

# **General Chemistry II - CHEM 1200 A**

## **Syllabus for Spring, 2009**

**Lecturer:** Dr. Nick Thomas

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The web site contains a copy of the course syllabus, timetable and sample tests. Test results will also be posted here (click on the CHEM 1200 box and follow link).

**Course Description:** General Chemistry II (3) Pr., CHEM 1100 and CHEM 1101. A detailed study of acid-base theory, kinetics, equilibria, and thermodynamics. Introductions to organic chemistry and nuclear chemistry will be included. Students who also take CHEM 1201 will conduct experiments which illustrate lecture topics.

**Text:** *General Chemistry the Essential Concepts*, 5th ed, Raymond Chang. A laboratory manual, and safety goggles must be obtained by the students who are also enrolled in CHEM 1201.

**Course Objectives:** The course will study the dynamic transformations of matter, looking at the thermodynamics and kinetics of reactions. Acid-base, redox, and nuclear reactions will be studied as well, and the student will be introduced to organic chemistry and coordination chemistry. Problem solving, data evaluation, and analysis are stressed. The student should meet the following basic objectives:

*Work with a variety of concentration units; Have a basic overview of hydrocarbons and functional groups; Understanding acid-base theory; Write and use equilibrium constants; Calculate pH in a variety of solutions; Work with free energy and entropy changes; Identify the geometry of coordination compounds; Balance redox reactions and determine cell potentials; Determine rate laws; Understand activation energies & temp dependence of reactions; Write chemical mechanisms; Balance nuclear reactions; Understand fission and fusion.*

**Attendance:** Students have an obligation to attend all lectures and to be ON TIME. Lectures will begin promptly at 10:50 am (Period 3) on Mondays/Wednesdays in room 319 Goodwyn Hall. Students are required to sign an attendance roll each day for the first few weeks of class. At the conclusion of each *Wednesday* lecture, there will be a discussion of the upcoming lab.

**Note:** *Unless you're on the waiting list for a liver transplant, please switch off cell phone ringers whilst in class as they are very distracting to all.*

**Registration:** All students must officially register for this course. Contact the registrar's office if you have any doubts concerning your registration status.

**Assistance:** Office hours will be posted on the instructor's office door. Additional appointments may be made with the instructor. The Instructional Support Lab (203G) can provide tutoring and practice examinations.

**Special Needs:** Students with disabilities who require special attention should contact the instructor during an office hour in the first week of the semester. *AUM attempts to make reasonable accommodations to meet the special needs of its disabled students.*

**Grading:** There are 5 multiple choice exams during the semester. The course grade is based on the best 4 of these exams. There is also a FINAL comprehensive exam which ***all students MUST take***. The final will cover material from both CHEM 1100 and CHEM 1200. The final exam and four exams taken during the semester will each count 20% towards the course grade. A Scantron is needed for each of the exams (do not bend the Scantrons as they may read incorrectly; write in pencil and do not erase answers). University regulations prohibit grades being given out over the telephone or by email. Letter grades will be assigned as follows:

A = 90-100%; B = 80-89%; C = 65-79%; D = 50-64%; F < 50%

Grades for each exam will be posted on the instructor's web page. On each exam, students must provide a code under which name the grades will be listed. The same code is to be used on all exams. The code may be any letter-single digit number-letter combination (e.g. K3T).

**Make-up exams:** Individual make-up exams will **not** be given. If one exam is missed FOR ANY REASON that exam automatically be dropped. If two exams are missed, a comprehensive make-up exam will be given during the final exam.

**Learning Outcomes:** After completion of this course, students will be able to analyze:

1. Properties of solutions, with respect to solubilities, molarities, and colligative effects
2. Chemical kinetics, including rate laws and mechanism
3. Chemical equilibrium, such as acid/base equilibria
4. Thermodynamic relationships, the 3 laws of thermodynamics and  $\Delta H$ ,  $\Delta G$ , and  $\Delta S$  calculations
5. Oxidation / reduction reactions, including balancing and E calculations

Students will also be able to describe:

1. Coordination compounds, including their nomenclature and magnetic properties
2. Nuclear processes
3. Acid / base properties, such as pH, buffers, and the Bronsted-Lowry definition
4. Organic compounds with respect to their classification and basic nomenclature

**Note:** *Significant home study is essential for any chemistry course. In addition to reading the text, it is recommended that you answer as many questions as you can from the end of each chapter in the text. As a bare minimum, at least tackle the problems highlighted in blue. Several practice tests are available on the website. Each contains 10-15 multiple choice questions typical of those you will encounter on actual exams for this course. Remember, these are just a sample of questions; the actual exams will be longer and contain questions on more course topics.*

