Lecture: Tuesday / Thursday 10:30am-11:45am; Sander's Classroom 017

Professor: Megan D. Gall
Contact Information: OH A52 (back right room); megall@vassar.edu*; phone: x7115
Office hours: Wednesday 10:00-noon (appointments are useful here!)

Course Materials

Text: Sensory Ecology, Behaviour, & Evolution by Martin Stevens
(available from the bookstore, or in various formats from Amazon.com)

Raven Lite
(download: http://www.birds.cornell.edu/brp/raven/RavenVersions.html#RavenLite)

Course Description:

There are many behaviors that are critical to the survival and reproduction of animals including finding food, avoiding predators, attracting mates, and raising offspring. The ability to successfully engage in these behaviors is dependent on the ability of organisms to acquire and respond to information in their environment. In this course we will discuss the concept of information, the types of information available in the environment, the diversity of sensory systems animals have evolved to exploit that information, and how sensory information and processing influence behavior. Sensory ecology is a highly interdisciplinary field and we will make use of mathematical, physical, chemical, and biological principles. The class will be divided among traditional lectures, student-led discussions of the primary literature, and hands-on experiences with sensory ecology data and analysis.

Course Goals:

1. Understand and explain the fundamental principles and mechanisms of signal production, propagation and reception.
2. Use information about evolution, behavior, and ecology to predict the sensory function of organisms (and vice-versa).
3. Critically analyze and present information from primary literature.
4. Convey information about sensory ecology in written and oral formats.
5. Become comfortable *not* knowing the answer - scientists investigate the unknown!

GRADING

Class Discussion and Participation (40%)	
Participation (attendance / engagement)	80
Written Discussion Assignments	80
Journal Article Discussion Lead	40
Popular Press / Staying Current (23%)	
Enroll in five eTOCs (required for blog posts)	--
Blog Posts (total of 3; each 30 points)	75
Tad Talks	40
Opinion/Review Paper (37%)	
Pitch to Editor	15
Annotated Bibliography	40
Final Draft and Response to Reviewers	100
Reviews (total of 2; each 15 points)	30
Total	**500**

TENATIVE SCHEDULE (note: the class schedule will be available via Moodle. It will be updated as need to reflect any changes to the schedule)

Week (Date)	CLASS TOPIC	Readings[1]	Assignments Due
Week 1 Aug. 29, 31	8/29: Class overview 8/31: Introduction, Information and Signal Detection	Stevens: Ch 1	
Week 2 Sept. 5, 7	9/5: Electromagnetic energy I (light): production, transmission and reception 9/7: Electromagnetic energy II / Chemical energy	Stevens: Ch 2,3	Sign-up for eTOCs
Week 3 Sept. 12, 14	9/12: Sound: production, transmission and reception 9/14: Analyzing Sounds with Raven Pro (bring laptop)	Stevens: Ch 2,3 Raven Manual	
Week 4 Sept. 19, 21	9/19: Sensory Systems: Trade-offs, Costs, & Integration 9/21: **Sensory Trade-offs paper discussion**	Stevens: Ch 4	9/19: Blog Post 1 Due
Week 5 Sept. 26, 28	9/26: Signaling and Communication 9/28: **Signaling and Communication paper discussion**	Stevens: Ch 5	
Week 6 Oct. 3, 5	10/3: Multimodal Signals and Communication 10/5: **Multimodal Signals paper discussion**	Stevens: Ch 6	Pitch Opinion / Review by Friday
Weeks 7 Oct. 10, 12	**No Class (Spring Break)**		
Week 8 Oct. 17, 19	10/17: Tad Talk Session 1 10/19: Trade-offs and Costs in Signaling	Stevens: Ch 7	
Week 9 Oct. 24, 26	10/24: **Trade-offs and Costs paper discussion** 10/26: Opinion / Review Workshop		10/24: Annotated Bibliography
Week 10 Oct.31, Nov. 2	10/31: Deception, Mimicry, and Sensory Exploitation 11/2: **Deception et al. paper discussion**	Peer Work[1] Stevens: Ch 8	
Week 11 Nov. 7, 9	11/7: Arms Races, Coevolution, and Diversification 11/9: **Arms Races et al. paper discussion**	Stevens: Ch 9	11/7: Blog Post 2 Due
Week 12 Nov.14, 16	11/14: Adapting to the Environment 11/16: **Adapting to the Environment paper discussion**	Stevens: Ch 10	11/16: Opinion Paper Due
Week 13 Nov. 21	11/21: Tad Talk Session 2		
Week 14. Nov. 28, 30	11/28: Divergence, Sensory Drive, and Speciation 11/30: **Divergence et al. paper discussion**	Stevens: Ch 11	11/28: Peer Reviews Due
Week 15 Dec. 5	12/5: Conclusions	Stevens: Ch 12	12/5: Blog Post 3
Finals	Final Draft of Opinion Paper and response to reviewers due first day of finals		

Notes: [1]Always check moodle for journal articles and other readings, **Student Led Classes**

Class Discussion and Participation

Chapter Presentations / Discussion Lead

Eight of our class sessions will be student led discussions of papers. These class sessions are in bold and underlined on the schedule. Each of these sessions will have students assigned to each paper to be the point person and help us lead the discussion. I will provide some discussion questions in advance for us to focus our discussion. **You must meet with me in my office to discuss the concepts in your papers before your class sessions. Ideally this will be at least a week in advance, so you have time to digest the paper thoroughly.** You should bring any questions that you have about the papers (either things you don't understand or ideas you would like to discuss) to our meeting.

Class Participation

We will spend a great deal of time discussing ideas in this course; therefore, participation is critical for full engagement in the course. While you are not required to attend class, participation points will comprise 16% of your grade and will be earned through (1) attendance and (2) active and thoughtful engagement in discussion and activities.

Discussion preparation

To ensure that everyone has ample to time to digest and prepare thoughtful comments about the reading, there will be short assignments related to the readings for each class (16% of your grade). Use the questions found on page 6 of the syllabus to help you think about the papers we'll read each week. Assignments will be posted on Moodle. If everyone comes to class prepared, these will simply be for you to prepare for discussion (i.e. you all get full credit). However, I may choose to grade these assignments if participation or preparedness seems to be flagging.

Popular Press

eTOC Subscriptions:

It is very important for scientists to stay up-to-date on research that is occurring in their fields. One of the best ways to stay informed is to subscribe to eTOCs (electronic tables of contents). You can sign-up to receive eTOCs by e-mail for many different journals. For this class, you will need to sign-up to receive eTOCs from at least 5 different journals that are likely to publish sensory ecology research. **A list (that is not exhaustive) of potential journals can be found on the Moodle site - please sign-up for the journals you choose.**

Blog Posts:

One of the biggest challenges in modern science is conveying the importance and excitement of your research to non-scientists (the media, congress, your mom). In order to hone our ability to make science accessible to a lay audience, each of you will produce three popular-press style blog posts (http://pages.vassar.edu/sensoryecology/whats-new-in-ensory-ecology/). You should select three interesting sensory ecology articles from your eTOC subscriptions that will be the basis of your blog posts. You can find links to examples of sensory ecology articles featured in the popular press and blogs on the Moodle site for the course. Be sure to post your article choice, so we don't replicate.

Tad Talks

The TED talk series have become extremely popular. I am making a terrible pun here by having you present a "Tad Talk". Here you will give two **5 minute** presentations on journal articles that you wrote blog posts about. The presentations should give us a short

background on the subject, the most interesting points from the paper, and how this information moves the field forward. We will have two sets of tad talk presentations.

Review (Opinion) Piece

What is an Opinion Paper?

Opinion style review papers use the existing literature to support a particular hypothesis and set a course for future work in the field. These differ from a standard review, in which the authors attempt to give equal coverage to competing hypotheses in the field. We will use the Trends in Ecology and Evolution format for our opinion pieces. To help you frame your opinion piece, I will give you three general ideas, from which you may pick one on which to focus. Within each of these areas you will have to form an argument for why one hypothesis or direction would be the best area to focus future research. These arguments should be strongly supported by literature in the field.

Journal Editor Pitch:

Writing an Opinion / Review takes a lot of work. Luckily the editors of many journals are there to help you. If you think you have a great idea, you will often call up the editor and ask what they think. You generally have two questions: (1) "Is this a good idea?" and (2) "Are you likely to publish this kind of work?" Once you have your idea ready, you should set-up a time to meet with me in my office (or call me on the phone) to pitch your paper. You'll be graded on the quality of the idea and your ability to sell it to me.

Annotated Bibliography:

Prior to writing the full paper, you will turn in an annotated bibliography. This is basically a review of the literature. For each journal article you find you should state the main ideas in the paper and how you will use this paper to further your argument in your opinion piece. If it helps, you can essentially create an outline for your paper showing how each article will be used in your paper.

Opinion / Review:

I will post a guide on how to write an Opinion / Review posted on Moodle. I will give you more explicit instructions about the format of the proposal and the review criteria in class.

Reviews 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.

OTHER CLASS INFORMATION

Late Policy:

You have 2 grace days during the semester (write "grace day" on top of a late assignment). After you use you grace days there will be a 5% penalty for each 24 hour period that an assignment is turned in late. You will receive 1 bonus points for each grace day you have

remaining at the end of the semester. Grace days cannot be used for your final assignment or presentations.

Originality and Attribution:

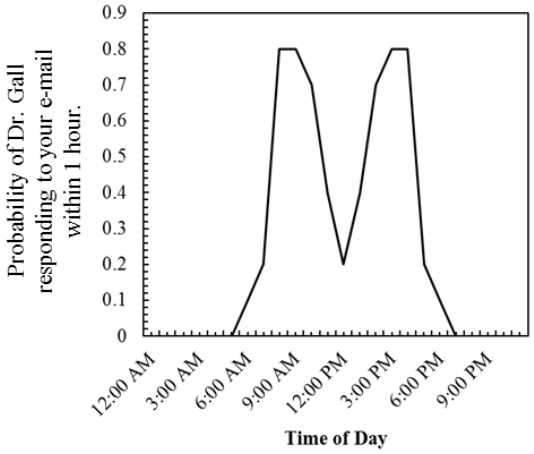
You are responsible for following the procedures detailed in the handbook, Originality and Attribution: A Guide for Student Writers at Vassar College. If you have any questions about attribution, you must see me well before an assignment is due.

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.

E-mail Policy (Monday through Friday):

Before sending an e-mail, please make sure your question cannot be answered by the syllabus (e.g. where is my office, when are my office hours, etc.). I expect your e-mails to be professional. Be sure to sign your e-mails.



Grades:

% Points	**Final Grade**
93-100:	A
90-92.99:	A-
87-89.99	B+
83-86.99	B
80-82.99	B-
77 -79.99	C+
73-76.99	C
70-72.99	C-
67-69.99	D+
60-66.99	D
< 60	F

Descriptions of the characteristics necessary to achieve each grade can be found in the Vassar Catalogue.

Questions to think about when reading primary literature

1) What is the main goal of this paper?

2) What hypotheses and/or predictions were the authors testing?

3) How did the authors test the hypotheses and/or predictions?

4) What results* did the authors find? Are the results convincing?

5) How did the authors interpret the results? In other words what is important about these results and what are the implications for the field?

6) What did the authors do well?

7) What could the authors have done better?

8) What is the importance of this paper to our class? What ideas from the paper can you integrate into your opinion piece?

9) What terms did you not understand? How did you go about learning what they meant?

10) What is one thing about this paper that you would like to discuss in class?