Chemistry

Chemistry is the science of the composition, structure, properties, and reactions of matter, especially of atomic and molecular systems. Students take chemistry courses to prepare for the major, to fulfill general education requirements, and to meet prerequisites for related courses and programs. A bachelor's degree in chemistry can lead to a career in scientific research, medicine, health, engineering, industry, government, environmental science, and teaching.

Academic and Career Pathway

Math and Sciences (https://www.miracosta.edu/academics/degree-and-certificate-programs/math-and-sciences/)

Contact Information

Chair: Kent McCorkle(Chemistry)
Dean: Michael Fino
https://www.miracosta.edu/academics/degree-and-certificate-programs/math-and-sciences/chemistry/index.html (https://www.miracosta.edu/academics/degree-and-certificate-programs/math-and-sciences/chemistry/)

Department: Chemistry
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Full-Time Faculty

Kristine Arquero
Kyle Arriola
Theresa Bolaños
Kaitlin Fisher
Pierre Goueth
Christina Johnson
Kent McCorkle
Thong Nguyen
Lynnie Trzoss

Courses

CHEM 103: Chemistry and Society: For Non-Science Majors
Units: 3
Prerequisites: None
Advisory: CHEM 103L or concurrent enrollment in CHEM 103L.
Acceptable for Credit: CSU, UC
Lecture 3 hours.
Course Typically Offered: Fall, Spring, and Summer

This course explores chemical concepts and their applications to everyday life, real world problems, and sustainability. It reviews the properties of matter and energy, chemical bonding and reactions, acids and bases, and the chemistry of water, the earth, and the atmosphere. Sustainability topics explored include energy production and consumption, the depletion of natural resources, renewable energy, pollution, climate change, and their effects on society and diverse populations. Students also discuss current scientific research to overcome problems in society.

CHEM 103L: Chemistry and Society: For Non-Science Majors (Lab)
Units: 1
Prerequisites: CHEM 103.
Enrollment Limitation: Concurrent enrollment in CHEM 103 if prerequisite not met.
Acceptable for Credit: CSU, UC
Laboratory 3 hours.
Course Typically Offered: Fall, Spring

This course is designed to accompany CHEM 103. It offers hands-on experiences with chemical techniques in both the laboratory and the field. Lab topics include water analysis, acid rain, forensic analysis, acids and bases, and soap synthesis. Required field trips can include visits to a winery, brewery, the beach, a cosmetic chemistry lab, a garden center/nursery, ocean water desalination plant, and an environmental conservation site.

CHEM 112: Introductory General, Organic, and Biological Chemistry: For Allied Health Majors
Units: 5
Prerequisites: None
Enrollment Limitation: Not open to students with prior credit in CHEM 116.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 6 hours.
Course Typically Offered: Fall, Spring, and Summer

This course surveys concepts and skills of the chemistry of living organisms with an emphasis on the human body. Topics include the structure of the atom, chemical bonding, chemical reactions, the structure and reactions of organic compounds, carbohydrates, lipids, amino acids and proteins, nucleic acids, and metabolism, with applications in the physiology, nutrition, and pharmacology of the human body. UC CREDIT LIMITATION: No credit if taken after CHEM 116.

CHEM 115: Introductory General Chemistry: For Allied Health Majors
Units: 4
Prerequisites: None
Enrollment Limitation: Not open to students with prior credit in CHEM 115H, CHEM 140, CHEM 150, or CHEM 150H.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 3 hours.
Course Typically Offered: Fall, Spring

This introductory course for non-chemistry majors teaches students the language, materials, mathematics, and principles of chemistry. It covers properties of matter, atomic theory, use of the periodic table of the elements, naming of compounds, formulas and equations, metric measurement, physical states of matter, chemistry of solutions, acids and bases, and organic and nuclear chemistry. UC CREDIT LIMITATION: Credit for CHEM 115 or CHEM 140. No credit if taken after CHEM 150.

CHEM 116: Introductory Organic and Biological Chemistry: For Allied Health Majors
Units: 4
Prerequisites: CHEM 115 or CHEM 140.
Enrollment Limitation: Not open to students with prior credit in CHEM 210, or CHEM 210H.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 3 hours.
Course Typically Offered: Spring

This course introduces organic chemistry and is designed for students pursuing health professions. Topics include nomenclature, bonding, isomerization, reaction mechanisms, and instrumental methods of interpreting aliphatic and aromatic compounds as well as the structure and reactions of carbohydrates, proteins, lipids, nucleic acids, enzymes, and metabolic functions. UC CREDIT LIMITATION: No credit if taken after CHEM 210. C-ID CHEM-102.

CHEM 140: Preparation for General Chemistry: For Science Majors
Units: 4
Prerequisites: Knowledge, skills, and abilities at the intermediate algebra level as determined by the math placement process.
Enrollment Limitation: Not open to students with prior credit in CHEM 150 or CHEM 150H.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 3 hours.
Course Typically Offered: Fall, Spring, and Summer

This introductory chemistry course focuses on developing problem-solving skills needed for success in CHEM 150. It emphasizes the application of the scientific method, modern ideas concerning atomic structure and chemical bonding, the periodic table and its relationship to chemical properties, principles of stoichiometry, including chemical ratio calculations, chemical nomenclature, properties of the states of matter, and chemical reaction principles. The laboratory component of this course provides direct participation in experiments, demonstrations, learning activities, and discussions related to fundamental concepts in chemistry. UC CREDIT LIMITATION: Credit for CHEM 115 or CHEM 140; no credit if taken after CHEM 150.

CHEM 150: General Chemistry I: For Science Majors
Units: 5
Prerequisites: CHEM 140, 1 yr high school chem, or qualify via placement exam; knowledge, skills, abilities at intermed. algebra level as determined by math placement process.
Advisory: CHEM 140 (Recommended if 4 or more years since taken a chemistry course.)
Enrollment Limitation: Not open to students with prior credit in CHEM 150H.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 6 hours.
Course Typically Offered: Fall, Spring, and Summer

This first semester of a one-year general chemistry sequence focuses on the fundamental principles of chemistry. Students learn the application of these principles with special significance placed on chemical computation. Topics include atomic structure, the periodic table, nomenclature, chemical reactions, stoichiometry, thermochemistry, and bonding. The course emphasizes critical thinking, writing, problem-solving, and analytical skills, and it meets the requirements of chemistry, biochemistry, biology, physics, pre-dental, pre-medical, and pre-engineering majors. C-ID CHEM-110 and CHEM-120S (with CHEM 151).

CHEM 151: General Chemistry II: For Science Majors
Units: 5
Prerequisites: CHEM 150.
Enrollment Limitation: Not open to students with prior credit in CHEM 151H.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 6 hours.
Course Typically Offered: Fall, Spring, and Summer

This continuation of CHEM 150 studies the fundamental principles of chemistry and their applications. Topics include intermolecular forces, solutions, kinetics, equilibrium, acid-base chemistry, aqueous ionic equilibrium, thermodynamics, electrochemistry, nuclear chemistry, and coordination chemistry. The laboratory includes a variety of experiments to supplement and reinforce the class work. It also includes a section on qualitative analysis. C-ID CHEM-120S (with CHEM 150).

CHEM 210: Organic Chemistry I: For Science Majors
Units: 5
Prerequisites: CHEM 151.
Enrollment Limitation: Not open to students with prior credit in CHEM 210H.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 6 hours.
Course Typically Offered: Fall, Spring

This first course in a standard one-year organic chemistry sequence is designed for students majoring in chemistry and other sciences. Major themes include bonding, molecular structure, isomerism, conformational analysis, nomenclature, reaction mechanisms, and synthesis. The lecture emphasizes the mechanisms, reactions, and synthesis of aliphatic compounds, such as alkanes, cycloalkanes, alkenes, alkynes, alkyl halides, and alcohols; the lab emphasizes the determination of physical properties and the separation, purification, and identification of organic compounds using spectroscopic techniques. C-ID CHEM-150 and C-ID CHEM-160S (with CHEM 211).

CHEM 211: Organic Chemistry II: For Science Majors
Units: 5
Prerequisites: CHEM 210.
Enrollment Limitation: Not open to students with prior credit in CHEM 211H.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 6 hours.
Course Typically Offered: Fall, Spring, and Summer

This continuation of the one-year organic chemistry sequence emphasizes the application of organic chemistry reactions, mechanisms and synthesis learned in CHEM 210 to other compounds. It examines new reactions for different functional groups, including alcohols, thiols, aldehydes, ketones, arenes, carboxylic acid and its derivative, amines, and their application in biological molecules. C-ID CHEM-160S (with CHEM 210).

CHEM 292: Internship Studies
Units: 0.5-14
Prerequisites: None
Corequisite: Complete 54 hours of work per unit, paid or unpaid.
Enrollment Limitation: Instructor, dept chair, and Career Center approval. Fourteen unit maximum in any combination of work experience education and/or internship studies per semester.
Acceptable for Credit: CSU
Course Typically Offered: Fall, Spring, and Summer

This course provides students the opportunity to apply the theories and techniques of their discipline in an internship position in a professional setting under the instruction of a faculty-mentor and site supervisor. It introduces students to aspects of the roles and responsibilities of professionals employed in the field of study. Topics include goal-setting, employability skills development, and examination of the world of work as it relates to the student's career plans. Students must develop new learning objectives and/or work/intern at a new site upon each enrollment.