

Chemistry 110: General Chemistry

Note: this is a representative syllabus for Chemistry 110. It is here for informational purposes. It is not intended to substitute for or replace the syllabus your instructor provides.

Course Description:

Introduction to the general principles of chemistry for students planning a professional career in chemistry, a related science, the health professions, or engineering. Stoichiometry, atomic structure, chemical bonding and geometry, thermochemistry, gases, types of chemical reactions, statistics. Weekly laboratory exercises emphasize quantitative techniques and complement the lecture material. Weekly discussion sessions focus on homework assignments and lecture material.

Prerequisite: Mathematics 055 or equivalent.

Previous high school chemistry not required.

Taught: Annually, 5 semester credits.

Course Components: Lecture, Recitation section, Laboratory

Textbook: Steven S. Zumdahl and Susan A. Zumdahl, Chemistry, 5th Ed., Houghton Mifflin Company (New York, 2000). The text is available in the college bookstore.

Lab Manual: Chemistry Department Faculty, *Chemistry 110 Lab Manual*, Fall, 2001 Edition, Kinkos. These may be purchased from Linda Noble, the Chemistry Secretary.

Safety Goggles: These must be worn at all times in the laboratory. They can be purchased in the college bookstore.

Calculator: Must have logs and exponential capability.

Lab Notebook: This is a bound duplicate notebook with numbered pages. It can be purchased in the college bookstore

Lecture Schedule

1.1-1.5 introduction, laboratory precision and uncertainty, significant figures

1.6-1.9 dimensional analysis, density, classification of matter

2.1-2.6 atomic structure

2.7-2.8 periodic table, nomenclature

3.1-3.4 mass, the mole

3.5-3.7 molecular formulas, balancing equations

3.8-3.9 stoichiometric calculations

4.1-4.3 solutions

4.5-4.8 precipitation reactions, acid-base reactions

4.9-4.10 redox reactions

5.1-5.3 $PV=nRT$

5.4-5.5 applications of $PV=nRT$

5.6-5.9 kinetic theory of gases, real gases

6.1-6.2 energy and calorimetry
6.3-6.4 Hess's Law, heats of formation

Exam I (Chapters 1-5)

Fall Break - no class

6.5-6.6 practical applications
7.1-7.3 waves and particles
7.4-7.6 Bohr model
7.7-7.8 atomic orbitals
7.9-7.11 periodic table
7.12-7.13 periodic trends and group properties
8.1-8.3 chemical bonds
8.4-8.7 ionic vs. covalent compounds
8.8-8.10 covalent bond energies, Lewis structures
8.11-8.12 Lewis structures
8.13 VSEPR model
9.1-9.2 hybridization, molecular orbitals
9.3-9.4 molecular orbital view of bonding
9.5 delocalized bonding
10.1-10.3 intermolecular forces

Exam II (Chapters 6-9)

10.4-10.5 bonding in metals and semiconductors
10.6-10.8 ionic and molecular solids
10.8-10.9 vapor pressure and phase changes
11.1-11.3 solutions
11.4 vapor pressure of solutions
11.5-11.7 colligative properties
11.8 teaching evaluations, colloids
review

Final Exam

Additional Resources

See professor Balko's site

<http://www.lclark.edu/~balko/>