

# MCB 165: Neurobiology of Disease, Spring 2019

T/Th 1-2pm, 126 Barrows

## **Instructors**

Helen Bateup, bateup@berkeley.edu

Office hours Tues 2-3pm during instruction weeks, 447 LSA

Stephan Lammel, lammel@berkeley.edu

Office hours Tues 2-3pm during instruction weeks, 145 LSA

Robin Ball (course director), rwbball@berkeley.edu

Office hours Wed 11am-12pm during instruction weeks, 134 LSA

Marcela Preininger (GSI), mpreininger@berkeley.edu

Office hours Wed 12-1pm, 235 Barker

Molly Lapoint (GSI), mlapoint17@berkeley.edu

Office hours Mon 3-4pm, 235 Barker

## **Course description**

The goal of this course is to provide students with insights into the cellular mechanisms underlying neurological diseases. The course is divided into three main sections: neurodevelopmental disorders, psychiatric disorders and neurodegeneration. We will explore each of these topics at the molecular and cellular levels, reviewing what is currently known and the areas of active research. In lecture we will refer to figures from research literature, and you will be reading and discussing articles in discussion section each week. Reading articles critically is an important skill for all biologists and a great way to learn how research is conducted. By the end of the course you will have a good background in neurological diseases, but more importantly you will have a better ability to understand primary literature.

## **Prerequisites**

MCB 160 is a prerequisite for this class. While we will not check each student for prerequisites, having a strong background in cellular and molecular neurobiology is necessary to succeed in this course. In our lectures, we will assume you have taken MCB 160 (or equivalent) and will not review basic material.

## **Textbooks**

There is no required textbook for this course, but you may want to refer to the following book, which is available as an ebook through the library. You will need to sign in with your CalNet ID or be on a UCB network to have access to the ebook.

Sontheimer, Harald, *Diseases of the Nervous System*. 2015. Elsevier Inc. ISBN: 978-0-12-800244-5 <http://www.sciencedirect.com/science/book/9780128002445>

In addition, you may need to use Neuroscience textbooks, like *Principles of Neural Science* (Kandel) or *Principles of Neurobiology* (Luo) to review background material you learned in MCB 160. These books are available at the Biosciences library.

You are responsible for the material covered in lecture and in the papers for discussion section, not any extra material that is in these textbooks.

## Discussion section

Section number	Time	Location	GSI
101	Th 9-10am	2066 VLSB	Molly
102	Th 3-4pm	55 Evans	Marcela
103	F 9-10am	31 Evans	Molly
104	F 2-3pm	79 Dwinelle	Marcela

Attendance of one discussion section a week is required for this course. Please attend the discussion section you are enrolled in.

We will assign a research paper to read every week, which will be posted on bCourses along with a reading guide to help you. You are expected to thoroughly read the assigned article **before your discussion section**. In section, we will split you up into groups and assign a figure to each group to discuss in detail. We will randomly call on students to present the figure their group prepared. You will be graded on attendance and participation at discussion section, as well as your informal figure presentations.

## Exams

There will be a midterm exam at the end of each of the three main topics, so there are three midterms total. Exams will take place during lecture, so you will have 50 minutes to complete them. Expect both fact-based questions and problems involving analysis of figures, similar to what you have seen in discussion section and lecture. The final exam is comprehensive, including all the lecture material and papers.

**There are no make-up exams.** If you know ahead of time that you must miss an exam for a school related activity (official sports, medical school interview, etc) please let Robin Ball know. If you miss an exam for an excusable reason, such as a medical problem, you must provide the instructor with written documentation within seven days of the exam date. There are no make-up exams, but if you miss an exam for a documented excusable reason, your final exam will be worth more to cover the missed exam ( $20\% + 30\% = 50\%$ ).

## Grading

Discussion section	10%
Three midterms (20% each)	60%
Final exam	30%

Grades will be determined using a standard grading scale

A (some form of an A)	100-90%	D (some form of a D)	69-60%
B (some form of a B)	89-80%	F	59-00%
C (some form of a C)	79-70%		

Your letter grade in the course will be determined according to absolute standards of performance. You will not be in competition with your classmates for grades, nor will the class be curved to a predetermined distribution. However, as you all know, letter grades are based upon the points that you EARN (not based upon needs or wants). We strongly recommend that you focus on learning and enjoying the material. If you are enjoying the class and excited about the material we are discussing, the good grades will follow!

### **Accommodations**

If you need disability-related accommodations in this class, if you have emergency medical information you wish to share with us, or if you need special arrangements in case the building must be evacuated, please inform us immediately. Please see Robin Ball privately after class or by email.

Students who need academic accommodations (for example, a notetaker), should request them from the Disabled Students' Program, 260 César Chávez Center, 642-0518 (voice), dsp@berkeley.edu. DSP is the campus office responsible for verifying disability-related need for academic accommodations, assessing that need, and for planning accommodations in cooperation with students and instructors as needed and consistent with course requirements.

### **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.

**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](mailto:ask_ophd@berkeley.edu), or go to <http://survivorsupport.berkeley.edu/>.

## Lecture Schedule (subject to change)

HB = taught by Helen Bateup, SL = taught by Stephan Lammel, RB = taught by Robin Ball  
 “None” in Discussion column means that there is no section that week

Lec	Date	Prof	Topic	Discussion
<b>Introduction and neurodevelopmental disorders</b>				
1	Tu 1/22	HB	Introduction to diseases of the nervous system	Intro
2	Th 1/24	HB	Disease models	Intro
3	Tu 1/29	HB	Neuropharmacology and drug discovery	Paper 1
4	Th 1/31	SL	Introduction to mesolimbic/reward pathways	Paper 1
5	Tu 2/5	HB	Autism spectrum disorder	Paper 2
6	Th 2/7	HB	Syndromic developmental disorders	Paper 2
7	Tu 2/12	HB	Epilepsy 1	Paper 3
8	Th 2/14	HB	Epilepsy 2	Paper 3
9	Tu 2/19	HB	EXAM 1 (Lec 1-8 and Papers 1-3)	None
<b>Psychiatric disorders</b>				
10	Th 2/21	HB	Genetic and environmental risk factors	None
11	Tu 2/26	SL	Drug addiction 1	Paper 4
12	Th 2/28	SL	Drug addiction 2	Paper 4
13	Tu 3/5	SL	Depression and bipolar disorder	Paper 5
14	Th 3/7	SL	Anxiety and PTSD	Paper 5
15	Tu 3/12	SL	Schizophrenia 1	Paper 6
16	Th 3/14	SL	Schizophrenia 2	Paper 6
17	Tu 3/19	SL	ADHD, OCD, Tourette syndrome	None
18	Th 3/21	SL	EXAM 2 (Lec 10-17 and Papers 4-6)	None
	3/25-3/29		SPRING BREAK	
<b>Neurodegeneration</b>				
19	Tu 4/2	RB	Aging and neurodegeneration	None
20	Th 4/4	RB	Huntington disease	None
21	Tu 4/9	RB	Alzheimer disease 1	Paper 7
22	Th 4/11	RB	Alzheimer disease 2	Paper 7
23	Tu 4/16	RB	Parkinson disease	Paper 8
24	Th 4/18	RB	Multiple sclerosis	Paper 8
25	Tu 4/23	RB	Traumatic brain injury	Paper 9
26	Th 4/25	RB	Spinal cord injury	Paper 9
27	Tu 4/30	RB	Stem cells and regeneration	None
28	Th 5/2	RB	EXAM 3 (Lec 19-27 and Papers 7-9)	None
	5/6-5/10		RRR week	
	Th 5/16		3-6pm: FINAL (cumulative)	