Montgomery County Community College
CHE 121
General Chemistry - Inorganic
4-3-3

COURSE DESCRIPTION:
The course is designed to acquaint liberal arts majors with certain fundamental facts, principles, and techniques of chemistry with a view toward their ap

SEQUENCE OF TOPICS:

A) Lecture

1. Introduction to Chemistry and the scientific method
    a) General classifications of matter
    b) Properties of matter
    c) Changes of matter
    d) Elements and compounds
    e) Solutions and suspensions
    f) Examples of elements, compounds, and mixtures in science and society
2. Chemical calculations and measurement systems
    a) SI and metric measurement systems
    b) Scientific notation and significant figures
    c) Factor-label method conversions
    d) Temperature, density, specific gravity, and specific heat calculations
3. Introduction to atomic structure
    a) Historical overview of the atomic model
    b) Subatomic particles
    c) Atomic number, mass number, atomic mass, and isotopes
    d) Modern atomic theory
    e) The periodic table and the atomic model
    f) Electronic structure of atoms
4. Bonding-Ionic compounds
    a) Electronic structure and the formation of ions
    b) Common ions
    c) Transition metal ions and polyatomic ions
    d) Nomenclature and formulas for ionic compounds
    e) Properties of ionic compounds
    f) Occurrence of ions in consumer products and nature
    g) Introduction to acids and bases
5. Bonding-Covalent compounds
    a) Lewis dot representation
    b) Drawing simple Lewis structures
    c) Introduction to simple organic compounds and isomers
    d) Coordinate bonding
    e) Resonance
    f) Polyatomic species
    g) Bond polarity, molecular geometry, and molecular polarity
    h) Nomenclature and formulas for covalent compounds
    i) Properties of covalent compounds
6. Chemical Reactions and stoichiometry
    a) Writing and balancing chemical equations
    b) Classes of chemical reactions
    c) The mole concept
    d) Stoichiometry

7. Kinetics, Equilibrium, and Thermodynamics
    a) Introduction to thermodynamic functions
        1) Enthalpy
        2) Entropy
        3) Gibb's Free Energy
    b) Introduction to reaction rates
    c) Introduction to equilibrium states
    c)
8. States of matter
    a) General properties of the states of matter and changes of state
    b)

B) Laboratory Activities

A minimum of eight laboratory experiments are to be conducted during the semester. The list of experiments (or a reasonable substitute) is indicated below. Additional laboratory activities are strongly recommended. Laboratory experiments can also be obtained from the Vernier computer technology equipment available in room SC 312.

1) Laboratory Techniques
2) Measurements
3) Preparation and Properties of Oxygen
4) Lewis Structures and Molecular Models
5) Identification of Selected Anions
6) Quantitative Preparation of Potassium Chloride
7) Double Displacement Reactions
8) Single Displacement Reactions
9) Chemical Equilibrium
10) Gas Laws
11) Water in Hydrates
12) Properties of Solutions
13) Neutralization
14) Composition of Potassium Chlorate

LEARNING MATERIALS:

Textbook:

McMurry, Ballantine, Hoeger and Peterson. (2013). *Fundamentals of General, Organic, and Biological Chemistry* (7th ed.). Prentice Hall (Pearson Education, Inc.).

Laboratory Manual:

Hein, Peisen and Ritchey. (2009). *Introduction to General, Organic, and Biochemistry in the Laboratory* (9th ed.). John Wiley & Sons, Inc.

Learning Resources Centers (Central-College Hall, West-South Hall)

The Brendlinger Library/AV Library (Central)
Library (West)
Tutoring Services (Central, West)

Computer-Based Laboratory (Central-Room SC 312)

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by: Raymond J. Leary, Professor of Chemistry Date: 10/23/2004
Revised by: Dr. Janet A. Graurof0 612 792 r