

CHEM-361 Physical Biochemistry (Fall 2017)

- Instructor:** Rui Sun
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Email: ruisun@hawaii.edu
- Lectures:** Mon/Wed/Fri 10:30 – 11:20 AM in Bilger 335
- Office Hours:** Monday 2:00 – 3:00 PM in Bilger 245B or by appointment.
- Textbook:** *Physical Chemistry: Principles and Applications in Biological Sciences*; 5th Edition, Tinoco et al. (Available at the University Bookstore)
<https://www.pearson.com/us/higher-education/program/Tinoco-Physical-Chemistry-Principles-and-Applications-in-Biological-Sciences-Plus-Mastering-Chemistry-with-Pearson-e-Text-Access-Card-Package-5th-Edition/PGM290637.html>
- Required Materials:** *Calculator:* You must have a calculator capable of natural logarithms and exponentials. Cell phones or any devices with transmitting or receiving functions are not permitted.
- Description:** This 3-credit-hour course is to cover fundamental topics in physical chemistry (e.g. thermodynamics, phase theory, kinetics, spectroscopy, etc.) and will focus on their application to a biological system.
- Grading Scheme:** The learning outcomes will be assessed through homework and exams, with some bonus points from homework and attendance.

Method of Assessment	Percentage of Grade (%)	Date
Homework	20 + 2 (bonus)	Weekly
Midterm Exam 1 (50 mins)	20	Sep 29 th
Midterm Exam 2 (50 mins)	20	Nov 3 rd
Final Exam (120 mins)	40	Dec 11 th
Attendance	8 (bonus)	Random

1. Homework (20% + 2% bonus) – Homework will be assigned weekly on every Monday, and **due by noon of the next Monday**. You can hand in the homework during the Monday lecture, or stop by my office on

Monday morning, but please make sure it is submitted before noon. Homework is deducted 50% every 24 hours past the deadline. There won't be homework assignment on the first or the last week of the semester, the two midterm-weeks, and the Thanksgiving week. There will be 11 homework assignments total and each homework makes up 2% of the final grade. You can discuss the homework with other students, however, homework needs to be finished and submitted independently. **Completing the homework assignments plays an essential role in understanding the material and preparing for the examinations.**

2. Exams (80%) – There will be two midterm exams (20% each) and one final exam (40%). Exam questions will be based on homework problems, the textbook reading assignment, and class content. The dates of the midterms will be Sep 29th (Friday) and Nov 6th (Monday). Midterms will take place at the usual lecture time and location. The first midterm will cover topics in “Thermodynamics” and the second midterm will cover topics in “Phase Theory and Kinetics” (see the tentative course outline below). The final exam will be on Dec 11th, from 9:45 AM to 11:45 AM, location TBA. There will be one quarter of the final exam (10% of the total score) covering “Thermodynamics” and “Phase Theory and Kinetics”, and the rest three quarters (30% of the total score) will focus on topics in “Quantum Theory”. Both midterms and final will be closed-book exams. Scratch paper needs to be handed in with the exam.

Students who miss an exam for a valid illness or university obligation will be given a make-up exam within one week (mid-terms) or two days (final), provided they are able to furnish a written proof. After that period of time, if you have not contacted me and arranged a make-up, you will receive zero credit for that exam.

3. Attendance (bonus 8%) – The attendance in the lecture is **highly recommended**, but not mandatory. To encourage the attendance, I will choose eight random lectures through the semester to take attendance, and each attendant will be granted 1% of the final score as a bonus.

You will get partial credit for a reasonable attempt at each problem in both homework and exams, even if some details or the final answer are wrong. The sum of the grade of each assignment will be your final grade, for which letter grades will be assigned (89% and above **A**; 78-88%: **B**; 67-77%: **C**; 56-66%: **D**; 55% and below: **F**).

Outline: Below is a **tentative** course outline, serving as guidance of the course. Reading assignments will be given prior to each lecture. You are responsible for everything in the reading, even if it is not covered in lecture.

	Week of	Topics
Thermodynamics	Aug 21 st	Energy and Enthalpy
	Aug 28 th	Entropy
	Sep 4 th	Free Energy and its Application
	Sep 11 th	Statistical Thermodynamics
	Sep 18 th	Statistics in Biophysical Chemistry
Phase Theory and Kinetics	Sep 25 th	Phase Transition and Equilibration
	Oct 2 nd	Electrochemistry
	Oct 9 th	Molecular Motion
	Oct 16 th	Reaction Rate
	Oct 30 th	Enzyme Catalysis
Quantum Theory	Nov 6 th	Quantum Theory
	Nov 13 th	Orbitals and Chemical Bond
	Nov 20 th	Interactions in Biomolecules
	Nov 27 th	Fundamental Spectroscopy
	Dec 4 th	Review
	Dec 11 th	Final Exam

Special Conditions: Any student who feels s/he may need an accommodation based on the impact of a disability is invited to contact me privately. I would be happy to work with you, and the KOKUA Program (Office for Students with Disabilities) to ensure reasonable accommodations in my course. KOKUA can be reached at (808) 956-7511 or (808) 956-7612 (voice/text) in room 013 of the Queen Lili'uokalani Center for Student Services.

Academic Honesty: It is the aim of the University to foster a spirit of complete honesty and high standard of integrity. Any attempt of cheating and plagiarism is regarded by the faculty and administration as a **most serious offense** and renders the offenders liable to serious consequences, possibly suspension.
<http://www.catalog.hawaii.edu/about-uh/campus-policies1.htm>