

Chemistry (CHEM)

Courses

CHEM 115. Introductory Chemistry. 4 Credits.

A study of measurement, ionic and covalent compounds, chemical calculations, states of matter, energy, solutions, and chemical bonding. The course includes laboratory and may serve as a preparatory class for students with weak or no background in chemistry.

Typically Offered: Fall.

CHEM 116. Introduction to Organic and Biochemistry. 4 Credits.

A study of alkanes, alkenes, alkynes, aromatics, alcohols, pheols, ethers, aldehydes/ketones, carboxylic acids and esters, amines and amides, carbohydrates, lipids, amino acids, proteins, and nucleic acids. The course includes laboratory.

Typically Offered: Spring.

Prerequisite: CHEM 115 or CHEM 121.

CHEM 121. General Chemistry I. 5 Credits.

The first semester of a two semester sequence covering the study of matter, measurements, atoms, ions, molecules, reactions, chemical calculations, thermochemistry, bonding, molecular geometry, periodicity, gases, intermolecular forces, liquids, solids, kinetics, equilibria, acids and bases, solution chemistry, precipitation, thermodynamics, and electrochemistry. Topics covered are illustrated with descriptive and historical perspectives, as well as applications of chemistry in society. The course includes laboratory.

Typically Offered: Fall, Spring.

Prerequisite: ASC 93, MATH 103, or ACT Math score of 20 or higher.

CHEM 122. General Chemistry II. 5 Credits.

The second semester of a two semester sequence covering the study of matter, measurements, atoms, ions, molecules, reactions, chemical calculations, thermochemistry, bonding, molecular geometry, periodicity, gases, intermolecular forces, liquids, solids, kinetics, equilibria, acids and bases, solution chemistry, precipitation, thermodynamics, and electrochemistry. Topics covered are illustrated with descriptive and historical perspectives, as well as applications of chemistry in society. The course includes laboratory.

Typically Offered: Fall, Spring.

Prerequisite: CHEM 121.

CHEM 194. Independent Study. 1-3 Credits.

Directed reading, study, and/or activities in selected topics.

Typically Offered: On sufficient demand.

Repeatable: Up to 12 Credits.

CHEM 294. Independent Study. 1-3 Credits.

Directed reading, study, and/or activities in selected topics.

Typically Offered: On sufficient demand.

Repeatable: Up to 12 Credits.

CHEM 330. Quantitative Analysis I. 4 Credits.

The first semester of a two semester sequence covering an investigation of the statistical treatment of data and error analysis, gravimetric analyses, solution chemistry and solubility equilibria, volumetric analyses, acid-base neutralization, complexometric and redox methods. Students are introduced to the theory, operation and applications of some modern instrumental techniques for chemical analysis. This course includes laboratory.

Typically Offered: Fall, odd years.

Prerequisite: CHEM 122.

CHEM 331. Quantitative Analysis II. 4 Credits.

The second semester of a two semester sequence covering an investigation of the statistical treatment of data and error analysis, gravimetric analyses, solution chemistry and solubility equilibria, volumetric analyses, acid-base neutralization, complexometric and redox methods. Students are introduced to the theory, operation and applications of some modern instrumental techniques for chemical analysis. This course includes laboratory.

Typically Offered: On sufficient demand.

Prerequisite: CHEM 330.

CHEM 341. Organic Chemistry I. 5 Credits.

The first semester of a two semester sequence in organic chemistry for students in sciences and pre-professional curricula. Topics include structure and reactivity of carbon containing molecules, name reactions, carbon-carbon bond forming reactions, aromatic and heterocyclic chemistry, biomolecules and polymers, and multistep syntheses. This sequence of organic chemistry is designed for students desiring careers in chemistry, biology, health professions, science education, and related areas. This course includes laboratory.

Typically Offered: Fall, even years.

Prerequisite: CHEM 121.

CHEM 342. Organic Chemistry II. 5 Credits.

The second semester of a two semester sequence in organic chemistry for students in science and pre-professional curricula. Topics include structure and reactivity of carbon containing molecules, name reactions, carbon-carbon bond forming reactions, aromatic and heterocyclic chemistry, biomolecules and polymers, and multistep syntheses. This sequence of organic chemistry is designed for students desiring careers in chemistry, biology, health professions, science education, and related areas. This course includes laboratory.

Typically Offered: Spring, odd years.

Prerequisite: CHEM 341.

CHEM 360. Elements of Biochemistry. 4 Credits.

A study of protein structure, function conformation, and dynamics; enzymes, DNA-RNA; structure and flow of genetic information; biological membranes; and metabolism. The course includes laboratory.

Typically Offered: Fall, odd years.

Prerequisite: CHEM 116 or CHEM 341.

CHEM 394. Independent Study. 1-3 Credits.

Directed reading, study, and/or activities in selected topics.

Typically Offered: On sufficient demand.

Prerequisite: Junior Standing or Senior Standing.

Repeatable: Up to 12 Credits.

CHEM 395. Laboratory Preparation and Management. 1 Credit.

An opportunity to participate in a practicum-like course. The student directly assists the instructor in numerous aspects of laboratory instructional delivery. The course is designed to improve the competency of teaching laboratories by involving the students in preparation of laboratory materials, storeroom management, evaluation of laboratory experiences, chemical storage, waste disposal, and related safety topics. This course may be repeated for credit up to 3 semester credit hours.

Typically Offered: Fall, Spring.

Repeatable: Up to 3 Credits.

**CHEM 399. Special Topics. 1-4 Credits.**

Courses not offered in the regular catalog that provide an opportunity to extend student learning.

Typically Offered: On sufficient demand.

Repeatable: Up to 12 Credits.

CHEM 411. Physical Chemistry I. 4 Credits.

A one semester course covering the study of the laws and theories of chemistry including statistical thermodynamics and quantum mechanics. Course materials are interpreted through the application of fundamental mathematical and physical principles. Statistical methods and concepts are introduced during the study of statistical mechanics. This course includes laboratory.

Typically Offered: Fall, even years.

Prerequisites: CHEM 122, MATH 165, and either PHYS 212 or PHYS 252.

CHEM 412. Physical Chemistry II. 4 Credits.

A one semester course covering the study of the laws and theories of chemistry including thermodynamics, phase equilibria, and kinetics. Course materials are interpreted through the application of fundamental mathematical and physical principles. Statistical methods and concepts are introduced during the study of the kinetic molecular theory of gases. This course includes laboratory.

Typically Offered: Spring, even years.

Prerequisites: CHEM 122, MATH 165, and either PHYS 212 or PHYS 252.

CHEM 425. Inorganic Chemistry. 4 Credits.

A study of major topics in inorganic chemistry. The structure of crystalline solids, molecular symmetry, acids and bases, oxidation and reduction, and the chemistry of d-metal complexes will be covered. Topics in atomic and molecular structure and bonding as applied to inorganic molecules will also be discussed. The course includes laboratory.

Typically Offered: Spring, odd years.

Prerequisite: CHEM 122.

CHEM 490. Secondary Science Methods and Techniques. 3 Credits.

A course designed to prepare prospective chemistry teachers in the areas of curriculum planning, textbook selection, supplemental teaching aids, laboratory procedures, and the ordering of equipment and supplies. The course includes laboratory practicum experience.

Typically Offered: Fall.

Prerequisite: Admitted to Teacher Education.

CHEM 491. Integrated Science Capstone. 2 Credits.

A capstone course that requires students to apply previously-learned knowledge and skills to develop solutions to practical scientific issues. Students will be divided into small groups for plan development. Various majors are involved to allow for integrated course material.

Typically Offered: Fall, Spring.

Prerequisite: Senior Standing.

Same As: BIOL 491/CHEM 491.

CHEM 494. Undergraduate Research. 3-12 Credits.

The course is designed to integrate subject matter from major coursework and other disciplines into a project that leads to the creation of an original body of knowledge.

Typically Offered: On sufficient demand.

Prerequisite: Junior Standing or Senior Standing.

Repeatable: Up to 12 Credits.

CHEM 497. Internship. 3-12 Credits.

An opportunity for students to apply classroom learning to an on-the-job work experience. Internship must be related to the student's major or minor course of study and may be in any geographic location. Credit is granted in the range of three to twelve hours per semester and may be repeated up to a maximum of 12 credit hours. Application and approval through Career Services.

Typically Offered: Fall, Spring, Summer.

Prerequisites: Junior Standing or Senior Standing and cum GPA of 2.50 or higher.

Grading: S/U only.

Repeatable: Up to 12 Credits.