

Introductory Neurobiology labs Biology 322 Fall 2021

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Office Hours: These are the same as for the lecture part of the course

Prerequisites: You must have successfully completed (i.e. grade C- or higher) Bio 107. You must also be taking, or have previously taken, the Neurobiology lecture course (Bio 321).

Text: There is no specific textbook for the lab section of the class. We cover a wide range of topics and techniques. I will provide materials on a weekly basis. You can also refer to the textbook for the lecture course: Neuroscience, Exploring the Brain, Eds. Bear, Connors and Paradiso. LWW press. 4th Edition.

Additional Text: If you are not familiar with writing lab reports then I recommend Writing About Biology by Jan Pechenik, which you may have used in Bio 106.

Outline: This course is designed to introduce students to many practical aspects of nervous system function and neuroscience research. As neuroscience is a multi-disciplinary field we will cover aspects of anatomy, cell physiology and behavior. Another element of this course is to introduce students to the research skill of information gathering. You will be introduced to multiple sources of information available to scientists on the internet and will be required to use these resources to produce a research paper on a given neurological disease.

Attendance is mandatory for all labs. Labs cannot be made up. If you have to miss a lab you must let me know the reason why. I will determine the acceptability of the reason. Part of your grade will be determined by your level of participation and involvement. If you miss multiple labs you will fail the course. You will also be required to keep a lab book in which you will document work done and results obtained during the labs.

Grading : You will be graded on in class assignments, lab reports, homework assignments and your web research paper in addition to attendance and participation in the class. Some lab reports will be larger and thus will be worth more points. I will let you know which reports these are. You need to take notes and keep a record of all projects performed in the lab. This will be reviewed and will count towards your final grade.

Grading scheme:

Lab reports 90% (this includes the research paper).

Poster, participation and involvement 10%.

The grading scale will be the same as for the lecture course.

In some labs you will be working with material from freshly killed animals. The method of killing these animals is painless and you will not be required to kill any animals. You will, however, be required to use and dissect tissue from these animals.

Keep good, comprehensive notes of what you are doing, why you are doing it and clearly record the data you acquired in your lab book.

Equipment is delicate, expensive and limited in supply. Please use it carefully as your work and the work of others is dependent on its proper function.

Lab Safety Policy

1. Be sure and label everything at your work station.
2. Do not pipette anything by mouth in this lab.
3. Do not bring any food or beverages to your work area. If you want to take a break and have a soda, go out in the hall.
4. If you are not sure about a procedure, ask me!
5. Pay attention to specific instructions given at the beginning of each lab.
6. Keep your work area clean while you work – once you are finished with a piece of glassware, or a pipette, place them in the appropriate containers. Glassware goes in the plastic pan next to the sink – remove any label tape and rinse with tap water, then leave it in the pan. Pipettes go into the pipette soaker which is to the right of the sink – remove any tape, lift the basket so its upper lip is above the container and place the pipette in the basket with its tip up.
7. If you are doing any dissection wear gloves and wash your hands when you are finished.
8. Keep all extraneous material, e.g. coats, books etc. off of the lab bench.
9. Leave you work area as you found it.

Introductory Neurobiology 322 labs Schedule Fall 2021

My office hours are the same as for the lecture course.

Sept 1	No lab
Sept 8	Structure of the nervous system: Anatomy and microscopy Introduction to the World Wide Web as a research resource
Sept 15	Neurotoxicology and Behavior: Planaria lab
Sept 22	Introduction to intracellular recording: NerveWorks 1
Sept 29	Sensory neuron function- Two pin discrimination OR Bioinformatics: Allen Institute neuron analysis
Oct 6	Introduction to information mining- Library visit. Ion channel diseases tutorial; Catch neurological disease.
Oct 13	Drosophila toxicology and disease models. Arsenic and neuron development. Disease research

Oct 20	Introduction to neuron culture: Establish first in vitro cultures
Oct 27	Glia differentiation and migration in vitro experiment
Nov 3	Neurotoxicology in vitro: ROS, Trehalose and Methylene Blue Immunohistochemistry on cultured glia
Nov 10	Nerveworks 2: Hyperkalemic Periodic Paralysis
Nov 17	Immunohistochemistry: antibodies, dyes, flies and microscopy. Data analysis: Phase and Fluorescence microscopy
Nov 24	Thanksgiving Break
Dec 1	Electrophysiology: Nerve Recording: Cricket and cockroach leg recordings
Dec 8	Disease Presentations
Dec 15	Finals week No Lab

This is a tentative schedule and is subject to change by the instructor if necessary