

CHEMISTRY 130

General Chemistry: Macroscopic Investigations and Reaction Principles

Fall 2003 Syllabus

Chemistry 130 is a general introduction to the principles of chemistry. Chemistry 130 meets as lectures and discussion sections only. General Chemistry laboratory is a separate course (Chemistry 125) which can be taken concurrently but does not need to be - it can be taken in a later term. Some entering students have had the equivalent of Chem 130 in high school and proceed directly to Chemistry 210. The usual requirement for this is advanced placement (AP) 4 or 5 credit.

In Chemistry 130 you will attend lectures three times per week. The lecture sections are listed below. In addition, you will meet once per week in a discussion class, lead by a graduate student instructor (GSI), who provides individual help with assignments. Weekly quizzes (10-15 minutes) will be given in discussions.

Lecturer	unique name	Office	Section	Time	Room
Robert Sharp	rrsharp	2815 Chem	100 300	10-11 2-3	1800 1800
Jadwiga Sipowska	dotie	3545 Chem	200 400	1-2 10-11	1800 1640
Omar Yaghi	oyaghi	2815 Chem	500	9-10	1210

Required Course Materials

- The textbook is General Chemistry by Ebbing and Gammon, 7th edition (Houghton-Mifflin). You will need to purchase the Course Pack, which includes the textbook, plus the Solutions Manual for end-of-chapter problems and a accompanying CD-ROM, at one of the local bookstores. These include Ulrich's Bookstore (549 E. University), Michigan Book and Supply (317 S. State St.), and Barnes and Noble (basement of the Michigan Union).
- For exams and quizzes, you will need a non-programmable scientific calculator. (Programmable calculators are not allowed on the exams or quizzes. Any TI 80 or above is unacceptable)

Chem 130 Homepage (General Course Information) <http://www.umich.edu/~chem130>. This page contains the link to the Course Tools web page for sections 200 and 400.

Course Tools (<https://coursetools.umm.umich.edu/>). Course-Tools is a web site that contains information, assignments, etc., related to individual courses and sections at the University of Michigan. The CourseTools site for Chem 130 is used by your lecturer to post course-related material of all kinds, including supplemental information, information about tests and quizzes, assignments, lectures, etc. You should check CourseTools often.

The Science Learning Center (SLC). The SLC is located just outside Chem 1800 (the large lecture hall) in the mezzanine of the Atrium of the Chemistry Building. The SLC contains many resources to help you learn chemistry. It is where the GSI's hold office hours and where the Peer-Study groups meet (see below).

Office hours of GSI's. Chemistry 130 GSI's hold scheduled office hours in the SLC, where they can provide one-on-one help to Chem 130 students. You can get help from any Chem 130 GSI at office hours (it does not have to be the GSI who leads your discussion section). The schedule of office hours is posted in the SLC and on the CourseTools web site.

Peer-study groups. You can sign up for peer-study groups, in which small groups of your classmates, lead by an upper-class undergraduate student, discuss the course material. These groups can be extremely effective aids in helping you to master course material. They are organized through the Science Learning Center (<http://www.umich.edu/~slc/>)

Grading Policy

Your grade will be determined by your performance on three hour exams, on the final exam, and on the weekly quizzes. There are 550 points total assigned as follows:

hour exams	(100 pts each)	300 pts
final exam		200 pts
quizzes	(5 pts each)	50 pts
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Total Points		550 pts

Hour exams are scheduled from **8:00 to 10:00 P.M.** on Tuesday evenings (exam rooms will be assigned). The three hour exam dates are

- Tuesday September 30th
- Tuesday October 21st
- Tuesday November 18th

The **final exam** is **Tuesday December 16th** from **8 to 10 A.M.**

12 **Weekly quizzes** (worth 5 points each) will be given in discussion section. The two lowest quiz scores will be dropped.

Some comments about the letter grade.

There is no automatic relation between number of points and the letter grade, and there is no requirement that a fixed percentage of the class obtain a particular grade. As a guide, the following number of points will guarantee you a letter grade as follows (i.e., the grading won't be less generous than this scale):

- 85% of the points (468 points) gives a letter grade of A- or better.
- 70% of the points (385 points) gives a letter grade of B- or better.
- 55% of the points (303 points) gives a letter grade of C- or better.

In case of illness or other emergency -

Sometimes (rarely) students miss tests because of illness or another emergency. If you are ill for an exam or quiz, e-mail your lecturer immediately and ask the Health Service or your M.D. for a note in confirmation. **There are no make-ups for the hour exams.** For the final exam, there is a scheduled alternate exam time which can be taken with the lecturer's permission in cases of exam conflicts or illness.

Any course grade appeal must be made by the student within six months after the end of the term in which the original grade was assigned.

Schedule of topics to be covered in lecture, assigned readings, and end-of-chapter problems

It is recommended that you read each assigned chapter before coming to lecture. The lectures will provide a broader perspective and help you understand difficult material. End-of-chapter homework problems that are representative of questions you will encounter on exams and quizzes are also assigned. Homework problems will not be collected or graded but will be discussed in your Discussion class. It is essential that you keep up with the homework on a weekly basis as you read the textbook chapters. Practice with the homework problems while reading the text is probably the most effective way to study.

Using the Solutions Manual. Note that the Solutions Manual provides solutions for odd-numbered questions, while the assigned problems are even-numbered. If you are having trouble with one of the assigned homework problems, try the odd-numbered questions just before or after it. In most cases, odd- and even-numbered problems next to each other are similar. Use the Solutions Manual for an example of how to do the odd-numbered problem, then try the even-numbered problem again.

Dates	Subjects	Reading	Problems
9/3-9/5	matter classification, measurement, introduction to the Periodic Table physical, chemical changes/properties	1	1: 13, 24, 30, 34, 36, 44, 50, 58, 68, 78, 86, 92, 100, 116, 120, 124, 134, 136, 144
9/8-9/12	structure of atom, nuclide symbols, atomic weights, atomic masses, nomenclature, balancing equations	2	2: 2, 8, 28, 36, 38, 44, 46, 54, 58, 62, 64, 66, 68, 70, 72, 74, 76, 78, 82, 90, 100, 114, 118
9/15-9/19	mass relationships, stoichiometry the mole, empirical and molecular formulas avogadro's number, percentage composition, yields	3	3: 14, 18, 20, 34, 38, 46, 56, 60, 66, 72, 74, 82, 84, 88, 90, 100, 104
9/22-9/26	reactions in aqueous solutions electrolytes, molecular and ionic equations, reaction types, redox reactions, oxidation numbers, molarity, titrations, gravimetric and volumetric analysis	4	4: 18, 20, 24, 26, 30, 34, 36, 40, 44, 50, 54, 56, 58, 62, 68, 72, 78, 84, 90, 106, 128
9/29	Catch up and review		
9/30	EXAM 1 8:00 PM		
10/1-10/3	behavior of gases, ideal gas law, stoichiometry gas mixtures, partial pressures	5:1—5:5	5: 24, 30, 34, 38, 46, 56, 66, 70, 74, 78, 82, 110, 128
10/6-10/10	thermochemistry, enthalpy, standard enthalpies, Hess's law, calorimetry, thermochemical equations	6.1—6.8	6: 26, 32, 34, 38, 42, 46, 48, 52, 54, 58, 62, 64, 68, 72, 76, 88, 96, 118

10/15-10/22	quantum theory, light, waves, photons contributions of Bohr, deBroglie, Einstein, Planck quantum numbers, atomic orbitals	7	7: 22, 26, 30, 36, 40, 44, 50, 54, 58, 60, 66, 70, 74, 76, 80, 86, 90
10/20	Catch up and review		
10/21	EXAM 2 — 8:00 PM		
10/24-10/27	electron configurations, orbital diagrams, periodic properties	8.1—8.6	8: 26, 30, 34, 36, 42, 48, 56, 60, 64, 66, 68, 76, 84, 88
10/29-11/3	ionic versus covalent bonds, lattice energy Lewis structures, resonance, formal charge, Polar bond, non-polar bond, bond order, bond length	9	9: 20, 26, 28, 32, 36, 40, 48, 52, 56, 58, 57, 58, 60, 64, 68, 76, 80, 90, 106
11/5-11/10	molecular geometry, VSEPR, dipole moment, multiple bonding, molecular orbitals	10	10: 20, 22, 24, 26, 30, 34, 40, 46, 52, 54, 56, 58, 62, 66, 68, 70, 76, 80
11/12-11/14	phases, vapor pressure, solids intermolecular forces	11.1—11.3, 11.5, 11.6	11: 22, 28, 30, 36, 40, 46, 50, 54, 56, 60, 62, 90, 118
11/17	Catch up and review		
11/18	EXAM 3 8:00 PM		
11/19-11/24	chemical equilibrium, K_c and K_p , Q_p , Q_c , equilibrium concentrations, LeChatelier's principle	15	15: 18, 20, 24, 26, 28, 34, 36, 42, 46, 50, 52, 58, 64, 66, 68, 74, 80, 86, 94, 106
11/26-12/1	acid base concepts, strengths, pH, pOH, K_w	16	16: 16, 20, 24, 28, 30, 34, 40, 44, 50, 52, 58, 62, 68, 72, 80, 92, 102
12/3-12/8	acid/base equilibria, K_a , K_b , acid/base behavior of salts	17.1—17.5	17: 18, 22, 26, 34, 40, 42, 46, 52, 58, 64, 66
12/10	Catch up and review		
12/16	Final Exam 8-10 AM		

WEB SITES to mark down:

General information about CHM 130 and links to the Course Tools:

<http://www.umich.edu/~chem130/>

General web page for Course Tools:

<https://coursetools.ummu.umich.edu/>

Web page for CHM 130 sections 200 and 400:

<https://coursetools.ummu.umich.edu/2003/fall/chem/130/200.nsf>

Textbook web page:

http://college.hmco.com/chemistry/general/ebbing/general_chem/7e/students/index.html

Tutorial web page:

<http://www.smarthinking.com/houghton.html>