

**CHEM641 Biochemistry
Fall 2014**

Section 011 Tuesday/Thursday 9:30 - 10:45 am, 207 Brown Laboratory
Section 010 Tuesday/Thursday 5:00 - 6:15 pm, 207 Brown Laboratory
You are free to attend the section of your choice.

The 1st Half Lecturing, 08/26/14-10/10/14

Instructor: Prof. **Sharon Rozovsky**

E-mail: rozovsky@udel.edu

<http://www.udel.edu/chem/rozovsky/group/index.html>

Office hours (sections 011 and 010): Tuesday 10:45-11:45 am, Thursday 4:00-5:00 pm

Location: 136 Brown Laboratory

The 2nd Half Lecturing, 10/11/14-12/3/14

Instructor: Prof. **Zhihao Zhuang**

E-mail: zzhuang@udel.edu

<http://zhuanggroup.chem.udel.edu/>

Office hours (sections 010 and 011): Tuesday 10:45–11:45 am, Thursday 4:00–5:00 pm

Location: 214A Drake Hall

Because CHEM641 is a large class, we ask you to adhere to the posted office hours. We will not be able to discuss class materials outside of those times.

Teaching assistant

Teaching assistant: **Meghan Klems**

E-mail: mms@udel.edu

Office hours (section 010 and 011): Friday 9:00-10:00 am

Location: 219 Brown Laboratory.

The TA will lead recitation sessions that will focus on solving problems.

Recitation sessions: Monday 11:00 - 12:00 pm, Wednesday 7:00 - 8:00 pm and Friday 11:00 – 12:00 pm. Recitation sessions are held in 220 Brown Laboratory.

The three recitation sessions are identical and are open for both sections (010 and 011). Feel free to attend the session of your choice.

Textbook and reading aid

"Principles of Biochemistry" by Lehninger, 6th edition, Nelson and Cox, ISBN-10: 1429234148, ISBN-13: 978-1429234146.

The ebook option is the most cost effective option. For additional details visit

<http://ebooks.bfwpub.com/lehninger6e>

Students may purchase access to the eBooks as a direct purchase at ebooks.bfwpub.com - Direct purchase offers a discount to students of 30-40%.

You may also rent a copy in the bookstore.

If you already own a copy of "Principles of Biochemistry" by Lehninger, 5th edition you are free to use it. However, it is your responsibility to verify that the assigned reading material is similar to that of the 6th edition.

Student Media (free of charge) www.whfreeman.com/lehninger6e

The CHEM641 web page (sakai.udel.edu) will have announcements, exam answer keys, and selected class notes. Please check routinely for announcements since we will not be emailing them to the entire class.

Reading will be assigned in advance of the lectures covering the topic. Further reading may also be assigned following certain lectures. Material that is covered in the reading assignment but was not discussed in class may appear on the exams.

Prerequisites

One year of Organic Chemistry or equivalent (CHEM 322 or 332)

Tentative class schedule

Topic	Chapter in Lehninger, 6th Ed.
First Half	
Water, pH and Ionic Equilibria	2
Amino acids, Peptides, and Proteins	3
The Three-Dimensional Structure of Protein	4
Protein Function	5 (independent reading)
Enzymes	6
If time permits: Biomembranes	10+11 (selected sections)
Second Half	
Bioenergetics and Biochemical Reaction Types	13
Glycolysis & Gluconeogenesis	14
The Citric Acid Cycle	16
Fatty Acid Catabolism	17
Oxidative Phosphorylation	19

Course Structure and Grading

Homework

Homework will be assigned on Thursday and are due back by Thursday noon the following week. The homework and respective answer keys will be posted on the class' website. The answer key will be provided on line on Thursday evening. You may submit the assignment electronically on the class web site (in a pdf format only) or, if you prefer submitting a hard copy, in the instructor's mailbox. We strongly encourage electronic submission (papers copies are easier to misplace). We will select randomly two-three problem sets to grade. Those will account for 20% of the final class grade.

While you are welcome to work together on the problem sets, you should formulate the answers in your own words. Duplicate answers or answers copied from books, web resources, etc. will not be graded. 20% of the points will be taken off for late submission that is after Thursday noon. Assignments submitted after the answers are posted on line will not be graded. In general we do not grant exceptions to those rules but if you think you have an unusual situation please contact the TA directly. The instructors will not respond to emails regarding late submission.

Exams

The exams will include questions closely related to the problem sets. The final exam will cover all the course materials.

Exams will account for 80% of the grade

Exams: Saturday Sep 28	20%
Saturday Nov 8	20%
Tuesday Dec 10 (Final, tentative date)	40%

Both midterm exams are scheduled between 10 AM - 12 PM in 101 Brown Laboratory (common for both sections).

Exams are closed book. No cell phone and PDA are allowed in the exam but you may bring a calculator. For the final you are allowed to bring a 4x6" index card. The card has to be hand written on only one side. You will be asked to submit the card along with your exam.

There will be no make up exams. You should get approval from Dr. Zhuang or Dr. Rozovsky to be excused from a particular exam. In case of an excused absence, the other exams will be weighted accordingly to determine the class grade (30% out of class exam, 50% final).

You need to successfully complete the final examination in order to pass the class. If you missed the final or both of the out of class exams without known cause, your grade will

be assigned as Z (Unofficial Withdrawal, counts as an F in the GPA calculation). The grade of I (Incomplete grade) will be given only in situations where events beyond the student's control, e.g., illness, accident, death in the family, have prevented her/him from completing the course requirements. Documentation is required.

For the first half of the class

Please bring to class colored index cards (blue, green, red and yellow). The University Barnes and Nobles has an assorted rainbow spiral ruled index cards that cost \$3.5. Alternatively you can download flash cards app for your phone.

I Phone Apps:

1. iStudious: \$3.99
 - a. Allows for the incorporation of colored backgrounds, type, and handwriting.
2. iFlashcards: free
 - a. Allows for the incorporation of colored backgrounds and typed details.
3. Index card board: \$2.99 from Wombat Apps
 - a. Allows for the incorporation of colored backgrounds, font, and images.

We will post ahead of time questions on Sakai that you can complete for extra bonus points (2.5 points total). These questions are based on the reading and help get you prepared for the lectures. Submission of ahead of time questions (see Sakai class website) is possible until 8AM the day of class.

Course learning objectives

The main objective of the class is to provide an introduction to biochemistry. In particular, after successful completion of this course, a student will be able to:

1. Describe key intermolecular forces and their magnitude in proteins.
2. Describe the building elements of proteins, and how they come together to form secondary and tertiary structure.
3. Understand protein folding, aggregation and their relevance for human diseases.
4. Describe key biochemical characterization techniques and their use in studying protein function.
5. Understand enzymatic catalysis.
6. Be familiar with the composition, structure and properties of membranes as well as the composition and fold of membrane proteins.
7. Understand the chemical logics of chemical transformations catalyzed by metabolic enzymes.
8. Comprehend the catalytic mechanisms of several classes of common metabolic enzymes.
9. Understand and be able to write down the major metabolic pathways covered in the class.
10. Understand the regulation of the chemical steps in metabolic pathways.
11. Comprehend the energetics of biochemical transformations.
12. Understand the molecular basis of some human diseases that are associated with deficiency in metabolic pathways.
13. Be familiar with basic graphical software and bioinformatics resources.
14. Work together with other students in discussing ideas, evaluating information and formulating solutions to problems.
15. Communicate ideas clearly and effectively in written format.
16. Solve problems based on reading from the textbook and primary literature.