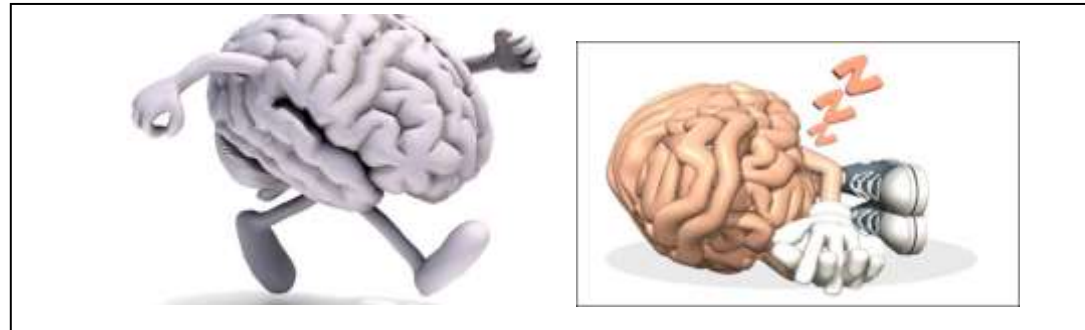


Psychology 363: Laboratory in Behavioral Neuroscience

General Course Information		
Class Details	Professor	Teaching Assistant
Classroom: SELE 3069 Time: Wednesdays 2-5:50pm	Dr. Mike Ragozzino mrago@uic.edu Office: BSB 1066B Office Hours: by appointment	Rachel Donka rdonka2@uic.edu Office Hours: by appointment



Course Objectives

1. Develop a deep knowledge of behavioral neuroscience through lectures, laboratory exercises, and readings on numerous and diverse behavioral neuroscience topics.
2. Develop a broad knowledge about the field of neuroscience.
3. Develop skills in reading and critically evaluating primary neuroscience literature.
4. Develop an understanding of neuroscience hypothesis generation, research design and methods, techniques, statistical data analysis, drawing conclusions and insights.

Course Overview

The goal of this laboratory course is to experience being a behavioral neuroscientist. This includes understanding of how we arrive at the “facts” that fill our textbooks in Behavioral Neuroscience. The conclusions we’ve reached about how the brain and nervous system generates behavior are based

on empirical data collected from experiments conducted in laboratory settings. Here, you will learn about neuroanatomy, neurophysiology and neurobiological contributions to behavior. All of the teaching goals will be met through “hands on” experience and experimentation. Thus, you’ll gain a strong appreciation for the scientific process in general.

Each class will begin with about 60 minutes of discussion/lecture. 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, students 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. The course is designed to give students a basic understanding of Behavioral Neuroscience through experimentation and the reading of primary literature.

Course Content

The course will begin with lectures that provide a critical understanding of how brain cells (neurons and glia) function how genes are differentially expressed in neurons, brain areas and related to various disorders and diseases. We will then expand this view of neural circuits to place them within the functional neuroanatomy of the brain, and cover how single neurons communicate with one another within the brain. At this point, you will have been introduced to the basics of neural structure and function at the micro, meso, and macro levels.

After covering neural structure and function, we will conduct experiments involving our own nervous system both peripheral (ulnar nerve) and central (EEG cortical alpha waves). This will be followed by discussing behavior in the context of neurodevelopmental disorders. This will include using mice and examining how pharmacologically manipulating the major inhibitory system in the brain may be effective in rescuing phenotypes related to repetitive motor behaviors and social behaviors. Following this, we will delve into how different inbred strains of mice affected by the psychostimulant amphetamine and how this may relate to reward and drug abuse. To finish the course, we will conduct another experiment looking at our evoked-related potentials and how they may relate to attention and consciousness.

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!

Class Schedule

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

Week	Date	Topic	Lab	Readings	Quizzes	Assignments	
1	1/12/22	Introduction		Syllabus		In Class: D&D Word Generator	
2	1/19/22	Neuroanatomy	Allen Brain Atlas: Genes, Brains, Disorders	NINDS reading			
3	1/26/22	Neuroanatomy	Comparative Neuroanatomy: Hippocampal Formation	http://neurosciencelibrary.org/Evolution/paleo/index.html	Quiz	Gene Expression Questions	
4	2/2/22	Neuroanatomy	Sheep Brain Dissection			Comp Neuroanat Questions	
5	2/9/22	Ulnar Nerve	Nerve Conduction Velocity	Int. J Sports Med 5, 26-30 Arch Phys Med Rehabil 86, 21-25	Quiz		
6	2/16/22	Sensation & Brain Waves	EEG: Alpha Rhythms	J ALT & COMPLEM MED 15, 11, 1187–1192		Abstract on NCV Due	
7	2/23/22	Neurodevelopmental Disorders: ASD	Grooming Behavior 1	Autism Research 7: 555–567, 2014 Neuropsychopharmacology 40, 2228–2239		Abstract on Alpha Waves	
8	3/2/22	Neurodevelopmental Disorders: ASD	Grooming Behavior 2	<i>International Journal of Neuropsychopharmacology</i> (2020) 1–11	Quiz		
9	3/9/22	Neurodevelopmental Disorders: ASD	Grooming Behavior III	<i>International Journal of Neuropsychopharmacology</i> (2022) 25: 64-74	Quiz		
10	3/16/22	Alternative Careers in Neuroscience Symposium; Public Speaking Article Assignment			Discuss NDD Report		
11	3/23/22	No Class – Spring Break					
12	3/30/22	Neurodevelopmental Disorders: ASD	Cognitive Flexibility I	Neuropsychology 27, 2, 152–160	Quiz	NDD Report –Draft 1 Due	
13	4/6/22	Neurodevelopmental Disorders: ASD	Cognitive Flexibility II	Behavioural Brain Research 227 64– 72	Quiz		
14	4/13/22	Psychostimulants & Genetics	B6 mice and amphetamine	Behavioural Brain Research 130 103–109		<i>NDD Report – Draft 2 Due</i> <i>NDD Report –Draft 1 Returned</i>	

15	4/20/22	Psychostimulants & Genetics	DBA mice and amphetamine	Neuroscience 82, 2, 521–528.	Quiz		
16	4/27/22	Consciousness	Event-related Potentials: P300	Env Health & Prevent Med 5, 13-17	Quiz	<i>NDD Report – Draft 2 returned</i>	
17	5/4/22	No Class – Final Lab Report Due					

Grading

Grading Philosophy:

Your grade on each graded item starts at zero, and then 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 had been taken from you. To ensure you are receiving the highest level of education possible, UIC requires students to earn their degrees. Accordingly, the burden is on you to demonstrate why you earned the 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 Rubric		
Assignment	Total Possible Points	My Score
Weekly Quizzes (x8) -15 Sheep Brain	50 points	
Gene Expression Questions	10 points	
Comparative Neuroanatomy Questions	10 points	
Ulnar Nerve Abstract	15 points	
EEG Abstract	15 points	
Alternative Careers in Neuroscience Attendance	10 points	
Lab Report – Draft 1	40 points	
Lab Report – Draft 2	40 points	
Final Lab Report	60 points	
Total	250 points	

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 considered 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).

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 writing which you will then use to improve the document. There will be several small writing assignments where you will not receive feedback. However, approximately half 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.

Appropriate Use of Course Materials

The materials distributed in this class, including the syllabus, quizzes, handouts, study aids, and in-class presentations, may be protected by copyright and are provided solely for the educational use of students enrolled in this course. Please discuss any redistribution of course materials with me. Do not post course materials or your notes from lectures and discussion on commercial websites. Unauthorized uses of course materials may be considered academic misconduct.

Students with Disabilities

Accommodations are available for students who have disabilities. Any student who feels he or she may need an accommodation based on the impact of a disability should contact me privately as soon as possible (and before the second week of class) to discuss his or her specific needs. Students with disabilities who require accommodations for access and participation in this course must be registered with the Office of Disability Services (ODS). Please contact ODS at 312-413-2183 (voice) or 312-413-0123 (TTY).

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

- Are you squeamish? Don't deal well with biological specimens or rodents? This course is meant to be hands on, you will be handling sheep brains, rat brain tissue, and working with live laboratory rodents. If you feel that you'll have difficulty with any of the above, please come speak to me privately.

- 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.