

## Psychology 363: Laboratory in Behavioral Neuroscience

General Course Information		
Class Details	Professor	Teaching Assistant
Time: Wednesdays 2-5:50pm	Dr. Mitch Roitman <a href="mailto:mroitman@uic.edu">mroitman@uic.edu</a> Office Hours: by appointment	Onella Athnaiel <a href="mailto:oathna2@uic.edu">oathna2@uic.edu</a> Office Hours: by appointment

### Course Objectives

1. You will develop a broad knowledge of neuroscience through lectures, readings and laboratory exercises.
2. You will develop skills in reading and critically evaluating primary neuroscience literature.
3. You will develop an understanding of neuroscience hypothesis generation, research design and methods, techniques, statistical data analysis, drawing conclusions and insights.
4. You will develop communication skills for presenting neuroscience research.
5. You will cultivate an appreciation and enjoyment of neuroscience (it should be fun!)

### Course Overview

The goal of this laboratory course is to provide you with both an understanding of the structure and function of the brain as it relates to (and interacts with) the behavior of organisms interacting with the world as well as an understanding of how we arrive at the “facts” that fill our textbooks in Behavioral Neuroscience. The conclusions neuroscientists have reached about how the brain and nervous system generate behavior are based on empirical data collected from experiments conducted in laboratory settings. In this course, you will learn about neuroanatomical, neurophysiological, and neurochemical contributions to behavior. Each of the course objectives will be met through “hands on” experience and experimentation as well as critical review and presentation of primary neuroscience literature. Thus, you’ll gain a strong appreciation for the scientific process in general.

## **COURSE CONTENT**

The course will begin with lectures that provide a critical understanding of both the cellular level information (individual brain cells; neurons and glia) and their place within the circuits of cells that comprise our nervous system. We will then expand this view of neural circuits to place them within the functional neuroanatomy of the brain, and cover how neurons communicate with one another within the brain. At this point, you will have been introduced to the basics of neural structure and function. After covering neural structure and function, we will discuss the “behavioral basics” – i.e., some principal neural drivers of behavior – starting with incoming sensory information to compute appropriate patterns of motor output. We will then cover how the brain integrates the body’s changing internal state with sensory information to behavioral choices.

Each class will begin with ~60 minutes of lecture/discussion. Slides, made available on Blackboard, will be used to introduce the day’s lab exercise. This material will often serve to help you craft assigned written work (see below). Thus, it will be imperative that you listen carefully and ask questions if you do not understand the material being presented. In addition, you will read original, peer-reviewed research articles related to experiments conducted in the lab course. Readings should be completed before the class date for which they are assigned.

**It is our hope that each student learns the material and succeeds. If at any point you are struggling with the material it is imperative that you meet with myself or the TA!**

## **COURSE MATERIALS**

### **Required Text**

There is no required text for this course. We will read articles from the primary literature that are available on UIC databases and will be uploaded to Blackboard.

### **Technology requirements**

For remote sessions, you will need regular access to a personal computer that runs on a broadband internet connection. For all technical questions about Blackboard, email ACCC-Learning Technology Solutions at [LTS@uic.edu](mailto:LTS@uic.edu)

### **Respect for Copyright**

Please protect the integrity of all course materials and content. By enrolling in this course, you agree to honor this request. Be mindful of the work and time that instructors and TAs put into creating course materials such as worksheets, lecture videos, and reading materials. Please do not upload course materials not created by you onto third-party websites or share content with anyone who is not enrolled in our course.

## **COURSE EXPECTATIONS**

### **Class Logistics**

Save for the very first class session, we will be meeting in synchronous online sessions. Because this is a laboratory class, attendance is important for both data collection and analysis/interpretation of labs. There is no required text for this class, and all assignments are based on the material covered in these sessions. Both for the sake of a more enriched educational experience and the opportunity to interact with peers, I **strongly** encourage your presence in all synchronous sessions.

My current plan is to:

- Greet each of you in Science and Engineering Laboratories East (SELE) Room 3069. You will receive a specific time to come to the room. At this time, I will distribute materials that you will need for the first several weeks of class. You will be required to wear a mask at all times while on campus and in SEL. I will also be masked and will maintain a safe distance. ***If you are unable to safely come to campus for the first class meeting, please let me know and we will make alternative arrangements.***
  - For the first class session, you will have card access to the building, and ***will need to complete a health survey before entering.***
  - UIC is providing [free, saliva-based COVID testing](#). I strongly encourage you to test before coming to SEL. In the event of a covid-positive test result, it is critical that you inform the instructor.
- Conduct synchronous sessions at the scheduled class time. These sessions will be held on Zoom and will be recorded. Again, they will be much more productive if you are present, so I strongly encourage your participation.
- Use Blackboard, Zoom, and Google apps as integral parts of the course. All course information will be available on Blackboard, with links to Zoom recordings and Google forms, sheets, and docs that we will use to complete labs.
  - Note: this plan is tentative and dependent on public health measures. As the situation evolves, I will notify you of any changes.

## **COURSE COMMUNICATIONS**

Blackboard is an integral tool for communication for this course. Critically important emails will be sent via Blackboard and it will be critically important for you to regularly check you UIC email. Lecture slides will be posted before class, and grades will be posted as soon as they are available.

To best participate in remote classes:

- Be in a quiet place and use headphones
- Mute microphone unless talking
- You are encouraged to turn video on when speaking or engaging in group activities
- Quit all other screens (email, text, social media) to create a classroom “presence”
- Actively participate in class
- Raise your hand if you have a question to ask verbally

- Use the Chat feature if you prefer to type your question

When interacting with peers online, please:

- Be sensitive to different cultural and linguistic backgrounds, as well as different political and religious beliefs.
- Use good taste when composing your responses. Swearing and profanity should be avoided. Also consider that slang terms can be misunderstood or misinterpreted.
- Don't use all capital letters when composing your responses. This can be considered "shouting" and is regarded as impolite or aggressive.
- Be respectful of others' views and opinions. *Call in, don't call out.*
- Use good grammar and spelling, and avoid using text messaging shortcuts.

I am happy to communicate with you by email, and this is often the most reliable way to reach me. You should be sure to identify yourself as a student in PSCH 363. In general, people born before 1983 will take your message more seriously if you use proper spelling, punctuation, and grammar. Finally, it will serve you well to not demand a response 'ASAP'. I will typically be able to respond to emails within two workdays, but there will be circumstances that prevent this occasionally. These suggestions may seem superficial, but communicating in a professional manner with those who are teaching (mentoring, advising, or employing) you will make a good impression and are an essential part of your professional development.

#### Privacy Notification and Policy for Video Recording of Synchronous Class Sessions

I will be recording synchronous class sessions. The recording feature for others is disabled so that no one else will be able to record this session through Zoom, Blackboard Collaborate, Webex, or Echo360. Recording by other means is not permitted. The recorded class sessions will be posted on our Blackboard class website unless otherwise notified. If you have privacy concerns and do not wish to appear in the recording, turn OFF your video and notify me in writing (via email) prior to the next class session. If you prefer to use a pseudonym instead of your name, please let me know what name you will be using, so that I can identify you during the class session. If you would like to ask a question, you may do so privately through the chat feature by addressing your question to me or your TA only (and not to "everyone"), or you may contact me or your TA by another private method, which we will agree upon in advance of class. If you have questions or concerns about this video recording policy, please contact me before the end of the first week of class.

#### **Policy for Missed or Late Work**

All assignments must be handed in by the time and date listed on Blackboard. **No extra credit will be given and no evaluations can be dropped.** There are several writing assignments throughout this course, which you will submit via Blackboard's SafeAssign. This course meets the Psychology major requirement for writing in the discipline. A significant portion of your final grade will be based on a single lab report. You will be asked to hand in drafts **of sections of the lab report and you will receive feedback on these drafts.** If you submit any written assignment at any time after the deadline, the grade for that assignment will be reduced by 10% for each day late, beginning at the time that the assignment is due.

## **Academic Honesty**

UIC is an academic community committed to providing an environment in which research, learning, and scholarship can flourish and in which all endeavors are guided by academic and professional integrity. In this community, all members including faculty, administrators, staff, and students alike share the responsibility to uphold the highest standards of academic honesty and quality of academic work so that such a collegial and productive environment exists. As a student and member of the UIC community, you are expected to adhere to the [Community Standards](#) of integrity, accountability, and respect in all of your academic endeavors. When [accusations of academic dishonesty occur](#), the Office of the Dean of Students investigates and adjudicates suspected violations of this student code. Unacceptable behavior includes cheating, unauthorized collaboration, fabrication or falsification, plagiarism, using unauthorized study aids, coercion regarding grading or evaluation of coursework, and facilitating academic misconduct. Please review the [UIC Student Disciplinary Policy](#) for additional information about the process by which instances of academic misconduct are handled towards the goal of developing responsible student behavior. *By submitting your assignments for grading you acknowledge these terms, you declare that your work is solely your own, and you promise that, unless authorized by the instructor or proctor, you have not communicated with anyone in any way during an exam or other online assessment.*

## **COVID-19 POLICIES**

### **Safety Protocols**

**Face Masks:** [Masks must be worn at all times](#) by all students, faculty, and staff while on campus, whether in or out of class, in all offices, on all pathways, and inside and outside of all buildings, in accordance with [University policies](#). If you do not wear a mask, you will be asked to leave the classroom and will not be allowed back in class unless or until you wear a mask. Eating and drinking is not allowed in classrooms.

**Social Distancing:** We all must maintain appropriate social distancing at all times, whether in or out of class, in all offices, on all pathways, and inside and outside of all buildings. On-campus classes are being held in classrooms that are large enough to maintain a minimum physical distance of 6 feet (or two arm's length) between people; we will implement assigned seating to ensure social distancing is observed and also to make contact tracing easier if there is an incident of COVID-19 infection in our class.

**Hand Washing/Sanitizing:** Everyone is expected to wash or sanitize their hands before class, either by using personal sanitizer or by using one of the sanitizer dispensers located on campus. Please remember to wash your hands with soap for 20 seconds or more. If using hand sanitizer, please remember it should be at least 60% alcohol and you should rub your hands together until dry.

### **COVID-19 Infection Procedures, Testing and Tracing:**

UIC has built an infrastructure for COVID-19 testing and tracing of UIC community members. Please refer to the UIC website, [Coronavirus Disease 2019 \(COVID-19\) | UIC Today](#), and the Circle Back to Campus Plan [website](#) and [newsletter](#) for up-to-date campus policies and procedures. For information about what to do: [UIC FAQs](#)

Students who think they have been exposed to COVID-19 or who have tested positive should inform Student Health Services at 312-996-2901, as soon as possible, so that the University can take action in accordance with [University policies](#). Please do not hesitate to share a positive diagnosis; your

identity will NOT be revealed to your classmates. UIC's utmost concern is for the students' welfare and trying to ensure that everyone can take the needed precautions to reduce the likelihood of additional infection. Arrangements will be made with students on an individual basis to accommodate missed classes or assignments due to illness.

### **RELIGIOUS HOLIDAYS**

I will make every effort to avoid scheduling exams or requiring student projects be submitted on religious holidays. If you wish to observe your religious holidays, please notify me of the date when you will be absent. If an assignment is due during your absence, I will adjust the due date appropriately. Students may appeal through campus grievance procedures for religious accommodations.

### **ACADEMIC DEADLINES**

<https://catalog.uic.edu/ucatalog/academic-calendar/#Fall2020>

### **INCLUSIVE LEARNING ENVIRONMENT**

UIC values diversity and inclusion. Regardless of age, disability, ethnicity, race, gender, gender identity, sexual orientation, socioeconomic status, geographic background, religion, political ideology, language, or culture, we expect all members of this class to contribute to a respectful, welcoming, and inclusive environment for every other member of our class. If there are aspects of the instruction or design of this course that result in barriers to your inclusion, engagement, accurate assessment or achievement, please notify me as soon as possible.

### **ACCOMMODATIONS**

UIC is committed to full inclusion and participation of people with disabilities in all aspects of university life. If you face or anticipate disability-related barriers while at UIC, please connect with the Disability Resource Center (DRC) at [drc.uic.edu](http://drc.uic.edu), via email at [drc@uic.edu](mailto:drc@uic.edu), or call (312) 413-2183 to create a plan for reasonable accommodations. In order to receive accommodations, you will need to disclose the disability to the DRC, complete an interactive registration process with the DRC, and provide me with a Letter of Accommodation (LOA). Upon receipt of a LOA, I will gladly work with you and the DRC to implement approved accommodations.

## Class Schedule

**\*\*Note: all readings & assignments will need to be completed prior to the class day listed below\*\***

Week	Date	Topic	Lab	Readings	Eval	Assignments
1	01/13/21	Introduction & Orientation				
2	01/20/21	The Action Potential	Nerve Conduction Velocity (earthworm preparation)	Billman, 2020 <a href="https://backyardbrains.com/experiments/NeuronSpikerBoxPro">https://backyardbrains.com/experiments/NeuronSpikerBoxPro</a>	Questions & reflections	Figures and Stats (due 01/27)
3	01/27/21	The Action Potential	Rate Coding (isolated cockroach leg)	Lowell, 2019 <a href="https://backyardbrains.com/experiments/neuropharmacology">https://backyardbrains.com/experiments/neuropharmacology</a>	Questions & reflections	Figures and Stats (due 02/03)
4	02/03/21	The Autonomic Nervous System	Sympathetic nervous system You are your own subject	Lowell, 2019 <a href="https://backyardbrains.com/experiments/SympatheticNervousSystem">https://backyardbrains.com/experiments/SympatheticNervousSystem</a>	Questions & reflections	Figures, Figure legends and Stats (due 02/10)
5	02/10/21	The Reflex	Stretch reflex You are your own subject	Lowell, 2019 <a href="https://backyardbrains.com/experiments/Musclekneejerk">https://backyardbrains.com/experiments/Musclekneejerk</a>	Questions & reflections	Figures, Figure legends and Stats (due 02/17)
6	02/17/21	Homeostasis	Thirst: circuits Rats: data collected by course staff	Oka et al. 2015	Quiz (group develops); Class presentation 1	Figures, Figure legends and Stats (due 02/14)
7	02/24/21	Homeostasis	Hunger: circuits Rats: data collected by course staff	Aponte et al. 2011	Quiz (group develops); Class presentation 2	Figures, Figure legends and Stats (due 03/03)
8	03/03/21	Homeostasis	Sodium appetite: circuits Rats: data collected by course staff	Jarvie and Palmiter, 2017	Quiz (group develops); Class presentation 3	Figures, Figure legends and Stats (due 03/10)

9	03/10/20	Homeostasis	Fluid homeostasis: hormones Rats: data collected by course staff	Sakai et al. 1986	Quiz (group develops); Class presentation 4	Figures, Figure legends and Stats (due 03/17)
10	03/17/21	Homeostasis	Fluid homeostasis: taste Rats: data collected by course staff	Zocchi et al. 2017	Quiz (group develops); Class presentation 5	Figures, Figure legends and Stats (due 03/31)
11	03/31/21	How to write a research paper	None	None	None	Literature review assignment due
12	04/07/21	Spring Symposium	Dr. Ed Boyden	None	None	Introduction due
13	04/14/21	Reward and Reinforcement	Dr. Ted Hsu	None	None	Methods, Results due
14	04/21/21	Careers in Neuroscience	TBD	None	None	Discussion due
15	04/28/21	Party	None	None	None	Abstract due
Finals Week	5/05/21	No Class – Final Lab Report Due				



Grading

**Grading Philosophy:** Your grade on each graded item starts at zero and increases in relation to the quality of your work. Please do not ask “why did you take points off for this or that?”, since that question implies that the points were yours to begin with, and have been taken from you. Thus, the burden is on you to demonstrate why you earned points in question. This approach has you assume a proactive role in your education – an excellent habit to acquire early in your lifelong journey of learning!

Grading		
Assignment	Total Possible Points	My Score
Weekly Questions/reflections and Quizzes (x9; 5 points each)	45 points	
Figures, figure legends and stats (x9; 5 points each)	45 points	
Presentation, quiz development	10 points	
Lit Review Assignment	10 points	
Introduction	20 points	
Methods	15 points	
Results	15 points	
Discussion	20 points	
Final Lab Report Submission Bonus	20 points	
<b>Total</b>	<b>200 points</b>	

## Policies

### **Attendance & Punctuality:**

Attendance, defined as being present at the start of class and remaining present for the duration of the class period, is essential for your success in this course and is **mandatory**. Absences will only be excused under extreme circumstances, and will require documentation. To ensure weekly attendance, your final grade will be reduced by 5% for each unexcused absence. *Please note: regardless of whether an absence is excused or not, you are responsible for the material and assignments discussed in sessions that you do not attend.* Punctuality is also essential. To make the most of each session and to reduce distractions to other students, you are expected to be in your seat at the start of each class (2:00pm). My laptop clock will be the time keeper for our course.

### **Assignments**

All assignments must be handed in by the start of class on the due date. No extra credit will be given and no evaluations can be dropped. ***Cheating and plagiarism will not be tolerated. Any evidence of cheating or plagiarism will result in disqualification and a 0 will be entered for that evaluation.***

This course meets the Psychology major requirement for writing in the discipline. As such, we will provide feedback on your major writing assignment – the Lab Report – which you will then use to improve the document. There will be several smaller writing assignments where you will not receive feedback. However, ~1/3 of your final grade will be based on a single lab report. You will be asked to hand in drafts of sections of the lab report and you will receive feedback on these drafts.

For ALL assignments (e.g. smaller writing assignments, drafts, final lab report) your score will be reduced by 10% for each day that the assignment is late. Exceptions will be made for only the most serious of documented circumstances.

### **Academic Integrity Policies**

I do not anticipate any issues with academic integrity, but I am obligated to note the following at the outset of this course. Please reach out to me directly if there are any questions or concerns about academic integrity policies or standards.

*(copied directly from the UIC Academic Catalog [here](#))*

As an academic community, the University of Illinois at Chicago is committed to providing an environment in which research, learning, and scholarship can flourish and in which all endeavors are guided by academic and professional integrity. All members of the campus community—students, staff, faculty, administrators—share the responsibility of insuring that these standards are upheld so that such an environment exists. Instances of academic misconduct by students, and as defined herein, shall be handled pursuant to the *Student Disciplinary Policy*, which can be found online at <http://www.uic.edu/depts/dos/docs/Student%20Disciplinary%20Policy.pdf>.

Academic dishonesty includes, but is not limited to:

**Cheating:** Either intentionally using or attempting to use unauthorized materials, information, people, or study aids in any academic exercise, or extending to or receiving any kind of unauthorized assistance on any examination or assignment to or from another person.

**Fabrication:** Knowing or unauthorized falsification, reproduction, lack of attribution, or invention of any information or citation in an academic exercise.

**Facilitating Academic Dishonesty/Plagiarism:** Intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

**Bribes, Favors, Threats:** Bribing or attempting to bribe, promising favors to or making threats against, any person, with the intention of affecting a record of a grade, grade, or evaluation of academic performance. Any conspiracy with another person who then takes or attempts to take action on behalf or at the direction of the student.

**Examination by Proxy:** Taking or attempting to take an exam for someone else other than the student is a violation by both the student enrolled in the course and the proxy or substitute.

**Grade Tampering:** Any unauthorized attempt to change, actual change of, or alteration of grades or any tampering with grades.

**Nonoriginal Works:** Submission or attempt to submit any written work authored, in whole or part, by someone other than the student.

### Course Notes

- Primary literature takes A LOT of time and patience to read, please plan accordingly.
  - We will review primary literature readings in class.
  - These readings are assigned to give you a background for the lab exercises and the data that is collected in neuroscience research.
  - These readings will give you an understanding of what is expected from your lab report.
  - Pay careful attention not only to the overall structure and themes, but to the details: how are the statistics represented and discussed, how are figure legends written, etc.
  
- Indicate that you've read through this entire syllabus by sending me, via email, your favorite animal meme for 1pt of extra credit.