Course Syllabus – NEURO 410

Course Information

Course Number: NEURO 410 FA19
Course Name: Fundamentals of Neuroscience
Term: Fall 2019
Start Date: 09/09/2019
End Date: 12/13/2019
Credits: 3.0

Meeting Days / Times

Mondays and Wednesdays, 1:15-2:45pm PT / 4:15-5:45pm ET
(See Calendar in Canvas for the most up-to-date schedule.)

Locations

CA Campus: Graduate Large Conference Room (Hazen Theory Building)
FL Campus: B387

Course Managers

Role	Last Name	First Name	Email Address
Course Director	Srinivasan	Supriya	supriya@scripps.edu
TA	Mukhopadhyay	Sourish	sourish@scripps.edu
TA	Sabandal	John Martin	jsabanda@scripps.edu

Course Description

This course will cover the fundamental principles of neuroscience from a cellular and molecular perspective and will integrate foundational knowledge with state-of-the-art approaches in the following areas:

- Structural units of information acquisition, relay and function
- Organization and logic of sensory systems: vision, olfaction, somatosensation
- Learning and memory, development and wiring of the nervous system
- Regulatory systems, brain disorders, genomics

Program Learning Outcomes

By the end of the program, students will have accomplished these objectives:
PLO1: Published research story.
PLO2: Generate creative approaches and methodologies for complex scientific questions.
PLO3: Master a potent set of technical research skills.
PLO4: Possess strong communication skills.

Course Learning Outcomes

By the end of this course, students will be able to:
CLO1: Understand basic concepts and mechanisms in neuroscience.
CLO2: Critically read the current neuroscience literature.
CLO3: Learn how to formulate questions and design experimental tests of these questions.
CLO4: Propose and defend, in writing, the logic and arguments for advancing research questions.

Background Preparation (Prerequisites)

There are no prerequisites for this course. Students will find it helpful to have a general undergraduate level introduction to neuroscience, genetics, molecular biology, and behavior. However, the necessary background to understand the material will be presented during the course and in the assigned reading material.

Course Materials

Required: Luo (2015). Principles of neurobiology. ISBN: 9780815344940.
Readings from books listed for background information and from research papers in the current literature will be assigned for each class. A textbook that will serve as a backdrop for the information presented will be essential reading.

Expectations and Logistics

Assignments: Readings from books listed for background information and from research papers in the current literature will be assigned for each class.

Preparation and presentation in student pairs or trios will present primary literature as part of the course. Students should reach out to the faculty at least two weeks before their class to schedule a time that is mutually convenient. For this critical meeting before class, students should come prepared with having read the assigned material and have a draft presentation ready. One student should prepare the background introduction slides; the other the data slides. All final presentations should be sent to the relevant faculty member 2-3 days before class for final comments.

Class Format: Each class is 90 minutes. Monday classes will be in the form of a lecture presented by a faculty member. Wednesday classes will be journal club style, presented by student-led pairs, and for which the rest of the class must come prepared by having read the assigned paper chosen by the faculty member. The faculty member will aid in preparation and presentation. However, the student leaders will independently present background, relevance, impact, and critical reading.

Course Requirements

Grades will be based on the following:

- 30% class participation
- 30% next experiments
- 40% journal club presentations

Grading of presentations will be based on the student's pre-class preparation, general understanding of the subject matter, and ability to logically organize and convey that understanding to peers. Class participation will be evaluated on the quality and quantity of participation in classroom discussions. The written component will be evaluated by the faculty member in charge of each module.

Attendance Statement

Students are expected to attend all classes. Students who are unable to attend class must seek permission for an excused absence from the course director or teaching assistant. Unapproved absences or late attendance for three or more classes may result in a lower grade or an "incomplete" for the course. If a student has to miss a class, he or she should arrange to get notes from a fellow student and is strongly encouraged to meet with the teaching assistant to obtain the missed material.

Scientific and Professional Ethics

The work you do in this course must be your own. Feel free to build on, react to, criticize, and analyze the ideas of others but, when you do, make it known whose ideas you are working with. You must explicitly acknowledge when your work builds on someone else's ideas, including ideas of classmates, professors, and authors you read. If you ever have questions about drawing the line between others' work and your own, ask the course professor who will give you clear guidance. Exams must be completed independently. Any collaboration on answers to exams, unless expressly permitted, may result in an automatic failing grade and possible expulsion from the Graduate Program.

Technology Requirements and Support

For issues related to Canvas, please contact the Graduate Office by email at: gradprgm@scripps.edu or by phone at: 858-784-8469.

Course Grading

Grading is in accordance with the academic policies of the Skaggs Graduate School.

Grade Point	Letter Grade	
4.00	A	Outstanding achievement. Student performance demonstrates full command of the course subject matter and evinces a high level of originality and/or creativity that far surpasses course expectations.
3.67	A-	Excellent achievement. Student performance demonstrates thorough knowledge of the course subject matter and exceeds course expectations by completing all requirements in a superior manner.
3.33	B+	Very good work. Student performance demonstrates above-average comprehension of the course subject matter and exceeds course expectations on all tasks as defined in the course syllabus. There is notable insight and originality.
3.00	B	Satisfactory work. Student performance meets designated course expectations and demonstrates understanding of the course subject matter at an acceptable level.
2.67	B-	Marginal work. Student performance demonstrates incomplete understanding of course subject matter. There is limited perception and originality.
2.33	C+	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.
2.00	C	Unsatisfactory work. Student performance demonstrates incomplete and inadequate understanding of course subject matter. There is severely limited or no perception or originality. Course will not count toward degree.
0.00	I	Incomplete is assigned when work is of passing quality but is incomplete for a pre-approved reason. Once an incomplete grade is assigned, it remains on student's permanent record until a grade is awarded.

0.00	P	Satisfactory work. Student performance demonstrated complete and adequate understanding of course subject matter. Course will count toward degree.
0.00	F	Unacceptable work/Failure. Student performance is unacceptably low level of knowledge and understanding of course subject matter. Course will not count toward degree. Student may continue in program only with permission of the Dean.
0.00	W	Withdrew from the course with Dean's permission beyond the second week of the term.

- All courses will be recorded and maintained in the student's permanent academic record; only courses that apply towards the degree will appear on the academic transcript. Non-credit or audited courses will not appear on the transcript.
- 4 core courses taken for a letter grade (pass = B- or higher for a core course)
- 2 elective courses taken pass/fail (pass = A, B, C for an elective)

Because students are encouraged to take electives outside their area of expertise, a "C" letter grade is passing.

Course Schedule

Date	Details
Mon Sep 9, 2019	An Invitation to Neurobiology and Ways of Exploring (Srinivasan)
Wed Sep 11, 2019	Journal Club (Srinivasan)
Mon Sep 16, 2019	Signaling within Neurons and Development of the Nervous System (Lippi)
Wed Sep 18, 2019	Journal Club (Lippi)
Mon Sep 23, 2019	Signaling Across Synapses and Cell-type diversity (Maximov)
Wed Sep 25, 2019	Journal Club (Maximov)
Mon Sep 30, 2019	PNS: Olfaction, Taste, Audition and Somatosensation (Patapoutian)
Wed Oct 2, 2019	Journal Club (Patapoutian)
Mon Oct 7, 2019	Vision and Wiring of the Visual System (Cline)
Wed Oct 9, 2019	Journal Club (Cline)
Mon Oct 14, 2019	The Brain and Social Behavior (Stowers)
Wed Oct 16, 2019	Journal Club (Stowers)
Mon Oct 21, 2019	Homeostatic and Regulatory Systems (Ye)
Wed Oct 23, 2019	Journal Club (Ye)
Mon Oct 28, 2019	Memory, Learning and Synaptic Plasticity (Mayford)
Wed Oct 30, 2019	Journal Club (Mayford)
Mon Nov 4, 2019	Evolution, Genomics and Stem Cells (Baldwin)
Wed Nov 6, 2019	Journal Club (Baldwin)
Mon Nov 11, 2019	Brain Disorders and Neurological Disease (Encalada)
Wed Nov 13, 2019	Journal Club (Encalada)
Mon Nov 18, 2019	CNS Drug Discovery and Neuropharmacology (Petrascheck)
Wed Nov 20, 2019	Journal Club (Petrascheck)