

**Biophysical Chemistry I**  
MCB 3003 and 5003 Fall, 2019  
Monday and Wednesday, 4:40-5:55pm

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

**Instructor**

James Cole

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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.

**Additional Resources**

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

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.

Proteins: Concepts in biochemistry. Almeida, P. 2016, Garland Science.

**Course Evaluations**

Exams: There will be two in-class exams and a final exam.

Problem Sets: Three problem sets will be assigned.

Presentations: Students will be assigned short presentations of key applications of biophysical chemistry that address important biological questions.

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

**Grading**

Exams:	60%
Problem Sets:	20%
Presentations:	10%
Class Participation:	10%

**Policy Statements**

[Policy Against Discrimination, Harassment and Related Interpersonal Violence](#)

[Student Conduct Code](#)

[Academic Integrity Statement](#)

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).

**Final Exam Policy**

In accordance with UConn policy, students are required to be available for their final exam and/or complete any assessment during the time stated. If you have a conflict with this time you must obtain official permission to schedule a make-up exam with the Dean of Students. If permission is granted, the Dean of Students will notify the instructor. Please note that vacations, previously purchased tickets or reservations, graduations, social events, misreading the assessment schedule, and oversleeping are not viable reasons for rescheduling a final.