NEUR327: Cellular Neuroscience

Spring 2023-ONLINE Synchronous

INSTRUCTOR: N KABBANI
Contact Information: nkabbani@gmu.edu
Online meeting times: TR 9:00-10:15AM
Meeting coordinates:
https://gmu.zoom.us/j/99408763582?pwd=SGlDamVpM1V4MlhnNUVBYUplc1BHUT09

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. Reading of the textbook (**Neuroscience 5/e, Purves et al. or any other edition**) is highly recommended.

Attendance: This is a **Synchronous online course therefore your attendance on the Zoom meetings is required** unless you have special permission.

GRADING: Your grade will be calculated based on 3 exams @ 25% each and a group presentation @ 25%.

ONLINE EXAM INFO: Your exams will be available via Blackboard at 9AM on the scheduled day. The exam will remain available until 5PM that same day. The exams are to be completed within 90 minutes. You will have 2 attempts to complete the exam, with the better of the two scores being recorded. The exam **is not** open book/notes and you are asked to use the GMU Honor Code throughout the exam.

Group Presentation
You will be divided into 7 groups. You are expected to work together as a team to prepare a 15 min presentation on an assigned topic. I am happy to meet with each group to go over questions. Presentations will be graded based on the below rubric.

Presentation Rubric (25% of your grade)

Criteria	Strong (12.5)	Average (10)	Below average (8)
Content (12.5%)	Topic was discussed thoroughly and sufficient information	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 (12.5%)	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

SCHEDULE

Week of Jan 23, 2023 T: Introduction to the Course, Ch. 1 R: Studying the Nervous System Ch.1
Week of Jan 30, 2023 T: Electrical Properties of Neurons, Ch.2 R: Electrical Properties of Neurons, Ch.2
Week of Feb 6, 2023 T: The Action Potential, Ch. 3 R: The Action Potential, Ch.3
Week of Feb 13, 2023 T: The Action Potential, Ch.3 R: EXAM 1 (Ch. 1-3)
Week of Feb 20, 2023 T: Membrane Proteins, Ch.4 R: Membrane Proteins, Ch.4
Week of Feb 27, 2023 T: Presynaptic Release, Ch.5 R: Presynaptic Release, Ch.5
Week of March 6, 2023 T: Presynaptic Release, Ch.5 R: EXAM 2 (Ch. 4-5)
Week of March 13, 2023 SPRING BREAK
Week of March 20, 2023 T: Neurotransmitters, Ch.6 R: Neurotransmitters, Ch.6
Week of March 27, 2023 **T: No Class** **R: No Class**
Week of April 3, 2023 T: Neurotransmitters, Ch.6 R: Receptor Signaling, Ch 7
Week of April 10, 2023 T: Receptor Signaling, Ch 7 R: Receptor Signaling, Ch 7

Week of April 17, 2023 T: Synaptic Plasticity, Ch.8 R: Synaptic Plasticity, Ch.8
Week of April 24, 2023 T: Synaptic Plasticity, Ch.8 R: REVIEW
Thursday May 11, 2023 EXAM 3 (Ch. 6-8)

Group 1. Connectomics

Group 2.

3 new neurotechnology devices

Group 3.

Psychedelic therapy

Group 5.

Brain cancer & vaccine treatment

Group 6.

Air pollution & brain disease