

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

**Course Prefix and Number:** CHM 112

**Credits:** 4

**Course Title:** General Chemistry II

**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 II of II. Prerequisite: MTH 161 or higher and CHM 111 with a grade of C or better. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

**General Course Purpose:** Designed primarily for science and engineering majors. This is a prerequisite course for those students who must take Organic Chemistry CHM 241/242 or the equivalent. It is the recommended chemistry course for pre-medicine, pre-dental, pre-pharmacy, and pre-veterinary students.

**Course Prerequisites and Co-requisites:**

**Prerequisites:** MTH 161 or higher and CHM 111 with a grade of C or better

**Student Learning Outcomes:**

Upon completing the course, the student will be able to

- a. Apply the basic concepts of chemistry to explain the interaction of the different forms of matter;
- b. Demonstrate ability to weigh evidence and decide if generalizations or conclusions based on the obtained data are warranted;
- c. Demonstrate the ability to interpret and use mathematical formulas; and
- d. Explain clearly and concisely the methods and reasoning used to accomplish the above objectives.

**Major Topics to Be Included:**

- a. Intermolecular forces
- b. Liquids and solids
- c. Solutions and colligative properties
- d. Rates of reactions
- e. Chemical equilibrium
- f. Acids/bases equilibrium
- g. Precipitation equilibrium and solubility
- h. Complex ions
- i. Thermodynamics: Gibbs free energy, second and third law of thermodynamics
- j. Electrochemistry
- k. Safety/laboratory notebook/lab reports for each lab
- l. Fundamental of Research/Report Writing
- m. Laboratory techniques: such as
  - o Calorimetry
  - o IR Spectroscopy
  - o UV Spectrometry
  - o Chromatography
  - o Physical Properties of an Unknown
  - o Acid/Base Titration

**Date Created/Updated (Month, Day, and Year):** January 4, 2019