

PSY 719
Behavioral Neuroscience

Course Text: Kandel, E. R., Schwartz, J. H., & Jessell, T. M. (2000). *Principles of Neural Science*. McGraw Hill. ISBN: 0838577016 / 9780838577011

Prerequisites: Consent of Instructor

Course Overview/ Learning Outcomes:

The primary goal of this course is for students to understand the cellular and molecular mechanisms that contribute to behavior in complex systems. The material presented will highlight genetic, molecular, and cellular functions that impact the behavior of organisms. Students will gain an understanding of the current state of knowledge in the field, as well as the research methods used to examine how subtle changes in the function of a single cell or small populations of cells are used to examine processes such as sensory perception, learning, memory, attention, sleep, feeding, and reproductive behaviors. The final portion of the course will focus on the molecular and cellular underpinnings of neurological and psychiatric disorders as well as the pharmacological methods utilized to treat them.

Grades:

Your course grade will be based on a total of 2 exams (each worth 25% of overall grade). The remainder of the course grade will be based on an original research proposal and presentation (25% of overall grade) and your participation in class (25% of grade). The participation grade will be based on students serving as a discussion leader for at least one topic, attending class, reviewing the material assigned, and participation in class discussions. In order to obtain participation credit for each session of the class students will be required to submit at least two discussion questions relevant to the material being covered as well as take an active role in the discussion. Overall grades will be on a traditional scale of A (90-100) etc., B, C, D, or F.

Research Paper:

The paper will be an original research proposal of a topic in neuroscience that fits with topics and techniques discussed in class (cellular, molecular, and/or genetic). Students may select any topic within neuroscience (examples will be given) that they are interested in, however, the instructor must approve the topic by the deadline listed below on the course timeline. The research proposal must identify the topic/subject matter to be investigated, background material on the current status of the research on the topic, and a clear hypothesis and experimental design for the research proposal. Each student will also prepare a presentation that will be given to the entire class. All students are expected to critically evaluate these presentations and ask questions.

Course format:

This course will be a principally discussion based format in which the students will discuss and examine topics assigned in the readings. There will be some lecture material by the instructor over the course of the semester to supplement the assigned

readings. Students are responsible for making sure they have read the appropriate material from the course text as well as original research articles that will be provided prior to each class session. All students are expected to participate in classroom discussion.

Course Policies:

Students are expected to be respectful of their classmates and instructor and refrain from disruptive behavior. All cell phones are to be turned off or set on silent. Because this is a discussion-based course, students must be present to earn participation credit. Each unexcused absence will result in a 10% reduction in the participation grade. Students are expected to inform the instructor one week in advance if they know they will miss a class. Students who miss class due to illness are expected to inform the instructor of the reason for absence before the next class meeting. Students must inform the instructor prior to a scheduled exam if they will not be able to complete it on the scheduled day. If given permission by the instructor, students will have 1 week to complete a make-up exam. The deadline for approval of the research paper and the due date for the paper will not be extended. Students may turn in the research paper any time before the deadline, but papers will not be accepted after the due date.

WEBCAMPUS:

This course uses WebCampus for a number of useful functions. You can access WebCampus on the internet at: <http://webcampus.nevada.edu>. There are instructions on the WebCampus website as to how to register and logon. If you are having any problems with WebCampus, please let me know right away. To stay up-to-date, I recommend logging in at least twice a week. Note: A frequent problem that students encounter is an inability to download certain files. Use Adobe Reader for pdf files and Microsoft Office for Word documents or PowerPoint files.

University Policies and Resources:

Academic Misconduct—

It is expected that you have familiarized yourself with the UNLV Academic Misconduct Policy (see <http://studentlife.unlv.edu/judicial/misconductPolicy.html>) and that you will complete all work for this course in accordance with that policy.

Copyright –

The University requires all members of the University Community to familiarize themselves and to follow copyright and fair use requirements. **YOU ARE INDIVIDUALLY AND SOLELY RESPONSIBLE FOR VIOLATIONS OF COPYRIGHT AND FAIR USE LAWS. THE UNIVERSITY WILL NEITHER PROTECT NOR DEFEND YOU NOR ASSUME ANY RESPONSIBILITY FOR EMPLOYEE OR STUDENT VIOLATIONS OF FAIR USE LAWS.** Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. To familiarize yourself with

copyright and fair use policies, you are encouraged to visit the following website:
<<http://www.unlv.edu/committees/copyright/>>.

Disability Resource Center (DRC) –

The Disability Resource Center (DRC) coordinates all academic accommodations for students with documented disabilities. The DRC is the official office to review and house disability documentation for students, and to provide them with an official Academic Accommodation Plan to present to the faculty if an accommodation is warranted. Faculty should not provide students accommodations without being in receipt of this plan.

UNLV complies with the provisions set forth in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, offering reasonable accommodations to qualified students with documented disabilities. If you have a documented disability that may require accommodations, you will need to contact the DRC for the coordination of services. The DRC is located in the Student Services Complex (SSC), Room 137, and the contact numbers are: VOICE (702) 895-0866, TTY (702) 895-0652, FAX (702) 895-0651. *For additional information, please visit:* <<http://studentlife.unlv.edu/disability/>>.

UNLV Writing Center –

One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance.

Appointments may be made in person or by calling 895-3908. The student's Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. <http://writingcenter.unlv.edu/>

Tentative schedule:

Week 1	Cellular and Molecular Biology of Neurons: cellular structure, transcription, translation, protein processing and trafficking- REVIEW
Week 2	Neurophysiology: ion channels, resting membrane potential, action potential, intracellular signaling
Week 3	Neurotransmission: synaptic transmission, volume transmission, electrical/chemical synapses
Week 4	Structural and Functional Neuroanatomy: behaviorally relevant structures in CNS and neurotransmitters Moderator:
Week 5	Psychopharmacology: the dose response relationship, drug effects on receptor expression, homeostatic mechanisms, experimental approaches Moderator:

Week 6	Neuroethology- simple forms of behavior tied to specific circuits Moderator:
Week 7	Exam 1 and*Deadline for instructor to approve proposal topic Development of the Nervous System: gross, cellular and molecular development Moderator:
Week 8	Sensory systems: cellular and molecular basis of vision, audition, somatosthesis, and chemosensation across several species Moderator:
Week 9	Learning and Memory: molecular and cellular plasticity, electrophysiology and behavioral correlates Moderator:
Week 10	A Network Approach to Behavior: plasticity and electrophysiology of neural networks regulating perception, sleep, and behavior Moderator:
Week 11	Neurological Disorders Degenerative: cellular/molecular pathophysiology Moderator:
Week 12	Arousal/Emotion: central systems involved in attention, arousal, and stress Moderator:
Week 13	Neurological Disorders Psychiatric: cellular/molecular pathophysiology Moderator:
Week 14	Proposal presentations
Week 15 *Paper Due	Proposal presentations
Finals Week	Exam 2

For each week we will divide the class time to discussion of principles of neurobiology concepts as well as original research projects.

The “Moderator” for each week will be responsible for guiding the discussion on the research papers selected. For each topic the instructor will select at least one article and the Moderator will select another article relevant to the discussion.