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

Contact Information

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

Department: Chemistry
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Full-Time Faculty

Kristine Arquero
Kyle Arriola
Theresa Bolaños
Kaitlin Fisher
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Christina Johnson
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Thong Nguyen
Lynnie Trzoss

Courses

CHEM 103: Chemistry and Society: For Non-Science Majors
Units: 3
Prerequisites: None
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. Topics explored include energy production, chemistry of the earth and atmosphere, pollution and the environment, and food and nutrition. The course also reviews properties of elements and compounds, energy and matter, chemical bonding, and major scientific discoveries.

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 field. Lab topics include forensic analysis, cosmetics, batteries, acids, and bases. Common field trips include visits to a winery, brewery, nuclear power plant, cosmetic chemistry lab, ocean water desalination plant, and 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/CHEM 115H or CHEM 140. No credit if taken after CHEM 150/CHEM 150H.

CHEM 115H: Introductory General Chemistry: For Allied Health Majors (Honors)
Units: 4
Prerequisites: None
Enrollment Limitation: Not open to students with prior credit in CHEM 115, 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. This honors course offers students the opportunity to complete, document, and discuss independent scientific research. UC CREDIT LIMITATION: Credit for CHEM 115/CHEM 115H or CHEM 140. No credit if taken after CHEM 150/CHEM 150H.

CHEM 116: Introductory Organic and Biological Chemistry: For Allied Health Majors
Units: 4
Prerequisites: CHEM 115, CHEM 115H, 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/CHEM 210H. 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/CHEM 115H or CHEM 140; no credit if taken after CHEM 150/CHEM 150H.

CHEM 150: General Chemistry I: For Science Majors
Units: 5
Prerequisites: None
Advisory: CHEM 140
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. UC CREDIT LIMITATION: Credit for CHEM 150 or CHEM 150H. C-ID CHEM-110 and CHEM-120S (with CHEM 151/CHEM 151H).

CHEM 150H: General Chemistry I: For Science Majors (Honors)
Units: 5
Prerequisites: None
Advisory: CHEM 140
Enrollment Limitation: Not open to students with prior credit in CHEM 150.
Acceptable for Credit: CSU, UC
Lecture 3 hours, laboratory 6 hours.
Course Typically Offered: Fall

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 requirements of chemistry, biochemistry, biology, physics, pre-dental, pre-medical, and pre-engineering majors. This honors course offers students the opportunity to complete, document, and discuss independent scientific research. UC CREDIT LIMITATION: Credit for CHEM 150 or CHEM 150H. C-ID CHEM-110 and CHEM-120S (with CHEM 151/CHEM 151H).

CHEM 151: General Chemistry II: For Science Majors
Units: 5
Prerequisites: CHEM 150 or CHEM 150H.
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. UC CREDIT LIMITATION: Credit for CHEM 151 or CHEM 151H. C-ID CHEM-120S (with CHEM 150/CHEM 150H).

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

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. This honors course offers students the opportunity to complete, document, and discuss independent scientific research. UC CREDIT LIMITATION: Credit for CHEM 151 or CHEM 151H. C-ID CHEM-120S (with CHEM 150/CHEM 150H).

CHEM 210: Organic Chemistry I: For Science Majors
Units: 5
Prerequisites: CHEM 151 or CHEM 151H.
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. UC CREDIT LIMITATION: Credit for CHEM 210 or CHEM 210H. C-ID CHEM-150 and C-ID CHEM-160S (with CHEM 211/CHEM 211H).

CHEM 210H: Organic Chemistry I: For Science Majors (Honors)
Units: 5
Prerequisites: CHEM 151 or CHEM 151H.
Enrollment Limitation: Not open to students with prior credit in CHEM 210.
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. This honors course offers students the opportunity to complete, document, and discuss independent scientific research. UC CREDIT LIMITATION: Credit for CHEM 210 or CHEM 210H. C-ID CHEM-150 and C-ID CHEM-160S (with CHEM 211/CHEM 211H).

CHEM 211: Organic Chemistry II: For Science Majors
Units: 5
Prerequisites: CHEM 210 or CHEM 210H.
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. UC CREDIT LIMITATION: Credit for CHEM 211 or CHEM 211H. C-ID CHEM-160S (with CHEM 210/CHEM 210H).

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

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. This honors course offers students the opportunity to complete, document, and discuss independent scientific research. UC CREDIT LIMITATION: Credit for CHEM 211 or CHEM 211H. C-ID CHEM 160-S (with CHEM 210/CHEM 210H).

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.