

Minnesota State College Southeast

CHEM 1010: Fundamentals of Chemistry

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: None

The purpose of this course is to introduce basic chemical principles and theories for students intending to take the General, Organic and Biochemistry or other General chemistry courses. It is intended for students with no recent background in chemistry. It covers measurements in chemistry; the concepts of matter and energy; elements, mixtures and compounds; chemical formulas; atomic theory and structure; the formation and nomenclature of compounds; chemical bonds; basic chemical reactions; and chemical quantities. (Prerequisite: None) (3 Credits: 2 lecture/1 lab)

B. COURSE EFFECTIVE DATES: 01/14/2019 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Matter, energy and atomic structure
2. Chemical formulas and nomenclature
3. Chemical bonding and molecular structure
4. Chemical reactions and stoichiometry
5. Measurements and proper lab technique

D. LEARNING OUTCOMES (General)

1. Use different measurement systems and convert between them while using significant figures as they relate to accuracy and precision of measurements
2. Understand the difference between elements, compounds and mixtures as well as the differences between physical and chemical properties
3. Understand energy as it relates to potential and kinetic energy, the formation and breaking of chemical bonds and exothermic and endothermic reactions
4. Use accepted notation for representing chemical formulas for molecules
5. Describe the subatomic particles in atoms and how they relate to atomic theory
6. Use the periodic table to obtain information about the subatomic particles of an atom and relate this information to the electron configuration of atoms and ions
7. Understand the octet rule and use it to predict ionic compounds formulas
8. Demonstrate the ability to differentiate between covalent and ionic bond formation, and the macroscopic and microscopic consequences of these types of bonds as well as name both types of compound
9. Use Lewis structures together with the octet rule to represent covalent molecules and then predict the shape and polarity
10. Able to balance chemical reactions, identify products and reactants, and predict products of common chemical reactions
11. Identify and classify simple chemical reactions, including acid base reactions
12. Able to solve problems involving the concept of the mole
13. Determine the molar mass of different elements and compounds
14. Understand the basic laws regarding the effect of temperature, volume and pressure of gas molecules and how these relate to motion of gas particles
15. Be able to use the scientific method to observe and document experimental results while safely handling laboratory glassware and chemicals

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted