

Chemistry 121 - Introductory Chemistry I !!

MWF 11:10-12noon

Text - Chang's Chemistry, 11th ed.

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Office hours M & W 9:05–11am or email for appointment

Course Description –

This course provides a thorough introduction to the fundamental concepts, theories, and methodologies of chemistry. Topics may include stoichiometry, theories of molecular structure and bonding, the periodic table, acid-base chemistry, chemical equilibria, and thermodynamics. This course provides a basis for further study of chemistry.

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.

Expectations –

From the course – to be amazed, challenged, and learn a lot about chemistry. Students can expect to improve their problem-solving skills, apply and extend their chemical knowledge to other areas of science, and enhance their written and oral communication skills. We will be spending 3-5 class periods on each topic and it is expected that you will have read the associated material before class. In class we will work more challenging problems, analyze demonstrations, and discuss various applications of chemistry.

From the instructor – to treat each person with respect, be enthusiastic and knowledgeable about the subject, arrive to class on time and prepared, return graded and assessed items in a timely manner, reply to emails in a timely manner (within 24-48 hours), and be available outside of class for questions or further discussion.

Of the students – to respect others, be on time (when arriving to class, turning in assignments, etc.), be prepared for class (have read related course material before class, be alert, etc.), and participate during class (participate in small group activities, answer/ask questions, etc.). Outside of class, you are expected to make consistent progress towards completing course objectives on ALEKS.

Evaluation –

Exams (3)	45 %
Final	15 %
Quizzes	10 %
ALEKS	17 %
Homework/Case Studies	10 %
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.

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.)

Quizzes –

There will be 10 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) and handouts

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.

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

Fall 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. *Winter 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 dates fixed, however content is subject to change)

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

Fundamentals Workshop –	Sun. Sept 2, Tom 101 4-6pm (<i>or earlier if no questions!</i>)
Fundamentals Workshop –	Tues Sept 4, Tom 101 7-8:30pm (<i>or earlier if no questions!</i>)
MSSC tutoring –	Tues, Thurs, Sun 7-10pm, Tom 101 (2 nd week to end)
Exam 1 –	September 24 (Mon – Week 4)
Exam 2 –	October 29 (Mon – Week 9)
Exam 3 –	December 3 (Mon – Week 13)
Seminar Summary –	before December 14th
Final Exam –	Monday, December 17 @ 6:30pm

TENTATIVE Topic Schedule

Sept 3-7 –	Atomic Structure, Formulas, Reactions, etc. Ch 2 Mole Concept, Stoichiometry Ch 3
Sept 10-14 –	Theoretical, Percent Yield, Limiting Reactant Ch 3 Ionic Substances in Water & Aqueous Reactions Ch 4
Sept 17-21 –	Molecular & Net Ionic Eqs, Redox Reactions. Ch 4
Sept 24-28 –	EXAM 1 Monday, September 24 EM radiation, Bohr's Atom Model Ch 7
Oct 1-5 –	Quantum Numbers, Electron Configurations Ch 7 Atomic Trends Ch 8
Oct 8-12 –	Valence Electrons, Covalent Bonds, Lewis Structures, Octet Rule & Breakdown Ch 9
Oct 15-19 –	Lewis Structures, Octet Rule & Breakdown Ch 9 VSEPR, Molecular & Electronic Geometry Ch 10
Oct 22-26 –	Sigma & Pi Bonding, Atomic & Molecular Orbitals Ch 10
Oct 29-Nov 2 –	EXAM 2 Monday, October 29 Energy As Heat, 1 st Law of Thermo Ch 6
Nov 5-9 –	State Functions, Enthalpy, Hess' Law Ch 6
Nov 12-16 –	Equilibrium, Equil. Constant, Rxn Coefficient Ch 14
Nov 19-23	<i>Thanksgiving!</i>
Nov 26-30 –	Brønsted-Lowry Acids & Bases, Strength of Acids & Bases pH, Weak Acids & Bases Chang 15
Dec 3-7 –	EXAM 3 Monday, Dec 3 Weak Acids & Bases, Structure & Strength Chang 15
Dec 10-14–	Ideal Gas Law, Non-Ideal Gases Ch 5

Homework

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

Suggested Homework Problems from Chang (Non-graded):

Ch 2

9-18, 27,33,35-38,40,43-47

Ch 3

9-10,12 (calc thickness in inches), 13-17,19,22,23,25,27,29,38, 40, 42-44,46-49, 54, 55, 58, 59, 61, 64, 65, 66, 69, 70 (writing reaction is challenging), 72 73, 74, 77,79-81, 83, 84,86,90, 93,104, 117, 128,

Ch 4

1-8,16-19,22,23,35-37,41,43-45, 47,50,51,57,59-63,65,66,

Ch 7

1,4, 6,7,9,13-16, 18-23,25,29,31-33,48-50,52,54, 56,57,59-60, 62,63,65,66,72,74,75-78,79,84,88, 89 ,91, 96,110, 112,

Ch 8

20,21,28, 30,33-39,43,44,49,52-57,59,61,62,64,

Ch 9

5,31,33-35,39-45,47 (give correct structures for molecules specified),49, 51-56, 57, 63-65, 75,80,81,91, 105, 106

Ch 10

1-5,7-13 (predict electron and molecular geometries, hybridization and angles associated with central atom(s)),15,17,19, 21-24, 46-55,63, 64, 82, 90,100, 103,112

Ch 6

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

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 5

2,3,16, 17,19-23, 27,29-35,38, 43, 45,46,49