

**J. Sargeant Reynolds Community College  
Course Content Summary**

**Course Prefix and Number:** CHM 111

**Credits:** 4

**Course Title:** College Chemistry I

**Course Description:** Explores the fundamental laws, theories, and mathematical concepts of chemistry. Designed primarily for science and engineering majors. Requires a strong background in mathematics. Part I of II. Prerequisite or Co-requisite: MTH 163 or higher. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**General Course Purpose:** Designed primarily for science and engineering majors.

**Course Prerequisites and Co-requisites:**

**Prerequisite or Co-requisite:** MTH 163 or higher

**Course Objectives:**

Upon completing the course, the student will be able to

- a. Use stoichiometric concepts to solve problems and recognize differences in composition of compounds and chemical reactions;
- b. Understand the current descriptions of atomic and molecular structure and periodicity, and use that understanding to solve problems involving (1) electron configuration, (2) molecular composition and geometry, and (3) molecular and atomic properties;
- c. Demonstrate an understanding through problem-solving and laboratory work of (1) rates and rate laws of chemical reactions, and (2) homogeneous and heterogeneous equilibria in chemical systems; and
- d. Balance oxidation/reduction equations.

**Major Topics to Be Included:**

- a. Introduction and basic concepts
- b. Atoms, molecules, and ions
- c. Stoichiometry
- d. Thermochemistry
- e. Introduction to chemical bonding
- f. Properties of liquids and solids, gases and phase changes
- g. Solutions--properties and measures of concentration
- h. Chemical equilibrium (general)

**Effective Date of Course Content Summary:** February 16, 2009