

CHEM/BIOL 445: Biochemistry II

Professor: Jeff Watson, HU230A x5929, watsonj@gonzaga.edu
Text: **BIOCHEMISTRY**, Berg, Tymoczko and Stryer, 6th edition
Lecture: MWF 1:10pm-2pm, HU 014
Office Hours: M9am-11am, F10am-noon

Goals of the Class

- To gain an understanding of how and why biochemical phenomena, reactions and pathways occur in the manner they do
- To be able to integrate biochemical pathways into an understanding of the larger whole of biochemistry at a functional and regulatory level

Philosophy of the Class

Biochemistry can be a vast, complicated and seemingly random collection of information. The goal of this class is to a) demystify the randomness, b) simplify the complications to a series of core concepts and c) somewhere in there, learn some facts. Notice that 'learning the facts' is last on that list.

Simply memorizing names, structures, reactions and so forth will not be enough to do well in this course. The goal is to understand why things happen the way they do, and memorizing **what** happens is rarely enough to achieve this goal. I will not tell you NOT to memorize. Frankly, having pathways memorized can be very helpful to understanding how and why they work. All I will say is that memorizing will not be enough to help you do well in the course. It is expected that you have retained the general mechanistic and regulatory details of glycolysis, gluconeogenesis and the citric acid cycle, as they integrate extensively with the pathways we will discuss this semester. In addition, you should have the structures of the 20 amino acid side chains memorized, including hydrogens, as well as the pK_as of the commonly ionizable amino acids. Refer to the table in Chapter 3 of your textbook for these values.

There will be "weekly assignments" posted on Blackboard, each worth 10 points, roughly each week that will test very basic concepts. I will post answer keys to these assignments on Blackboard, and you will be expected to grade yourselves and turn the assignment in with a score on the due date. It should go without saying that you'll get more out of these if you finish them prior to seeing the answer key and grade them honestly and fairly. There will also be more detailed homework assignments that are meant to be similar to questions you would find on exams. In addition, there will be short quizzes at the end of each chapter, held on dates listed on the class schedule. These quizzes are meant to be primarily straightforward assessments of whether or not you picked up the basic concepts central to each chapter, and will be tied directly to a list of chapter objectives that will be posted prior to our beginning a chapter. I will provide a sample quiz based on a chapter from Biochemistry I to introduce you to the format of the quizzes. The quizzes will take no more than 25 minutes. One comment I frequently get from students is that they'd like more incentive to stay current in reading the textbook. We'll try the quiz idea out for a while and see how it goes.

Before each exam, I will distribute a "study guide" that will outline key topics and concepts to help you focus your study efforts. Exams are almost entirely essay-based

and are meant to test your ability to think through a problem or situation and apply the knowledge you've gained through reading, lectures and the problem sets. Fair warning: exams are likely to be long. I generally give 55 minutes (an extra 5 minutes at the end) to complete the exam. As a general rule, makeup exams will not be given. If you have a legitimate conflict (an unalterable commitment that takes you off-campus, a severe illness), then we can try to make arrangements. I will be the final arbiter of what I consider a legitimate conflict. If you know for certain you will be unable to take an exam, you must come talk to me **at least** three (3) days prior to the exam.

The final three weeks of the course do not have an official set of topics yet. I will be happy to take suggestions if there's anything in particular you're interested in, and I'll also have a short list of topics the class can vote on. Please consider what topics in particular you might be interested in. Some of the topics I've considered as possibilities are:

- Molecular mechanisms of replication, transcription and/or translation
- Drug discovery and development
- Biophysical methods (x-ray crystallography, for example, and other techniques used to study macromolecular structure)
- Biochemistry of signal transduction
- Extremophile metabolism

Grading and Evaluation

3 in-class exams	100 points each
Assigned homework/projects	290 points total
7 quizzes	210 points total
<u>Final exam</u>	<u>200 points</u>
	1000 points total