

Behavioral Neuroscience

Department of Psychology – Columbia University

PSYC2450 - Course Syllabus – Spring 2026

Instructor: Dr. Sarah DeMoya (she/her)

Course Meeting Time: MW 10:10 AM – 11:25 AM

Office Hours: Tuesdays 12:00 PM – 2:00 PM

E-mail: sed2182@columbia.edu

Course Location: Uris 301

Office: 355D Schermerhorn Ext.

The TAs are here to help you this semester and are a fantastic resource. Please take advantage of their help! TAs will hold weekly office hours, answer emails, hold exam reviews, and grade your work. You are each assigned a TA who will be your go-to person for email questions or concerns. (See below for TA assignment.) For office hours, please go to whichever office hours work best in your schedule. Office hours are listed below. Please check back before you attend office hours for any updates to time and/or location.

Last Name: **Your Assigned TA:** **Email:**

Office Hours:

Location:

TA:

Course Description:

Behavioral Neuroscience is an introductory neuroscience course that explores what we know about the brain using animal models. It explores behavior by understanding the influences of biological processes. What does a prototypical neuron look like? How do neurons talk to each other? How does neuronal communication produce behavior? And then moving more into behavioral questions like: What happens in the brain when you want to move? Why do we dream? How do we form memories? What are the biological bases of mental disorders? How does the environment interact with our genes? We will explore answers to questions like these by looking at the principles governing neuronal activity, the relationship between brain activity and subjective experience, the role of neurotransmitter systems in memory and motivational processes, and the presumed brain dysfunctions that give rise to mental illnesses like schizophrenia and depression.

Course Prerequisites:

PSYC1001 or permission of the instructor. Basic knowledge of biology and chemistry is helpful, but not necessary.

Course Role in the Department:

PSYC2450UN Behavioral Neuroscience is an intermediate-level lecture course, open to undergraduates and students in the Post-baccalaureate Psychology program. It fulfills the following degree requirements:

- For the Neuroscience & Behavior major, this course can be used to fulfill either the P2 Course in Neuroscience requirement or the P4 Additional 2000-level Psychology lecture course, but not both.

- For the Psychology major and concentration, and for the Post-baccalaureate Psychology program, this course meets the Group II – Psychobiology & Neuroscience – distribution requirement.

Required Textbook:

Neuroscience Exploring the Brain. Mark R. Bear, Barry W. Connors, Michael A. Paradiso, Lippincott Williams and Wilkins, Fourth Edition, 2016; ISBN 9780781778176

Copies of this book are on reserve at the Science & Engineering Library in the Northwest Corner building. Call number: QP355.2.B425 2016

Supplemental Materials:

Various supplemental materials will be provided by the instructor on the course website.

Course Website:

The most up-to-date information, including changes to the syllabus or to the class schedule, announcements, lecture slides and additional materials are contained on the course website on CourseWorks (Canvas). Be sure you are familiar with it, that you are easily able to login to the website, and that you always have the lecture slides with you (whether printer or digital). If you have problems accessing the course website at any point during the semester, please let Dr. DeMoya know.

Course Learning Objectives:

Specific learning objectives for each chapter are provided for you on the Module pages for each chapter. Some weeks have more than others. It is highly to your advantage to fill them out each week as you read because the questions for the weekly quizzes and for the exams will be taken directly from the learning objectives. I may not have time to cover all learning objectives in class.

Grades:

Your overall course grade will be determined by your effort in the following areas:

- Three Midterm Exams 60% (20% each)
- Final Exam 25%
- Written Assignments 5%
- Post-class Quizzes 5%
- In-class Participation 5%

Letter Grade Assignment:

99-100%: A+	87-89.9%: B+	77-79.9%: C+	67-69.9%: D+	<60%: F
94-98.9%: A	84-86.9%: B	74-76.9%: C	64-66.9%: D	
90-93.9%: A-	80-83.9%: B-	70-73.9%: C-	60-63.9%: D-	

Note about A+ grades: A+ grades are earned by portion of students who have achieved high mastery of the material. If extra credit opportunities are provided, they cannot be used to move a student from an A to an A+ grade.

Exams:

There will be four midterms given in this course. Your lowest midterm score will be dropped, and each of the three remaining midterms is worth 20% of your overall grade for a total of 60% of your grade being determined by your midterm performance. There is a comprehensive final that is worth 25% of your final grade. The final will be administered during finals week. The final exam will not be administered early, so please plan accordingly for any end of semester travel.

The midterms will each be 1 hour and 15 minutes long. The final exam will be 2 and a half hours long and will have comprehensive questions covering the entire semester. Exams will consist of multiple-choice questions. These questions will test your mastery of the learning objectives for each lecture. You are permitted to bring one 8.5 x 11 or A4-sized sheet of notes to the exam. It may be double-sided, typed or handwritten, and may include images or diagrams.

- While studying, try to emphasize *understanding* and *critical thinking*. Knowing key concepts and definitions is highly valued, of course, but successful students use that knowledge to scaffold a more comprehensive understanding of the material. This is highly advisable for these exams and in general for your career. Rather than simply “memorizing,” try to “understand” the material and use your Instructor and the TAs for clarification. Test questions will include more basic definitional / conceptual knowledge as well as application of that knowledge to new scenarios.
- Slides on the course website should be considered as a study aid, but they may not be “good enough” on their own unless you come to class and take notes. Sometimes I may have to skip slides in the posted lectures if we run out of time in class. If that happens, you should still read the relevant sections in the textbook and answer the learning objectives, as the exam questions will be taken directly from the learning objectives.

Make-up Exams:

Make-up exams are allowed only with written justification (e.g., by your doctor or advising dean) and must be taken within *one week* after the exam. (Make-up exams will not be offered before the scheduled exam date.) Exams taken after that time or that do not have written justification will have the same late penalty as all other assignments.

Written Assignments:

This semester you have an opportunity to explore the world of behavioral neuroscience in two ways in addition to attending class: A.) by reading about a recent discovery in the field of behavioral neuroscience, and B.) by watching a seminar on Youtube given by a neuroscientist about their work. To get credit for each of these, you will submit a written reflection. All assignments must be submitted through the Assignments tab on CourseWorks. You can complete the assignments at any time during the semester before the due date so please plan appropriately as there are no extensions for these assignments.

Post-Class Quizzes:

Each Friday at 12:00 PM a post-class quiz will be available on Courseworks. You will have until Sunday evening at 11:59 PM to complete it. Your scores count for these quizzes but

you may retake the quiz two additional times after your first attempt for a total of 3 attempts to improve your score. There is no time limit but all attempts must be submitted before the Sunday deadline. If you are happy with your first attempt you do not need to retake it. Think of these quizzes as learning check-ins.

In-Class Participation (Poll Everywhere):

Each class period we will have polling questions to check our understanding of the material. These questions will not be graded for accuracy, but your participation in the poll is required. We will use Poll Everywhere for our polling questions. Your 4 lowest scores will be dropped. If there are extenuating circumstances (hospitalization, etc.) that cause you to miss more than 4 consecutive class periods we will discuss this on a one-on-one basis in conjunction with your academic advisor.

Course Policies: please read the following policies carefully!

Disability Services:

Students must register with their school's Disability Services office in order to receive disability-related accommodations and must complete the testing accommodation request form. More information is available at:

Columbia: <https://health.columbia.edu/content/disability-services>

Barnard: <https://barnard.edu/disabilityservices/register-cards>

Religious Observance:

If you are going to miss class(es) due to religious observance, you must notify Dr. DeMoya during the first week of class so that accommodations can be made.

Class Attendance and Electronics Policy:

It is strongly encouraged that you take hand-written notes. If you need to use a device, please be respectful of your classmates and your instructor by only accessing the document for class and not using the device to message or access the internet. Coming to class is of no value if you are not paying attention. Messaging friends, watching videos online, and browsing social media are not appropriate for the classroom. Remember to silence your phones before class.

Unreadable File Submission:

Any assignments that have unreadable files will automatically receive a 0% score. It is a student's responsibility to make sure that submissions are done in a proper manner and double check that files are readable and accessible to the teaching team. To avoid the penalty for unreadable file submission, try to work on the assignments ahead of time and give yourself enough time to check that the files submitted are accessible/readable.

Late Assignments:

Any assignment that is turned in late will have a 10% deduction in points per day. Any assignments turned in 5 or more days late will receive a maximum score of 50%. Any

assignments not turned in by the last day of class (Monday, May 4th at 11:59 PM) will receive 0% credit. Courseworks automatically applies this deduction in points. If there are extenuating circumstances (death in the family, hospitalization, etc.) please notify Dr. DeMoya immediately. Accommodations cannot be made if Dr. DeMoya is not informed by the student or their advisor, or if circumstances arise after the due date. Note: to avoid the penalty for late submissions, do not wait until the last minute to submit an assignment. Courseworks can be slow to upload, resulting in a late penalty.

Academic Honesty:

Academic honesty is taken very seriously. Columbia students commit to the Honor Code as follows: “I affirm that I will not plagiarize, use unauthorized materials, or give or receive illegitimate help on assignments, papers, or examinations. I will also uphold equity and honesty in the evaluation of my work and the work of others. I do so to sustain a community built around this Code of Honor.” All suspected cases of dishonest behavior will be reported to Student Conduct and Community Standards. All submissions will be run through TurnItIn.

Sexual Respect:

Any form of gender-based misconduct will not be tolerated. “Columbia University is committed to fostering an environment that is free from gender-based discrimination and harassment, including sexual assault and all other forms of gender-based misconduct.” Visit this website for more information: <http://sexualrespect.columbia.edu/>

Course Schedule:

The calendar below details topics, readings, and assignments for each class period. Students should complete the assigned reading before coming to class.

Date	Topic	Reading
January 21 st (Wed.)	Course Intro	Syllabus
January 26 th (Mon.)	Neurons and Glia	Chapter 2
January 28 th (Wed.)	Neurons and Glia	Chapter 2
February 2 nd (Mon.)	Membrane Potential	Chapter 3
February 4 th (Wed.)	Membrane Potential	Chapter 3
February 9 th (Mon.)	Action Potential	Chapter 4
February 11 th (Wed.)	Action Potential	Chapter 4
February 16 th (Mon.)	Exam #1	Chapters 2, 3, 4
February 18 th (Wed.)	Synaptic Transmission	Chapter 5
February 23 rd (Mon.)	Synaptic Transmission	Chapter 5
February 25 th (Wed.)	Neurotransmitter Systems	Chapter 6
March 2 nd (Mon.)	Neurotransmitter Systems	Chapter 6
March 4 th (Wed.)	Structure of the Nervous System	Chapter 7

March 9 th (Mon.)	Brain Control of Movement	Chapter 14
March 11 th (Wed.)	Exam #2	Chapters 5, 6, 7, 14
March 16 th (Mon.)	Spring Break	
March 18 th (Wed.)	Spring Break	
March 23 rd (Mon.)	Brain Rhythms and Sleep	Chapter 19
March 25 th (Wed.)	Brain Rhythms and Sleep	Chapter 19
March 30 th (Mon.)	Motivation	Chapter 16
April 1 st (Wed.)	Motivation	Chapter 16
April 6 th (Mon.)	Emotion	Chapter 18
April 8 th (Wed.)	Emotion	Chapter 18
April 13 th (Mon.)	Exam #3	Chapters 19, 16, 18
April 15 th (Wed.)	Attention and Consciousness	Chapter 21
April 20 th (Mon.)	Attention and Consciousness	Chapter 21
April 22 nd (Wed.)	Wiring the Brain, Memory	Chapter 23, 24
April 27 th (Mon.)	Memory	Chapter 24
April 29 th (Wed.)	Psychiatric Disorders	Chapter 22
May 4 th (Mon.)	Exam #4	Chapters 21, 23, 24, 22
TBD	Final Exam	Cumulative – All Chapters

****SUBJECT TO CHANGE****

Any changes will be announced in lecture and posted as an announcement on CourseWorks.