



Chemistry SLOs

By the end of the course, students will be able to:

General Chemistry

1. Design, construct, and interpret graphs accurately.
2. Solve quantitative chemistry problems and demonstrate reasoning clearly and completely as applied to stoichiometry and molarity, gas laws, and thermodynamics. Integrate multiple ideas in the problem solving process. Check results to make sure they are physically reasonable.
3. Write balanced general chemical and net ionic equations, classify types.

Chemistry 102 – General Chemistry

1. Solve quantitative chemistry problems and demonstrate reasoning clearly and completely as applied to equilibria, chemical kinetics, electrochemistry, and solutions. Integrate multiple ideas in the problem solving process.
2. Apply models of atomic behavior to explain general properties of matters such as colligative properties of solutions, crystal field theory, collision theory, and entropy.
- 3) Identify ions in solution using qualitative analysis.

Chemistry 105 – Organic Chemistry

1. Predict and explain the expected chemical and physical behavior of an organic compound based on its functional group(s) and geometry.
2. Discern chirality in an organic compound, draw stereoisomers in the standard 3-dimensional conventions, and determine relationships between pairs of stereoisomers drawn in these conventions, including conformational stereoisomers.
3. Outline a rational synthesis of a small target organic compound using reactions, reaction conditions and mechanisms learned in the course.



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Student Learning Outcomes

4. Write a rational mechanism to explain a given transformation of an organic compound, including proper use of the directed-arrow convention.
5. Apply the theory and practice of laboratory techniques used in the preparation, purification, separation and identification of organic compounds including the proper use of specialized glassware and output from instruments such as HNMR, CNMR, FT-IR, GC, refractometer, polarimeter, Mel-Temp, etc.
6. Practice safety in the organic chemistry laboratory including personal safety and deportment, safe deployment and use of glassware and apparatus, as well as the proper handling of hazardous chemicals and management of chemical waste. Instructor observations; laboratory quizzes; frequency of student injuries
7. Maintain a complete and organized record of laboratory experimental data and observations in accordance with the format of the scientific notebook.

Chemistry 106 – Organic Chemistry

1. Expand, reinforce, and apply all of the concepts and skills acquired in the first semester of organic chemistry to organic compounds containing additional functional groups including arenes, amines, aldehydes, ketones, carboxylic acids and the derivatives of carboxylic acids.
2. Outline multi-step syntheses of more complex organic compounds using reactions learned to date via serial and convergent strategies.
3. Understand the basic physical, chemical, and stereochemical properties of organic compounds of biological importance.
4. Apply and reinforce the laboratory techniques learned in Chemistry 105 to the synthesis and characterization of a variety of organic compounds.
5. Using a combination of classical and modern spectroscopic tools, identify an unknown organic compound.
6. Handle laboratory glassware, equipment, chemicals, and generated waste using guidelines and basic knowledge about the hazards associated with operations in an organic chemistry laboratory.
7. Maintain a complete and organized record of laboratory experimental data and observations in accordance with the format of the scientific notebook.

Chemistry 110 – Elements of General Chemistry



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Student Learning Outcomes

1. Solve quantitative problems and check answers to make sure that they are physically reasonable as applied to areas such as unit conversions, stoichiometry, and gas laws.
2. Apply IUPAC naming rules to acids, salts and molecular compounds.
3. Explain qualitative chemical concepts and trends.
4. Perform laboratory experiments correctly using appropriate techniques and safety procedures.
5. Describe, model and analyze microscopic behavior to explain macroscopic properties as applied to such areas as chemical bonding, gas laws, atomic theory, acids, bases, nuclear chemistry, and oxidation-reduction.
6. Write and predict the products of chemical reactions. Classify chemical reactions as to type.

Chemistry 120 – Fundamentals of College Chemistry: Inorganic

1. Analyze the structure of the atom to identify elementary particles, their charges, and how they are involved in chemical reactions.
2. Identify fundamental particles of the atom that are involved in radioactive decay and how they may affect the human body.
3. Apply the structure of the periodic table to the structure of atoms and their chemical reactivity.
4. Apply the dimensional analysis method to calculations of solution concentrations, quantities involved with chemical reactions, buffers, etc.

Chemistry 121 – Fundamentals of College Chemistry: Organic and Biochemistry

1. Given the IUPAC names for organic reactants, students will identify or draw the structural formulas and for the reaction, predict products, provide organic structures and their IUPAC names.
2. Differentiate physical and chemical properties of organic functional families and correlate them with the structure.
3. Construct models of organic molecules using ball and stick models.



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Student Learning Outcomes

4. Differentiate composition, properties, and chemical reactions of the biologically important compounds: Carbohydrates, Lipids, Proteins, and Nucleic Acids.
5. Identify the functions of biomolecules in biological systems and their metabolic pathways.

Source: [Glendale Community College](#)