

**BIOL 5301/6321: Advanced Topics in Biological  
Science  
Cell & Molecular Neuroscience  
Fall 2023  
ROOM # UGLC 216  
Tuesdays and Thursdays 10:30 – 11:50 AM**

**Instructor:** Travis Moschak

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Office Hours: Email me to schedule a virtual or in-person appointment M-F

**Course Description:**

This course focuses on cellular and molecular mechanisms that underlie the development and function of the nervous system. This includes aspects of gene expression (transcription, mRNA, translation, epigenetics) and cell biology (cellular transport, cytoskeleton, cell cycle, signal transduction, signaling pathways) as they pertain to neurons and glia. Lectures supplemented by discussion of primary research articles will also serve as an introduction to microscopic, electrophysiological, molecular biological, and genetic techniques, as well as to the animal models used to study the nervous system and the molecular and cellular alterations that occur during a variety of neurological disorders.

**Learning Objectives:**

This course will provide a broad introduction to nervous system structures and functions. At the end of the academic term, students who successfully complete this course will be able to: 1) understand the basic mechanisms of neuronal function; 2) explain the underpinnings of neuronal communication and signaling; and 3) apply molecular insights to neurological disorders

**Accommodations and Support Services:**

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, by email to [cass@utep.edu](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at [www.sa.utep.edu/cass](http://www.sa.utep.edu/cass). The instructor must be notified by CASS by the end of the first week of classes to facilitate accommodations support implementation.

**Blackboard:**

All materials, assignments, and exams will be posted on Blackboard. Announcements about the class will be posted on Blackboard as well.

**Grades:**

**Exams: 300pts**

- There will be 3 exams, each worth 100 points during the course of the semester (dates below).
- No test scores will be dropped. No make-up exams will be administered under any circumstances, no matter how compelling.**
- Each exam will be focused on lecture material. Note that the final is *not* cumulative.
- Exams will take only 90 minutes and are timed.** If you require any additional time or accommodation you must provide appropriate documentation at least one week prior to the first exam.
- No make-up exams will be administered under any circumstances, no matter how compelling.**

**Assignments: 90pts**

- **Homework Worksheets (30 pts each).** There will be 3 homework worksheets worth 30 pts each

**Student Presentations: 210 pts**

- Each student will give 2 presentations on papers assigned in class (75 pts each, 150 pts total)
- Each student will be required to give a brief written critique (<200 words) on 2 different papers presented by other students in the class (20 pts each, 40 pts total)
- Each student will be required to read all papers assigned for the course and partake in group discussion following presentation of each paper (20 pts total)

**Academic Dishonesty:** Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student or possessing unauthorized materials during a test. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another person's as one's own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Violations will be taken seriously and will be referred to the Dean of Students Office (Office of Student Conduct and Conflict Resolution) for possible disciplinary action. Students may be suspended or expelled from UTEP for such actions.

**Final Grade Calculation:** Final grades will be calculated as follows (points earned/600) x 100.

**Grading scale:**

A = 90.0-100.0%

B = 80.0-89.9%

C = 70.0-79.9%

D = 60-69.9%

F < 60.0%

**Please note that grades will not be "rounded up".**

**Class Schedule:** Lecture title bold, RED indicates assignment deadlines. *Italics indicates student presentations*, Yellow highlight indicates Exams.

Tues 08/29 **Course Overview**

**Overview of Neuroanatomy**

Thurs 08/31 **Overview of Neural Function**

Tues 09/05 **Neural Proliferation and Differentiation**

Thurs 09/07 **Neuronal Polarity and Synapse Formation**

Tues 09/12 **Neurotrophins and Calcium Signaling**

Sun 09/17 **Homework 1 due at 11:59 PM**

Tues 09/19 **Exam 1**

Thurs 09/21 **Membrane Potential**

Tues 09/26 **Ion Channels 1**

Thurs 09/28 **Ion Channels 2**

Tues 10/03 **G Proteins**

Thurs 10/05 **Synaptic & Vesicle Function**

Tues 10/10 **Synaptic Plasticity and Networks**

Wed 10/11 **Homework 2 due at 11:59 PM**

Tues 10/17 **Exam 2**

Thurs 10/19 ***Student Presentations***

Tues 10/24 ***Student Presentations***

Thurs 10/26 **Animal Models and Technology 1**

Tues 10/31 **Animal Models and Technology 2**

Thurs 11/02 **Neurobiology of Disease 1**

Tues 11/07 **Neurobiology of Disease 2**

Thurs 11/09 **Neurobiology of Disease 3**

Tues 11/14 **No Class**

Thurs 11/16 **No Class**

Tues 11/21 **Interactions between the CNS and Immune system**

Wed 11/22 **Homework 3 due at 11:59 PM**

Thurs 11/23 **Thanksgiving – No Class**

Tues 11/28 **Exam 3**

Tues 12/05 *Student Presentations*

Thurs 12/07 *Student Presentations*

**\*\*Please note: The syllabus is subject to change during the semester. Please make sure I have your best email contact information, to insure you always have the most up to date version of the syllabus. I will also always post the most recent version to Blackboard.**