Course Outline for: CHEM 1061 Principles of Chemistry 1

A. Course Description:

1. Number of credits: 5
2. Lecture hours per week: 4
3. Lab hours per week: 3
4. Prerequisites: CHEM 1020: OR
   CHEM self-assessment eligibility; AND
   MATH 0700 (C- or better, valid for 5 years); OR
   Placement Level of MATH 1020/1055/1080/1100; OR
   Algebra College Level:
   High School GPA of 2.80+ and passed Algebra II or a higher-level math course; OR
   ACT Math Sub-Score of 22+ OR
   ACT Math Sub-Score of 20+ and High School GPA of 2.70+ OR
   SAT Math Composite score of 530+ OR
   SAT Math Composite score of 520-529 and High School GPA of 2.70+ OR
   Accuplacer Advance Algebra score of 250+ OR
   Accuplacer Advance Algebra score of 236-249 and High School GPA of 2.70+ OR
   MCA Algebra score of 1158+ OR
   MCA Algebra score of 1152-1157 and High School GPA of 2.70+)
5. Corequisites: None
6. MnTC Goals: Goal 3 Natural Sciences

Concepts in Chemistry that will be explored include: atomic theory, stoichiometry, thermochemistry, chemical bonding, molecular structure, properties and behavior of the physical states, reaction types.

B. Date last reviewed/updated: May 2024

C. Outline of Major Content Areas:

1. Quantitative Skills and Problem Solving.
2. The Scientific Method.
3. Nomenclature.
4. Atomic Structure.
5. Stoichiometry.
6. Reaction Types.
7. Thermochemistry.
8. Molecular Structure: Bonding, Geometry, and Polarity.
9. States of Matter.
10. Optional: Basics of Organic Chemistry.

D. Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. Interpret structures, chemical changes, and physical changes using concepts of matter and energy at the atomic and molecular level. (Goal 3a)
2. Employ standardized names and symbols to represent atoms, molecules, compounds, mixtures, ions and chemical reactions. (Goal 3c)
3. Solve quantitative problems involving measurements, matter and energy in mixtures, physical processes, and chemical reactions. (Goal 3a, 3b)
4. Collect, interpret, and communicate laboratory information following safety guidelines. (Goal 2a, 3b, 3c)
5. Predict chemical bonding and molecular shape based on accepted models. (Goal 3a)

E. Methods for Assessing Student Learning:

Methods for assessment may include, but are not limited to, the following:

1. Exams
1. Quizzes, homework, and/or a lab practical exam
2. Laboratory experiments (12 lab sessions) which will include the following general topics:
    a. Lab safety
    b. Density
    c. Calorimetry
    d. Molecular geometry
    e. Observations of chemical reactions
3. Comprehensive Final Exam

F. Special Information:

None