MCB 262: Advanced Topics in Systems Neuroscience

also listed as Neuroscience C262

Spring 2017

Instructors: Dan Feldman & Kristin Scott

Guest lecturers: Jose Carmena, Michael Yartsev

Meetings: Tue & Thu 9:30-11 AM
Tuesdays are student presentation meetings and discussion meetings
Thursdays are faculty lectures

Contact information:

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Office hours: By arrangement.

This is a graduate-level course on advanced topics in circuit and systems neuroscience. Topics include sensory coding, computation by neural circuits, plasticity and learning, hippocampal function and motor control.

We have 3 types of meetings. Most weeks consist of a Thursday faculty lecture on a specific topic, followed by a Tuesday student presentation session in which 2 students present papers from the primary research literature. Each presentation will be 30 min, journal club style, with slides showing relevant figures, background material, models, and conclusions. Four weeks of the class will consist of discussion meetings. Here, faculty will give a brief overview of a topic on a Thursday, and all students will read 3-4 assigned papers illustrating major principles or debates in the field. On the following Tuesday, we will discuss those papers and principles as a group. Students will then write a critical synthesis of the topic, and turn this in for a grade.

Grading & Attendance. Each student will present 1 research paper during the student presentation sessions. This is 50% of the grade. Each student will also turn in 2 written reports on the discussion meetings. These are 25% of the grade each. We will take attendance at each meeting. Students are excused 2 absences.

We hope you enjoy the class!

MCB 262: Systems Neuroscience
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Date	Day	Unit	Theme	Fmt	Instructor	Topic
1-17	T	1	Overview	Lec	KS	
1-19	Th	2	Circuits	Lec	KS	C. elegans: complete circuits for behaviors
1-24	T			Disc	KS	Whole-class discussion
1-26	Th	3	Systems & Coding	Disc	KS	Chemosensation: labeled lines and population coding
1-31	T			Disc	KS	
2-2	Th	4	Systems & Coding	Lec	KS	Visual Processing: Direction Selectivity
2-7	T			Pres	KS	
2-9	Th	5	Systems & Coding	Lec	DF	Sparse Coding in Neocortex
2-14	T			Pres	DF	
2-16	Th	6	Systems & Coding	Lec	DF	Cortical Microcircuits
2-21	T			Pres	DF	
2-23	Th	7	Plasticity	Lec	DF	Cortical Maps & Map Plasticity
2-28	T			Disc	DF	
3-2	Th	8	Systems & Coding	Disc	DF	Population Coding and Decoding
3-7	T			Disc	DF	
3-9	Th	9	Hippocampus	Disc	DF	Hippocampus & Learning
3-14	T			Disc	DF	
3-16	Th	10	Hippocampus	Lec	Yartsev	Hippocampus & Space
3-21	T			Pres	DF	
3-23	Th	11	Systems & Coding	Disc	KS	Internal compasses (HD cells, fly compass, attractor networks)
3-28	T		Spring Break			
3-30	Th		Spring Break			
4-4	T			Disc	KS	
4-6	Th	12	Motor	Lec	Carmena	Motor Cortex
4-11	T			Pres	KS	
4-13	Th	13	Motor	Lec	KS	Cerebellum and Motor Learning
4-18	T			Pres	KS	
4-20	Th	14	TBA	Lec	KS	Sexually Dimorphic Behavior
4-25	T			Disc	KS	
4-27	Th	15	Summary	Lec	DF	Unsolved Problems in Systems Neuroscience

Lec = Faculty Lecture. Pres = Student presentations. Disc = Class Discussion

Berkeley Honor Code Statement

The student community at UC Berkeley has adopted the following Honor Code:
"As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others." The hope and expectation is that you will adhere to this code.

Collaboration and Independence: Reviewing lecture and reading materials and studying for exams can be enjoyable and enriching things to do with fellow students. This is recommended. However, unless otherwise instructed, homework assignments are to be completed independently and materials submitted as homework should be the result of one's own independent work.

Cheating: A good lifetime strategy is always to act in such a way that no one would ever imagine that you would even consider cheating. Anyone caught cheating on a quiz or exam in this course will receive a failing grade in the course and will also be reported to the University Center for Student Conduct. In order to guarantee that you are not suspected of cheating, please keep your eyes on your own materials and do not converse with others during the quizzes and exams.

Plagiarism: To copy text or ideas from another source without appropriate reference is plagiarism and will result in a failing grade for your assignment and usually further disciplinary action. For additional information on plagiarism and how to avoid it, see, for example: http://gsi.berkeley.edu/teachingguide/misconduct/prevent-plag.html

Academic Integrity and Ethics: Cheating on exams and plagiarism are two common examples of dishonest, unethical behavior. Honesty and integrity are of great importance in all facets of life. They help to build a sense of self-confidence, and are key to building trust within relationships, whether personal or professional. There is no tolerance for dishonesty in the academic world, for it undermines what we are dedicated to doing – furthering knowledge for the benefit of humanity.

Your experience as a student at UC Berkeley is hopefully fueled by passion for learning and replete with fulfilling activities. And we also appreciate that being a student may be stressful. There may be times when there is temptation to engage in some kind of cheating in order to improve a grade or otherwise advance your career. This could be as blatant as having someone else sit for you in an exam, or submitting a written assignment that has been copied from another source. And it could be as subtle as glancing at a fellow student's exam when you are unsure of an answer to a question and are looking for some confirmation. One might do any of these things and potentially not get caught. However, if you cheat, no matter how much you may have learned in this class, you have failed to learn perhaps the most important lesson of all.

Safe, Supportive and Inclusive Environment

Whenever a faculty member, staff member, post-doc, or GSI is responsible for the supervision of a student, a personal relationship between them of a romantic or sexual nature, even if consensual, is against university policy. Any such relationship jeopardizes the integrity of the educational process.

Although faculty and staff can act as excellent resources for students, you should be aware that they are required to report any violations of this campus policy. If you wish to have a confidential discussion on matters related to this policy, you may contact the Confidential Care Advocates on campus for support related to counseling or sensitive issues. Appointments can be made by calling (510) 642-1988.

The classroom, lab, and work place should be safe and inclusive environments for everyone. The Office for the Prevention of Harassment and Discrimination (OPHD) is responsible for ensuring the University provides an environment for faculty, staff and students that is free from discrimination and harassment on the basis of categories including race, color, national origin, age, sex, gender, gender identity, and sexual orientation. Questions or concerns? Call (510) 643-7985, email ask_ophd@berkeley.edu, or go to http://survivorsupport.berkeley.edu/.