# CHEMISTRY (CHEM)

**CHEM 101. Basic Chemistry. (4 Credits)**
Primarily for students with no previous chemistry. Fundamentals of chemistry including mathematical concepts, classification and states of matter, chemistry symbols, formulas and equations, Chemical reactions, mole concepts, atomic structure, bonding and solutions. Prerequisite: Knowledge of basic algebra strongly suggested. Co-requisite: CHEM 101L 3 credits (3 lecture hours), fall or spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 110. Contemporary Chemistry. (4 Credits)**
A descriptive, but non-mathematical approach to chemistry for non-science majors based on issues important to society and the chemical sciences. Topics to be discussed include, but are not limited to, atmospheric chemistry, gases, and air pollution; aqueous chemistry, water pollution, and acids and bases; thermodynamics, fossil fuels, and alternative energy sources; organic chemistry, plastics, and recycling; drugs, pharmaceuticals, and consumer chemicals; food, chemistry, and agricultural chemicals; biochemistry and biotechnology. Chemistry concepts are presented as needed to discuss a particular issue. The course is meant to fulfill a student's science/liberal arts requirement and does not serve as a prerequisite for CHEM 121 or 141. This course is not meant for students who have taken or will take CHEM 101, CHEM 121/122, or CHEM 141/142 as part of their program requirements. Co-requisite: CHEM 110L 3 credits (3 lecture hours), fall or spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 121. General College Chemistry I. (4 Credits)**
A course using chemical principles to explain chemical phenomena. Units, significant figures, dimensional analysis, and math and calculators as tools; chemical symbols, atomic structure, bonding, and the periodic table; anions, cations, molecules, acids, bases, formula writing, and nomenclature; classification of chemical reactions, equation writing, solutions, and stoichiometry. Additional topics to be taken from the gaseous state, the liquid state, the solid state, and thermochemistry. Prerequisite: placement in CHEM 121 or higher and high school algebra, or placement in MATH 102 or higher, or CHEM 101 with a C- or better Co-requisite: CHEM 121L 3 credits (3 lecture hours), fall or spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 122. General College Chemistry II. (4 Credits)**
A continuation of CHEM 121 emphasizing the practical aspects and applications of chemistry in the fields of health, medicine, agriculture, foods, biology, and engineering. Topics covered include chemical equilibrium, chemical kinetics, acid-base equilibrium, oxidation-reduction and electrochemistry, nuclear chemistry, and organic chemistry. Prerequisite: CHEM 121 Co-requisite: CHEM 122L 3 credits (3 lecture hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 141. Chemical Principles I. (4 Credits)**
Theoretical in-depth approach to atoms, electronic structure, bonding, thermochemistry, behavior of gases, and solution behavior. Emphasis on problem solving. Prerequisite: Placement into CHEM 121 or CHEM 141; three units of high school mathematics Co requisite: CHEM 141L 3 credits (3 lecture hours), fall semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 142. Chemical Principles II. (4 Credits)**
Theoretical approach to reaction kinetics, principles of equilibrium and their applications, oxidation-reduction reactions, thermodynamics, nuclear chemistry, metal ion complexes, and organic chemistry. Prerequisite: CHEM 141 or permission of instructor Co-requisite: CHEM 142L 3 credits (3 lecture hours) This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 220. Intro to Organic Chemistry. (4 Credits)**
This is a survey of organic chemistry utilizing functional group and mechanistic approaches. The course will review the basics of chemical bonding, thermodynamics, kinetics, and acid-base chemistry needed to understand the chemistry of organic molecules. The chemical and physical properties of the standard functional groups will be examined. Transformations of functional groups will be explored and the fundamentals of the spectroscopic identification of each functional group will be practiced. The three dimensional structure of molecules will be a point of major focus. Examples of the relevancy of organic chemistry to everyday activities will be stressed, and the relationship of organic molecules to the chemistry of life will be highlighted. Prerequisite: CHEM 122 and CHEM 122L or CHEM 142 and CHEM 142L. 3 credits (3 lecture hours) fall and spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 241. Organic Chemistry I. (4 Credits)**
Bonds and bonding, nomenclature, properties and methods of preparation of the aliphatic compounds as well as conjugation, resonance, stereochemistry and aromaticity. The study of the functional groups correlates with the study of reaction mechanisms, conformational analysis, concepts of resonance, transition state theory, and spectroscopic properties. Prerequisite: CHEM 122 or CHEM 142 or permission of instructor Co-requisite: CHEM 241L 3 credits (3 lecture hours) fall semester This course satisfies SUNY General Education Requirements for "Natural Sciences" as long as students also enroll in the lab. This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 242. Organic Chemistry II. (4 Credits)**
A continuation of CHEM 241. Nucleophilic substitution, aromatic substitution, ethers, aldehydes, ketones, alcohols, carboxylic acids, amines, phenols and special topics. Emphasis on reactions mechanisms. Prerequisite: CHEM 241 and CHEM 241L or permission of instructor Co-requisite: CHEM 242L 3 credits (3 lecture hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science

**CHEM 361. Biochemistry. (3 Credits)**
A study of the molecular components of cells, catabolism, and biosynthesis with applications of principles from general and organic chemistry. Pre- or Co-requisite: CHEM 242 3 credits (3 lecture hours), spring semester This course satisfies the Liberal Arts and Sciences requirement and the SUNY General Education Requirement for Natural Science