



### Chemistry II

2013-2014

#### Course Description:

Chemistry II is an extension of Chemistry I or Honors Chemistry. It should be considered only by students who are seriously planning to pursue a science-oriented program in college. Topics covered include the kinetic theory of gases, acid-base theory, chemical equilibrium, oxidation-reduction reactions, electrochemistry, and the basic nomenclature of organic chemistry. These topics will be covered through classroom lecture/discussion as well as laboratory investigations. Particular emphasis is placed on the problem solving aspects of chemistry necessary for success in college chemistry courses. Student evaluation will be based on tests, quizzes and laboratory reports.

#### Course Content:

- I. Fundamental Concepts
  - Atomic structure
  - Chemical reactions
    1. balancing
    2. mass-mass calculations
    3. limiting reagents and percent yield
- II. Gases
  - Kinetic-Molecular theory
  - Gas laws
- III. Kinetics
  - Solution concentration
  - Reaction rate
    1. rate expressions and constants
    2. orders of reaction
- IV. Chemical Equilibria
  - Dynamic equilibria
  - Law of Mass Action
  - Equilibrium constants
    1. converting constants
    2. basic equilibrium calculations
  - Le Châtelier's Principle and calculations
- V. Acids and Bases
  - Acid-base theories
    1. Arrhenius
    2. Brønsted-Lowry
    3. Lewis
  - Brønsted-Lowry concepts

1. conjugate acid-bases pairs
  2. strong and weak acids and bases
  3. water equilibrium
  4. pH
- Strong acid and base calculations
  - Weak acid and base calculations
  - Acid-base titrations
  - Buffers
- VI. Precipitation Equilibria
- Slightly soluble salts
  - Solubility product constants
- VII. Electrochemistry
- Oxidation and reduction
  - Oxidation numbers
  - Balancing redox reactions
    1. acidic solution
    2. basic solution
  - Electrochemical cells
    1. voltaic cells
    2. electrolytic cells
    3. cell notation
    4. electrode potentials
    5. electrolysis
- VIII. Organic Chemistry
- Alkanes
    1. bonding
    2. nomenclature
    3. cycloalkanes
  - Alkenes
    1. bonding
    2. nomenclature
    3. geometric isomers
    4. cycloalkenes
  - Alkynes
    1. bonding
    2. nomenclature
  - Aromatic hydrocarbons
    1. bonding
    2. nomenclature
  - Substituted hydrocarbons
    1. halides
    2. alcohols
    3. ethers
    4. acids
    5. aldehydes
    6. ketones
    7. esters
    8. amines
    9. amides

The textbook for this course is a well reviewed and long-standing text used for both AP Chemistry classes and freshman college classes.

*Chemistry: Principles and Reactions* by Masterton, Hurley & Neth. Brooks/Cole, Cengage Learning, ©1993.

Course Requirements:

Each student is required to complete all test, labs, and assignments. Failure to do so will affect student's overall grade.

A scientific calculator is required for this course.

Grade Components/Assessments:

Grades will be based on a point system that will be converted into overall percentages. The following methods will be used to assess and evaluate student performance.

Assessments: 60 – 70% for the year

Laboratory: 25 – 35% for the year

Assignments: 5 – 15% for the year

Each marking period is worth 20% of a student's overall grade. The midterm and final exam are each worth 10% of a student's overall average:

Quarter 1	20%
Quarter 2	20%
<b>Midterm</b>	<b>10%</b>
Quarter 3	20%
Quarter 4	20%
<b>Final</b>	<b>10%</b>

Required Summer Reading/Assignments:

There are no summer reading or other assignments for this course.