

**HAROLD WASHINGTON COLLEGE**  
**MASTER SYLLABUS – COLLEGE CREDIT COURSE**

**1. TITLE, NUMBER, AND CLASSIFICATION:**

Name of Course Basic Chemistry I  
Department Name Physical Science  
Number Code 073  
Course Number: 0121

**2. COURSE TERM:** 16 Week Semester

**3. CREDIT AND CONTACT HOURS:**

(i) credit hours 4 (ii) contact hours per week 6 (iii) types of activities  
x Lecture/Discussion  
x Lab  
Clinical/Work Experience  
Other

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

Eligibility for Math 099 and English 101 or consent of department chairperson. Concurrent enrollment in Chemistry 100 required.

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

Principles of general inorganic chemistry, including properties of matter, dimensional analysis, fundamentals of stoichiometry, interpretation of the periodic table, nomenclature, and introduction to solution chemistry and commonly used concentration units. Writing assignments, as appropriate to the discipline, are part of the course. 2 lecture and 4 lab hours per week

**6. STUDENTS FOR WHOM THE COURSE IS INTENDED:**

- a. Pre-nursing students
- b. Students who are not eligible for Chemistry 201 – General Chemistry
- c. Students may use this course to satisfy the laboratory Physical Science component of the Natural Science requirements in General Education.

**7. COURSE OBJECTIVES:**

1. Identify and express measured values and perform calculations with them.
2. Explain basic properties of matter and energy.
3. Describe the atomic structure.
4. Interpret the periodic table.
5. Investigate chemical bonding.
6. Name and calculate quantities of compounds and molecules
7. Examine solutions (aqueous compounds) and gases.
8. Balance chemical equations and perform stoichiometric calculations with them.
9. Provide experience with laboratory equipment and procedures.

## 8. STUDENT LEARNING OUTCOMES

Upon completion of the course, the student will be able to:

- Determine the number of significant figures in measured and calculated values and round accordingly.
  - Express numbers in scientific notation.
  - Convert between English and metric units and metric and metric units.
- Distinguish among elements, compounds, and mixtures.
  - Provide examples of chemical and physical properties and changes.
  - Identify the three physical states of matter.
  - Relate heat, energy, and temperature.
- Describe the atom in terms of its subatomic particles.
  - Define valence electrons.
  - Write electron configurations and construct electron-dot formulas for elements.
- Locate metals and nonmetals on the periodic table.
  - Relate the periodic table to valence electrons.
  - Explain periodicity of atomic and ionic sizes and ionization energy.
- Differentiate among ionic, polar covalent, and nonpolar covalent bonding.
- Write chemical formulas and names of ionic and covalent compounds and molecules.
  - Calculate the molar mass of a compound or molecule.
  - Determine the empirical and molecular formula of compounds.
  - Use dimensional analysis to solve for mass, moles, or number of atoms/ions/compounds when one quantity is given.
- Distinguish between solute and solvent.
  - Define and perform calculations with molarity.
  - Compare acids and bases.
  - Describe how the kinetic molecular theory accounts for the characteristics of gases.
  - Perform calculations involving gas laws.
- Classify, complete, and balance chemical equations.
  - Use stoichiometry to solve for mass, moles, or volume when one quantity is given in a chemical equation.
  - Determine the limiting reactant in a chemical reaction.
- Measure quantities with the appropriate laboratory equipment.
  - Use laboratory techniques, such as filtration and titration, to perform experiments.

## 9. TOPICAL COURSE OUTLINE:

- Introduction
- Measurements and calculations
- Matter and energy
- The atom
- Atomic structure
- The periodic table
- Chemical bonds
- Nomenclature of inorganic compounds
- Quantitative composition of compounds
- Chemical equations

- 11. Stoichiometry
- 12. Solutions
- 13. Acids and bases
- 14. Gases

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

Burns, Fundamentals of Chemistry 4<sup>th</sup> Edition, Prentice-Hall Publishers, 2003.  
Chapters 1 – 16

**Laboratory Exercises for Chemistry 121**

Physical Science Faculty  
Harold Washington College, 2005 – 2006

Safety goggles  
Calculator

**11. AMOUNT OF WRITING REQUIRED:**

Laboratory reports, short answer essay questions, definitions, writing assignments

**12. METHODS OF EVALUATION: (Direct and indirect)**

Exams, quizzes, laboratory reports, and writing assignments.

**13. AUTHORIZED SIGNATURE AND FILE DATE:  
DEPARTMENT AND CAMPUS**

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**Physical Science Department  
Harold Washington College**

5/06