BIOL-195: Gateway: Neurobiology
Spring 2009
Lectures: MWF 9:15-10:05, Reiss 262
Discussions: Section 01 M 2:15-3:05, Reiss 284
Section 02 M 3:15-4:05, Reiss 284

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Course Description: This is a course that will cover the fundamentals of Neurobiology, the study of the cellular basis of nervous system function. We will examine the cellular composition of the nervous system, the characteristics and functions of neurons, and the ways that signals are relayed within the nervous system. Then, we will examine the input (or sensory) systems and the output (or motor) systems. We will investigate plasticity and learning within the nervous system as well as touch on the molecular basis of nervous system development and evolution.

The course will include presentations of each topic by the instructor, as well as weekly readings of primary literature. In addition, each student will cite current Neurobiological research, and will produce a weekly essay on a topic related to Neurobiology.

Learning Goals:

I) To identify the cellular constituents and governing principles of nervous system design and function.

II) To communicate the elegance of the nervous system to students, thus serving as a gateway into the Neurobiology major.

III) To create a community of thinkers centered around the investigation of Neurobiological concepts.

IV) To allow students to read and critically digest primary literature in Neurobiology and form opinions about scientific results.

V) To promote effective written and verbal communication by students centered on Neurobiological topics.

Office Hours: Tuesday 8:30-10:30 AM, Reiss 334

Lectures: Three class periods each week will involve a presentation by the professor or a guest lecturer, with lively class participation and debate. Powerpoint files of these presentations will be posted, according to the date of the lecture, on the course Blackboard site the night before each class. Students are encouraged to print these presentations out and use them as a template for note taking.

Text: *Neuroscience, Fourth Edition (2008), by Purves et al. (ISBN 978-0-87893-697-7)*

Textbook Readings: Assigned readings are intended to provide background for and supplement material presented in class and should be completed prior to each class. Readings are likely to be more comprehensive than material presented in class and this extra material is intended to round out students' understanding of neurobiological processes. Questions regarding material covered in the readings are welcome in class, as the goal is to integrate this material.

Primary Research Paper Readings: Every student will be required to read primary research papers each week and be prepared to discuss thi work with their instructors and classmates. Students will be responsible for both the content and the rationale of these papers.

Exams- There will be four two-hour exams in this course. Three exams will be taken in class (from 8-10:05 AM on 2/11, 3/20, 4/27), each worth 15% of the final grade. A cumulative final will be given during finals week (9-11 AM on 5/1) and will be worth 20% of the grade. Sample questions will be distributed and review sessions will be scheduled prior to each exam. Exams will consist of 6-8 short answer questions. Successful exams will require the identification of facts, the integration of new information into existing knowledge bases, the interpretation of data, and creative extrapolation from existing knowledge to novel topics.

Participation and Presentations- An additional 35% of the grade will be based upon student involvement in the course, including participation during class meetings, both lectures (10%) and discussions (12.5%) and postings on Blackboard (5%), and IV) the quality and insight of essays on Neurobiology (12.5%).

I) All students are expected to participate in the course as neurobiology scholars. Students are expected to come prepared to discuss and

debate topics presented in class. All students should be prepared to be called upon to state their opinions frequently.

Every Monday afternoon, discussion sessions will be held focusing on primary reseatch papers. PDF's for each paper will be on Blackboard. One student will be responsible for providing a Powerpoint file of the paper, which will include figures. All students will be expected to have read the work and be ready to participate in discussions.

II) Each student is expected to cite one neurobiology-related article from a scientific journal (for example, *Science, Nature, Nature Neuroscience, Neuron, J. Neuroscience, J. Comp. Neurology, Mol. Cell. Neuroscience, Curr. Opinions in Neurobiology, Nature Neuroscience Reviews*) each week on the course Discussion Board in Blackboard. This posting should include a brief description of the paper and an explanation of why the work interests them. In the beginning of the semester, the instructors will post responses to a subset of the postings. At some point in the semester, students will be required to respond to their classmate's postings.

III) Each student will write an essay of not more than 200 words centered on an assigned topic every other week in order to sharpen science writing. A list of topics will be posted on Blackboard. Students can pick the topic of their essay each week, so long as all topics are completed by the end of the semester. First versions will be submitted by class time on Fridays. Comments on the writing will be returned to the student by the following Monday and revised essays will be due the following Friday.

Modes of Communication: Students are encouraged to visit office hours, arrange appointments with the instructor and/or TF, or e-mail the professor and/or TF. All e-mails must include a salutation to the person to whom the e-mail is being sent (Professor Donoghue or Ms. Clifford), a body containing full sentences, and an appropriate closing, with your name.