BCEM 393 Course Profile

The course description for Biochemistry 393 (**Introduction to Biochemistry**) can be found here.

Generally offered in: Winter & Spring semesters

Prerequisite(s): CHEM 351, BIOL 311 and admission to a Major offered by the Department of Biological Sciences or the Neuroscience Major or a primary concentration in Biological Sciences in either the Natural Sciences or Environmental Science Major. Or, CHEM 351, and MDSC 341, and admission to either the Biomedical Science or Bioinformatics Major.

Antirequisite(s): Credit for BCEM 393 and 341 will not be allowed.

Answered by Dr. Brianne Burkinshaw

In your own words, can you give a brief summary about what this course is about?

BCEM 393 is focused on the molecules that are the building blocks of life: proteins, nucleic acids, lipids, and carbohydrates. We study the structures and physiochemical properties of these molecules in order to understand their functions in the cell. As an example, we investigate the chemical properties of amino acids, study how amino acids are linked together to form polypeptides, and describe the forces that drive folding of polypeptides into proteins with complex 3D structures. We then analyze how the structure of an enzyme may allow it to bind substrates and catalyze chemical reactions, such as the reactions in metabolic pathways in our cells.

What is the main skill you want students to take away from this course?

I want students to have a strong foundational knowledge of biochemistry that they can draw on to succeed in their upper-level courses. They should be able to apply the concepts learned in lecture and labs to solve problems in different contexts. I also want students to learn to work collaboratively together to perform experiments and develop writing and quantitative skills to analyze and communicate scientific findings.

What aspect of the course do you think students struggle with the most?

This may vary from student to student as we all have different strengths and weaknesses. One challenge of the course is that it requires students to combine knowledge from different pre-requisite courses such as biology, genetics and organic chemistry and apply that knowledge to new contexts. General writing and numeracy skills are also important in the course. Finally, we cover lots of material so time management is critical. Fortunately, there are resources available for students to address these challenges. It's important for students to recognize if they are struggling with a particular aspect of the course, and seek resources or help as early as possible. Ask your instructor if you are unsure where to start.

What can students do to be successful in this course besides attending lectures?

Ask questions! The first year I taught the course, I noticed some students summarized their notes after each class and highlighted any questions they had about the material. I think this is an effective strategy. Asking questions in lecture, after class, during office hours, or by email helps me understand which concepts students find more challenging so I can try to spend more time on those topics.

Also, use the learning objectives as a study tool. I use the learning objectives to design the assessments. You can also use the learning objectives to design your own practice questions to test your understanding of the material.

Does this course have a lab or tutorial component? If so, what should students expect from that component of the course?

There is a lab component. In the lab, students do experiments that relate to the principles and concepts we learn in class. For example, students learn how to purify a protein and how to set up a kinetic assay and analyze the data. They learn basic techniques that scientists use in research labs.

Another important component of the lab is learning how to communicate the data in a written report. Communicating scientific research is a critical skill that students build throughout their degree program.

What do you think is the most effective way that students can prepare for an examination in the course?

Students are busy, so time management is critical! I recommend creating a study plan two weeks prior to an examination to avoid cramming the night before. Breakdown the content into manageable chunks to review each day and schedule that review time in your calendar.

To use your time efficiently, pre-read before class, and take notes in class. Review your notes after class and highlight any areas that need further clarification. Test your knowledge by doing practice questions. Review the learning objectives. Study in a group and create practice questions to test each other.

Aside from the textbook and lecture notes, are there any other resources that you recommend students use?

Course instructors want students to succeed in the course. Come to office hours and ask questions. TAs also have office hours and can provide helpful feedback for the lab work.

Other students in the course can also be a great resource. Discussing concepts in a small study group can help you realize which concepts you understand well, and which concepts need more revision.

Do you have any other advice for incoming students taking this course?

This course builds on concepts you learned in first year biology and chemistry, as well as genetics, and organic chemistry. We move quickly through the material, so if you do not feel confident in some of the pre-requisite subjects, you may need to invest some extra time to brush up on those topics.

Some students also find they struggle with calculations in the course. Set yourself up for success by seeking help early on. The Student Success Centre can offer help with general numeracy and writing skills.

What is your favorite part about teaching this course?

I enjoy seeing students make connections between the concepts we cover in class and the experiments they do in the lab or even science topics they read in the news. In general, it's a pleasure to interact with a group of bright people who are committed to learning.