

## CHEM. 20A-3 GENERAL CHEMISTRY: CHEMICAL STRUCTURE Fall 2005

**DESCRIPTION:** This first course in general chemistry is designed for physical science and engineering majors. It includes an introduction to quantum mechanics, atomic and molecular structure, chemical bonding, organic molecules and polymers, transition metal complexes, spectroscopy, and intermolecular forces.

**LECTURES:** MWF @ 12.00 pm in CS 50 Young Hall

**INSTRUCTOR:** Dr. Eric Scerri; Office: 4077C Young Hall; Phone: ext 6-7443,

**TAs:**

**OFFICE HOURS:** Mon & We. 2.30 - 3.30 pm. and on the web through Virtual Office Hours at <http://voh.chem.ucla.edu> under 20A. **The instructor will not answer questions by phone or private e-mail.**

**REQUIRED TEXT:** Chemical Principles, S. Zumdahl, available at the ASUCLA Bookstore. An optional study guide by the authors is also available. In addition there is a course reader containing copies of all transparencies shown in classes. This is from "Course Reader Material", a store at 1137 Westwood Blvd, about one and a half blocks north of Wilshire..

**READING & HOMEWORK:** Read assigned material during the week of the related lectures. Reading and suggested homework problems from the text are listed with the lecture schedule below. It is your responsibility to do (at least) the suggested homework in order to master the material. The more problems you do, the more you will learn, so it is in your best interest to do as many problems as you can (including ones not suggested). Homework solutions will be posted on the course website. Homework is not graded.

**EXAMINATIONS:** Each student must take assigned computer quizzes during the term (see course web pages). Two 50-minute midterm exams are scheduled during the regular lecture time slot. The 3-hour final exam is also scheduled but not necessarily in the usual lecture room (see below for details). No make-up exams will be given. A legitimate reason (e.g., verified serious illness) for missing a midterm must be discussed with the instructor, preferably prior to the exam. NO ONE will be permitted to take the final exam outside the scheduled time, and no one can receive a passing grade for the course without taking the final. An "Incomplete" grade will be given only in the case of serious illness. Drop petitions will only be signed up through the 10th week of classes. Only non-programmable, non-graphing calculators will be allowed during exams. Pagers, cell phones, palm pilots, etc. are not allowed during lectures or exams. Students found in possession of such items during exams or who commit other forms of academic dishonesty will receive a zero on the entire exam and be referred to the Dean of Students.

**GRADING:** Sum of Mastering Chemistry quiz scores = 20%. The midterm on which you do better will count 25% toward the final grade; the midterm on which you do worse will count 20%. The final exam will count 35% toward your final grade. The class is graded on a curve rather than an absolute scale.

**PREREQUISITES:** This course assumes a working knowledge of high school mathematics, chemistry and physics, including: exponentials, logarithms, algebra, simple physics, units, significant figures, molecular weights, stoichiometry, balancing equations, etc. You should also read and do extra problems in Chapters 1-2 and the appendices as needed. Quizzes have self-study components on the web.

<u>Week</u>	<u>Topics</u>	<u>Reading (R) / Problems (HW)</u>
1	Conceptual Basis of Chem. Equations and Reaction Yields	R: 1.1, 1.3, 1.4; 2.5 - 2.8 include all of ch 3, 12.12, 12.6 HW: Ch.2 #'s 27, 29, 33 a-e, 35, 49, Ch 3 #'s 23, 25, 31, 33, 39, 47, 55, 59, 61, 65, 69, 87, 99
2-3	Quantum Mechanics Wave-Particle Duality etc.	R: all ch 12 except p. 531-536 incl HW: Ch 12 #'s 21, 27, 29, 31, 35, 37, 41, 53, 55, 65, 69, 75, 77, 81, 85, 89, 95, 117, 125, 139

**Mid term-Exam I – Wed. 19<sup>th</sup> October - Covers everything up to and including prior lecture.**

4	Hydrogen and many-e atoms Periodic Trends	R: same as for weeks 2-3 HW: same as for weeks 2-3.
5	Classical molecular structure Lewis structures, VSEPR, etc	R: all ch 13 except 13,8. HW: ch 13 #'s 11, 13, 25, 27, 47, 59, 67, 75, 77, 101, 105, 107 a-b.
6	Quantum Mechanics and Molecular Structure MO and VB theories	R: 14.1 - 14.6 inclusive. HW: Ch 14 #'s 11, 19, 21, 25, 31, 35, 37, 41.

**Midterm Exam II - Wed. Nov 16th – Covers everything since first mid term up to prior lecture.**

7	Intro to Spectroscopy	R: 14.7 - 14.11 inclusive. HW: Ch 14 #'s 43, 44, 45, 47, 48.
8	Transition Metal Complexes	R: Ch 20, p. 930 - 934, 20.3 - 20.6, omit nomenclature, 20.8 HW: Ch. 20 #'s 7, 17, 29, 41, 43, 45, 51
9	Organic Molecules & Polymers HW:	R: all ch 22 but omit nomenclature. HW: Ch. 22 #'s 17, 21, 29, 31, 41, 47, 51, 77, 107, 115.
10	Intermolecular Forces	R: Chapter 16.1 - 16.2 HW: Ch. 16 #'s 11, 15, 17, 19, 21.

**Final Exam – date TBA - Comprehensive but 40-50% weighed towards topics since mid term II.**