

Chemistry 124 – Biophysical and Medicinal Chemistry

Course Description:

In Biophysical and Medicinal Chemistry (CHEM 124) we will explore fundamental concepts in chemistry using case studies from biochemical research. The rapid advance of technology over the last 60 years has allowed scientists to understand the processes that enable life at molecular resolution. This course will examine how this understanding has been applied to the discovery of small molecule medicines. The principles required to understand the molecular nature of medicine will be built up from familiar chemical concepts.

Instructor and Resources:

Instructor: Dr. John Hofferberth
Email: hofferberthj@kenyon.edu
Office: 312 Tomsich Hall
Office Hours: M-R 2:30-4:00 PM (to reserve an office hour visit <https://hofferberthj.youcanbook.me/>)
Lecture Hall: 101 Tomsich
Class Time: 9:10-10:00 AM, MWF (Section 1)
11:10-noon, MWF (Section 2)
Text: Chemistry, 11th Ed, Raymond Chang, McGrawHill
Materials: HGS Molecular Structure Model (Kit C), Access to ALEKS site for the class.
Website: moodle.kenyon.edu (search for Chemistry 124)

Course Policies and Expectations:

Course Grade: Your grade will be determined by your performance on the items tabulated below:

Quizzes (12 × 10 pts)	120 pts
Seminar Synopses (2 × 25 pts)	50 pts
Midterm Exams (3 × 100 pts)	300 pts
Final Exam	200 pts
Notebook Checks (14 × 10 pts)	140 pts
Challenges (39 × 5 pts)	195 pts
ALEKS	300 pts
Total Points	1305 pts

The instructor will assign fair grades at the conclusion of the term. To estimate your grade during the semester use the following grade scheme.

Grade	Percent of Total Points Earned
A (+/-)	100% - 90%
B (+/-)	89% - 80%
C (+/-)	79% - 70%
D (+/-)	69% - 60%
F	< 60%

Attendance: Your attendance at every class session is expected.

Preparation: The material in this course builds on itself. For that reason it is imperative that you keep up with the course material. Chemistry is a subject that requires the memorization of facts, the understanding and application of concepts, and the integration of knowledge from all parts of the

course and prerequisite courses. To be successful, students will need to employ a variety of study tactics and strategies. The instructor will highlight good strategies for the different kinds of material we study. An understanding of how we best learn is a valuable asset in this course (and others). An excellent guide to understanding how best to learn is the following text and is *highly recommended reading* prior and throughout the course: “Make it stick: the science of successful learning”, Brown, Roediger, and McDaniel, ©2014 Harvard University Press. In brief, **ACTIVE** learning strategies are far more valuable than passive ones. The course is structured to encourage the use of effective learning strategies that can be transferred to other courses as you learn how to use them.

Homework: Active preparation is essential for your success in *Biophysical and Medicinal Chemistry*. Your out-of-class work will have three components:

1. **Completion** of in-class challenges and as many **suggested practice** problems/activities as possible (this work will go in your notebook, see below).
2. **ALEKS Concept Mastery** (Objective completion dates below).
3. **Processing** material for the next class session. Prior to each class session (excepting the first day and prior to exam days), your job will be to expose yourself to the material and concepts that will be the focus of the *next* session and to consolidate and organize that information into your course notebook (see below). During class, using only your notebook as a resource, you will participate in a small group that will take on challenges that will apply and extend your knowledge of the topic. Your personal work on the challenges will be recorded in your notebook while the product of the group effort will be turned in at the end of class.

A daily HW assignment will be emailed and texted (register for Remind texting service if you would like to get course information via text) to you following each class session. The assignment will indicate the Completion (and suggested problems), Concept Mastery, Processing needed prior to the next course meeting. Feel free to work ahead in ALEKS as you have time. If you need extra practice on any topic the textbook and the instructor are good sources of practice materials – just ask. If you are ever unclear about what you need to do to prepare for the next session please email the instructor.

Notebooks: Your notebook for this class will be your location to summarize, consolidate, organize, and process information that is contained in material you study prior to each class session AND it will contain your personal work on daily in-class challenges and suggested practice.

You are required to bring your notebook to class each session. Notebooks will be checked-in each day when you are assigned to a challenge team and collected and graded each Friday at the conclusion of class. Notebooks will be returned before 5 PM each Friday outside my office so you can prepare for the following class session.

Quizzes: Quizzes are an important learning tool that will enable you to calibrate your own understanding of course material prior to exams. Quizzes have also been shown to help students consolidate their memory of a topic and allow them to build durable knowledge (read “Make it Stick” for details). Quizzes will be given in the final 10 minutes of class on Fridays and submitted with your notebook prior to leaving class.

Exams: Three cumulative 50-minute midterm examinations will be given during the semester on the dates indicated on the syllabus. If you have a conflict with any of the exam times you must notify Dr. Hofferberth by email **at least one week prior to the exam to schedule an alternate exam time**.

- Final:* The cumulative final exam will be held on:
Section 1: May 11th from 6:30 to 9:30 PM
Section 2: May 10th from 8:30 to 11:30 AM
- Seminars:* You will attend two science seminars during the semester and prepare a one-page synopsis of each seminar that clearly describes the motivation for and the significance of the results presented in the seminar. You should indicate your name, the title and date of the seminar clearly at the top of the page. Synopses will be typed and submitted electronically on the course Moodle page. *You must submit your synopsis within 24 hours of each seminar you attend.*
- Accommodations:*
In accord with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990: If you anticipate you may need accommodation in order to fully participate in this class, please identify yourself to Erin Salva, Director of Student Accessibility and Support Services (PBX 5453, salvae@kenyon.edu). The instructor must receive information regarding the nature of the accommodation directly from Erin Salva and you must speak to the instructor about the accommodation at least one week in advance of using the accommodation for the class.
- Title IV:* Kenyon College and the instructor of this course seek to provide an environment that is free of bias, discrimination, and harassment. If you have been the victim of sexual harassment/misconduct/assault we encourage you to report this. If you report this to the instructor, he must notify our college's Title IX coordinator. For more information about your options at Kenyon, please go to: <http://www.kenyon.edu/directories/offices-services/office-of-equal-opportunity/sexual-assault-and-harassment/>
- The instructor of this course will respect the privacy of all personal conversations with his students. In the case that he learns of activities or incidents that violate Title IX (sexual discrimination and/or harassment) or otherwise violate the law he is required to report such information to the Title IX coordinator or campus law enforcement, respectively.
- Integrity:* Academic integrity is expected in all aspects of this course. A detailed description of academic integrity and the College policy regarding academic dishonesty can be found at the following link: www.kenyon.edu/directories/offices-services/registrar/course-catalog-2/administrative-matters/academic-integrity-and-questions-of-plagiarism/
- Devices:* Full engagement with the in-class portion of this course will be a key component of success. All electronic devices should be turned off before the beginning of every class session.

Tentative Schedule:

Date	Topic	Reading	ALEKS Due
1/16	Introduction to Med. Chem.	Review Ch9 all Review Ch10 all Brief Introduction to Medicinal Chemistry Ch24	
1/18			
1/20			Prereq. (1/22)
1/23			
1/25			
1/27		Obj. #1 (1/29)	
1/30	Intermolecular Forces	Ch11 S1-3, 8, 9	
2/1			
2/3			Obj. #2 (2/5)
2/6	Properties of Solutions	Ch12 S1-3, 6-8	
2/8			
2/10			Obj. #3 (2/12)
2/13			Exam 1
2/15	Polymers	Ch25 S1-3	
2/17			
2/20	Kinetics	Ch13 all	
2/22			
2/24			
2/27			
3/1			Obj. #4 (3/1)
3/3	Exam 2		
3/20	Acid-Base Chemistry	Ch15 Review S1-8, New S9, 10, 12 Ch16 S1-5	Open Pie (3/19)
3/22			
3/24			
3/27			
3/29			
3/31			
4/3			
4/5			
4/7	Obj. #5 (4/9)		
4/10	Thermodynamics	Ch17 all	
4/12			
4/14			
4/17			
4/19			
4/21	Exam 3		
4/24	Thermodynamics (con'd)		
4/26			Obj. #6 (4/27)
4/28	Electrochemistry	Ch18 S1-5	
5/1			
5/2			
5/3			
5/5			
5/11	Final Section 1 – 6:30-9:30 PM		
5/12	Final Section 2 – 8:30-11:30 AM		