

CIP Code: 40.0501

METROPOLITAN STATE COLLEGE OF DENVER
Office of Academic Affairs

REGULAR COURSE SYLLABUS

SCHOOL: Letters, Arts & Sciences

DEPARTMENT: Chemistry

SEMESTER(S) OFFERED: Fall, Spring, & Summer

PREFIX & COURSE NUMBER: CHE 1810

COURSE TITLE: General Chemistry II

CREDIT HOURS: 4 (4 + 0)

CONTACT HOURS: Lecture 60 Lab 0 Internship 0 Practicum 0

RESTRICTIONS (VARIABLE TOPICS COURSES): None

PREREQUISITE(S): CHE 1800 and minimum performance standard scores on reading, writing, and mathematics preassessment placement tests. Completion of CHE 1810 and CHE 1850 with a passing grade is required to receive general studies credit.

COREQUISITE(S): None

CATALOG COURSE DESCRIPTION:

A continuation of CHE 1800. This course provides a comprehensive study of the facts, concepts, and laws of chemistry. The course is designed to meet the requirements of students majoring in Chemistry, Medicine, Medical Technology, Biology, Physics, and other fields requiring a strong background in Chemistry. (General Studies Course - Level II, Natural Science)

APPROVED:

Department Chair

Dean

V.P., Academic Affairs

Edward Lind
James Conkle
Frieda Kosta Halley

DATE:

2/19/00

2/10/00

2/27/00

DISTRIBUTION: Original to Vice President for Academic Affairs
Copies retained by Dean and Department Chair

Revised 9/94: Academic Affairs-Curriculum-Regular Course Syllabus
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REQUIRED READING MATERIALS (Title, Author, Publisher, Copyright Date):

General Chemistry – An Integrated Approach, Hill & Petrucci, Prentice Hall, 2nd Edition, 1999.

SPECIFIC (MEASURABLE) STUDENT BEHAVIORAL LEARNING OBJECTIVES:

Upon completion of this course the student should be able to:

1. Discuss energy changes associated with chemical reactions in terms of 1st, 2nd and 3rd laws of thermodynamics.
2. Derive rate law equations from pertinent kinetic data.
3. Propose plausible mechanisms for balanced chemical equations based on rate law data.
4. Describe in a qualitative fashion the factors that affect chemical equilibrium.
5. Solve equilibrium problems based on K_p and K_c mass law expressions.
6. Define acidity/basicity in terms of Arrhenius, Bronsted-Lowry, and Lewis concepts.
7. Discuss factors that affect the strength of acids/bases.
8. Solve equilibrium problems that pertain to weak acids/bases, hydrolysis, buffers, titrations, solubility product, and dissociation of complex ions.
9. Define oxidation and reduction and balance redox reactions.
10. Use Faraday's laws to solve problems that pertain to electrolytic cells.
11. Use the Nernst equation to solve problems pertaining to voltaic cells.

OUTLINE OF COURSE CONTENT (Major Topics and Subtopics):

- I. Thermodynamics
 - a. first law of thermodynamics
 - b. second law of thermodynamics
 - c. third law of thermodynamics
- II. Kinetics
 - a. factors that affect reaction rate
 - b. rate law
 - c. mechanism
- III. Equilibrium
 - a. K_p and K_c mass law expressions
 - b. LeChatelier's Principle
 - c. quantitative mass law problems
- IV. Acid/Base chemistry and ionic equilibrium
 - a. concepts of acidity/basicity
 - b. relative strengths of acids/bases
 - c. ionic equilibrium

- V. Oxidation-reduction reactions and electrochemistry
 - a. oxidation, reduction, and oxidation state numbers
 - b. balancing redox reactions
 - c. electrolytic cells
 - d. voltaic cells

EVALUATION OF STUDENT PERFORMANCE:

Student performance will be evaluated on the basis of results from topic examinations and/or quizzes and a comprehensive American Chemical Society final examination.