

NEUR327 Cellular Neuroscience

Spring 2025, Monday 1:30-4PM online (synchronous)

INSTRUCTOR: N KABBANI

Contact Information: nkabbani@gmu.edu

Office Hours: Directly after class or by appointment

OBJECTIVE: This is a fundamental neuroscience course that presents basic concepts of cellular and molecular neuroscience. We will study key topics in neuronal function, including the structure of neurons, the functions of cell membranes, regulation of electrical properties, and intracellular signaling that participates in synaptic plasticity.

Textbook: The textbook used for developing this course is **Neuroscience 5/e, Purves et al. or any other edition**). Although not required, reading of the textbook is highly recommended.

This is an online synchronous course and weekly attendance via Zoom is required for success.

GRADING: Your final grade will be based on

3 exams @ 25% each

1 group presentation @ 25%

EXAM INFO: Your exams will be available via Blackboard on the scheduled day. The exam is closed book and timed for 60 minutes. You are asked to use the GMU Honor Code during the exam. There are no make-up exams.

Group Presentation: You will be divided into groups of 3-5. You are expected to work together to prepare a 20 min presentation on an assigned topic. I am happy to meet with each group individually to go over questions and ideas. Presentations will be graded based on the below rubric. All group members will receive the same score.

| Criteria | Strong | Average | Weak |
|----------------|---|---|---|
| Content (50%) | Topic was discussed thoroughly and sufficient information provided. | Topic was discussed well. One or more issues were not entirely clear. | Discussion of the topic enabled a broad understanding leaving a number of unanswered questions. |
| Delivery (50%) | Well prepared. Slides were clear. The presenter answered all questions. | Minor aspects of the presentation (visual or verbal) were not clear. | Presentation lacked clarity or poorly prepared slides |

Weekly Schedule (subject to change as the semester progresses)

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| Jan 27 Introduction and Studying the Nervous System Ch.1 (form groups) |
| Feb 3 Electrical Properties of Neurons, Ch.2 (breakout rooms: select presentation topic) |
| Feb 10 The Action Potential, Ch.3 |
| Feb 17 Membrane Proteins, Ch.4 (Group 1) |
| Feb 24 EXAM 1 (Ch. 1-4) |
| March 3 Presynaptic Release, Ch.5 (Group 2) |
| March 10 Spring Break |
| March 17 Neurotransmitters and Receptors Ch. 6 (Group 3) |
| March 24 Neurotransmitters and Receptors Ch. 6 (Group 4) |
| March 31 EXAM 2 (Ch. 5-6) |
| April 7 Molecular Signaling Ch. 7 (Group 5) |
| April 14 Molecular Signaling Ch. 7 (Group 6) |
| April 21 Synaptic Plasticity Ch. 8 (Group 7) |
| April 28 Synaptic Plasticity Ch. 8 (Group 8) |
| May 5 EXAM 3 (Ch. 7-8) |