

Cellular Basis of Animal Behavior

BIO/PSYCH 5080

Syllabus

Credits: 3
Type: Online: synchronous and asynchronous
Live Classes: T/Th 2:30 – 3:45PM
Place: <https://canvas.wayne.edu/courses/144867>

Instructor: Dr. Justin Kenney
Biological Sciences Building, room 2117
Ph: 313-577-5943
Preferred method of contact: within Canvas
Office hours: By appointments scheduled in Canvas. See “Office Hours” link on course homepage.

Course description

The goal of this course is to enhance your understanding of nervous system function by studying the mechanisms by which animals have evolved to solve various problems posed by their environment. This field is called “Neuroethology”. A key goal of neuroethology is to identify the neural basis of behavior occurring in naturalistic conditions. You will gain an appreciation for the wide variety of behaviors exhibited by various animals and the neural mechanisms that underlie those behaviors. This is an exciting field that sits at the nexus of biology and psychology and yields unique insight into the variety of ways nervous systems can function.

Recommended textbook: *Behavioral Neurobiology* by Thomas J. Carew. Sinauer Press, 2001.

This is an older textbook that you should be able to find an inexpensive copy of online. Much of the basic material in the class will be based on the textbook. This will be supplemented with other papers that will be posted in Canvas.

Readings: Readings from the scientific literature and elsewhere will be uploaded to Canvas prior to the beginning of each section. You should read these prior to class. You are expected to be familiar with the posted readings, but the emphasis will be on topics covered in class.

Course website: On Canvas.

Readings, lecture slides, and homework will be posted on Canvas.

Learning objectives**Subject Specific**

- Understand the utility of different animal behaviors
- Understand the different ways of asking 'why' an animal engages in a specific behavior
- Understand the neural basis for various animal behaviors
 - Understand how different techniques inform our understanding of brain-behavior relationships

General Skills

This course will challenge you to apply subject specific knowledge to enhance your critical thinking and problem-solving skills. Indeed, the true mark of understanding a subject is that you can use your knowledge to solve problems you have not previously encountered. This is a critical life skill that will help you succeed in all your future endeavors wherever they may take you. Towards this end, the class also includes the following learning objectives:

- Basic proficiency in reading the primary scientific literature
- Proficient in interpreting experimental data and figures
- Understanding what data supports a given hypothesis, and why
- Generating hypotheses or expected data based on an experimental setup
- Translating between words and simple equations to solve a given problem

General Class Structure

The primary form of delivering instructional material in the class will be *asynchronous lectures* with embedded questions. Synchronous learning time is largely **yours** and is where we will review specific questions submitted via surveys. The overall organization of assignments will adhere to the following *general* structure to the extent possible (with exceptions for holidays and exams):

Tuesdays and Thursdays @ 12:00PM – Survey of topics for live class due (*to submit the survey you need to watch all the prior lectures; see below for more details*)

Wednesdays @ 11:59PM – Homework is due

Tuesdays and Thursdays @ 2:30PM – Live class to discuss submitted questions/topics, homework, and/or exams

This is the general structure. The specific due dates are in Canvas. **It is your responsibility to keep up with due dates. They may change. Times in Canvas will always be the most up to date.**

Asynchronous lectures

- Asynchronous lectures constitute the bulk of the material for the class. To make lectures easier to watch, they will be available as ‘chunks’ of approximately 15-20 minutes each. Thus, you could expect the material typically covered in a 75-minute lecture to be broken down into about 4 -5 mini lectures.
- Embedded in the asynchronous lectures will be questions based on the presented material. These questions are for *extra credit*; you can earn up to 3% extra credit by getting these asynchronous embedded questions correct.
- During your watching of the asynchronous lectures, *you will not be able to jump forward through the lecture*. However, if you are using the Chrome browser, you can speed up the lectures up to 2X (<https://chrome.google.com/webstore/detail/video-speed-controller/nffaoalbilbmmfgbnbgppjihopabppdk?hl=en>).
- In order to submit the survey by 12:00PM on before class, you **must watch all the asynchronous lectures**. This is meant to encourage you to watch lectures throughout the week and minimize the incentive to binge watch lectures immediately prior to homework due dates or exams.

Synchronous (live) lectures

- During live lectures on Tuesdays and Thursdays we will discuss questions related to the asynchronous lectures, homework, or exams and other topics based on the responses to the surveys.
- Attendance of live lectures is *optional* (with the exception of the live lecture you are assigned for asking questions for graduate student presentations; see below for more details). Lectures will be recorded for later viewing.
- I do not anticipate live classes taking the entire class period. Once I am finished addressing questions, I will remain available the entire assigned class period to ask any questions.
- Much of the initial learning will occur during your engagement with asynchronous lectures and reading the materials. Synchronous class time is **yours** to ask for clarification of materials from lectures or the book. I do not intend to introduce new material during live class lectures.

Technology Requirements

Free Software

- Web browser (I recommend Chrome)
- Canvas
 - Free app is available for iOS and Android.
 - Accessible via web browsers
- Zoom (free app is available for all platforms)
 - For office hours and live lectures
- Drawing software
 - Some homework questions (but *not* exam questions) will require you to draw diagrams or graphs. There are many ways to achieve this using free tools such as:
 - [Zoom whiteboard](#): You can open a zoom meeting, click on 'share screen', then click on 'white board'. Any items you draw on the whiteboard can be saved by clicking the 'save' button.
 - For Windows: Microsoft has a whiteboard app that is simple to use. Images can be saved as png files for upload.

Hardware

- At a minimum you need to have a microphone and speakers to participate in class
- Webcam (recommended)
 - Most webcams contain a microphone
 - Most laptops have a webcam and microphone built in
- Speakers/headphones
 - This is necessary for both asynchronous and synchronous lectures
- Reliable internet connection
- *Optional*: A pen tablet for easily 'drawing' on any device. This may be a good option to consider if you have several classes that may use diagrams or drawing or if you wish to draw on power point slides etc. Some examples are:
 - <https://www.storexppen.com/list/star-series-tablet.html>
 - <https://www.wacom.com/en-us/products/pen-tablets>

Support for Online Learning

For some of you this may be the first time you have enrolled in an online course. Wayne State University has several resources to help you be successful for online learning:

[*The Effective Online Learner*](#)

This is a self-paced course to bolster the skills needed for remote and online learning.

[*Learn Anywhere*](#)

This is a webpage that provides resources and tips for taking online courses.

[*Academic Success Center*](#)

They offer resources for improving study skills, building study groups and other activities

To be successful in this course, you will need to keep up with the material. The course is designed to encourage you to engage with the material on a consistent basis. This is the most effective way to learn (as you'll find out in the course!). The course is explicitly designed to discourage cramming or binge-watching videos immediately prior to an assignment due date. Neuroscience is a challenging, yet immensely rewarding, topic. To truly partake in this bounty of modern scientific knowledge class videos should be digested, pondered, slept-on, thought about, and engaged with. You will be rewarded with a deeper understanding of the neural basis of animal behavior.

Grading*Grade Weighting:*

Exam I (2/16)	23%
Exam II (3/30)	23%
Exam III (4/28)	23%
Homework	23%
Pre-class surveys	4%
Graduate student Q & A	4%
<hr/> Total	<hr/> 100%*

*Up to 3% Extra credit can be earned through correctly answering asynchronous lecture questions.

Grade Scale:

A	93 – 100%
A-	90.0 – 92.9%
B+	87.0 – 89.9%
B	83.0 – 86.9%
B-	80.0 – 82.9%
C+	77.0 – 79.9%
C	73.0 – 76.9%
C-	70.0 – 72.9%
D+	67.0 – 69.9%
D	63.0 – 66.9%
D -	60.0 – 62.9%
F	< 60%

*I do **not** round grades. You can earn up to 3% extra credit via asynchronous lecture questions. It is up to you to earn any boost to your grade. I do not offer any other options for extra credit.*

The most updated grades will always be calculated and available in Canvas. These grades will automatically be weighted as indicated in the “grade weighting” table (i.e. they will not incorporate your extra credit. I will add in your extra credit at the end of the semester when calculating final grades).

Exams

There will be three midterm exams, each worth 23% of your final grade. Exam grades will be posted on Canvas.

Students with any exam scheduling conflicts must notify Dr. Kenney by January 25th, 2021. There will not be any alternate make-up exams other than for University-sanctioned obligations, such as WSU team athletic competitions or University recognized religious holidays. No make-up exams will be given unless notified in writing by this date.

Reasonable exceptions will be granted in cases of illness, which will require notification prior to the exam and must be followed up with an original signed note from a physician.

Cheating on exams will not be tolerated. Anyone caught cheating will get a zero for the assignment and be reported to the Dean's office for disciplinary action. *Exams will be designed to catch cheaters.*

Exam Policies

- Exams may include multiple choice, matching fill-in-the-blank, problem solving, drawing, or short answers.
- To accommodate any needed flexibility for taking an online exam, they will be **available** for at least an additional 30 minutes before and after our scheduled class time.
- Once the exam is started, you will have **75 minutes** to complete the assignment. **THE EXAM MUST BE SUBMITTED PRIOR TO THE DEADLINE.** *Thus, if you start your exam too late, you will not have the full 75 minutes to take the exam.* It is up to you to start your exam on time.
- Exams will be open book and open notes **BUT NOT OPEN TO DISCUSS.**
 - Your work must be your own only. You can use whatever resources (book, notes, etc.), but you cannot discuss the exam with anyone else or solicit answers from a third party.
- You should make sure you have access to the following:
 - A calculator
- Exam III will be the length of a typical exam, but given on our scheduled day during the final exam period.

A note on open book/open note exams

Open book/note exams will have a greater emphasis on critical thinking and problem solving than a closed book exam. Please do not take this to mean that you do not have to study for the exams. Indeed, you will need to study the material *more* deeply. A basic understanding of the material is a prerequisite to *apply* your knowledge. Also keep in mind that you will have a time limit of only 75 minutes to complete the exam. Sifting through large quantities of information for each question will simply not be practicable.

Homework

I consider homework to be an essential part of the learning process. It is in engaging with the homework that you can take as much time as needed and identify gaps in your understanding. You are welcome to consult with one another on the homework. However, I would caution against copying the answers of someone else. While this may increase your homework grade, it will negatively impact your exam grades. Recall that each individual homework is worth only 2.3% of your grade whereas each exam is worth 23%.

My suggestion in getting the maximum benefit from the homework would be to:

1. Watch the appropriate lectures
2. Attempt the homework **on your own**
3. Ask for clarification of any topics that are unclear prior to our synchronous lecture time via the surveys or directly sending me a message
4. Attempt the homework again **on your own**
5. Consult with classmates on any concepts that you may be struggling with
 - a. Ask your classmates to explain their choices on the homework and walk you through their thought process. Be careful not to co-opt their understanding as your own; you should be able to explain the ideas accurately in your own words.
6. Consider coming to office hours if concepts are still unclear.

There will be homework assignments due throughout the semester (due dates within Canvas). Typically, homework will be due at midnight on Wednesday before our live lecture on Thursdays. The Thursday live lecture will then be spent going over the homework and any questions that arose. You will only have one opportunity to answer the questions correctly. You will be able to see your scores and correct answers after the due date has passed and everyone has had a chance to submit the assignment.

Any homework submitted late will have the grade automatically reduced by 50%.

Homework cannot be submitted after it is discussed in class (i.e. at the start of class time at 2:30PM).

Expected homework due dates:

Homework #	Date	Time
1	Jan. 20 th	11:59 PM
2	Feb. 3 rd	11:59 PM
3	Feb. 10 th	11:59 PM
4	Mar. 3 rd	11:59 PM
5	Mar. 10 th	11:59 PM
6	Mar. 24 th	11:59 PM
7	Apr. 7 th	11:59 PM
8	Apr. 14 th	11:59 PM
9	Apr. 21 st	11:59 PM

NOTE: These due dates may change. If they do, the Canvas website will be updated. It will be your responsibility to keep up with any changes. Dates on Canvas are always the most up to date.

Surveys

Surveys make up 4% of your final grade. Surveys only need to be submitted to receive full points.

Survey due dates are in Canvas but are typically due at 12PM prior to our synchronous class. You are responsible for checking in Canvas for due dates/times.

Late submissions of surveys will be reduced by 50% and are only allowed up to the class time in which they will be discussed after which they will be automatically scored zero.

To access and submit the survey, you will need to watch all the lectures associated with that survey (~4-8 lectures). Before the survey is due, you will not be able to skip through the lectures (but lectures can be sped up 2X). Asynchronous lectures will be made available at least one week prior to the survey due date.

The purpose of the surveys is twofold:

1. To let me know what questions students have from the lectures for further clarification during our live lecture time
2. To encourage you to watch lectures throughout the week

Asynchronous lecture questions

Pre-recorded asynchronous lectures are the *primary* form of instruction for this course. Within these lectures will be embedded questions for you to answer. Answering these questions correctly will contribute to up to 3% of *extra credit*.

Asynchronous lecture questions can only be submitted for extra credit up to the time the associated survey is due (typically prior to class at 12PM). Late submissions will be reduced by 50% and are only allowed up to the live class time in which the lectures will be discussed after which they will be scored a zero.

Graduate Student Q&A Session

There are some graduate students taking this course for credit. As an additional requirement, graduate students will put together a presentation of a journal article to be presented during one of our synchronous lectures. Later in the semester (after the drop period is over; January 25th), everyone will be assigned one of the presentations (available under "groups" in Canvas). You will also be given access to the research article that is going to be presented. You **must attend your assigned live lecture and ask a good question to get credit**. Asking one good question is sufficient to get the full points towards this part of your grade (4%).

A good question is thoughtful and well-reasoned. It can be a question of clarification, data interpretation, or methods. The question should demonstrate that you attempted to understand the material presented. A question that was clearly addressed in the paper or presentation is not considered a good question.

Grade disputes

- Students will have one (1) week after the grading of an exam or an assignment to challenge the grade. Any challenges require a written note providing an explanation.
- Failure to challenge the grade within this period indicates a willingness to accept the grade as is.
- The challenge should consist of a written description of why the answer is correct based on other published material that you cite.

Cheating

- A strict zero-tolerance policy for cheating will be enforced.
- Anyone caught cheating on an exam will receive a score of 0 (zero) for that portion of the grade.
- Students found to be cheating during an exam (using a “cheat sheet”, looking at another’s paper, or allowing another to look at yours), will receive a zero for that test with no opportunity to drop or replace that score.
- A second episode of cheating will result in a grade of F for the course and may also result in initiation of university disciplinary action.

Technical Support

WSU Computing and Information Technology (C&IT): For free help with campus computing, including email, Canvas, or your AccessID call (313) 577-4778, see computing.wayne.edu/ or email csthelph@wayne.edu. Unfortunately, I am not trained to provide technical computing support.

Special considerations for students with disabilities

You need to register documented disabilities with Student Disability Services for coordination of your academic accommodations. They need a week or more to arrange accommodations, so make an appointment early. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TTY: telecommunication device for the deaf; phone for hearing impaired students only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your needs. Please refer to the SDS website for further information about students with disabilities and the services we provide for faculty and students: studentdisability.wayne.edu/

Unexpected closures

It is not expected that University closures will affect this class due to it being entirely online. However, if there are any unexpected issues, we will follow all University guidelines. Such events will be announced via the WSU homepage (www.wayne.edu).

Any issues that arise that are not in the syllabus will be dealt with according to University policies.

Tentative schedule

Section	Survey Due Dates (Live Class Equivalents)	Topics	Book Chapter
1	Th Jan 14 (1) T Jan 19 (2)	<u>Introduction to neuroethology & basic neuronal function</u> • HW #1 due Wed. Jan 20 @ 11:59PM	Chapter 1
2	T Jan 26 (1) Th Jan 28 (1) T Feb 2 (1)	<u>Echolocation in bats</u> • HW #2 due Wed. Feb 3 @ 11:59PM	Chapter 2
3	Th Feb 4 (1) T Feb 9 (2)	<u>Prey location in owls</u> • HW #3 due Wed. Feb 10 @ 11:59PM	Chapter 3
	T Feb 16	EXAM #1 (Sections 1-3)	
4	T Feb 23 (1) Th Feb 25 (1) T Mar 2 (1)	<u>Reflex regulation in crayfish</u> • HW #4 due Wed. Mar 3 @ 11:59PM	Chapter 7
5	Th Mar 4 (1) T Mar 9 (2)	<u>Song Learning in Birds</u> • HW #5 due Wed. Mar 10 @ 11:59PM	Chapter 8
6	Th Mar 11 (1) T Mar 23 (2)	<u>Foraging in honeybees</u> • HW #6 due Wed. Mar 24 @ 11:59 PM	Chapter 9
	Th Mar 30	EXAM #2 (Sections 4-6)	
7	T Apr 6 (2)	<u>Molecular basis of learning in Aplysia</u> • HW #7 due Wed. Apr 7 @ 11:59PM	Chapter 10
8	T Apr 13 (2)	<u>Genetics of learning in <i>Drosophila</i></u> • HW #8 due Wed. Apr 14 @ 11:59PM	Chapter 11
9	Th Apr 15 (1) T Apr 20 (2)	<u>Spatial navigation in rats</u> • HW #9 due Wed. Apr 21 @ 11:59PM	Chapter 12
	W Apr 28	Exam #3 (Sections 7-9) exam starts at 2:45PM	

This schedule is **tentative** and may be altered. It is your responsibility to check Canvas announcements to be aware of any changes.