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