

# Chemistry 124 - Biophysical & Medicinal Chemistry

MWF 11:10-12 noon

Text - Chang's *Chemistry*, 9<sup>th</sup> ed.

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*Office hours*      *M 4-5pm, W 12-2pm, F 12-1pm 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.* 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.

## **Sapling (www.saplinglearning.com - you need to purchase access) –**

- **Graded Homeworks** - due dates as posted
- Access to helpful tutorials (ex. building molecular structures, etc.)

## **Where to get help –**

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

*Math & Science Skills Center (MSSC)* – 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	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 10, March 31, and April 21. The final exam time, May 8 at 6:30pm, 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 at 5am on Friday and are due by 10pm on Sunday. Each quiz may cover pre-requisite chemistry skills or material covered since the last quiz.

## Graded Homework – from [www.saplinglearning.com](http://www.saplinglearning.com) (due dates specified)

Graded homeworks for each chapter (with respective due dates) are found on [saplinglearning.com](http://saplinglearning.com) (subscription needed). For full credit on a homework, you must work to solution on **at least 50%** of the chapter's problems. After 3 unsuccessful attempts you may ask to look at the solution and this will count as part of the 50%.

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

## Poster Presentation – WEDNESDAY, April 29 , 11:10-noon

The culmination of the poster project will be the presentation of your work on WEDNESDAY, April 30<sup>th</sup> , 11:10-noon. 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 constantly looking at similar examples. When finished with a problems 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.)

### **\*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/](http://www.kenyon.edu/directories/offices-services/title-ix/sexual-assault-and-harassment/)

### **Students with Disabilities**

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](mailto: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/](http://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 Schedule (NO make-ups for UNEXCUSED absences)**

Exam 1 – February 9 (Mon – Week 5)  
Exam 2 – March 23 (Mon – Week 9)  
Exam 3 – April 20 (Mon – Week 13)  
Poster Session – Wednesday, April 30<sup>th</sup> 11am – noon  
Final Exam – Tuesday, May 5 @ 1:30pm

### **Papers for discussion (Tentative) find on Moodle site**

BPA paper discussion	Jan 17, Fri 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 –	<b>EXAM 1 Monday, February 9</b> 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
<b>Spring Break!!!</b>	
Week 8 –	Thermodynamics Chang Ch 18
Week 9 –	<b>EXAM 2 Monday, March 23</b> 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 –	<b>EXAM 3 Monday, April 21</b> Kinetics Chang 13 Electrochemistry Chang 19
Week 14 –	<b>POSTER PRESENTATIONS Wednesday, April 30</b> Electrochemistry Chang 19

## Homework

### Graded Homework Problems found on Sapling ([www.saplinglearning.com](http://www.saplinglearning.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