office for Accessibility and Educational Opportunity. Students in need of ADA/504 accommodations should schedule an appointment with me early in the semester to discuss any accommodations for this course that have been approved by the Office for Accessibility and Educational Opportunity, as indicated in your AEO accommodation letter.

Grades:

% Points	Final Grade
95-100:	A
91-94.99:	A-
87-90.99	B+
83-86.99	B
80-82.99	B-
77-79.99	C+
72-76.99	C
70-71.99	C-
67-69.99	D+
60-66.99	D
0-59.99	F

From the Vassar Catalogue

A indicates achievement of distinction. It involves conspicuous excellence in several aspects of the work.

B indicates general achievement of a high order. It also involves excellence in some aspects of the work, such as the following:

- Completeness and accuracy of knowledge
- Sustained and effective use of knowledge
- Independence of work
- Originality

C indicates the acceptable standard for graduation from Vassar College. It involves in each course such work as may fairly be expected of any Vassar student of normal ability who gives to the course a reasonable amount of time, effort, and attention. Such acceptable attainment should include the following factors:

- Familiarity with the content of the course
- Familiarity with the methods of study of the course
- Evidence of growth in actual use both of content and method
- Full participation in the work of the class
- Evidence of an open, active, and discriminating mind
- Ability to express oneself in intelligible English

C-, **D+**, and **D** indicate degrees of unsatisfactory work, below standard grade. They signify work which in one or more important respects falls below the minimum acceptable standard for graduation, but which is of sufficient quality and quantity to be counted in the units required for graduation. Work evaluated as **F** may not be counted towards the degree.

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Log for your field experiences.

Lab/Field Session	Date	Time	Place to Meet
Banding			VFEP Parking Lot
Banding			VFEP Parking Lot
Video / Audio / Hearing Data Recording			
Video / Audio / Hearing Data Recording			
Video / Audio / Hearing Data Analysis			OH A52
Video / Audio / Hearing Data Analysis			OH A52