

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

Course Prefix and Number: CHM 111

Credits: 4

Course Title: General 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 161 or higher 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:

Prerequisite or Co-requisite: MTH 161 or higher 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. Matter and measurement/significant figures
- b. Physical properties: density, boiling point/melting point
- c. Atoms, molecules and ions, and ionic bonding
- d. Covalent bonding
- e. Lewis structures/Valence shell electron pair repulsion model(VSEPR) and molecular models
- f. Polarity/Orbital hybridization
- g. Mass relationships, % Composition/Empirical formula and stoichiometry
- h. Reactions in aqueous solutions and solubility
- i. Gas relationships and gas laws
- j. Electronic structure and the periodic table
- k. Thermochemistry
- l. Safety/Lab notebook/Report writing
- m. Chemical nomenclature
- n. Laboratory techniques

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