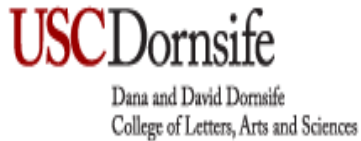


**PSYC 427 Special Topics:  
Neuropsychopharmacology  
Fall 2022  
Location: VHE 206  
Time: Tues and Thurs from 12:00 PM – 1:50 PM**



**Instructor: Shirin Birjandi, Ph.D.**  
**Office: SGM 611**  
**Office Hours: TBD**  
**Contact Info: [birjandi@usc.edu](mailto:birjandi@usc.edu)**

**Required Text:**

- **Brady et al.** *Basic Neurochemistry, Principles of Molecular, Cellular, and Medical Neurobiology 8th edition*

**Course description:**

- This course will provide a study of the pharMO-chemical nature of the human nervous system and its diseases. A comprehensive introduction to the human nervous system will be reviewed. Brain metabolic pathways, intra-cellular signaling, neuronal transport, neurotransmitters and their target receptors will be reviewed in order to understand the pharmacological nature of the brain and drug treatments for nervous system diseases.
- Introduction to techniques such as brain imaging (fMRI, EEGs, CT scans), brain tissue staining, and use of microelectrodes to measure brain activity will be reviewed to investigate questions relating to the effects of drugs on mood, sensation and behavior and disease.
- Through student presentations, students will improve their ability to read and understand primary scientific literature, as well as hone their critical thinking skills.
- This field often draws upon basic principles in a number of related areas. An analysis of sensory operations may require an understanding of protein structure, and one may be faced with principles and methodology derived from molecular biology. The discussion of neurophysiology may draw from biochemistry, especially the fields of brain metabolism and neurotransmitters. A student who has such background training may find that preparation to be of value, but don't despair if you do not. Every effort will be made to provide an explanation of any major fact or concept, and to build the more advanced explanations on what has been said in earlier lectures.

### Goals of the course:

- Understanding of critical concepts that help explain how electrical signals are generated in neurons from the concerted activity of ion channels and receptors.
- Increase the ability of students to perform literature searches and review science articles and critically evaluate the methods, results and interpretations of primary journal articles.
- Learn how pharmacological therapies targeted at a single receptor or protein in the brain can improve disease.
- Appreciation of how important even a single gene can be in maintaining normal brain function.
- Knowledge and understanding of the elastic structure of the brain, its cellular makeup and the mechanism that control the ability of the brain to change during learning and disease.

### Course assignments and evaluations

Assignment	Points	Approx % of Grade
Midterm 1	100	21.2%
Midterm 2	100	21.2%
Final Exam	100	21.2%
Presentations	100	21.2%
Participation	60 (5 pts/presentation)	12.7%
Labster	12 (4 pts/simulation)	2.5%
<b>TOTAL</b>	<b>472</b>	<b>100%</b>

The final grade is calculated based on point totals, percentages are given for your reference.

### Grade scale

A 100-90%	B+ 84-86.9%	C+ 75-77.9%	D 60-68.9%	F ≤59.9%
A- 87-89.9%	B 81-83.9%	C 72-74.9%		
	B- 78-80.9%	C- 69-71.9%		

### Exams

Course exams follow the lecture, supplemental reading and text. Complete reading assignments and supplemental material will be posted on Blackboard prior to lecture. There will be three 60-minute exams worth 100 points each.

## **Presentations**

Presentations are designed to introduce students to current basic and clinical research in the areas of neuronal injury and disease. Student pairs (*no more than two*) will each present a primary paper dealing with basic or clinical research on class topics. Students are welcome to discuss papers of their own choosing upon instructor approval. Otherwise, papers will be assigned. Papers need to be emailed to the class at least one week prior to the presentation. Students will need to specify the papers and date they will present ***no later than 5:00 pm, Tuesday, Sep 7th***. A group discussion thread will be available on Blackboard to specify the names of the presenter, paper(s), and date of presentation. Preferred dates will be given on a first-come-first-serve basis.

The student is to discuss sufficient background related to the hypothesis of the paper, how the hypothesis was tested, the main results (showing all *figures* of the paper), and the conclusions.

A cohesive Power Point presentation is expected. The total presentation should be between 40-45 minutes leaving 10-15 minutes for discussion and questions and the end. *Please also be prepared for questions asked throughout the presentation.* It will be important for student presenters to be able to answer questions from the instructor and other students. **A bibliography should be turned in at the time of the presentation.**

Students not presenting are expected to familiarize themselves with the article prior to the presentation in order to ask thoughtful scientific questions pertaining to the work. **Student participation will also be evaluated and graded by the instructor.**

## **Presentation Participation**

Students not presenting on a presentation day are still expected to familiarize themselves with the article prior to the presentation in order to ask thoughtful scientific questions pertaining to the work. **Student participation will be evaluated based on attendance and submission of two written questions pertaining to the article(s) presented. Participation is worth 5 pts/presentation for a total of 60 pts.** No credit for participation will be given in the case of an unexcused absence.

## **Labster**

Three lab simulations will be required to supplement your learning experience. You will need to log into Bb, find the Labster Simulation link on the left-hand side. The link for each simulation will be available the Sunday before the specified date on the syllabus. It is highly recommended that you start and complete the simulations during your regularly scheduled class session so that if you have any questions or want to discuss any topics, your instructor will be readily available. You'll have 72 hrs from the beginning of your class session to complete the simulation (to 100% progress). Throughout each simulation, you will perform specific lab activities and tasks. The 'Simulation Quiz' points will be earned from answering Labster Quiz questions, based on theory and results, throughout these simulations. The scores you receive from answering questions will be automatically recorded and transferred to the Bb Grade Center. You can watch these simulations as many times as you'd like, but your first attempt score will be the one recorded so do not rush through these simulations. You can also go to the Theory tab for help if you are not sure about an answer. In order to receive 100% of your quiz score, you must complete the simulation to 100% progress; otherwise, your final score will be based on the percent completed. If you do not attempt to do your lab simulation within the 72-hr time frame, you will receive a zero (0) for that simulation.

### **Labster Minimum Requirements**

Labster can be used on laptop- or desktop-based computers, which meet standard requirements. Labster will NOT work on iPads. All popular browsers are supported, but Google Chrome and Mozilla Firefox work the best; historically, students have had problems with Safari (so DO NOT use Safari). Labster simulations are typically only 30MB or less in size, however, internet/Wi-Fi speed may affect the time it takes to load a simulation. Typically, it only takes 1 - 5 minutes to load the entire simulation. Try not to have multiple browser windows or tabs open while loading or doing the simulation. If you experience technical issues or need help with the simulation app, please contact the Labster Help Center at <https://help.labster.com/en/>. Do not contact your instructor as I will not be able to help you with any Labster technical issues.

### **Additional Policies**

Students who are unable to take an exam at the scheduled time must give written notification as soon as possible, preferably in advance. Students who miss an *exam, assignment, presentation, etc.* for a legitimate reason, must provide documentation of said reason within seven days of the exam date or due date. Documentation must be sent to course Instructor. If documentation is not received within seven days, the score for the missed assignment/exam will be zero. Making up an exam will only be allowed if the student can demonstrate with written documentation a compelling reason (such as family or medical emergency) for not taking the exam at the scheduled time. A make-up exam may include an oral component and will generally be more difficult than the in-class exam.

**Re-grading of exams.** Your graded midterm exams can be reviewed. If you feel an error was made in the grading of your exam, you must submit your exam, along with a Regrade Request Form (found on Bb) in which you have a thorough (but concise) typewritten explanation of why you think your answer deserves more credit within 1 week of the time it was viewed. The entire answer will be re-graded, not just the part you think deserves more credit. Your score may increase or decrease as a result of a regrade.

**Lecture and Discussion Absences.** Attendance at student presentations is expected. If you must miss a student presentation due to illness or valid USC travel, please present with evidence the reason for absence and you will be allowed to make-up the discussion assignment within 1 week of the missed lecture period.

**Late Policy.** For every 12-hour increment any assignment is handed in late, you will lose 10% of the total possible points [i.e., if the assignment is past 5 days (120 hrs) late, you will receive a zero (0) for that assignment]. Saturdays, Sundays, and University holidays ARE counted. The Labster simulations adhere to the 72-hr policy as stated in the Lab Syllabus.

**Cell phone usage.** During lecture you will not be able to use your cell phone – please silence it and keep it either in your backpack/purse.

*It may be necessary to adjust the syllabus during the semester; check BLACKBOARD for updates.*

## TENTATIVE COURSE SCHEDULE

Week	Date	Topic	Readings
	08/23/22	Introduction to the nervous system, neurons and glia	Brady, (Ch. 1) (additional readings on Blackboard)
	08/25/22	Neuropharmacology	
2	08/30/22	Cytoskeleton of neurons and glia	Brady, (Ch. 6) (additional reading posted on Blackboard)
	09/08/22	Cytoskeleton of neurons and glia Labster: experimental design	Brady, (Ch. 6) Labster Online
3	09/13/22	Intracellular trafficking	
	09/15/22	Intracellular trafficking Axonal transport	Brady, (Ch. 7) Brady, (Ch. 8)
4	09/20/22	Action potential and ion channels	Brady, (Ch. 4)
	09/22/22	<b>Exam 1</b>	
5	09/23/22	<i>Discussion: Shirin Birjandi, Presenter navigating a scientific paper</i>	TBD
	09/27/22	Action potential and ion channels Labster: action potential lab: experiment with a squid neuron	TBD
6	09/29/22	<i>Discussion:</i>	Brady, (Ch. 4) Labster Online
	10/04/22	Voltage gated channels Neurotransmitters in the CNS	Brady, (Ch. 4) Brady, (Ch.13-20)
	10/06/22	<i>Discussion:</i>	
7	10/11/22	<i>Discussion:</i>	TBD
	10/13/22	<b>Fall Recess, No Lecture</b>	TBD
8	10/18/22	Neurotransmitters in the CNS	Brady, (Ch.13-20)
	10/20/22	<i>Discussion:</i>	TBD
9	10/25/22	<i>Discussion:</i>	TBD
	10/27/22	Energy metabolism of the brain	Brady, (Ch. 11)
10	11/01/22	<b>Exam 2</b>	
	11/03/22	<i>Discussion:</i>	
11	11/08/22	<i>Discussion:</i>	TBD
	11/10/22	Intracellular signaling: G-proteins, cyclic nucleotides, calcium Labster: signal transduction: how cells communicate	Brady, (Ch. 21) Labster Online
12	11/15/22	<i>Discussion:</i>	TBD
	11/17/22	<i>Discussion:</i>	TBD
13	11/22/22	Intracellular signaling: G-proteins, cyclic nucleotides, calcium	Brady, (Ch. 21)

	11/24/22	<b>No lecture, Thanksgiving</b>	
14	11/29/22	Neurodegenerative diseases: Multiple Sclerosis and Brain Cancer	Brady, (Ch. 41)
	12/01/22	<i>Discussion:</i>	TBD
15	12/6/22	<b>Final Exam (non-cumulative) 12:30PM</b>	

### Statement on Academic Conduct and Support Systems

#### **IMPORTANT: COVID-19 PROTOCOLS**

Students must comply with all COVID-19 safety protocols outlined by federal, state, local, and university policies. These policies will likely evolve with the changing conditions of the COVID-19 pandemic and may include social distancing, the use of face coverings at all times, proof of vaccination, and regular COVID testing, among others.

#### **Academic Conduct:**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

#### **Support Systems:**

*Counseling and Mental Health - (213) 740-9355 – 24/7 on call*

[studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

*National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call*

[suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

*Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call*

[studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault)

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

*Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298*

[equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu)

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

*Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298*

[usc-advocate.symplicity.com/care\\_report](https://usc-advocate.symplicity.com/care_report)

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity |Title IX for appropriate investigation, supportive measures, and response.

*The Office of Disability Services and Programs - (213) 740-0776*

[dsp.usc.edu](https://dsp.usc.edu)

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

*USC Campus Support and Intervention - (213) 821-4710*

[campussupport.usc.edu](https://campussupport.usc.edu)

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

*Diversity at USC - (213) 740-2101*

[diversity.usc.edu](https://diversity.usc.edu)

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

*USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

[dps.usc.edu](https://dps.usc.edu), [emergency.usc.edu](https://emergency.usc.edu)

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

*USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call*

[dps.usc.edu](https://dps.usc.edu)

Non-emergency assistance or information.

*Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)*

[ombuds.usc.edu](https://ombuds.usc.edu)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.