COMMON COURSE OUTLINE: CHEM 1062: Principles of Chemistry 2

A. Catalog Description

a. 5 credits
b. Hours/Week: 4
c. Lab Hours/Week: 3
d. Prerequisites: CHEM 1061 (C or higher)
e. Co-Requisites: None
f. MnTC Goals (if any): Goal 3 – Natural Sciences,

Continuation of Chemistry 1061: physical properties of solutions, chemical equilibrium, kinetics, reaction mechanisms, acid-base chemistry, thermodynamics, electrochemistry, qualitative analysis, nuclear chemistry, chemistry in the atmosphere.

B. Date Last Reviewed: Spring 2018

C. Outline for major content areas

a. Properties of aqueous solutions
b. Chemical kinetics and mechanisms
c. Chemical equilibrium
d. Acids and Bases: Theory, equilibria, and buffer solutions
e. Solubility equilibrium
f. Thermodynamics
g. Electrochemistry
i. Nuclear Chemistry
j. Chemistry in the atmoshere

Transition metal chemistry and complex ions (optional)

D. Course Learning Outcomes

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

a. Discuss the principles and concepts of chemistry. (Goal 3)
b. Describe the structure of substances and its relationship to physical properties. (Goal 3)
c. Explain how the atomic and molecular structure of matter relates to its chemical reactivity (Goal 3)
d. Solve quantitative problems involving physical processes and substances in chemical reactions. (Goal 3)
e. Perform required lab techniques correctly using appropriate safety procedures. (Goal 3)
f. Communicate lab results and analysis. (Goal 3)
g. Interpret the role of energy in physical and chemical processes. (Goal 3)
h. Relate chemistry to the environment and everyday life. (Goal 3)

E. Methods for Assessing Student Learning:

a. Minimum of four one-hour exams
b. Methods of evaluation may include – quizzes and homework
c. Laboratory experiments (12 lab sessions)
    i. MSDS and classification of chemicals
    ii. Determination of molar mass by freezing point depression
    iii. Rates of chemical reactions
    iv. Determination of equilibrium constant
    v. Synthesis of coordination compounds
    vi. Acid-base titration
    vii. pH measurements
    viii. Buffers
    ix. Hardness of water –part I
    x. Hardness of water—part II
    xi. Qualitative analysis—cations
    xii. Electrochemistry
d. Lab Practical Exam
e. Comprehensive final exam

Statement of Departmental Policy:
The use of graphing calculators will not be allowed during quizzes or exams.

F. Special information

a. Requirements
    i. Reading assignments, questions and problems from the textbook: *Chemistry, 12th Edition)*, by Raymond Chang.
    ii. Completion of all laboratory experiments with the following exception:
        1. One lab may be missed. This will result in the reduction of one full letter grade for the course.

b. Grades
    i. A – 90%
    ii. B – 80%
    iii. C – 70%
    iv. D – 55%