

# COLLEGEWIDE COURSE OUTLINE OF RECORD

## CHEM 101, INTRODUCTORY CHEMISTRY I

COURSE TITLE: Introductory Chemistry I

COURSE NUMBER: CHEM 101

PREREQUISITES: Demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 050 Basic Algebra, ENGL 025 Introduction to College Writing II and ENGL 032 Reading Strategies for College II

SCHOOL: Liberal Arts and Sciences

PROGRAM: Liberal Arts

CREDIT HOURS: 3

CONTACT HOURS: Lecture: 2 Lab: 2

DATE OF LAST REVISION: Spring, 2007

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, equation writing and balancing, stoichiometry, and gases.

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

1. Measure with S.I. (Systeme Internationale) and U.S.C.S. (U.S. Customary System) units of length, volume and mass.
2. Perform mathematical calculations using scientific notation.
3. Distinguish between accuracy and precision of measurement.
4. Solve mathematical problems using dimensional analysis.
5. Differentiate among electrons, protons, and neutrons and describe how they affect the properties of elements.
6. Explain the differences between the common states of matter in terms of visible properties and particle movement.
7. Distinguish between elements, compounds, homogeneous mixtures and heterogeneous mixtures.
8. Describe the periodic table in terms of element arrangement in periods, groups, and subshell blocks.
9. Describe modern atomic theory.
10. 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.
11. Distinguish between ionic and covalent bonding.
12. Describe the different types of intermolecular forces.
13. Given the name (or formula) of a compound, write the formula (or name) of that compound.
14. Given the mass (or moles) of an element or compound, calculate the moles (or mass) of that element or compound.

15. Calculate the concentration of a solution in terms of percent and molarity.
16. Classify chemical reactions into one of the three major groups (synthesis, oxidation-reduction, and exchange).
17. Balance a chemical equation by inspection.
18. Describe the properties of acids, bases, and salt.
19. Determine simple pH and pOH.
20. Calculate mass relationships in chemical reactions by using stoichiometry.
21. Calculate the change in pressure, volume, or temperature of a gas using the appropriate gas law.
22. Use common types of chemical glassware, equipment, and chemicals safely and appropriately.
23. Describe and illustrate chemical principles in laboratory situations.
24. Obtain reproducible data from chemical experiments; analyze, interpret, and communicate the data in a logical and coherent manner.
25. Recognize uncertainties in data and identify potential sources of error.

COURSE CONTENT: Topical areas of study include --

Introduction to chemistry	pH and pOH
Measurements and calculations	Introduction to acids and bases
Matter and energy	Chemical compositions
Chemical foundations I: Elements, atoms, and ions	Chemical quantities
Nomenclature	Chemical foundations II: Modern atomic theory
Chemical reactions: Introduction	Chemical bonding
Chemical reactions: Classification	Stoichiometry
Chemical reactions: In aqueous solutions	Gases

Topical areas of study to be included in the laboratory –

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

#### COPYRIGHT STATEMENT:

Students shall adhere to the laws governing the use of copyrighted materials. They must insure that their activities comply with fair use and in no way infringe on the copyright or other proprietary rights of others and that the materials used and developed at Ivy Tech Community College contain nothing unlawful, unethical, or libelous and do not constitute any violation of any right of privacy.

#### 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.