CHEMISTRY (CHEM)

Courses

CHEM-100 CONCEPTS OF CHEMISTRY 4.00 Credits
From the food we eat to the medicines we take to the transportation we use, we experience chemistry every day. In this course, you will study the chemistry of everyday life with the goal of making informed consumer decisions. Pre-requisite: Level C or higher: Core math ready (excluding 153P and 123P) or core math complete. See Course Placement Chart for equivalent courses and test scores.

CHEM-105 GENERAL, ORGANIC AND BIOCHEMISTRY 4.00 Credits
An introduction to chemistry with an emphasis on biochemistry for the health professions. Three lectures and one laboratory per week. Pre-requisite: Level C or higher: Core math ready (excluding 153P and 123P) or core math complete. See Course Placement Chart for equivalent courses and test scores.

CHEM-111 PRINCIPLES OF CHEMISTRY I 4.00 Credits
A systematic and intensive treatment of chemical principles and their applications. Four hours of lecture/recitation, and one 3-hour laboratory per week. Lab fee. Pre-requisite: Level C or higher: Core math ready (excluding 153P and 123P) or core math complete. See Course Placement Chart for equivalent courses and test scores.

CHEM-112 PRINCIPLES OF CHEMISTRY II 4.00 Credits
Elementary theoretical chemistry and its application to analytical practice. Includes emphasis on intermolecular forces, equilibrium, electrochemistry and nuclear chemistry. Four hours of lecture/recitation and one 3-hour laboratory per week. Pre-requisite: CHEM-111 with a grade of C or better. Lab fee.

CHEM-190 DIRECTED STUDY IN CHEMISTRY 1.00-12.00 Credits

CHEM-192 SPECIAL TOPICS IN CHEMISTRY 1.00-12.00 Credits

CHEM-195 PRACTICUM IN CHEMISTRY 1.00-2.00 Credits

CHEM-199 RESEARCH ASSISTANTSHIP IN CHEMISTRY 1.00-12.00 Credits

CHEM-290 DIRECTED STUDY IN CHEMISTRY 1.00-4.00 Credits

CHEM-291 WORKSHOP IN CHEMISTRY 1.00-4.00 Credits

CHEM-292 SPECIAL TOPICS IN CHEMISTRY 1.00-4.00 Credits

CHEM-294 INTERNSHIP IN CHEMISTRY 12.00 Credits

CHEM-295 PRACTICUM IN CHEMISTRY 1.00-2.00 Credits

CHEM-299 RESEARCH ASSISTANTSHIP 1.00-12.00 Credits

CHEM-300 PHYSICAL CHEMISTRY I WITH LABORATORY 4.00 Credits
Investigates Properties of Matter and Gases, Laws of Thermodynamics, Energy Changes, Chemical and Phase Equilibrium, Solutions, and Chemical Kinetics. Laboratory component demonstrates and tests these concepts (3 hour lab). Pre-requisite: MATH-175 and CHEM-112 with a grade of C or better.

CHEM-306 PHYSICAL CHEMISTRY II 3.00 Credits
Topics include Quantum theory, Atoms, Diatomic Molecules, Polyatomic Molecules and Spectroscopy. Pre-requisite: CHEM-300 with a grade of C or better.

CHEM-325 QUANTITATIVE ANALYSIS 3.00 Credits
Theory of classical gravimetric and volumetric chemical analyses with an introduction to instrumental techniques. Basic data handling and statistics, chemical equilibrium, electrochemistry. Three hours of lecture per week. Pre-requisite of CHEM-112 with a grade of C or better. Co-requisite of CHEM-325L.

CHEM-325L QUANTITATIVE ANALYSIS LABORATORY 2.00 Credits
Laboratory course companion to CHEM 325 that develops quantitative laboratory skills including accurate/precise weighing and pipetting, acid digestion, dilution, filtration and titration. The operation and basic theory of instruments including molecular and atomic absorption, high performance liquid chromatography, ion chromatography, and gas chromatography-mass spectrometry will be explored. Statistical reasoning will be emphasized. 4 hours per week of lab. PREREQ: CHEM 112; COREQ: CHEM 325; LAB FEE.

CHEM-353 LABORATORY PREPARATION TECHNIQUES 2.00 Credits
Techniques of solution preparation, chemical storage and management, prevention of contamination, and quality assurance. One hour of lecture and one 3-hour laboratory per week. Pre-requisite: CHEM-325 with a grade of C or better.

CHEM-371 ORGANIC CHEMISTRY I 3.00 Credits
Principles and theories of organic chemistry and the properties, preparations, and reactions of organic compounds. Three hours of lecture per week. This is a writing integrated course. Pre-requisite: CHEM-112 with a grade of C or better.

CHEM-372 ORGANIC CHEMISTRY II 3.00 Credits
Continuation of Chemistry 371. Three hours of lecture per week. Pre-requisite: CHEM-371 with a grade of C or better.

CHEM-373 ORGANIC CHEMISTRY I LAB 1.00 Credit
Laboratory to accompany Chemistry 371. One 3-hour lab per week. Co-requisite: CHEM-371.

CHEM-376 ORGANIC CHEMISTRY II LAB 2.00 Credits
Laboratory to accompany CHEM-372. 3-hours of lab per week and information literacy. Pre-requisite: CHEM-371 and CHEM-373, with a grade of C or better.Co-requisite: CHEM-372. Lab fee.

CHEM-390 DIRECTED STUDY IN CHEMISTRY 1.00-4.00 Credits

CHEM-392 SPECIAL TOPICS IN CHEMISTRY 1.00-4.00 Credits

CHEM-394 INTERNSHIP IN CHEMISTRY 1.00-12.00 Credits

CHEM-395 PRACTICUM IN CHEMISTRY 1.00-2.00 Credits

CHEM-399 RESEARCH ASSISTANTSHIP 1.00-12.00 Credits

CHEM-420 PRINCIPLES OF GEOCHEMISTRY 3.00 Credits
This 400-level course is designed to draw together the themes and topics from other courses in the Earth Science major into an integrated picture of Earth and its interrelated systems, as well as applying chemistry to these systems. The focal discussion will be on the interactions between the atmosphere, hydrosphere, biosphere and lithosphere and current topics of interest related to them. Of particular interest are scientific problems involving Earth's systems such as coral bleaching, climate change, and water pollution. Pre-requisite: CHEM-112 with a grade of C or better. Crosslisted with GEOL-420.

CHEM-454 INSTRUMENTAL ANALYSIS 5.00 Credits
Course covers the basic principles and use of instruments. Ultraviolet, visible, infrared, Raman, and atomic absorption spectroscopy. Electrochemistry. Pre-requisite: CHEM-325 with a grade of C or better.

CHEM-463 INORGANIC CHEMISTRY 4.00 Credits
Course covers the basic principles of descriptive chemistry, coordination chemistry, models of bonding in transition metal complexes, molecular symmetry, molecular orbital theory, spectroscopy, and organometallic chemistry. The laboratory component introduces the student to standard aspects of synthetic inorganic chemistry, bioinorganic chemistry, organometallic chemistry and catalytic chemistry. Pre-requisite: CHEM-371 with a grade of C or better.

CHEM-481 BIOCHEMISTRY I 4.00 Credits
A study of protein structures and functions and the basics of sugar and lipid protein analysis. Three hours of lecture and one 3-hour laboratory per week. Pre-requisite: CHEM-371 with a grade of C or better.

CHEM-482 BIOCHEMISTRY II 3.00 Credits
Functional continuation of CHEM-481. Lipid, amino acid and nucleotide metabolism. Emphasis is on regulation of metabolism, metabolic dysfunctions, biochemical mechanisms of hormone action, biochemical genetics, protein synthesis, and metabolic consequences of genetic defects. Three hours of lecture/discussion per week. Pre-requisite: CHEM-481 with a grade of C or better.

CHEM-490 DIRECTED STUDY IN CHEMISTRY 1.00-4.00 Credits

CHEM-491 WORKSHOP IN CHEMISTRY 1.00-4.00 Credits

CHEM-492 SPECIAL TOPICS IN CHEMISTRY 1.00-4.00 Credits

CHEM-494 INTERNSHIP IN CHEMISTRY 1.00-12.00 Credits

CHEM-495 PRACTICUM IN CHEMISTRY 1.00-2.00 Credits

CHEM-499 RESEARCH PROJECT AND SEMINAR IN CHEMISTRY 1.00-3.00 Credits
Students will conduct and communicate the results of a research project in the Natural Sciences Division. Topics may include the historical, philosophical, cultural and environmental aspects, and the processes of natural science. Requirements of students include satisfactory oral presentation and defense of their research and submission of a written report approved by their advisor to the Natural Sciences Division. Pre-requisite: NS-398.