

Chemistry 124 - Biophysical & Medicinal Chemistry

MWF 9:10-10am

Text - Chang's Chemistry, 11th ed.

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Office hours *M & W 11:10-1pm* or *email for appointment*

Course Description –

General chemistry is a course that covers many of the fundamental concepts and basic principles that are common to the different fields in chemistry. In this semester we will explore topics such as structure, kinetics and thermodynamics as it relates to biological applications. Furthermore, it is hoped that the projects and topics covered in this course will help you become a more scientifically savvy consumer of news reports, products and services.

Words of Wisdom –

*If you have a question or are having difficulties with a concept get help **RIGHT AWAY!*** Chemistry is cumulative, so the small questions you have today could easily become tomorrow's nightmare...

Googling for answers – not ideal. Always study deep, i.e. work to solve problems using the knowledge stored in your brain. Googling for the answer will not allow you to understand where your strengths and weakness lie.

Moodle Page (moodle.kenyon.edu) –

- Student Lecture Notes – available by midnight the night before lecture
- Access to on-line quizzes - *announced in class, available by noon on designated Fridays*
- Discussion Papers, Handouts, etc.

ALEKS (www.aleks.com - you need to purchase access) –

- **Concept Mastery/Homeworks software** - due dates as posted
- Access to helpful tutorials and hints (ex. building molecular structures, etc.)

Where to get help –

Me – Visit me during office hours, make an appointment, etc. I don't care about your past history on exams, etc. I am interested in helping you discover your inner chemist and help you improve your chemical knowledge – your future is not dictated by your past.

Math & Science Skills Center (MSSC) – Tues, Thur, Sun 7-10pm.

Drop in anytime the center is open for help on class work. (First come, first served.) Their mission is to help you improve your understanding of class concepts and they will not judge you based on what you do/don't know at the present moment.

Evaluation –

Exams (3)	50 %
Final	15 %
Quizzes	10 %
Homework/ALEKS	10 %
Poster Project Assignments	12 %
Seminar Summary	3%

Letter grades for the course qualitatively correspond to:

A: excellent work. Mistakes are rare. Unusually good effort.

B: very good work. Some mistakes, but major concepts are well understood. Good effort.

C: good work. Small mistakes are common, but the major concepts are understood. Good effort.

D: poor work. Major conceptual mistakes. Effort is not enough.

F: unacceptable work. Major conceptual mistakes are common. Effort is minimal.

Exams –

Three 50-minute exams will be given during the semester on the dates February 15, March 28, and April 25. The final exam time has already been set by the Registrar.

Weekly Quizzes – none given in Weeks 7 and 14

There will be 12 quizzes given throughout the semester and the lowest grade will be dropped. Unless otherwise announced, the quizzes will be given via the class Moodle page. The Moodle quizzes will open by 5am on Thursday and are due by 10pm on Sunday (you will have two 45-minute opportunities). Each quiz may cover pre-requisite chemistry skills or material covered since the last quiz.

Graded Homework – from www.aleks.com (due dates specified)

Concept mastery/homeworks for each chapter (with respective due dates) are found on aleks.com (subscription needed).

Suggested homeworks (not graded) from Chang are found on the last page of the syllabus.

Poster Presentation – FRIDAY, May 6th

The culmination of the poster project will be the presentation of your work on WEDNESDAY, May 4th, during your class time. Please keep that date available.

Without an Official Excuse - No make-up exams or quizzes.

Exams/quizzes are to be taken on the day and at the time specified.

Other arrangements can be made ONLY if your name appears on the official *Excused Absence List* from the Dean's Office or I receive a Doctor's note.

- Planned and Excused Absences – You must arrange for a makeup **prior** to the absence.
- Unanticipated Emergency or Illness – As soon as possible, contact me and the dean of students so we can make alternate arrangements.
- **If you do not live up to these responsibilities you will receive a zero for that exam.**

To prepare for the exams and quizzes do the homework, ask questions, and try to make links between the course work and your everyday life.

When doing homework, do it without looking at similar examples. When finished with a problem try to *thoroughly explain* how you got to the solution or try to explain the background of the formula you used. The process of solving and explaining the problems forces you to confront and understand the depth of your knowledge, it also starts to burn the concepts into your brain such that you will have faster recall on the exams. ***Warning – Normally the time you have to take the exams will not allow you to ponder a question at your leisure, you need to have the concepts ready for instant recall and integration.***

Exam post-mortems

Exams will constitute the major portion of your grade in this class. Do not treat them as an annoying inconvenience that you just forget about after the exam hour. Instead, when the exam is returned, look at it as an indicator of what areas are challenging you, what types of questions you are having trouble understanding, etc. Once the exam post-mortem has been accomplished, make sure to get help with any problems as soon as possible. (And if you don't want to analyze the exam by yourself, ask me or MSSC staff to work with you.)

Seminar Summary

The energy and excitement of science is often conveyed in the seminars you can attend on Kenyon's campus and it is important to dip your toes in this world. To that end, you will automatically earn credit toward your final grade if you attend any chemistry, biology, math, neuroscience, physics or psychology seminar* **and** write up a one-page summary of the seminar and submit on Moodle. (The summary should include: speaker's name, date, title of talk, and, as you interpret it: goals of work, background/foundation of work, basic result of experiments, conclusions. (Write up should not take more than 1 hour.)

*Ask if you think there is another seminar that might be chemistry based.

Academic Honesty

At Kenyon we expect all students, at all times, to submit work that represents these standards of academic integrity. It is the responsibility of each student to learn and practice the proper ways of documenting and acknowledging those whose ideas and words you have drawn upon (see Academic Honesty and Questions of Plagiarism in the Course Catalog). Ignorance and carelessness are not excuses for academic dishonesty. Because collaborative work is an integral activity in the sciences, we wish to emphasize the difference between appropriate and inappropriate cooperation. A great deal of learning results from the exchange of ideas, and we encourage such exchanges both in laboratory and outside the laboratory. All materials submitted for a grade, however, must be prepared by you alone.

Bias/Discrimination/Harassment

Kenyon College seeks 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 a faculty member, she or he must notify our college's Title IX coordinator about the basic facts of the incident (you may choose whether you or anyone involved is identified by name). For more information about your options at Kenyon, please go to: www.kenyon.edu/directories/offices-services/title-ix/sexual-assault-and-harassment/

Accommodations

Students who anticipate they may need accommodations in this course because of the impact of a learning, physical, or psychological disability are encouraged to meet with the Director of Student Accessibility and Support Services privately early in the semester to discuss their concerns. Students must contact Erin Salva, (740-427-5453 or salvae@kenyon.edu), as soon as possible, to verify their eligibility for reasonable academic accommodations. Early contact will help to avoid unnecessary inconvenience and delays.

Students Athletes

Winter sport athletes must meet with me in the first week of classes to discuss any conflicts between the class assignments/requirements and the athletic requirements. *Spring sport athletes* must meet with me in the first week of practice to discuss any conflicts. This will allow us to find the best solution to any conflicts.

Student Activities in the Chemistry Department

The chemistry department sponsors seminars given by outside speakers several times a month, occasional parties, etc. These events will be announced at the beginning of the class. We would love to have you attend any or all of these events.

Student Research

The Chemistry department encourages students with interests in the sciences to consider an independent research experience at some point during your undergraduate education. If you are interested in doing research within the Chemistry department, first check the faculty websites (www.kenyon.edu/academics/departments-programs/chemistry/chemistry/) for an introduction to each person's individual research. If you find one (or more) faculty with interests that pique your curiosity, contact those people to set up an appointment to talk further. Some research groups may be full when you initiate contact, but this status may change semester to semester.

Tentative Schedule

(Exam & Poster dates fixed, however content is subject to change)

Exam, Poster & Seminar Schedule (NO make-ups for UNEXCUSED absences)

Exam 1 – February 12 (Mon – Week 5)
Exam 2 – March 26 (Mon – Week 9)
Exam 3 – April 23 (Mon – Week 13)
Seminar Summary – before May 4th
Poster Session – Friday, May 4th
Final Exam – Thurs, May 10 @ 8:30am)

Papers for discussion (Tentative) find on Moodle site

BPA paper discussion	Jan 19, Friday of Week 1
Napoleon's Buttons book excerpt discussion	TBA
Vancomycin paper discussion	TBA
Green Fluorescent Protein (GFP) paper discussion	TBA

TENTATIVE Topic Schedule

Week 1 –	Intro; Structure Review Chang Ch 9, 10 Intro Ligand Binding and Drug Discovery
Week 2 –	Bonding & Polarity Review Chang Ch 9, 10 Intermolecular Forces Chang Ch 11
Week 3 –	Intermolecular Forces Chang Ch 11
Week 4 –	Polymers: Protein Structure Chang Ch 25
Week 5 –	EXAM 1 Monday, February 12 Isomers Chang Ch 24.2
Week 6 –	Isomers Chang Ch 24.2 Aromatics Chang Ch 24.3
Week 7 –	Thermodynamics, Review & New Chang Ch 6, 18
Spring Break!!!	
Week 8 –	Thermodynamics Chang Ch 18
Week 9 –	EXAM 2 Monday, March 26 Equilibrium, Review & New Chang Ch 14, 15
Week 10 –	Acid/Base Equilibrium Chang Ch 15, 16
Week 11 –	Acid/Base Equilibrium Chang Ch 15, 16 Kinetics Chang 13
Week 12 –	Kinetics Chang 13
Week 13 –	EXAM 3 Monday, April 23 Kinetics Chang 13 Electrochemistry Chang 19
Week 14 –	Electrochemistry Chang 19 POSTER PRESENTATIONS Friday, May 4th

Homework

Graded Homework/Mastery Problems found on ALEKS (www.aleks.com)

Suggested Homework Problems from Chang (Non-graded):

Ch 9

1-10, 15-17, 28-34, 36, 40, 43,-49, 51, 52, 54-57, 63,-66, 74, 78, 80, 81, 85, 100-103, 105-107, 115, 121, 130

Ch 10

2, 3, 7-16, 18-24, 30, 31, 34-38, 40, 43, 44, 63-69, 71, 75, 76, 78-80, 82-86, 88, 90, 99, 100, 102, 110,

Ch 25

1, 3, 4, 7-11, 13-16, 18-21, 23-30

Ch 11

1-22, 24, 25, 27-30, 32, 59-70, 74, 75, 77, 78, 82, 84, 88, 91, 92, 95-97, 100, 102, 108, 112, 113, 135. 137

Ch 24

2, 3, 5, 6, 9, 10, 11-19, 24-32, 43, 50, 51, 53, 56, 61, 66 (also Ch 10 # 61, 62)

Ch 6

1-30, 33-37, 39, 41-65, 73, 74, 80, 81, 86, 89, 91, 98, 99, 118

Ch 18

1, 2, 4-38, 41-44, 49-51, 57, 58, 62, 63, 65-68, 76, 79, 83, 91-94

Ch 14

1-11, 13, 15-32, 37, 39-46, 49-62, 66, 81, 84, 93, 98, 106, 107,

Ch 15

1-94, 96, 103, 104, 107, 108, 122, 128, 130, 136, 138, 141, 145

Ch 16

1-54, 57-76, 122

Ch 13

1-35. 37-57, 59, 60, 62, 65, 67, 68, 73, 76, 82, 86, 96, 98, 107, 109, 110, 112, 114 (Also Ch 14 # 33-37, 113)

Ch 19

1-44