Survey of the Principles of Biochemistry and Molecular Biology

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, Chemistry 3B or an equivalent course. Recommended: a course in physical chemistry.
Please attend only your own selected discussion section.

Expectation from students
1) listen to recorded lectures and take notes to understand the material, ask questions during synchronous lectures
2) do the reading from the book, take notes and relate it to the lecture material.
3) do suggested homework problems at the end of each chapter. Answers provided the following week.
4) participate in quizzes and discussion activities
5) login to office hours, bring questions and pay attention to questions from others
6) attend discussions
7) login to GSI office hours, bring questions and pay attention to questions from others
8) take all discussion section quizzes and course exams
9) be active on Piazza

bCourse
The zoom link for synchronous lectures, discussion sections, office hours, will be provided through bCourses.
The syllabus will be updated as we have more information about review sessions, exam rooms, etc.
Powerpoints of lectures, recordings of synchronous and asynchronous lectures, homework answers and other instructional materials will be posted regularly. Please stay connected through bCourses.

Exams
Two evening mid-terms for parts I and II (100 points each) plus one midterm held on the assigned date for the final (100 points) for part III. Each exam covers only the portion in the 5 weeks of that module. The final exam is given at the time scheduled in the final exam period. The standard start time will be 7 PM Pacific. For students in other time zones, we will accommodate with an expanded window of start times (5 PM to 11 PM).

Exam-style quizzes
The standard start-time for the 15 min evening quizzes will be 7 PM Pacific. For students in other time zones, we will accommodate with an expanded window of start times (5 PM to 11 PM).

You may use a calculator during quizzes and exams for simple calculations. Please do not use your textbook, Google, e-resources, or notes for the exam. Please do not communicate with your classmates during the exams or the exam style quizzes.

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 end of the second week of the semester (September 9, 2020).

DSP students
Please identify yourself (ideally by end of the first week of classes), and no later than 2 weeks before the exam to the relevant instructor so that suitable accommodations may be made.

You will be informed about accommodations before each examination.

Missed quizzes or exam policy
No make-up quizzes or examinations will be given. Nevertheless, in event of emergency, it may be possible that you are granted an incomplete, which can be removed by taking the relevant exam in the subsequent semester (Spring 2021). The emergency must be documented by police report, hospital admission record, death certificate, or equivalent.
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. There can be no exceptions to this policy.

Lapse in integrity
We are sorry to have to review this particular topic because we assume every student enrolled in MCB 102 this semester would never consider engaging in any form of academic misconduct. However, based on past experience, there is, on rare occasion, someone who makes a very bad decision and perpetrates some form of cheating.
If a student is caught cheating or helping another student to cheat (e.g. during an exam or quiz when collaboration is not permitted) the student will be reported to the Office of Student Conduct and assigned a zero for that test.
http://guide.berkeley.edu/academic-policies/#studentconductappealstext

Missed quiz policy
No make-up quizzes are given. You are graded on your top score for 10 of the 12-14 activities in discussion section, your top scores for 10 out of 12 breakout session quizzes, and the top 3 out of 4 evening exam style quizzes.

In-class quizzes
Each student must complete his/her own 15 minute open-book quiz. Nevertheless, the analysis of the questions may be collaborative during the break out sessions in the synchronous class period. For those who are unable to attend the synchronous lecture because they are in a time outside the USA (Asia, Europe, Australia, Africa), you may take the quiz open-book on your own within 6h of conclusion of the lecture (2 pm to 8 pm PT).

Grade determination
Exams = 300 points (100 points per exam for each part)
Online quizzes = 150 points (50 points for each part)
Discussion activities) = 50 points (your top 10 scores), followed by normalization for each discussion
Total = 500 points.

We would like to remind you of the UC Berkeley honor code

"As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others."

created in collaboration between ASUC, the Graduate Assembly, the Academic Senate and Deans to support of environment of academic integrity and respect on campus. It is an affirmation of our highest ideals as Golden Bears.

https://teaching.berkeley.edu/berkeley-honor-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.

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 zero score for that activity and will also be reported to the University Center for Student Conduct. https://sa.berkeley.edu/student-code-of-conduct#Definitions In order to guarantee that you are not suspected of cheating, please work on your own for the evening quizzes and exams and do not consult other students or online materials during the evening quizzes and exams.

Academic Integrity and Ethics: Cheating on exams is a common example 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, we hope,fueled by passion for learning and replete with fulfilling activities. And we also appreciate that being a student can 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 it could be as subtle as consulting Google 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.

How is Academic Integrity Defined at UC Berkeley?

There is no single agreed upon definition of academic integrity at UC Berkeley. However, most definitions found in the literature and across higher education institutions consider academic integrity to entail honesty, responsibility, and openness to both scholarship and scholarly activity.

The University defines academic misconduct as “any action or attempted action that may result in creating an unfair academic advantage for oneself or an unfair academic advantage or disadvantage for any other member or members of the academic community” (UC Berkeley Code of Student Conduct).

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/.

MCB 102, Survey of the principles of Biochemistry and Molecular Biology

MWF 1:10P-2:00P | synchronous lecture

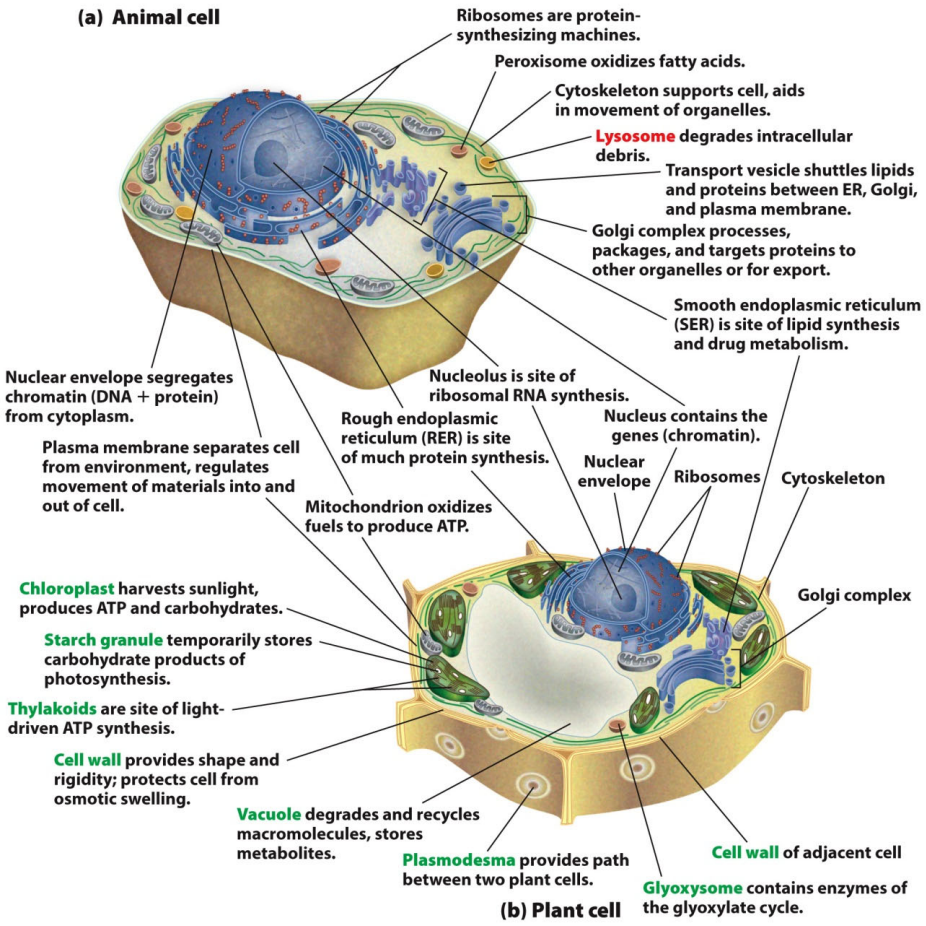


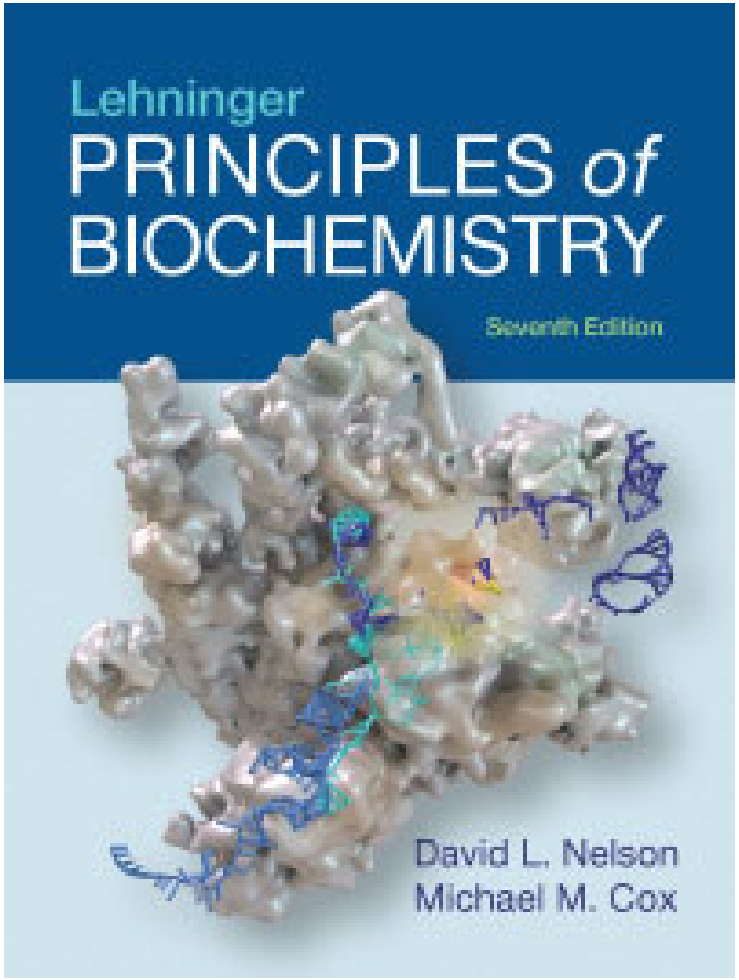
Figure 1-8
Lehninger Principles of Biochemistry, Seventh Edition

Instructors	Affiliation	Function
Sabeeha Merchant	MCB+PMB	Part I
Mary Wildermuth	PMB	Part II
Ross Wilson	IGI+MCB	Part III
Dimitrios Camacho	MCB	Discussion
Nick Campbell-Kruger	MCB	Discussion
Sunnyjoy Dupuis	PMB	Discussion
Jeremy McIntyre	MCB	Discussion
Maria McSharry	MCB	Discussion
Ashley Segura-Roman	MCB	Discussion
Julia Tartaglia	MCB	Discussion
Brittney Thornton	MCB	Discussion

Textbook: Lehninger Principles of Biochemistry 7th edition, 2017

All reading assignments from the 7th edition, 2017

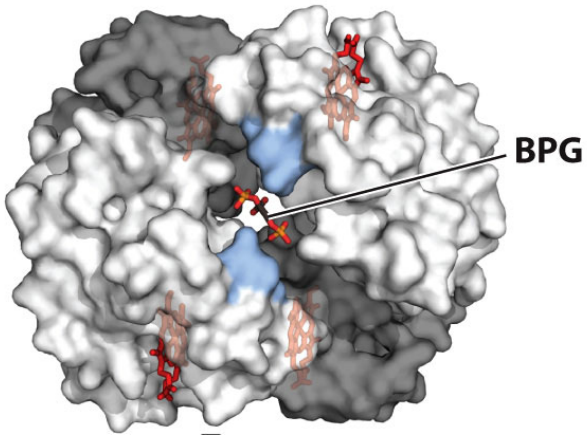
Sapling questions for Parts I, II, & III
available with e-book
may be purchased through bCourses
check buying options carefully
rental period (semester 4 mo. / 6 mo. vs. 2 years)
hard cover (+/- sapling)



piazza

This term we will be using Piazza for class Q+A discussion. The system is highly catered to getting you help fast and efficiently from your classmates, the GSIs, and the professors. Rather than emailing questions to the teaching staff, we encourage you to post your questions on Piazza. The GSIs will moderate your contributions to Piazza.

Sabeeha Merchant



Reviews for exams

- GSI Review Session
  Tue Sept 29, 7 – 9 PM by Zoom, recording posted in bCourses

- Q+A Review Session with Prof.
  Wed Sept 30, 5 – 7 PM
  use office hours zoom, recording posted in bCourses

Week	Day	Date	Topic	Reading
1	W	8/26	Course overview, review of water, pKas	Ch. 1, 2
	F	8/28	Amino acids, peptides, proteins - Ashura	Ch. 3
	M	8/31	The peptide bond and protein diversity + Quiz 7 pm	Ch. 3
2	W	9/2	Molecular interactions, 2°, 3° and 4° structures	Ch. 4
	F	9/4	Ligand binding, globins	Ch. 5
	M	9/7	Labor Day Holiday + Quiz 7 pm Tuesday instead	
3	W	9/9	Monosaccharides and polysaccharides	Ch. 7
	F	9/11	Lipids+membrane structure / function	Ch. 10-11
	M	9/14	Review + Quiz 7 pm	-
4	W	9/16	Introduction to enzymes and specificity	Ch. 6
	F	9/18	Enzyme mechanism – Rosh Hashanah	Ch. 6
	M	9/21	Enzyme kinetics + Quiz 7 pm – fast of Gedaliah	Ch. 6
5	W	9/23	Enzyme regulation	Ch. 6
	F	9/25	Protein modification & purification	Ch. 3
	M	9/28	Protein sequencing – Yom Kippur	Ch. 3
	W	9/30	Move to Part II of Course	
	F	10/2	**Exam 1: 2h duration, default start at 7 pm PT (start window is from 5 to 11 pm PT) -** Sukkot	

Mary Wildermuth

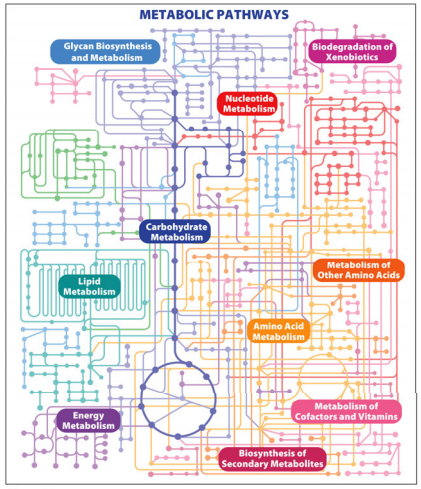


Figure 15-1
Lehninger Principles of Biochemistry, Seventh Edition
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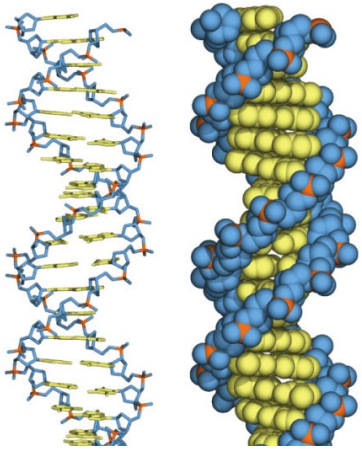
Reviews for exams

- GSI Review Session
  Thurs Oct 29, 7 – 9 PM by Zoom, recording posted in bCourses
- Q+A Review Session with Prof.
  (real time TBA, recording posted in bCourses)

Week	Day	Date	Topic	Reading
6	W	9/30	Bioenergetics I	Chapter 13.1-13.3
	F	10/2	Bioenergetics II	Chapter 13.4
	M	10/5	Glycolysis	Chapter 14.1-2
7	W	10/7	Gluconeogenesis	Chapter 14.3-5
	F	10/9	Metabolic Regulation I	Chapter 15.1-2
	M	10/12	Metabolic Regulation II	Chapter 15.3
8	W	10/14	Glycogen	Chapter 154.-5
	F	10/16	Citric Acid Cycle	Chapter 16.1-3
	M	10/19	Oxidative Phosphorylation	Chapter 19.1-3
9	W	10/21	Photosynthesis	Chapter 20.1-3, 20.5
	F	10/23	Fatty Acid Metabolism	Chapter 17.1-2, 21.1-2
	M	10/26	Chorismate & specialized metabolism	Chapter 22.2-3
10	W	10/28	Metabolic pathway – discovery & inhibition strategies	No textbook reading
Move onto Part III of Course				
	M	**11/2**	**Exam 2: 2h duration, default start at 7 pm PT (start window is from 5 to 11 pm PT)**	

Ross Wilson



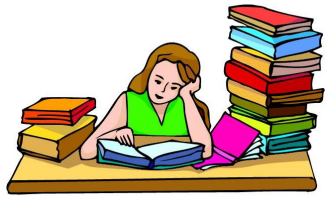
Reviews for Exam 3

- **GSI Review Session**
  Mon Dec 14, 7 – 9 PM by zoom
  recording posted in bCourses

- **Q+A Review Session with Prof.**
  real-time Thurs Dec 10, 5–7 PM
  by zoom, recording posted in
  bCourses

Week	Day	Date	Topic	Reading
10	F	10/30	Nucleic Acids: Structure	8.1-2
	M	11/2	Nucleic Acids: Reactions	8.3
	M	11/2	**Exam 2**	
11	W	11/4	DNA Topology & Chromatin	24
	F	11/6	DNA Replication	25.1
	M	11/9	DNA Repair	
12	W	11/11	*holiday*	25.2
	F	11/13	DNA Recombination / Engineering	25.3
	M	11/16	Bacterial Transcription	26.1, 28.1-2
13	W	11/18	Eukaryotic Transcription	26.1, 28.3
	F	11/20	RNA Processing	26.2, 28.2
	M	11/23	Genetic Code & Translation	27.1
14	W	11/25	*no instruction*	
	F	11/27	*holiday*	
	M	11/30	Protein Synthesis / Translation	27.2
15	W	12/2	Translation Regulation	28
	F	12/4	Protein Degradation; Genetic therapies	27.3, 9.1-2

Lehninger 7th edition [ch.sec]



Week	Day	Date	Topic	Reading
15	M	12/7	Review / Recitation	
16	W	12/9	Review / Recitation	
	F	12/11	Review / Recitation	
Final	W	12/16	**Exam 3: 2h duration, default start at 7 pm PT (start window is from 5 to 11 pm PT)**	

Summary of exam dates and times - 2h, online

Exam Part 1 – Merchant
October 2, 2020

Exam Part 2 – Wildermuth
November 2, 2020

Exam Part 3 – Wilson
December 16, 2020

Each exam will start at 7 pm Pacific Time. We will offer a start window from 5 pm to 11 for students in other time zones.

DSP students and Religious Creed
Please declare yourself by the end of Week 2 = Sept 9
You will be notified individually about accommodations.

Assessment basis

3 exams =	300
Online sapling quiz part I (10+10+30) =	50
Online component part II =	50
Online sapling quiz part III =	50
10 (out of 12-14 GSI activities) =	50
Total =	500