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Course Information

Course Title: PSCH 363 Neuroscience of Behavior
CRNs: 42727
Credit Hours: 3 Credit Hours
Prerequisites: PSCH 343 and credit or concurrent registration in PSCH 262 or BIOS 286. For psychology majors or students in the neuroscience degree program only.

Semester: Fall 2020

Instructor and Contact Information

Instructor name: Dr. Stephen Logan
E-mail address: slogan@uic.edu
Office hours: My drop in hours will be held online via Blackboard Collaborate Tues and Thurs 8-9PM. I will hold additional office hours by appointment.
Preferred method of communication: E-mail me; you should expect an answer to your emails within 24 hours. If you do not hear back within that time, please resend it, as I do not want to let your message fall through the cracks.
Ask and Assist: You may also post questions about class content for help from your colleagues, or to help your colleagues, to the "Ask and Assist" discussion board in Blackboard. My responses there will be helpful for all.

Teaching Assistant: Vaibhav Konanur
E-mail addresses: vkonanur@gmail.com

Communicating with the Instructor and Teaching Assistants

When questions arise during the course of this class, please remember to check these three sources for an answer:

1. Course syllabus
2. Announcements in Blackboard
3. **Ask and Assist** Discussion Board in Blackboard

Hopefully, by checking out these resources first, you will be able to get the answers you are looking for before I can get back to you via email.

Your question to the Ask and Assist forum can be answered to the benefit of all students by either your fellow students who know the answer to your question, me and/or your TA Vaibhav. You are encouraged to answer questions from other students in the Ask and Assist discussion forum when you know the answer to a question in order to help provide timely assistance.

If you have questions of a personal nature such as relating a personal emergency, questioning a grade on an assignment, or something else that needs to be communicated privately, please contact me via email. ***I will usually respond to email within 24 hours but weekends might take me a bit longer.***

Course Requirements

Remote Course

This is a fully online, synchronous course. We will meet every Monday (excluding Labor Day, September 7th) from 2-5:50PM. All of our sessions together will be done via Blackboard Collaborate or Zoom. I expect you to be present and participating in all of our sessions though these will be recorded for your benefit. Links to access our class sessions will be provided on the Announcements page and elsewhere on our Blackboard site.

Computer Requirements

This course requires that you have access to a computer that can access the internet. You will need to have access to, and be able to use, the following software packages:

- A web browser (Google Chrome or Mozilla Firefox)
- Adobe Acrobat Reader (free)
- Microsoft Word (Visit the Getting Started area in Blackboard for a link to obtain Microsoft Office 365 for free)
- **Access to a Mac, PC, or iPad** in order to ensure technical ease when taking the exams in this course; please be aware that you cannot rely on a Chromebook or mobile device when taking the practical

You are responsible for having a reliable computer and internet connection throughout the course. You will be using the Respondus lockdown browser and monitor system for taking exams. You will need a webcam and be required to download the Respondus browser. More details are available in the Getting Started area of Blackboard. The Respondus system only works on a computer or iPad. Please contact me (Dr. Logan) if you have any questions or concerns.

Course Description / Goals

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 world around us as well as an understanding of how we arrive at the "facts" that fill our textbooks in *Behavioral Neuroscience*. We often perceive science as a collection of facts to be learned by rote; the reality is that science is a process of dynamic modeling that is used to describe and understand natural phenomena. 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. Presumed facts in science should always be examined critically by carefully considering the foundations on which they are based. To this end, you will learn about neuroanatomical, neurophysiological, and neurobiological contributions to behavior through a "virtual hands on" experience and experimentation as well as through review of primary neuroscience literature. The hope is that, by the end of the class, you'll gain a strong appreciation for the scientific process in general.

Learning Objectives: By the end of the course, you will be able to demonstrate:

1. A broad knowledge of neuroscience through lectures, laboratory exercises, and readings.
2. Skills in reading and critically evaluating primary neuroscience literature.
3. An understanding of neuroscience hypothesis generation, research design and methods, techniques, statistical data analysis, drawing conclusions and insights.
4. Communication skills for presenting neuroscience research.
5. Cultivate an appreciation and enjoyment of neuroscience (the brain is cool!)

Overview of Course Content

The course will begin with lectures that provide a critical understanding of both the cellular level information about individual brain cells (neurons and glia) and their place within the 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.

As the brain does not operate in isolation, the next section will focus on processing of incoming sensory information, the internal state of the body, as well as generation of movement and motor behavior. As key examples of the many sensory modalities, we will cover basic processing of somatosensory information. With an understanding of how the brain processes incoming sensory information, we will cover movement, as the generation and coordination of motor behavior is one of the most fundamental roles of the brain, allowing for interaction with the rest of the world.

After covering neural structure and function, we will discuss the "behavioral basics" – i.e., some principal neural drivers of behavior – starting with an investigation of how the brain regulates body fluid homeostasis, a critical physiological need that influences all other behaviors. We will then delve into the neural substrates of learning and memory, the process by which previous experience can drive future behavior. We will focus on drugs of abuse and the neural systems mediating reward and pleasure, a circuitry that influences behavior as much as any other. To finish the course, we will focus on neurobiological substrates of human behavior disorders.

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). A goal to success, then, will be to listen carefully, take notes, 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. **Make sure to complete the readings before the class date for which they are assigned**.

My hope, along with Vaibhav, your TA, is that each of you will learn the material and succeed. If at any point you are struggling with the material, do not hesitate to talk with me and/or Vaibhav; we are here to help! Also, please do not be afraid to raise questions you have in class. Chances are that if you are struggling with something, others are wrestling with the same problem. By speaking up, you will help everyone learn and improve the class!

Modules & Topics

Module 1/Week 1: Understanding the Nervous System

a. Introduction to the course

b. Different approaches to understanding nervous system structure and organization

Module 2/Weeks 2-5: Neuroanatomy

a. Neuroanatomy; structure and function of key brain regions and systems

Module 3/Weeks 6-8: Fundamental Basics of Neurotransmission

a. Communication along a neuron; conduction velocity

b. Communication between neurons; spike coding

c. Communication between neurons: mechanosensation

Module 4/ Week 9: LIN Annual Christopher Comer Seminar Series

a. DATE TO BE ANNOUNCED (May require reordering of our modules)

b. Analyzing and responding to scientific talks and papers

c. Background research (TBD)

Module 5/Weeks 10-11: Neural Mechanisms of Homeostasis

a. Neural mechanisms of homeostasis; sodium and water regulation.

b. Neural mechanisms of homeostasis; literature review

Module 6/Weeks 12-13: Fear Conditioning

a. Fear conditioning

Module 7/Weeks 14-15: Neuromodulation

a. Drugs of abuse

b. Effect of Serotonin on fear.

Required Texts

There is no required text for the course; all readings including book chapters and original research articles will be supplied.

Course Schedule

All assignments are due at 11:59 PM Central Standard Time (Chicago Time) on the designated day unless otherwise noted.

	Class Schedule					
	****Note: all readings & assignments will need to be completed <u>prior</u> to the class day listed below****					
Module	Week /Date	Topic	Lab	Readings	Quizzes	Assignments
Mod 1: Understanding the Nervous System	Wk 1 Aug 24th	Introduction & Neuroanatomy	Histology Rotations	Portraits of the Mind – Ch. 2 Biol. Psych. – Ch. 2 (24-38);		1-page report on staining technique Cajol/Golgi Reflection post and comments
Mod 2: Neuroanatomy	Wk2 Aug 31st	Neuroanatomy pt1	Sheep brain dissection video		Quiz on Wk1	
	Wk 3 Sept 7th	Labor Day	Labor-free Lab (no lab today)	Biol. Psych. – Ch. 2 (39-49)		Create google slides for 2 regions of interest. Slides Due Sept 9th Comments due Sept 11th
	Wk 4 Sept 14th	Neuroanatomy pt2	Sheep brain dissection video		Quiz on Wk 2	

		Slide Presentations				
	Wk 5 Sept 21st	Lab Practicum based on Google Slide set and videos				
Mod 3: Fundamental Basics of Neurotransmission	Wk 6 Sept 28th	Communication Along a Neuron	Nerve Conduction Velocity (earthworm preparation)	Carlson – Ch. 2 (41-51) Shannon et al. 2014		
	Wk 7 Oct 5th	Communication Along a Neuron	Nerve Conduction Velocity (earthworm preparation)	Carlson – Ch. 2 (41-51) Shannon et al. 2014		
	Wk 8 Oct 12th	Communication Between Neurons (I)	Neural Rate Coding (isolated cockroach leg)	Carlson – Ch. 2 (51-64)	Quiz on wk 6	Abstract on Conduction Velocity due
Mod 4: Christopher Comer Seminar	**Wk 9 Oct 19th**	Christopher Comer Undergrad Seminar; Some awesome topic TBA				
	Wk 10 Oct 26th	Communication Between Neurons (II) Somatosensation	Two Point Discrimination	Han et al. (2015)	Quiz On wk 8	Comer Reflection due
Mod 5: Neural Mechanisms of Homeostasis	Wk 11 Nov 2nd	Sodium appetite and water Homeostasis; Homeostasis paper overview	Review Rate Coding data (Roach Lab); Paper Assignments; Body Fluid Homeostasis Lab	Lieb et al. 2016 5 Primary Lit. Papers (Assigned)	Quiz on wk10	
	Wk 12 Nov 9th	Homeostasis Paper Presentations Preparation (groups)	Review Two Point Discrimination Data Review Body Fluid Homeostasis Data		Quiz on wk11	Lit Review Assignment Due
	Wk 12 Nov 13th					Rate Coding (Roach Lab) Abstract Due
Mod 6: Fear Conditioning	Wk 13 Nov 16th	Group Homeostasis Paper Presentations; Fear Conditioning	Conditioned Taste Aversion Lab and data overview			

	Wk 13 Nov 20th					Lab Report A: Methods, Results, Figure and Figure Legends Due; Two point discrimination due
Mod 7: Neuromodulation	Wk 14 Nov 23rd	Autism Spectrum Disorder	Repetitive Behaviors in Mice Lab and Data review	Amodeo et al. (2014)	Quiz on Fear Conditioning	CTA abstract due
	Wk 15 Nov 30th	Drugs of Abuse	Effects of Amphetamine on Behavior Lab and Data review		Quiz on ASD	Report B: Intro Due
	Wk 15 Dec 2nd					ASD Abstract Due
	Wk 16 Dec 7th	No Class				Lab Report C: Discussion and D: Title page, Abstract, References Due
	Dec 13th	No Class				Final Paper Due Drugs of abuse Abstract due (extra credit)

Course Grading, Methods of Evaluation, & Grading Policies

Methods of Evaluation

Components	Total Possible Points
Weekly Quizzes (best of 6)	60 points
Lab Practicum	40 points
Brain Structure Report and Presentation	15 points
Report on Neuronal staining technique	10 points
Reflection and response to Golgi/Cajol	5 points
Abstract on Nerve Conduction Velocity	10 points

Abstract on Rate Coding	10 points
Comer Symposium Reflection Paper	10 points
Abstract on Two-Point Discrimination	10 points
Body Fluid Article Presentation	10 points
Lit Review Assignment	10 points
Abstract on Conditioned Taste Aversion	10 points
Abstract on Autism	10 points
Abstract on Amphetamine (extra credit)	(10 points)
Lab Report A	20 points
Lab Report B	30 points
Lab Report C	30 points
Lab Report D	15 points
Final Lab Report	20 points
Total	**325 points**

Respondus Lock Down Browser and Monitor

We will be using the Respondus online proctoring system to take exams in this course. In order to use the Respondus system, you will need to have a working webcam and laptop or desktop computer. An integrated or external USB webcam will both work. You will need to ensure that your computer system is charged and that you have a good stable internet connection. You will need to have the internet browser Google Chrome or Firefox downloaded on your computer and you will be required to show your UIC or government issued picture ID. More details on how to use the Respondus system along with a practice “quiz” that you can use to test out the system will be available in the Blackboard Getting Started Area. **All academic dishonesty policies apply while using the Respondus system to complete your exams.**

- Students can show either their UIC school picture ID or a valid government ID but don't need to show both
- Students cannot leave the room once the exam has started
- No one should be talking to the student while taking the exam
- No books, notes, headphones or ear buds are allowed
- No watches are allowed to be worn
- The students have no reason to be using a keyboard to type extensively as the exam is multiple-choice

- Students cannot attempt to take screen shots, use keyboard short-cuts, right click, use spell-check / dictionary programs, or read the question out loud.
- Students should not have their phone near them during the exam

A failure to follow these policies will lead to a loss of points or possibly failure of the class.

Grades and Grading Scale

Grade determination is based on the number of points earned divided by the maximum number of points. If you have any questions about your grade at any time, please feel free to contact me or Vaibhav (TA).
The following grading scale will be used:

- At least 90% of Total Points = A Final Grade (Student demonstrates achievement of learning objectives at a level of outstanding mastery)
- 80% of Total Points = B Final Grade (Student demonstrates achievement of learning objectives at a level beyond mere minimum competency)
- 70% of Total Points = C Final Grade (Student demonstrates achievement of learning objectives at a level of minimum competency)
- 60% of Total Points = D Final Grade (Student demonstrates achievement of learning objectives at a level below minimum competency but sufficient to receive credit)
- Below 59% of Total Points = F Final Grade (Student demonstrates insufficient achievement of learning objectives to receive credit)

Final Exams

PSCH 363 does not have a comprehensive final exam. You will be able to use all of exam week to complete any outstanding work you may have left to turn in. This includes the final paper and the abstract on ethanol.

http://www.uic.edu/depts/oar/current_students/calendars/final_exam_schedule.html

Grievance Procedures

UIC is committed to the most fundamental principles of academic freedom, equality of opportunity, and human dignity involving students and employees. Freedom from discrimination is a foundation for all decision making at UIC. Students are encouraged to study the University's "Nondiscrimination Statement". Students are also urged to read the document "Public Formal Grievance Procedures". Information on these policies and procedures is available on the University web pages of the Office of Access and Equity: http://oae.uic.edu/.

Course Policies

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***. Class runs from 2-5:50PM every Monday. 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*

Research indicates that students who attend class are more likely to be successful.

Preparation for class means reading the assigned readings & reviewing all videos and information required for that week.

Assignments
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, ~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.
All assignments are due at 11:59PM on the due date. All due dates listed in Blackboard and this syllabus are the date something should be completed, not the first day it should be started.
For ALL assignments (e.g. smaller writing assignments, drafts, final lab report) your score will be reduced by 5% for each day that the assignment is late. Exceptions will be made for only the most serious of documented circumstances.
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 (see Academic Integrity below).

Communication
. Please check the announcement on the Blackboard site frequently for updates, announcements, schedule changes etc. I will setup the BB announcements so that they will be sent to your uic email accounts as well.
. I will make every effort to respond to your email promptly. However, if you fail to hear back from me after 48 hours, do write a follow-up.
. Office hours are a great time to check-in with me to review material, discuss your progress in the class, or just chat about the wonders of Neuroscience. . I am available during the hours listed above; no appointment necessary.
. I am committed to your success in the class. If you feel like you are having difficulty with any aspect of the course or if you are encountering challenges that are preventing you from performing at your best, please see me as soon as possible so we can attempt to find a resolution or additional resources to help you.

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 invertebrates? This course is meant to be hands on, so you will be handling live invertebrates including worms, and crickets. If you feel that you'll have difficulty with this, please come speak with me.

- 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.

Campus Network or Blackboard Outage

When access to Blackboard is not available for an extended period of time (greater than one entire evening - 6pm till 11pm) you can reasonably expect that the due date for assignments will be changed to the next day (assignment still due by midnight). I will alert you to any changes in due date through an announcement in Blackboard that will also be sent to your UIC student email.

Preview Policy

While I do not allow for a revision of completed work, I will be happy to give early work a pre-view check. Please contact Professor Gibbons through email to discuss how a particular assignment can be given a preview check.

Student Courtesy Policy

This course brings together people from different backgrounds and experiences. We must respect each other's backgrounds. During this course, you are expected to be civil in discussions and interactions with your fellow students, teaching assistants, and professor. Avoid the use of text messaging language, limit the use of internet memes, and check responses for spelling & grammar. Also, follow the top five rules of netiquette in an online

course.

Academic Integrity Policy

As an academic community, UIC 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, and administrators–share the responsibility of insuring that these standards are upheld so that such an environment exists. A first offense for cheating or plagiarism on any assignment or exam will result in a zero. A second offence will result in an F for the course. Instances of academic misconduct by students will be handled pursuant to the Student Disciplinary Policy:

http://dos.uic.edu/docs/Student%20Disciplinary%20Policy.pdf

Privacy Policies

In this course, you will use several different tools in order to meet the course requirements. The links for these tools' privacy policies are included below for your information.

- Blackboard
- OpenStax
- Respondus LockDown Browser
- Respondus Monitor

Religious Holidays

Students who wish to observe their religious holidays shall notify the faculty member by the tenth day of the semester of the date when they will be absent unless the religious holiday is observed on or before the tenth day of the semester. In such cases, the student shall notify the faculty member at least five days in advance of the date when he/she will be absent. The faculty member shall make every reasonable effort to honor the request, not penalize the student for missing the class, and if an examination or project is due during the absence, give the student an exam or assignment equivalent to the one completed by those students in attendance. If the student feels aggrieved, he/she may request remedy through the campus grievance procedure.
http://oae.uic.edu/docs/ReligiousHolidaysFY20152017.pdf

Academic Deadlines

The last date to drop the class with a W on your transcript is October 30th, 2020. For more details on academic deadline see: http://catalog.uic.edu/ucat/academic-calendar/

Disability Accommodation

The University of Illinois at Chicago is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at UIC. Students with disabilities who require accommodations for access to and/or participation in this course are welcome, but must be registered with the Disability Resource Center (DRC). Students with disability accommodations must present the instructor with the letter outlining possible accommodations before any accommodation will be granted. You may contact DRC at 312-413-2183 (v) or 773-649-4535 (VP/Relay) and consult the following:
http://drc.uic.edu/guide-to-accommodations.

Accessibility Policies

The tools used in this course offer the below accessibility policies or Voluntary Product Accessibility Templates (VPATs) in order to convey the accessibility features of their products.

- Blackboard
- OpenStax
- Respondus