

HAROLD WASHINGTON COLLEGE
MASTER SYLLABUS – COLLEGE CREDIT COURSE

1. TITLE, NUMBER, AND CLASSIFICATION:

Name of Course General Chemistry I
Department Name Physical Science
Number Code 073
Course Number: 0201

2. COURSE TERM: 16 Week Semester

3. CREDIT AND CONTACT HOURS:

(i) credit hours 5 (ii) contact hours per week 8 (iii) types of activities
 Lecture/Discussion
 Lab
 Clinical/Work Experience
 Other

4. PREREQUISITES - if none check here ; otherwise describe below:

1. Eligibility for English 101;
2. Eligibility for Mathematics 140 or above; and
3. Grade of C or better in Chemistry 121 **or** one year of high school chemistry.

OR

4. Consent of Department Chairperson.

5. CATALOG DESCRIPTION - write below, as in current college catalog

Topics include the periodic table of the elements, atomic structure, basic concepts of quantum theory, bonding, stoichiometry of compounds and reactions, thermochemistry, the gaseous state, basic concepts of the liquid and solid states, solutions, acids and bases. Writing assignments, as appropriate to the discipline, are part of the course. 4 lecture and 4 lab hours per week

6. STUDENTS FOR WHOM THE COURSE IS INTENDED

This is a required course for students majoring in chemistry, other sciences, engineering, pre-medical, pre-dental or BS-RN. It will also satisfy the Physical Science laboratory component of the Natural Science requirements for General Education.

7. COURSE OBJECTIVES

- Students should be able to exhibit knowledge concerning the qualitative and quantitative description of matter and its changes.
 - Description and application of the scientific method
 - Appropriate calculations including the concept of precision, units in metric measurements and dimensional analysis
 - Description of atomic structure including quantum effects
 - Determination of chemical formulas, empirical formulas, names, and molar mass of compounds
 - Description of various types of chemical reactions
 - Use of balanced chemical equations in stoichiometric reactions with emphasis on limiting reagents, species in solution, and gases
 - Description of the periodic table and its use in predicting the physical and chemical properties of elements and compounds
 - Description and prediction of common models of bonding
 - Determination of the physical properties gases using the ideal gas equation
 - Description and prediction of the behaviors of gases, liquids, and solids based on ideas from the Kinetic Molecular Theory and intermolecular forces
 - Description of acids, bases, and the pH scale

Topics are addressed in both lecture and laboratory

8. STUDENT LEARNING OUTCOMES

- Correctly describe the structure of the atom.
 - Name the three subatomic particles
 - Describe the location of protons, neutrons, and electrons within the atom
 - Relate atomic structure to the periodic table
- Correctly use the periodic table to understand chemical systems.
 - Relate the periodic table to atomic structure
 - Predict periodic trends in physical properties
 - Predict periodic trends in chemical properties
- Correctly use stoichiometric relationships to understand chemical systems.
 - Balance chemical reactions
 - Calculate molar mass
 - Predict limiting reactant
 - Perform calculations related to chemical systems including those involving gases
- Correctly describe the three major states of matter
 - Describe the atomic differences of solids, liquids, and gases
 - Apply the Kinetic Molecular Theory to predicting the behavior of solids, liquids, and gases

9. TOPICAL COURSE OUTLINE

1. Introduction, Measurement and Scientific Method
2. Atoms, Molecules and Ions
3. Formulas, Equations and Moles
4. Reactions and Aqueous Solutions
5. Atomic Structure and Periodic Table
6. Ionic and Covalent Bonds
7. Thermochemistry
8. Gases
9. Liquids, Solids, Change of State and Intermolecular Forces
10. Properties of Solutions
11. Strong Acids and Bases
12. Introduction to pH

10. TEXTS AND MATERIALS USED: List of books and/or materials suggested for this course.

- Textbook: *Chemistry*, 9th Edition, by Brown, LeMay, Bursten and Burdge, Prentice Hall, NJ (2003).
- Laboratory Materials: Written by Harold Washington College faculty and provided by the instructor either through Blackboard or for a nominal fee when reproduced by the college's reproduction staff.
- Scientific Calculator
- Safety Glasses

11. AMOUNT OF WRITING REQUIRED

Exams include short answer questions and explanations.
Lab reports involve writing answers to specific questions.

12. METHODS OF EVALUATION: (Direct and indirect)

Suggested: Exams, laboratory reports, quizzes, homework, and special assignments.

13. AUTHORIZED SIGNATURE AND FILE DATE: DEPARTMENT AND CAMPUS

Physical Science Department
Harold Washington College

5/06