

CHEM B242 – Fall 2026

Biological Chemistry

Instructor: Professor Yan Kung (ykung@brynmawr.edu)

Time and classroom: Mondays and Wednesdays at 10:10–11:30 AM in Park 278

Office hours: Tentatively on Wednesdays and Fridays at 2:30 to 4:00 PM in Park 286

Class website: Moodle (<https://moodle.brynmawr.edu>)

Textbook (optional): Stryer's *Biochemistry*, 7th Edition (2012), which you may buy or rent from the bookstore, though it may be cheaper online. There are many other biochemistry textbooks (e.g. Lehninger *Principles of Biochemistry*, Voet & Voet's *Biochemistry*, and others), and you may use these as substitutes or supplements if you wish.

Note: This syllabus is subject to change, and modifications may be made throughout the term.

Course description

Biochemistry is the study of the chemical basis of biological phenomena. In this course, we will explore the structure and function of biological macromolecules; enzyme catalysis, inhibition, and mechanism; biosignaling pathways; and important features and pathways in primary metabolism. We will begin with a survey of the key biomolecular players—proteins, enzymes, carbohydrates, nucleic acids, and lipids—before delving into an exploration of topics like signal transduction and central metabolism. Throughout the course, we will pay particular attention to the ways in which molecular structure governs both biological function and chemical reactivity.

Learning goals

- Understand the intimate link between macromolecular structure and function
- Develop a chemical appreciation of biological processes
- Deepen comprehension of concepts learned in general and organic chemistry (and introductory biology, for some) and apply them to biochemistry
- Become familiar with the interplay between small molecules and biological macromolecules
- Conceptually integrate the metabolic pathways covered to construct a unified vision of central metabolism
- Gain an awareness of the “real world” importance of the topics studied, including in areas of medical and clinical relevance

Attendance, participation, and electronic devices

Class attendance is expected and will be the key to your success! Please arrive to classes on time; arriving late is very disruptive! If you must miss a class due to an illness or another unavoidable circumstance, please let me know. I can help you find ways to make up the material on your own.

Because all students must be fully engaged during class, electronic devices such as computers and tablets may only be used for note-taking. Your phone should be put away during class.

Please do not text, take photos, use your phones, browse the internet, record video or audio, check or write e-mails, or use social media during class!

Schedule of course topics (subject to change)

Wk	Dates	Monday (Stryer chapter)	Wednesday (Stryer chapter)
1	8/31, 9/2	Intro and review (1.1, 1.3)	Amino acids (2)
2	9/7, 9/9	Labor Day	Proteins (2, 3.6)
3	9/14, 9/16	Bioinformatics/modeling exercise, PS1 due	Hemoglobin (7)
4	9/21, 9/23	Enzymes (8.1-8.3)	Enzyme kinetics (8.4)
5	9/28, 9/30	Inhibition, proteases (8.5, 9.1), PS2 due	Carbohydrates (11)
6	10/5, 10/7	Carbohydrates, glycoproteins (11)	MIDTERM EXAM 1
7	10/12, 10/14	FALL BREAK!!!	
8	10/19, 10/21	Nucleic acids (4)	Fatty acids, lipids (12.1-12.3)
9	10/26, 10/28	Lipids, membranes (12, 13), PS3 due	Membrane transport (13)
10	11/2, 11/4	Biosignaling (14)	Biosignaling (14)
11	11/9, 11/11	Receptors, metabolic themes (15), PS4 due	Glycolysis (16.1-16.2)
12	11/16, 11/18	MIDTERM EXAM 2	Glycolysis, fermentation (16.1-16.2)
13	11/23, 11/25	PDH (17.1), PS5 due	TCA cycle (17)
14	11/30, 12/2	ETC, oxidative phosphorylation (18)	ETC, oxidative phosphorylation (18)
15	12/7, 12/9	Student presentations, PS6 due	Student presentations
	12/13–12/18	Final Exam (scheduled)	

Lectures

Although our classes will include material that is covered in the textbook, there will be many omissions, additions, corrections, and further elaborations. You will be responsible for what we cover in class, not what is in the textbook, so your attendance in lectures will be critical to your success in the course. This course moves fast; you are encouraged to read the textbook ahead of class so that you may come better prepared to digest and engage with the material. Although the textbook is a good resource, the class is our time to meet as a group to cover the material in a way that is most helpful to your learning needs. Therefore, you are encouraged to take an active role during class and to ask questions.

Lecture material will be posted to Moodle ahead of time, usually at least the day before each class. You can print out the material and bring it to class to take notes on, or you can save it to a tablet and write on it electronically. I will also bring additional printed copies to each class.

Assignments

There will be six problems sets during the semester, which will be posted to Moodle as PDFs. All problem sets are due *before* our class begins, at 10:00 AM sharp, on the due dates listed above. Completed problem sets will only be accepted electronically as PDFs via Moodle upload; they will not be accepted in paper form or via e-mail. To do this, you can either print out your problem sets, complete them by hand, and scan them to PDF (e.g. using a scanner or a smartphone app, like Adobe Scan or Genius Scan), or you can download and complete the problem sets electronically (e.g. on a tablet) and upload them as PDFs directly to Moodle. Graded problem sets will also be returned via Moodle.

Late assignments will not be accepted unless you have been granted an extension ahead of time. Extensions may be requested via e-mail up until 5 PM the day before the assignment is due. If you request an extension, please describe the circumstance and suggest a possible new due date.

Students are reminded to abide by the Honor Code and AI policy when completing assignments (see below).

Exams

There will be two in-class midterm exams and one cumulative final exam during Finals Week. All exams will be closed-book, closed-notes, and closed-internet; however, formulas, figures of pathways, reaction schemes, and other crucial material will be provided. Please bring your own writing utensil and a scientific calculator; you may not use your phone as a calculator! Students are reminded to abide by the Honor Code and AI policy (see below).

Student presentations

In the final week of the semester, students will give presentations on a prearranged topic. Here, you will work in assigned groups to research the topic and prepare and deliver an oral presentation to the class. Presentations will be graded on your group's mastery of the material, integration with course content, presentation format, style and effectiveness, and oral delivery. The use of computer slides (e.g. PowerPoint, Keynote, or other software) is encouraged. More detailed information about the presentations, topics, and grading will be provided at a later date.

Access and accommodations

Students needing academic accommodations should contact Access Services (accessservices@brynmawr.edu) to request an appointment. Haverford students should contact Haverford's Access and Disability Services (ads@haverford.edu). More information can be found on the Access Services website (<http://www.brynmawr.edu/access-services>). Early contact will help to avoid unnecessary inconvenience and delays.

Honor Code and AI policy

When working on problem sets, you may use your class notes and textbooks as references, and you may consult and collaborate with your fellow students. However, ***all of your answers must be written independently and in your own words***. AI may not be used in any way to help you solve problem set questions or write your answers. In other words, AI is completely off limits for anything related to problem sets. You may use AI as a general studying aid in the course, with the knowledge and caveat that AI may provide you with incorrect information or lead you in a wrong, irrelevant, or confusing direction. You can succeed in this course without any AI use whatsoever! All exams will be completed independently, without the use of any books, notes, or other aids.

Assessment

Midterm 1:	20%
Midterm 2:	20%
Final exam:	30%
Problem sets:	20%
Presentation:	10%