PSYC 427 (NEUR 427)
Neuropsychopharmacology
Fall 2023
Location: VHE 206
Time: Tues and Thurs from 12:00 PM – 1:50 PM

USC Dornsife
Dana and David Dornsife
College of Letters, Arts and Sciences

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Office Hours: Wednesdays from 1:00 PM – 2:00 PM
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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 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 several 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.

Textbooks:

- **Brady et al.** *Basic Neurochemistry, Principles of Molecular, Cellular, and Medical Neurobiology 8th edition* **(optional)**
- Alternative readings in the form of scanned book chapters from various textbooks will be provided on Blackboard.

Course assignments and evaluations

Assignment	Points	Approx % of Grade
Midterm 1	100	20.7%
Midterm 2	100	20.7%
Final Exam	100	20.7%
Presentations	100	20.7%
Participation	72 (8 pts/presentation)	14.9%
Labster	12 (4 pts/simulation)	2.5%
TOTAL	**484**	**100%**

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.

Re-grading of Exams

Your graded midterm exams can be reviewed with a 20-minute window. 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, to Dr. Birjandi 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 because of a regrade.

LockDown Browser Requirement
This course requires the use of LockDown Browser for online exams and quizzes.
Watch this brief video to get a basic understanding of LockDown Browser feature.
https://www.respondus.com/products/lockdown-browser/student-movie.shtml
Download Instructions. Download and install LockDown Browser from this link:
https://download.respondus.com/lockdown/download.php?id=945755274

Presentations
Presentations are designed to introduce students to current basic and clinical research in the areas of neuronal injury and disease. Students 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, Sept 12th***. 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 at 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 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 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 8 pts/presentation for a total of 72 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. 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/.

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 because 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.

No use of AI Generators
Since creating, analytical, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student working individually or in groups. Students may not have another person or entity complete any substantive portion of the assignment. Developing strong competencies in these areas will prepare you for a competitive workplace. Therefore, using AI-generated tools is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.

Course Content Distribution and Synchronous Session Recordings Policies
USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. (Living our Unifying Values: The USC Student Handbook, page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. (Living our Unifying Values: The USC Student Handbook, page 13).

Course Evaluations
Course evaluation occurs at the end of the semester university-wide. It is an important review of students' experience in the class.

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

TENTATIVE COURSE SCHEDULE

Week	Date	Topic	Readings
1	08/22/23	Introduction to the Nervous System, Neurons and Glia	Brady, (Ch. 1) (alternative readings on Blackboard)
	08/24/23	Introduction to the Nervous System, Neurons and Glia	Brady, (Ch. 1) (alternative readings on Blackboard)
2	08/29/23	Neuropharmacology and Biological Therapies I	Slide deck
	08/31/23	Biological Therapies II	Slide deck
3	09/05/23	Cytoskeleton of Neurons and Glia I (Antipychotic medications reviewed)	Brady, (Ch. 6)
	09/07/23	Cytoskeleton of Neurons and Glia II (Antipychotic medications reviewed) Labster: Experimental Design	Labster Online
4	09/12/23	Intracellular Trafficking Axonal Transport	Brady, (Ch. 7) Brady, (Ch. 8) (alternative readings on Blackboard)
	09/14/23	*Discussion: Shirin Birjandi, Presenter navigating a scientific paper*	Article posted participation questions due
5	09/19/23	Action Potential and Ion Channels I	Brady, (Ch. 4) (alternative readings on Blackboard)
	09/21/23	**Exam 1**	
6	09/26/23	Action Potential and Ion Channels II Labster: Action Potential Lab: Experiment with a Squid Neuron	TBD Brady, (Ch. 4) (alternative readings on Blackboard) Labster Online
	09/28/23	*Student Lead Paper Discussion*	participation questions due
7	10/03/23	*Student Lead Paper Discussion*	participation questions due
	10/05/23	Voltage Gated Channels (Mood stabilizers using voltage gated-ion channels reviewed)	Brady, (Ch. 4) (alternative readings on Blackboard)
8	10/10/23	*Student Lead Paper Discussion*	TBD participation questions due
	10/12/23	***Fall Recess, No Lecture***	
9	10/17/23	Neurotransmitters in the CNS I (Nicotine, Chantix, and Sarin gas reviewed)	Brady, (Ch.13-20) (alternative readings on Blackboard)

	10/19/23	*Student Lead Paper Discussion*	TBD participation questions due
10	10/24/23	*Student Lead Discussion*	TBD participation questions due
	10/26/23	Neurotransmitters in the CNS II (Haloperidol, Deprenyl, Adderall, Ritalin, and Cocaine reviewed)	Brady, (Ch.13-20) (alternative readings on Blackboard)
11	10/31/23	**Exam 2**	
	11/02/23	*Student Lead Paper Discussion*	TBD participation questions due
12	11/07/23	*Student Lead Paper Discussion*	TBD participation questions due
	11/09/23	Neurotransmitters in the CNS III (Monamine Antidepressants, MDMA, LSD, Psilocybin and Benzodiazepines reviewed)	Brady, (Ch.13-20) (alternative readings on Blackboard)
13	11/14/23	*Student Lead Paper Discussion*	TBD participation questions due
	11/16/23	*Student Lead Paper Discussion*	TBD participation questions due
14	11/21/23	Energy Metabolism of the Brain***** (Fundamentals of fMRI, MRI, and CT scans reviewed) Intracellular Signaling: G-proteins, Cyclic Nucleotides, Calcium I***** Labster: Signal Transduction: How Cells Communicate (*****Zoom Lecture)	Brady, (Ch. 11) Brady, (Ch. 21) **Labster Online**
	11/23/23	**No lecture, Thanksgiving**	
15	11/28/23	Intracellular Signaling: G-proteins, Cyclic Nucleotides, Calcium II (G-protein targeted Antidepressants: Esketamine and Zuronolone reviewed)	Brady, (Ch. 21)
	11/30/23	*Student Lead Paper Discussion*	TBD participation questions due
	12/12/23	**Final Exam (non-cumulative)** 11:00 AM	

Statement on Academic Conduct and Support Systems

Academic Integrity:
The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - 988 for both calls and text messages – 24/7 on call
The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over

200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - *(213) 740-9355(WELL) – 24/7 on call*
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - *(213) 740-5086*
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*
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - *(213) 740-0776*
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - *(213) 740-0411*
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - *(213) 740-2101*
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*
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) 442-1200 – 24/7 on call*
Non-emergency assistance or information.

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

Occupational Therapy Faculty Practice - *(323) 442-2850 or* otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.