Survey of the Principles of Biochemistry and Molecular Biology
Spring 2017

MCB 102 Mon / Wed / Fri 11am Valley Life Sciences 2050

Instructor's Information

Instructor Name: Karen Davies
Office Location: 458 Donner Laboratory
Office Hours (Time and Day): Tuesday/Thursday 9:30-10:30 am (except 14th February)
E-mail: KMDavies@lbl.gov

Instructor Name: Evan Miller
Office Location: 227 Hildebrand Hall
Office Hours (Time and Day): Thursday, 3-4 pm; Friday, 4-5 pm
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Instructor Name: Nicholas Ingolia
Office Location: 434 Barker Hall
Office Hours (Time and Day): Thursday, 3-4 pm; Friday, 4-5 pm
E-mail: ingolia@berkeley.edu

GSI Names, Emails, and Office Hours

Janice	Chen	jschen@berkeley.edu	Thurs, 2-3 pm, Stanley B1 Atrium
Dominic	Castanzo	castanzo@berkeley.edu	Mon, 9-10, Stanley B1 Atrium (tentative)
Ella	Hartenian	ehartenian@berkeley.edu	Fri, 10-11 am, 1st Floor Li Ka Shing
Emily	Lingeman	lingeman@berkeley.edu	Mon 12 to 1 pm, 1st Floor Li Ka Shing
Charlotte	Nixon	cfnixon@berkeley.edu	Wed, 4-5 pm, Stanley B1 Atrium
Avinash	Patel	patelab@berkeley.edu	Fri, 1-2 pm, Stanley B1 Atrium
Alan	Wang	alanwang@berkeley.edu	Wed, 10-11 am, 1st Floor Li Ka Shing

Course Description

A comprehensive survey of the fundamentals of biological chemistry, including the properties of intermediary metabolites, the structure and function of biological macromolecules, the logic of metabolic pathways (both degradative and biosynthetic) and the molecular basis of genetics and gene expression.

Prerequisites: Biology 1A, 1AL, and Chemistry 3B (or equivalent courses). Recommended: a course in physical chemistry.

Credit Restrictions: Students will receive no credit for 102 after taking 100B or C100A/Chemistry C130 or Chemistry 135.

Course Resources

- Required Text: Nelson & Cox, Lehninger's Principles of Biochemistry, 6th Edition.
  - Loose-leaf customized w/biochem portal (ISBN: 978-1464185755)
  - Hardcopy customized w/biochem portal (ISBN: 978-1429234146)

    - 5th edition (ISBN: 978-0716771081)
    - e-book version

- Website/Online Resources: We will use bCourses to post lecture slides, practice problems, and (after a delay) solution to these practice problems. We will also make class announcements through bCourses.

Policies & Grading

How to Succeed in this Course

Attend the lectures and ensure that you understand the material presented there. Work all of the practice problems and ensure that you understand the answers. Attend the discussion section and ask to discuss the practice problems. If you find that you have any trouble keeping up with assignments or other aspects of the course, make sure you let your instructor know as early as possible. Attend Faculty and GSI office hours; bring your questions and think about those from other students. Use Piazza (see below) to ask for and provide help.

Course Requirements

- Lecture and Discussion Attendance: Students are responsible for all materials presented in lecture and in discussion section and are expected to attend all meetings of the course. Lecture attendance does not directly impact your grade, although we find that attendance is linked to performance on the exams. Quizzes will be given in discussion sections (see below) and missing a discussion section will result in a grade of “0” on any quiz given in that section.

- We will use “Piazza” to facilitate group discussion. This is an application that runs through our bCourses site. Group discussion threads are moderated by the instructor and GSIs. *Please use Piazza instead of email to ask questions if you’re struggling with concepts or problem sets.* Posts can be completely anonymous to your classmates and can be answered by fellow classmates as well as GSIs or instructors.

- Practice problems: Practice problems are not turned in or graded. However, mastery of the practice problems is excellent preparation for the exams, and these problems will be discussed in section.

- Quizzes: Six quizzes will be given in discussion sections over the course of the semester. The best five out of six quizzes will contribute to the grade. Because the lowest-scoring quiz is automatically excluded from the grade, there are no make-ups for missed quizzes.

- Exams: There will be a 2-hour exam for each of the three, five-week sections of this class. The last exam will be given during the scheduled final-exam time-period. The final exam covers only the material in the last five-week section only and contributes to the grade with the same weight as the mid-term exams.

Exam #1: Thursday 23 February 2017, 7pm – 9pm

Exam #2: Thursday 23 March 2017, 7pm – 9pm

Exam #3: Tuesday 9 May 2017, 7pm – 9pm

Course Policies

I. **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/.

II. **DSP Students**

Students with disabilities are to provide the instructor of notice of their need for reasonable accommodations during exams by Feb. 1. Accommodation requests arising during the semester should be provided promptly and can apply only prospectively, to future exams. Accommodations cannot be provided without a letter from the DSP.

III. **Cheating**

Cheating will not be tolerated. UC Berkeley's cheating policy
http://bulletin.berkeley.edu/academic-policies/#studentconductappealstext
will be followed. Copying another's answers during an exam and other forms of cheating including plagiarism will result in the same penalties. 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 quizzes and exams.

The UC Berkeley honor code is posted at
http://asuc.org/honorcode/
The code of conduct is available at
http://sa.berkeley.edu/sites/default/files/UCB-Code-of-Conduct-new%20Jan2012.pdf

IV. **Incomplete Policy**

Students who miss an exam due to an emergency that could not have been predicted in

advance can request a grade of “incomplete” and complete the missing section in the following semester. Please note however that an incomplete grade can only be issued for students who have missed no more than one of the three major exams and who are doing satisfactory work (C- or better) in the exams completed.

V. Missed Exam Policy

Students are required to take all of the exams. If you have a schedule conflict with an exam, it is your responsibility to inform the instructor for the appropriate section of the course, in writing, no later than end of the second week of the semester (Feb. 1, 2016). A standardized exam such as the MCAT or GRE is an acceptable excuse only when the standardized exam occurs at the same time as the MCB 102 exam and no alternative exam date is available. In the event of an emergency that could not have been predicted in advance, the instructor is to be notified within two days after the missed exam. Examples include incapacitating illness or death in the immediate family, with a doctor’s note; or a serious traffic accident, with a police report. If you are excused, you will take a make-up exam as soon as you are able. Alternatively, you may request a grade of “incomplete” (see above).

In compliance with Education code, Section 92640(a), it is the official policy of the University of California at Berkeley to permit any student to undergo a test or examination, without penalty, at a time when that activity would not violate the student's religious creed, unless administering the examination at an alternative time would impose an undue hardship that could not reasonably have been avoided. Requests to accommodate a student's religious creed by scheduling tests or examinations at alternative times should be submitted directly to the faculty member responsible for administering the examination by the second week of the semester (Feb 1).

VI. Letters of Recommendation

Any of the three instructors may be approached for a letter of recommendation. We all are quite willing to provide a written evaluation for this purpose. So that we may prepare effective evaluations we ask that you follow the procedure outlined here.

- Be sure to attend at least 2 of the instructor’s office hours.
- Ask your discussion section GSI to write a brief note about your participation in section to the instructor.
- Sometime soon after the end of the course, request an interview with the instructor and bring a copy of your complete transcript, your CV and Personal Statement along with any recommendation forms that need to be filled in.
- The Berkeley Career Center runs a Letter Service that can collect reference letters and hold them for future use: https://career.berkeley.edu/Letter/Letter

VII. Grading Policy

Fraction	Description
30%	Midterm exam #1

30%	Midterm exam #2
30%	Final exam (*not* cumulative)
10%	Discussion section quizzes (best 5 of 6)
100%	of final grade

We will electronically scan and grade exams using Gradescope. Exams will be returned to students via Gradescope and a link sent to the email address of the student. Requests to correct clerical or procedural errors in grading midterm exams must be submitted through GradeScope no later than one week after the exams have been returned to the class. The instructors and GSIs will not discuss such issues until you have explained your case in writing. Exams will not be re-graded when less than one point is at issue. Answers that are illegible or in any other way ambiguous will be given zero points when grading.

In accord with University Policy, no change of the grade filed in the end-of-semester course report is permitted "…on the basis of reassessment of the quality of a student's work." Changes can only be made to correct clerical or procedural errors such as "…errors in adding scores or transcribing grades."

Grade Determination

Letter grades for the course are assigned on a "curve." The instructors review the grades of each student and make every attempt to be fair. In the past, scores in the range of the mean and the median have been assigned a grade of B-.

Lecture	Month	Date	Day	Faculty	Topic	Chapter
1	January	18	Wed	All		
2	January	20	Fri	Davies	Overview, water, pKa	2
3	January	23	Mon	Davies	Amino Acids	3
4	January	25	Wed	Davies	Protein Structure	4
5	January	27	Fri	Davies	Protein Purification	3
6	January	30	Mon	Davies	Protein Identification	3
7	February	1	Wed	Davies	Ligand binding	5
8	February	3	Fri	Davies	Enzymes (part I)	6
9	February	6	Mon	Davies	Enzyme Kinetics (Part II)	6
10	February	8	Wed	Davies	Lipids	10
11	February	10	Fri	Davies	Membrane proteins	11
12	February	13	Mon	Davies	Review - Protein Structure	
13	February	15	Wed	Davies	Carbohydrates	7
14	February	17	Fri	Davies	Carbohydrates in Cells	7
---	February	20	Mon	---	President's Day	

15	February	22	Wed	Miller	Bioenergetics and Metabolism	13
16	February	24	Fri	Miller	Glucose Metabolism I	14
17	February	27	Mon	Miller	Glucose Metabolism II	14
18	March	1	Wed	Miller	Citric Acid Cycle I	16
19	March	3	Fri	Miller	Citric Acid Cycle II	16
20	March	6	Mon	Miller	Oxidative Phosphorylation I	19
21	March	8	Wed	Miller	Oxidative Phosphorylation II	19
22	March	10	Fri	Miller	Photosynthesis I	19/20
23	March	13	Mon	Miller	Photosynthesis II	20
24	March	15	Wed	Miller	Fatty Acid Metabolism I	17
25	March	17	Fri	Miller	Fatty Acid Metabolism II	21
26	March	20	Mon	Miller	Amino Acid Metabolism I	18
27	March	22	Wed	Miller	Amino Acid Metabolism II	18
28	March	24	Fri	Ingolia	Nucleic acids: structure	8
--	March	27	Mon	---	Spring Break	
--	March	29	Wed	---	Spring Break	
--	March	31	Fri	---	Spring Break	
29	April	3	Mon	Ingolia	Nucleic acids: chemistry	8
30	April	5	Wed	Ingolia	DNA topology and chromatin	24
31	April	7	Fri	Ingolia	DNA replication; PCR	25
32	April	10	Mon	Ingolia	Episomes; Molecular cloning	25
33	April	12	Wed	Ingolia	DNA repair and recombination	25
34	April	14	Fri	Ingolia	Bacterial transcription	26/28
35	April	17	Mon	Ingolia	Eukaryotic transcription	26/28
36	April	19	Wed	Ingolia	RNA processing	26
37	April	21	Fri	Ingolia	Genetic code; translation	27
38	April	24	Mon	Ingolia	Protein synthesis and targeting	27
39	April	26	Wed	Ingolia	Protein decay; microRNAs	28
40	April	28	Fri	Ingolia	Genetic engineering	9
---	May	1	Mon		RRR	
---	May	3	Wed		RRR	
---	May	5	Fri		RRR	
Final Exam	May	9	Tuesday		7-10 pm	