NSC 210: ‘Fundamentals of Neuroscience’  Fall 2020

This is a foundational class for grounding you in the basic knowledge necessary to understand the complex and fascinating field of neuroscience!

We are thrilled that you will join us as we study the fundamentals of neuroscience! In this course we will learn about the cells of the nervous system, the basic mechanisms by which they connect and communicate. We will learn neuroanatomy in some detail - you will end the semester being much better acquainted with the structures and major connecting tracts of the brain. We will pull it all together by study of mental health, sleep, learning and memory.

The class material is accessible to students with an interest in biological systems.

Instructors: Mary Harrington (she/her) and Alexis Ziemba (she/her)
We would like to offer you many opportunities to meet with us and to discuss the fascinating details of the operations of neural tissues. We will talk about glial cells too!

Class meeting times:
Monday and Wednesday, we will meet 8-9am (YES, that is early, but we think you are all free at that time! Class meetings will be recorded.)
We will have small group meetings on Fridays. You will be assigned to one time, such as 7:45-8:05, 8:10-8:30, 8:35-8:55.

Office hours: Mary and Alexis will offer multiple times for office hours, some in person and some by zoom.

Synaptic strolls around Smith:
Join an instructor for an outdoor walk around campus to discuss course topics! Join Alexis on Tuesdays at 4 PM; Marty Thursdays at 3PM.

If we can do more to help you learn the material and enjoy the class, please feel welcome to let us know. Please come to office hours or send an email to discuss accommodations.

Prerequisites: BIO132 (at least concurrently), AP BIO 4/5, or permission of the instructors.

Text: “Neuroscience: Exploring the Brain” by Bear, Connors, Paradiso (3rd edition is fine)

Course Schedule

Part I: mechanisms of neurotransmission
Week 1: Sept 2, 4  Cells of the nervous system
Week 2: Sept 9, 11  The membrane potential at rest
Week 3: Sept 14, 16, 18  The action potential
Week 4: Sept 21, 23, 25  Synaptic communication
Week 5: Sept 28, 30, Oct 2  Neurotransmitters; Review

Part II: neuroanatomy and the senses
Week 6: Oct 5, 7, 9  Gross neuroanatomy and Motor pathways
Week 8: Oct 14, 16  Visual system
Week 8: Oct 19, 21, 23  Auditory and Somatosensory system
Week 10: Oct 26, 28, 30  Review

Part III: memory, sleep, mental illness, and more
Week 11: Nov 2, 4, 6  Learning and Memory
Week 12: Nov 9, 11, 13  Sleep and rhythms
Week 13: Nov 16, 18, 20  Mental illness

Part IV: special topics
Week 14: Nov 30, Dec 2, 4  Preparation
Week 15: Dec 7, 9, 11  Presentations

Special Topics Project (Part IV)
Each week during Part III, the final lecture will look at a research question related to the neuroscience topic. Using this same format, you will design a presentation on the neuroscience topic of your choice. A rubric will be provided to help you understand how we will grade your special topic presentation. The last week of class will not involve new lectures but will give you time to finalize your research and for groups to begin the 15 min presentations.

Assessments:

- In-class poll everywhere quizzes: 15%
- Label the diagram assignments on molecular mechanisms of neurotransmission: 10%
- Quiz 1 on molecular mechanisms of neurotransmission: 20%
- Mini quizzes on neuroanatomy and the senses: 10%
- Take home Quiz 2 on neuroanatomy and the senses: 15%
- Group discussion questions on memory, sleep, and mental illness: 15%
- Special Topics Project presentation: 15%

Total 100%

Slack is a messaging platform that we will use for discussions/questions at times when we are not meeting. Class sessions will be recorded so that all students have access.