

Neuroethology: Neur 301, Spring 2018

Class Overview

Class Time: Tuesday / Thursday 3:10-4:25 pm; OH A62

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

Drop in office hours: Wednesday 9-11:30 (an appointment can be helpful though!)

Other good times to meet with me: I'm happy to chat over lunch or dinner at ACDC. Tuesday and Thursday morning are student research time, so I'll likely be unavailable then.

Course Materials

Text: Behavioral Neurobiology: An Integrative Approach by Günther K.H. Zupanc. We will also be reading primary literature. Be sure to check Moodle – readings will be posted as PDFs. To facilitate our discussion, these papers will need to be printed. Tablets may also be acceptable if you have an annotation feature, to take notes on your pdf (please check with me).

Course Description:

Neuroethology is an interdisciplinary field that seeks to understand the mechanistic (i.e. neural) basis of behaviors animals perform under natural conditions (i.e. ethology). Neuroethologists typically employ experimental paradigms that are explicitly comparative or based in an evolutionary framework. We'll explore classic examples from neuroethology including bat echolocation, navigation in birds and sea turtles, escape behaviors in tadpoles, prey recognition in toads and more.

Course Goals:

1. Understand and explain the fundamental principles in ethology and neurobiology.
2. Understand the relationship between mechanism, development, function, and evolution of behavior and nervous system structures.
3. Critically analyze and present information from primary literature.
4. Convey information about auditory processing in written and oral formats at a high level.
5. Become comfortable *not* knowing the answer - scientists investigate the unknown!

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Tentative Schedule

(A more detailed schedule is available on Moodle)

Week	Class Session	In-class
Week 1	Introduction to Ethology / Neuroethology	R: Background Review Ch. 1 & 3
Week 2	Review: Neurobiology Review: History and Key Concepts of Animal Behavior	T: Background Review Ch. 2 R: Background Review Ch. 4
Week 3	Spatial Orientation (Echolocation, Geotaxis)	T: Background Review Ch. 5 R: Paper Discussion (**?)
Week 4	Neuronal Control of Motor Output (escape behavior, decision making)	T: Background Review Ch. 6 R: Student Led Discussion**
Week 5	Neuronal Processing of Sensory Information (Sound localizations, prey recognition)	T: Background Review Ch. 7 R: Student Led Discussion**
Week 6	Sensorimotor integration (jamming in electric fish)	T: Background Review Ch. 8 R: Student Led Discussion**
Week 7	Neuromodulation (plasticity, motivational change)	T: Background Review Ch. 9 R: Student Led Discussion**
Week 8 Week 9	SPRING BREAK	NO CLASS
Week 10	Circadian rhythms and biological clocks	T: Background Review Ch. 10 R: Student Led Discussion**
Week 11	Migration and Homing (salmon, sea turtles, birds)	T: Background Review Ch. 11 R: Student Led Discussion**
Week 12	Communication (neuroethology of cricket song)	T: Background Review Ch. 12 R: Student Led Discussion**
Week 13	Cellular Mechanisms of learning and memory	R: Background Review Ch. 13 R: Student Led Discussion**
Week 14	Ecology, hippocampus and spatial memory* Experience-Dependent Sensory Processing* *(Or Student Chosen Topics)	T: Student Led Discussion** R: Student Led Discussion**
Week 15	Neural Basis of Mate Choice* Neural Basis of Social Behavior* *(Or Student Chosen Topics)	T: Student Led Discussion** R: Student Led Discussion**
Week 16	Return to Key Concepts	Review

*We are going to be reading a wide variety of papers. Rather than have them all listed here, you should also consult Moodle for all readings assigned for each class.

**I have suggested reading (and posted it on Moodle) for the student led paper discussion.

However, students may choose to replace or supplement these readings with their own paper selections. If you would like to change the paper selection for your presentation, please run it by me.

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Grading Overview

How will your performance be assessed?

1. *Class Participation (Required for all students to pass)*
In order to pass the course, you must attend every class and engage actively and thoughtfully in discussion and activities (i.e. have at least one thing to say during each class period). We will spend a great deal of time discussing ideas in this course; therefore, participation is critical for full engagement in the course. You may make up one unexcused class session (see make up policy below).
2. Beyond simply passing the course, I expect you to demonstrate your mastery of the course concepts and “technical” skills. You can choose one of two ways for me to evaluate your performance. You should choose the method by which you wish to be evaluated prior to the add deadline for the semester.
 - a. Traditional seminar assessment
 - b. Gamified assessment

Option 1. Traditional Seminar Assessment

Under this system you will complete three major assignments for the course. The first will be a take home mid-term assignment in which you will complete one or more essays demonstrating (a) your mastery of course material and (b) your ability to interpret graphical information, to synthesize information from primary literature, and convey scientific information in a written format. The second will be leading a discussion of the primary literature during one of the class periods. The third will be an oral final examination. This will be a 45-60 minute discussion of the material with me at the end of the semester. This assignment is designed to assess your mastery of the course content, your ability to synthesize and integrate ideas across biological levels and your ability to communicate scientific information effectually in an oral format. Although your grade itself will be a product of these two assignments, you are required to attend and participate in all classes in order to pass.

GRADING

Participation (Required to pass)	
Mid-term assignment (Take Home)	40%
Final Exam (Oral)	40%
Discussion Lead	20%

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Option 2. Gamified Assessment Structure

In this assessment structure your final grade will be based on your ability to successfully demonstrate your mastery of both course content and technical skills. Assignments will not be “traditionally” graded, rather each assignment will be “accepted” if it sufficiently demonstrates the skill or skills that I would like you to acquire during our semester, or returned if the skill has not been demonstrated satisfactorily.

In this class structure the onus is on you to prepare and submit assignments. All assignments are due by the last day of class; however, I would strongly suggest staggering your assignments throughout the semester to enhance your chances to revise (should an assignment not be accepted). I will provide feedback on assignments through Thanksgiving break. After Thanksgiving break you may still submit assignments, but you will not have a chance to revise these submissions.

Level Achieved	Grade
Level 0: Where we all start	F
Level 1: Attend and participate in all classes (required!)	D
Level 2: Level 1 + One Assignment Accepted (1 total)	C-
Level 3: Level 2 + One Assignment Accepted (2 total)	C
Level 4: Level 3 + One Assignment Accepted (3 total)	C+
Level 5: Level 4 + One Assignment Accepted (4 total)	B-
Level 6: Level 5 + One Assignment Accepted (5 total)	B
Level 7: Level 6 + One Assignment Accepted (6 total)	B+
Level 8: Level 7 + One Assignment Accepted (7 total)	A-
Level 9: Level 8 + One Assignment Accepted (8 total)	A

Some examples of skill demonstrations:

- (1) **Communicate (with science peers):** Proactively participate in 4 classes. This means that you come to class with at least 5 written comments and/or questions about each of the readings. You actively engage in discussion, ask questions of your peers, and demonstrate deep thinking regarding the material. You should bring two copies of your written work (1 for me and 1 for you to reference during the discussion). All written work is due prior to our discussion. I will let you know following the class if your participation was sufficient to be “accepted” as active participation. **This assignment can be complete up to three times to count towards your grade.**
- (2) **Analyze:** Find and analyze a paper on a given class topic that has been published within the last 6 months. In your written analysis (~ 4-6 doubled spaced pages) you should first summarize the paper (what was the goal, the hypothesis, did the results support the hypothesis, what are the big implications) and then place this work in the context of the big ideas that we have discussed during one of our class periods (citing literature frequently, and as is appropriate).
- (3) **Communicate (with a lay audience):** Create a multimedia piece that translates a scientific concept for a lay audience. This work should assume our audience is intelligent,

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but not well versed in the sciences. This could be a website, series of blog posts on different articles on the topic, video, etc. (feel free to be creative here).

- (4) **Teach:** Choose a class session that you would like to teach. In order for this assignment to be “completed” you must practice your class lead with me in my office until I feel you sufficiently understand the material to teach it to your peers. This requires some planning ahead, so only classes in week 4 and beyond are open for this assignment. However, you may start practicing with me as early as you like.
- (5) **Lead and/or collaborate:** The last two weeks (likely 4 classes) we’ll investigate topics chosen by the class. For this assignment, you should create a proposal for one of those classes. You should describe the topics that you have chosen and explain why this topic fits under the umbrella topic of the course and why it is an important topic for us to explore. You should also propose two papers that we would read on this topic. In doing so, you should explain the main ideas in the papers and why they are good examples for the topic you have chosen. You can work with up to two other people in putting together a proposal for the class, but you must explain how each person contributed to the proposal.
- (6) **Demonstrate your knowledge:** Complete a take-home exam (essentially an essay) that demonstrates you have mastery of the topics in our class. There will be three opportunities to demonstrate your mastery through a take-home exam. You will have one chance to revise this assignment. A score of 95% or above will be considered “completion” of this assignment.
- (7) **Be creative:** There is a lot we still don’t know about many of the topics we’ve discussed in class. Choose one topic and write a mini-grant proposal (~8 double spaced pages) that first analyzed the state of the field (i.e. what we know), identifies a research questions (i.e. what we don’t know) and proposes experiments / methodology to address this question (i.e. how we’ll find out). Your proposal should be well cited and should include information from outside of our class readings.
- (8) **Interpret Graphical Information:** In this assignment you’ll demonstrate your mastery of graphical interpretation and the production of graphical information. Details of this assignment are TBD.
- (9) **Innovate:** Pitch an idea for an assignment to complete to me. If I like the idea, you can complete this as an alternative to one of the assignments above.

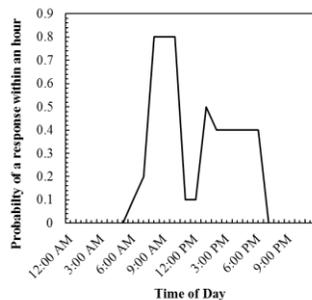
	Assignment	Completed	New Grade	Dr. Gall Signature
1.	Communicate (Peers) – 1X			
2.	Communicate (Peers) – 2X			
3.	Communicate (Peers) – 3X			
4.	Analyze			
5.	Communicate (Lay Audience)			
6.	Teach			
7.	Lead / Collaborate			
8.	Demonstrate your knowledge			
9.	Be Creative			
10.	Interpret Graphical Information			
11.	Innovate			

Other Important Information

Make up policy: You will only be allowed to make up one class session for which you have an excused absence by completing a reading guide for that class session. This must be turned in within one week of the class session that was missed.

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.



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.

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.

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Our Contract

This syllabus is our contract for the course. It details my expectations for your performance in the class. However, it also details my role in the course and sets up expectations you should have for me about what course material we will cover, what the timeline of the class will be, and when you can find me to discuss work outside of class. For these reasons, it is very important that you read and understand the content of this syllabus.

Please selected the structure under which you wish to be assessed.

Traditional Seminar Assessment

Gamified Seminar Assessment

I have read and understand the material contained within this syllabus

Print Name

Signature

Date

Received by Dr. Gall

Signature

Date