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 1800

COURSE TITLE: General Chemistry I

CREDIT HOURS: 4 (4 + 0)

CONTACT HOURS: Lecture 60 Lab 0 Internship 0 Practicum 0

RESTRICTIONS (VARIABLE TOPICS COURSES): None

PREREQUISITE(S): Minimum performance standard scores on reading, writing, and mathematics preassessment placement tests and high school chemistry, and either three years of high school mathematics or college algebra.

COREQUISITE(S): None

CATALOG COURSE DESCRIPTION:

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:		**DATE:**
Department Chair	Gerhard Lind	2/9/2000
Dean	James M. Crowley	2/10/00
V.P., Academic Affairs	Frieda Kostin Kelly	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 the significance of a chemical formula and derive empirical formulas utilizing the mole concept from elemental weight % and/or combustion analysis data.
2. Balance chemical equations and relate quantities of reactants consumed to products obtained.
3. Balance nuclear equations and discuss various types of radioactive decay processes.
4. Predict the behavior of elements in chemical reactions based on a knowledge of the elements.
5. Relate the organization of the Periodic table to the electron configuration of the elements.
6. Differentiate between and discuss the nature of ionic and covalent bonding.
7. Relate the concepts of covalent bonding, hybridization, molecular geometry, molecular shape, polarity, and resonance.
8. Relate various physical properties of compounds to the nature of their intermolecular attractive forces.
9. Describe the parameters that affect gas behavior.
10. Describe in qualitative and quantitative terms how concentration affects the behavior of solutions.

OUTLINE OF COURSE CONTENT (Major Topics and Subtopics):

I. Atoms, Molecules and Moles
   a. mole concept
   b. formula derivation
II. Gas Behavior
   a. Avogadro's law
   b. Boyle's law
   c. Charles' law
   d. Ideal gas law and van der Waals equation
   e. Dalton's law of partial pressures
   f. Graham's law
III. Chemical and Nuclear Equations
   a. balance chemical equations by inspection
   b. mass-mass, mass-volume, and volume-volume problems
   c. limiting reagent and percent yield problems
   d. balance nuclear equations

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IV. Atomic structure and trends in the periodic tale
   a. atomic orbitals and quantum mechanics
   b. Aufbau principle, Hund's Rule, Pauli exclusion principle
   c. organization of the periodic table
   d. trends in atomic/ionic size, ionization energy, electron affinity
V. Intramolecular and Intermolecular Attractive Forces
   a. ionic bonding and the nomenclature of ionic compounds
   b. covalent bonding, hybridization, VSEPR theory, molecular geometry, and shape
   c. intermolecular attractive forces
VI. Concentration Units & Colligative Properties
   a. molarity, molality, mole fraction, mass-mass %, mass-vol %
   b. colligative properties of solutions

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.