

Effective Date Summer 2005-2006

Course Description

Prerequisite: eligibility for MATH 1021. Fundamentals of chemistry covering the basic topics of general, inorganic, and nuclear chemistry. Students cannot use both this course and CHEM 1201 to meet a degree's requirements.

Course Objectives

Students will:

1. Understand the fundamentals of chemistry as presented in the topical outline.
2. Develop critical thinking and problem solving skills.

Procedures to Evaluate these Objectives

1. In-class problems after concept presentation
2. In-class exams
3. Cumulative final exam

Use of Results of Evaluation to Improve the Course

1. Student responses to in-class problems will be used to immediately help clarify any misunderstandings and to later adjust the appropriate course material.
2. All exams will be graded and examined to determine areas of teaching which could use improvement.
3. All evaluation methods will be used to determine the efficacy of the material presentation.

Detailed Topical Outline

1. The scientific method and matter and properties
 - a. The steps of the scientific method, theories and laws
 - b. The metric system and unit conversion
 - c. Making and interpreting measurements
 - d. Dimensional analysis, significant figures, and scientific notation
 - e. Matter and properties, classification of matter
2. Atomic structure and the periodic table
 - a. The atom
 - b. The periodic table
 - c. Chemical reactivity
3. Chemical bonding
 - a. Ionic bonding and covalent bonding
 - b. Lewis dot structure
 - c. Elements, molecules and compounds
 - d. Forming and naming compounds

4. Chemical reactions
 - a. The mole
 - b. Balancing equations and stoichiometry
 - c. Types of chemical reactions
5. States of matter: gases, liquids, and solids
 - a. Gas behavior
 - b. The combined gas law
 - c. The ideal gas law
 - d. Chemistry of liquids and solids
6. Solution chemistry
 - a. Properties of solutions
 - b. Concentrations of solutions
7. Equilibrium
 - a. Exothermic and endothermic reactions
 - b. Chemical equilibrium
8. Acids and bases and oxidation-reduction
 - a. Definition of an acid and base, pH scale
 - b. Oxidation-reduction processes
9. Nuclear chemistry
 - a. Types of particles
 - b. Nuclear decay