

# COLLEGEWIDE COURSE OUTLINE OF RECORD

## CHEM 101, INTRODUCTORY CHEMISTRY I

COURSE TITLE: Introductory Chemistry I

COURSE NUMBER: CHEM 101

PREREQUISITES: MATH 118 Concepts in Mathematics or MATH 123 Quantitative Reasoning or demonstrated competency through appropriate assessment or earning a grade of "C" or better in MATH 100 Intermediate Algebra or MATH 122 Applied Technical Mathematics, and ENGL 093 Introduction to College Writing and ENGL 083 Reading Strategies for College or ENGL 095 Integrated Reading and Writing.

SCHOOL: Liberal Arts and Sciences

PROGRAM: Liberal Arts

CREDIT HOURS: 3

CONTACT HOURS: Lecture: 2 Lab: 2

DATE OF LAST REVISION: Spring 2016

EFFECTIVE DATE OF THIS REVISION: Fall, 2016

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, gases and acids/bases. Includes lab.

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. Distinguish between accuracy and precision of measurement while using correct number of significant figures.
3. Perform mathematical calculations using scientific notation, and solve mathematical problems using dimensional analysis.
4. Describe modern atomic theory. Differentiate among electrons, protons, and neutrons and describe how they affect the properties of elements.
5. Explain the differences between the common states of matter in terms of visible properties and particle movement.
6. Distinguish between elements, compounds, homogeneous mixtures and heterogeneous mixtures.
7. Describe the periodic table in terms of element arrangement in periods, groups, and subshell blocks.
8. 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.
9. Distinguish between ionic and covalent bonding and relate that to the description of the different types of intermolecular forces.

10. Given the name (or formula) of a compound, write the formula (or name) of that compound.
11. Given the mass (or moles) of an element or compound, calculate the moles (or mass) of that element or compound.
12. Calculate the concentration of a solution in terms of percent and molarity.
13. Classify chemical reactions into one of the three major groups (synthesis, oxidation-reduction, and exchange).
14. Balance a chemical equation by inspection and calculate mass relationships in chemical reactions by using stoichiometry.
15. Describe the properties of acids, bases, and salt, and determine simple pH and pOH.
16. Calculate changes in pressure, volume, or temperature of a gas using the appropriate gas laws.
17. Describe and illustrate chemical principles in laboratory situations while following lab safety procedures.
18. Obtain reproducible data from chemical experiments; analyze, interpret, and communicate the data in a logical and coherent manner, and recognize non-human potential sources of errors when obtaining inaccurate results.

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

#### HOW TO ACCESS THE IVY TECH COMMUNITY COLLEGE LIBRARY:

The Ivy Tech Library is available to students on- and off-campus, offering full text journals and books and other resources essential for course assignments. Go to <http://www.ivytech.edu/library/> and choose the link for your campus.

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