

COURSE PROFICIENCY OUTLINE CHEMISTRY – 372

College Prep

5 Credits

Purpose

Chemistry - 372 is offered to juniors and seniors following the completion of a high school biology course. Adequate mathematical problem-solving skills and algebra skills are expected. Previously learned science skills and concepts will be utilized. The outcomes of the course will include the development of the students' knowledge of chemical principles, fundamental problem-solving skills, and an understanding of the applications of chemistry to basic natural phenomena.

- I. Student Outcomes 5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 5.10
 - A. Students will demonstrate an understanding of the terminology, facts, concepts and applications of chemistry.
 - B. Students will demonstrate the ability to utilize chemistry learning in fundamental chemical-mathematics problem-solving situations.
 - C. Students will demonstrate an understanding of chemistry and technology as related to daily life and the interrelationships of humankind, resources, energy and the environment.
 - D. Students will utilize competencies in science critical thinking skills, reading, writing, listening and organizing skills, academic chemistry problem-solving skills, and laboratory manipulative and investigative skills in everyday classroom situations.

- II. Content 5.1, 5.2, 5.3, 5.4, 5.6, 5.7, 5.10
 - A. Nature of Chemistry
 1. Chemistry as a Human Endeavor
 2. Energy and Matter
 - B. The Structure of Matter
 1. Atomic Structure
 2. Electron Configurations
 3. The Periodic Table
 4. Groups of Elements
 - C. Interactions of Matter
 1. Chemical Formulas and Bonding
 2. Molecular Shape
 3. Chemical Reactions and Equations
 - D. Stoichiometry
 1. The Mole
 2. The Mathematics of Chemical Equations
 3. Heat in Chemical Reactions
 - E. States of Matter
 1. Gases
 2. Liquids and Solids

- F. Chemical Equilibrium
 - 1. Solutions
 - 2. Chemical Equations
 - 3. Solvability and Precipitation
- G. Acids and Bases
 - 1. Acids, Bases, Salts
 - 2. Reactions of Acids and Bases
- H. Redox Chemistry
 - 1. Oxidation and Reduction
 - 2. Electrochemistry
- I. Kinetics and Thermodynamics
 - 1. Rates of Reaction
 - 2. Thermodynamics

III. Activities and Materials

- A. Text - LeMay, Beall, Robblee, Brower - Chemistry: Connections to Our Changing World
- B. Classwork
 - 1. Lectures, note-taking, discussions, demonstrations, problem-solving development, formula and equation writing, audio-visual materials and regular tests and quizzes will be utilized.
 - 2. College preparatory skills such as reading, writing, listening and note-taking, problem-solving, information processing, reporting and interpretation, and science-learning skills will be utilized.
- C. Laboratory activities - developing an attitude toward safety
 - 1. Use of chemistry laboratory apparatus such as balances, volumetric apparatus, glassware set-ups and computer assisted experiments.
 - 2. Studies developing fundamental quantitative relationships in chemistry, problem-solving skills, and quantitative and qualitative concepts
 - 3. Studies developing scientific skills and science critical thinking skills
 - 4. Studies of scientific principles and their applications related to the course content
- D. Assignments - to be checked and reviewed by the teacher and students utilizing college preparatory reading, writing, chemical shorthand, organizational and process thinking skills and problem-solving techniques and skills.
 - 1. Readings - text and other sources, outlining and the organization of information
 - 2. Written answers to questions
 - 3. Formula writing, equation writing and problem-solving practice
 - 4. Laboratory and other reports utilizing various techniques and methods
 - 5. Science study-learning assignments

IV. Evaluation

- A. Students will be expected to complete classwork and homework learning assignments, laboratory work and reports, and to make up work missed whenever it is practical to do so.
- B. Students will be expected to demonstrate an acceptable level of proficiency in all of the goals and objectives of the course within the previously defined content and process areas.
- C. The evaluation of student proficiencies shall consist of tests and quizzes, written assignments and reports, lab reports, and the teacher's regular observations of the student's proficiencies, involvement and learnings in classroom environment.
- D. Students will take a comprehensive final examination. This exam will count as 20% of the final grade.
- E. The final grade represents the teacher's professional judgment of the student's performance and all of the aforementioned activities and/or requirements are included in the evaluative process.