

COLLEGEWIDE COURSE OUTLINE OF RECORD

CHEM 111, CHEMISTRY I

COURSE TITLE: Chemistry I

COURSE NUMBER: CHEM 111

PREREQUISITES: MAT 111 Intermediate Algebra and demonstrated competency through appropriate assessment or earning a grade of "C" or better in ENG 025 Introduction to College Writing II and ENG 032 Reading Strategies for College II

SCHOOL: Liberal Arts and Sciences

PROGRAM: Liberal Arts

CREDIT HOURS: 4

CONTACT HOURS: Lecture: 3 Lab: 2

DATE OF LAST REVISION: Spring, 2006

EFFECTIVE DATE OF THIS REVISION: Fall, 2008

CATALOG DESCRIPTION: An introductory course that includes the science of chemistry and measurement, atomic theory and the periodic table, chemical bonding, stoichiometry, liquids and solids, gases and the ideal gas law, solutions, and acids and bases.

MAJOR COURSE LEARNING OBJECTIVES: Upon successful completion of this course the student will be expected to:

1. Measure with S.I. and U.S.C.S. units, perform mathematical calculations using scientific notation, solve mathematical problems using dimensional analysis, and express quantities with the appropriate number of significant figures.
2. Differentiate between electrons, protons and neutrons.
3. Explain the difference between the three states of matter in terms of visible properties and particle movement.
4. Distinguish between elements, compounds, homogeneous mixtures and heterogeneous mixtures.
5. Describe the periodic table in terms of element arrangement in periods, groups and subshell blocks.
6. Describe the electron configurations of elements, determine the number of valence electrons for all representative elements, write Lewis Structures for the representative elements and simple compounds.
7. Describe modern atomic theory.
8. Distinguish between ionic and covalent bonding.
9. Given the name (formula) of a compound, write the formula (name) of that compound.
10. Given the mass (moles) of an element or compound, calculate the moles (mass) of that element or compound.
11. Classify chemical reactions into one of three major groups (synthesis, oxidation-reduction, and exchange).
12. Balance a chemical equation by inspection.
13. Calculate mass relationships in chemical reactions by using stoichiometry.
14. Calculate the change in pressure, volume, or temperature of a gas by using the appropriate gas law.

15. Describe the different types of intermolecular forces and apply the concepts to predicting physical states.
16. Interpret a graph of temperature versus energy for a substance over a range from below the melting point to above the boiling point.
17. Calculate the concentration of a solution in terms of percent, molarity, molality, and normality.
16. Describe the properties of acids and bases and determine the pH and pOH of solutions.
17. Use common types of chemical glassware, equipment, and chemicals safely and appropriately.
18. Describe and illustrate chemical principles in laboratory situations.
19. Obtain reproducible data from chemical experiments; analyze, interpret, and communicate the data in a logical and coherent manner.
20. Recognize uncertainties in data and identify potential sources of error.

COURSE CONTENT: Topical areas of study will include --

Introduction to chemistry	Chemical compositions
Measurements and calculations	Chemical quantities
Matter and energy	Chemical foundations II: Modern atomic theory
Chemical foundations I: Elements, atoms, and ions	Chemical bonding
Nomenclature	Solution stoichiometry
Chemical reactions: Introduction	Gases
Chemical reactions: Classification	Intermolecular forces as applied to melting and boiling points
Chemical reactions: In aqueous solutions	

Topical areas of study to be included in the laboratory –

Chemical safety	Families of elements
SI measurements	Empirical formulas
Physical properties	Stoichiometry
Chemical properties	Gas laws
Acids and bases	Chemical reactions
Use of chemistry glassware and equipment	Chemical bonding

ACADEMIC HONESTY STATEMENT:

The College is committed to academic integrity in all its practices. The faculty value intellectual integrity and a high standard of academic conduct. Activities that violate academic integrity undermine the quality and diminish the value of educational achievement.

Cheating on papers, tests or other academic works is a violation of College rules. No student shall engage in behavior that, in the judgment of the instructor of the class, may be construed as cheating. This may include, but is not limited to, plagiarism or other forms of academic dishonesty such as the acquisition without permission of tests or other

academic materials and/or distribution of these materials and other academic work. This includes students who aid and abet as well as those who attempt such behavior.

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ADA STATEMENT:

Ivy Tech Community College seeks to provide reasonable accommodations for qualified individuals with documented disabilities. If you need an accommodation because of a documented disability, please contact the Office of Disability Support Services.

If you will require assistance during an emergency evacuation, notify your instructor immediately. Look for evacuation procedures posted in your classroom.