

MCB 163L Fall 2016 Syllabus

Instructors

Instructor: Henk Roelink <roelink@berkeley.edu>
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Graduate student instructors

Instructor: Molly Kirk <mollykirk@berkeley.edu>
Instructor: Amanda Tose <ajt@berkeley.edu>
Instructor: Zeke Barger <zeke@berkeley.edu>
Instructor: Vasiliki Karalis <vkaralis@berkeley.edu>

Textbook

Kandel, E.R., Schwartz, J.H., Jessell, T.M., Siegelbaum, S.A., Hudspeth, A.J. Principles of Neural Science. Fifth edition, McGraw-Hill, 2013. Earlier editions are OK, but reading instructions are based on the Fifth edition. Also available online through the UC Berkeley library.

Optional: Martin, J.H. Neuroanatomy. Text and Atlas. Fourth edition. McGraw-Hill, 2012.

Course policies

1. The lectures and labs can only be a good experience if you have done your assigned preparations and readings.

2. Examinations

No makeups* – We do not offer makeup exams if an exam is missed because of an **un-exused** absence. A 5-page research paper might substitute for the missing score. *The best score possible will be the mean obtained by the class on the missed exam.*

If you have official school travel that conflicts with an exam, we can let you take the exam early to accommodate.

Adjustments on test scores must be negotiated with your GSIs – with input from the instructors if necessary

Exams often include timed images for identification, as well as of short essays, matching, true/false and multiple choice.

Course is graded on a percentage scale - not a fixed curve.

Lab Section Grade	10 %
2 Presentations (5% each)	10 %
3 Lab Reports (7% each)	21 %
3 Midterms (20% Each)	60 %

3. Attendance in laboratory sessions is **required**. A laboratory missed for a documented medical reason can be made up through arrangement with your GSI. More than one missed lab requires a written excuse from a relevant health professional on their letterhead within one week. Labs missed for other than medical or official school function reasons are considered

unexcused and cannot be made up. It is not fair to the GSIs to have to arrange make-up labs for students who miss a lab for elective reasons. Official school-related excused absences include trips for music or sports activities or travel for scientific meetings, med. school/grad school interviews, etc. Only one unexcused absence from a lab is permitted. A subsequent unexcused laboratory absence will decrease your score on the next lab exam by 20%.

4. Where appropriate, lecture material will be posted on bCourses before class.
5. Teaching Evaluations are done online, please give your teachers the courtesy of your feedback how to improve the class.

Course Organization

The course consists of 1 hour of lecture (Mulford 159) and two 3 hour lab sessions a week (VLSB 4048). Lectures are on Mondays 2-3 pm. Laboratory sections are listed below.

Lab 101	TuTh	9 – 12 pm	Lab 103	WF	9 – 12 pm
Lab 102	TuTh	2 – 5 pm	Lab 104	WF	2 – 5 pm

Prerequisites: Biology 1A/1AL; MCB 160 (or taken concurrently), MCB 161 recommended

Student Honor Code

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.

Lab Schedule

Week 1 (Aug 29)

Lecture 1: (Aug. 29) Organization of the Brain

Lab 1: Safety and Lab rules. Use of the microscopes. Meet your TAs and benchmates.

Lab 2: Models, Introduction to Allen Brain Atlas / Brain Explorer

Week 2 (Sept 5)

NO Lecture, Labor Day

Lab 3: Human brain, spinal cord gross anatomy Sheep brain outer structures, rat brain slides spinal cord

Lab 4: Sheep Brain Dissection (Sagittal and Horizontal Planes)

Week 3 (Sept. 12)

Lecture 2: Vision and Hearing

Lab 5: Vision lab: Cow eyeball dissections, slides of the retina and vision pathways in Allen Brain Atlas

Lab 6: Auditory and vestibular system lab: Inner ear slides, Allen Brain for auditory pathways

Week 4 (Sept. 19)

Lecture 3: Somatomotor and Somatosensory pathways

Lab 7: Research Project using Allen Brain Atlas

Lab 8: Research Project using Allen Brain Atlas

Week 5 (Sept. 26)

Lecture 4: Emotions

Lab 9: Sheep brain dissection revisited (deep cortical structures) + Allen Brain for these structures

Lab 10: Presentation of Allen Brain Atlas Projects

Report due in Lab 10: Allen Brain Atlas project

EVENING EXAM 1 ON TOPICS OF WEEKS 1 – 5, Wednesday Oct 5, 8-9:30pm, 100 GPB

Week 6 (Oct. 3)

Lecture 5: Immunohistochemistry Principles, introduction to the different antibodies

Lab 11: Rat Brain: Medulla to Diencephalon [Slides + Human Case Study]

Lab 12: Rat Brain: Basal Ganglia / Hippocampus/ Telencephalon/ Midbrain [Slides + Human Case Study]

Week 7 (Oct. 10)

Lecture 6: Anatomy of nuclei in the medulla, pons and midbrain

Lab 13: Look at slices stained using different non-fluorescent labels (Golgi stain, etc)

Day 1 immunohistochemistry (IHC) on mice brain slices: primary antibody

Lab 14: Day 2 IHC: washes and secondary antibody

Week 8 (Oct 17)

Lecture: Image Data Analysis

Lab 15: Day 3 IHC: mount slides

Lab 16: Imaging and analysis of staining

Week 9 (Oct. 24)

Lecture: Clarity

Lab 17: Journal article discussion - Clarity

Lab 18: Presentation of Ab staining project

Report due in Lab 18: Immunohistochemistry

EVENING EXAM 2 ON TOPICS OF WEEKS 6 – 9, Thurs Nov 3, 8-9:30pm, 100 GPB

Week 10 (Oct 31)

Lecture: MRI and EEG background

Lab 19: fMRI Project / MRI – Case Studies

Lab 20: EEG Lab

Week 11 (Nov 7)

Lecture: Voltage-clamp experiments

Lab 21: Voltage clamp simulation

Lab on Th/F Canceled due to Veteran's Day.

Week 12 (Nov 14)

Lecture: Frog sciatic nerve recordings

Lab 22: Electrophysiology: Equipment

Lab 23: Electrophysiology: Frog Sciatic Nerve Recordings

(No Lecture or Lab during Thanksgiving week)

Week 13 (Nov 28)

Lecture: Neurological exam and reflexes

Lab 24: Neurological exam

Lab 25: Office Hours/Study time

Report due on Fri Dec 2 at 5pm: Frog sciatic nerve

EVENING EXAM 3 ON TOPICS OF WEEKS 10-13, Thurs Dec 1, 8-9:30pm, 100 GPB