

C483: Biological Chemistry
Fall 2017

Dr. Ben Burlingham
Office: Chemistry A206
Phone: 856-7782
Email: bburling@indiana.edu

Lecture:
8:00-8:50 AM, MWF
Discussion:
M 4:40 or 5:45PM

Class Website: <http://courses.chem.indiana.edu/c483/default.asp>
Grades will be posted on Canvas.

Instructor Office Hours: T 9-10AM, W 3:30-4:30PM, F 11am-noon
Students are also welcome to attend my C383 office hours (M 9-10AM, W 2:30-3:30PM, and R 11AM-noon) and ask questions when there are no C383 students.

Class Organization:

In this three-credit course, there will be classroom lecture MWF and discussion sections on Monday. Attendance is required in both lecture and discussion.

Associate Instructor: Laura Chamness (lmchamne@iu.edu)
Office Hours: Thursdays, 3:30-4:30PM in C046

Course Description: Introduction to macromolecular structure, enzymology, and major metabolic pathways.

Learning Objectives. At the completion of the course, students will be able to:

- Explain how the chemical structures of proteins, polysaccharides, lipids, and nucleic acids dictate their function in biological systems
- Solve qualitative and quantitative problems concerning solution pH, reaction thermodynamics, enzyme kinetics, membrane potential
- Use chemical principles to describe the metabolic processes of energy acquisition, storage, and utilization
- Describe metabolic regulatory processes, including those mediated by signal transduction
- Recognize the chemical motifs of redox reactions, hydrolysis, and decarboxylation in metabolic chemistry, and apply them to enzyme mediated organic chemistry reaction mechanisms and pathways
- Apply fundamentals of biochemistry to the reading and comprehension of primary literature
- Describe basic biochemical experimental techniques

Text Materials:

Required: Essential Biochemistry 3ed by Charlotte Pratt and Kathleen Cornely. You might choose to get the book, the loose leaf, or an electronic option.

Grading:

Discussion exercises:	100 pts
Metabolism quiz:	50 pts
Exams:	300pts
Final Exam:	<u>150pts</u>
Total	600 pts

Anticipated grading scale: A = above 90%, B = 80-89.9%, C = 65-79.9%, D = 50-64.9%, F=below 50%. Plus/minus grades will be awarded.

Homework: Working out problems is the only way to be successful in biochemistry. The problems will not be graded, but you should keep up with them from day to day. Many exam questions will be similar or the same as homework questions. There are two types of homework. Reading guides are lower-level questions that help you focus on what is essential in the chapter reading. If you can answer all these questions, you have a good baseline knowledge of biochemistry. Book Problems come from the end of the chapter, and tend to be higher order thinking problems. These help you to apply your knowledge of biochemistry.

Discussion Exercises: During discussion section, you will be reviewing material learned in class, often by applying it to a Case Study. You will work individually or in groups to finish an exercise given in class. Each Review or Case Study is worth 10 points. You may drop 3 of the 13 discussion exercises for a total discussion grade out of 100 points. There are no make-up discussion exercises; any missed exercise can be counted as a drop. The discussion schedule is on the website.

Exams: Exams will strongly resemble the homework, with ~50% like the Reading Guides, ~40% like the Book Problems, and ~10% like the Case Studies. Three midterm exams, each worth 100 points, will be given from **7:15-9:15PM on September 21, October 19, and November 30 in a room TBA**. A 50-pt metabolism quiz will be given on **November 6th during discussion**. The two hour exam time slot is designed so that you will not need to rush through the exam. Because biochemistry is a subject that builds upon previously learned material, all exams will be cumulative, but will focus on the material covered since the previous exam. No makeup exams will be given; if a valid excuse is given for missing an exam, the percentage grade on the final will be substituted for the missed exam grade. Please talk to the instructor at least a week ahead of the exam if there is a known conflict with one of the exams.

Final Exam: The final exam will be cumulative with an emphasis on most recent material. The final will be given from **8:00 AM- 10:00AM, Friday December 15, in a room TBA**.

Academic Honesty:

The determination of academic misconduct is at the discretion of the instructor. The sanctions may range from deduction of points to a failing grade for the class. In all cases, the infraction will be immediately reported to the Dean of Students as well as the dean or director of the student's school. Please read the *Code of Student Rights, Responsibilities, and Conduct* for further detail.

Withdraw: See the College's Policy on withdrawing from class at:
<http://college.indiana.edu/ado/policies.shtml>

My suggested plan for approaching C483: You should maximize the results you get for the amount of effort you put in. You can use the same amount of time in different ways and be more or less effective. If you avoid procrastination, you will do much better in the class!!! Here is how I would do it if I were you.

1. **Before class**, at minimum, I would skim the section to be covered in class, becoming familiar with the key concepts and terminology (look at titles and bold words.) Ideally, I would read the section and answer many of the Reading Guide Questions. If I ran into something I didn't understand right away, I would note it, move on, and not get bogged down.
2. **During class**, because I have already become familiar with the major topics and types of questions, I would take notes, writing more details on the concepts that I did not understand.
3. **AS SOON AS POSSIBLE after class** (while things are still fresh), I would finish the Reading Guide questions, then review them. After that, I would attempt the Book Problems. After checking the answers, I would go to office hours to get help with anything I did not understand.
4. **Then start again for the next class!**

Tips for maximum success:

- **You need to attend all classes and discussions.**
- Practice, practice, practice. Solve all assigned homework (and maybe work on some that are not assigned!)
- Develop and use your own study aids, such as flashcards and study guides.
- Be persistent in asking questions. Take advantage of discussion sections. Come to office hours as soon as you are having problems.
- Form study groups.
- Don't get behind! One day behind puts you two days behind; you won't understand the next class period well because you missed the previous.

I want to see you succeed! My personal goal is to see every individual student succeed to the level he or she is willing to work. Please feel free to talk with me any time you want—keep me up to date with how you are doing.

Tentative Schedule: The schedule on the following page may be changed by the instructor to better meet the needs of the class.

Date	#	Chapter/Topics	Discussion
Aug 21	1	Ch 1/2	1. Review of Organic chemistry
Aug 23	2	Ch 2	
Aug 25	3	Ch 2	
Aug 28	4	Ch 3	2. Review of Acid/base chemistry
Aug 30	5	Ch 3	
Sep 1	6	Ch 4	
Sep 6	7	Ch 4	
Sep 8	8	Ch 4/5	
Sep 11	9	Ch 5	3. Case Study
Sep 13	10	Ch 5/6	
Sep 15	11	Ch 6	
Sep 18	12	Ch 6	4. Enzyme Mechanisms
Sep 20		Review Exam 1	
Sep 22	13	Ch 7	
Sep 25	14	Ch 7	5. Enzyme Kinetics
Sep 27	15	Ch 8	
Sep 29	16	Ch 9	
Oct 2	17	Ch 10	6. Case Study
Oct 4	18	Ch 10	
Oct 9	19	Ch 11	7. Case Study
Oct 11	20	Ch 12	
Oct 13	21	Ch 12	
Oct 16	22	Ch 13	8. Metabolism and Thermodynamics
Oct 18		Review Exam 2	
Oct 20	23	Ch 13	
Oct 23	24	Ch 13	9. Case Study
Oct 25	25	Ch 13	
Oct 27	26	Ch 14	
Oct 30	27	Ch 14	10. Case Study
Nov 1	28	Ch 14	
Nov 3	29	Ch 15	
Nov 6	30	Ch 15	Metabolism Quiz
Nov 8	31	Ch 17	
Nov 10	32	Ch 17	
Nov 13	33	Ch 17/18	11. Case Study
Nov 15	34	Ch 18	
Nov 17	35	Ch 18	
Nov 27	36	Ch 18/19	12. Case Study
Nov 29		Review Exam 3	
Dec 1	37	Ch 19	
Dec 4	38	Ch 19	13. Case Study
Dec 6	39	Ch 19	
Dec 8	40	Review	
Dec 15		Final Exam	