

**Biophysical Chemistry I**  
MCB 3003 and 5003 Fall, 2022  
Monday and Wednesday, 4:40-5:55pm, Gentry 140

An introduction to the physical chemistry of biological molecules and systems. Principal topics include biomolecular thermodynamics, kinetics, transport properties, and biomolecular structure.

**Instructor**

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Office Hours: by appointment

**Course Objectives**

This course provides an introduction to the principles of physical chemistry as applied to biological molecules and systems. The course is intended for students who wish to develop an understanding of the physical-chemical basis for biological processes.

**Topics**

Biomolecular Thermodynamics

Basic framework

First Law and energy conservation

Second Law and entropy

Free energy rules

Chemical potential

Kinetics

Rate laws and reaction mechanisms

Enzyme-catalyzed reactions

Electron transfer

Transport Processes

Biomolecular Structure

Quantum mechanics

Applications of quantum mechanics

**Textbook**

Physical Chemistry for the Life Sciences. 2<sup>nd</sup> Edition, Atkins, P. and De Paula, J., 2011, W. H. Freeman and Co. ISBN 0199564280

**Additional Resources**

Physical Chemistry: Principles and Applications in Biological Sciences. 5<sup>th</sup> Edition, Tinoco, I., Sauer, K., Wang, J.C., Puglisi, J.D., Harbison, G.H., and Rovnyak, D. 2014, Pearson.

The Molecules of Life: Physical and Chemical Principles. 1st Edition, Kuriyan, J., Konforti, B. & Wemmer, D., 2012, Garland Science.

Biomolecular Thermodynamics: from theory to application. Barrick, D. 2017, CRC Press.

Physical Chemistry. 11th Edition, Atkins, P. de Paula, J., Keeler, J., 2018, Oxford University Press.

**Course Evaluations**

Exams: There will be two in-class exams and a final exam. The three exams will be weighted equally

Problem Sets: Three problem sets will be assigned.

Presentations: Student enrolled in MCB 5003 will do an oral presentation on an original research paper related to one of the areas of biophysical chemistry that we have covered in class and submit a written critique of the paper. Students in MCB 3003 will only write the critique.

Participation: Students will be evaluated on their participation in class discussions.

### Grading

<u>Component</u>	<u>Weight</u>
Exams:	60%
Problem Sets:	20%
Presentations:	10%
Class Participation:	10%

### Grade Scale

Grade	Letter Grade	GPA
A	93-100	4.0
A-	90-92	3.7
B+	86-89	3.3
B	82-85	3.0
B-	78-81	2.7
C+	75-77	2.3
C	72-74	2.0
C-	68-71	1.7
D+	64-67	1.3
D	60-63	1.0
D-	56-59	0.7
F	<56	0.0

### Resources for Students Experiencing Distress

The University of Connecticut is committed to supporting students in their mental health, their psychological and social well-being, and their connection to their academic experience and overall wellness. The university believes that academic, personal, and professional development can flourish only when each member of our community is assured equitable access to mental health services. The university aims to make access to mental health attainable while fostering a community reflecting equity and diversity and understands that good mental health may lead to personal and professional growth, greater self-awareness, increased social engagement, enhanced academic success, and campus and community involvement.

Students who feel they may benefit from speaking with a mental health professional can find support and resources through the [Student Health and Wellness-Mental Health](#) (SHaW-MH) office. Through SHaW-MH, students can make an appointment with a mental health professional and engage in confidential conversations or seek recommendations or referrals for any mental health or psychological concern.

Mental health services are included as part of the university's student health insurance plan and also partially funded through university fees. If you do not have UConn's student health insurance plan, most major insurance plans are also accepted. Students can visit the Student Health and Wellness-Mental Health located in Storrs on the main campus in the Arjona Building, 4th Floor, or contact the office at (860) 486-4705 for services or questions.

### Accommodations for Illness or Extended Absences

Please stay home if you are feeling ill and please go home if you are in class and start to feel ill. If illness prevents you from attending class, it is your responsibility to notify your instructor as soon as possible. You do not need to disclose the nature of your illness, however, you will need to work with your instructor to determine how you will complete coursework during your absence.

If life circumstances are affecting your ability to focus on courses and your UConn experience, students can email the Dean of Students at [dos@uconn.edu](mailto:dos@uconn.edu) to request support. Regional campus students should email the Student Services staff at their home campus to request support and faculty notification.

COVID-19 Specific Information: People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. These symptoms may appear 2-14 days after exposure to the virus and can include:

- Fever
- Cough
- Shortness of breath or difficulty breathing
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

Additional information including what to do if you test positive or you are informed through contract tracing that you were in contact with someone who tested positive, and answers to other important questions can be found here: <https://studenthealth.uconn.edu/updates-events/coronavirus/>

## **Standards, Policies and Resources**

As a member of the University of Connecticut student community, you are held to certain standards and academic policies. In addition, there are numerous resources available to help you succeed in your academic work. Review these important [standards, policies and resources](#).

Academic misconduct is dishonest or unethical academic behavior that includes, but is not limited to, misrepresenting mastery in an academic area (e.g., cheating), failing to properly credit information, research, or ideas to their rightful originators or representing such information, research, or ideas as your own (e.g., plagiarism).