

# CHEMISTRY

Chemistry is the science that deals with the composition, structure, and properties of matter and with the changes matter undergoes. There are many different employment opportunities open to chemists. A chemist can work in a laboratory or research environment asking questions and testing hypotheses with experiments. Another possibility for a chemist is to work on a computer developing theories or models or to predict reactions. Some chemists do field work, others contribute advice on chemistry for projects. Some chemists write. Some chemists teach, while others use chemistry to enter the medical field.

The Chemistry program offers two Associate degrees:

- Associate in **Arts** in Chemistry (A.A.)
- Associate in **Science** in Chemistry for UC Transfer (A.S.-UCTP)

The courses in this program can prepare students to transfer to Bachelor of Arts or Bachelor of Science degree programs in Chemistry.

To earn an Associate degree with a major in **Chemistry**, students must complete the core courses listed in the major, plus general education degree requirements. These major requirements help prepare students for upper-division course work for bachelor degrees and advanced degrees in chemistry offered by four-year institutions. Since the course work in chemistry is sequential, students may spend less time earning an associate degree by giving priority to the requirements for a major in chemistry. Earning an Associate degree in Chemistry suggests an achievement of technical skills that may be helpful in seeking immediate employment.

Universities differ slightly in requirements for the Bachelor of Arts degree in Chemistry and the Bachelor of Science degree in Chemistry or Biochemistry. The Counseling Department or a member of the Science Department faculty can help students plan their coursework at Oxnard College so students have a smooth transition to the university of his or her choice. Students are advised to refer to the official articulation agreements on [www.assist.org](http://www.assist.org) (<https://www.assist.org>) for the most current requirements of their intended transfer institution. Both the Bachelor of Arts degree in Chemistry and the Bachelor of Science degree in Chemistry are offered at California State University Channel Islands (CSUCI), California State University Northridge (CSUN) and the University of California Santa Barbara (UCSB). The University of California Los Angeles (UCLA) only grants the Bachelor of Science degree in Chemistry. In addition, CSUCI, CSUN, UCSB and UCLA all grant Bachelor of Science degrees in Biochemistry.

## University of California Credit Limitation on Transfer of Chemistry Courses

The UC will not give credit for CHEM R104 **or** CHEM R110 if taken after CHEM R120.

No credit will be given for CHEM R112 if taken *after* CHEM R130.

**NOTE:** The UC limits enrollment in some courses. See the UC Transfer Course Agreement (<http://catalog.vcccd.edu/oxnard/transfer-information/transfer-uc/#uctcatext>) page for details.

### CHEM R104 General, Organic, and Biological Chemistry 5 Units

*In-Class Hours:* 70 lecture, 52.5 laboratory

*Prerequisites:* Course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process

This course provides an introduction to the concepts of chemistry in the health sciences. Topics in general chemistry will include the modern view of the atom, molecule structure, chemical formulas, and chemical reactions. Topics in organic chemistry will include hydrocarbons, alcohols, aldehydes, ketones, carboxylic acids, amines, and amides. Topics in biochemistry will include carbohydrates, proteins, lipids, nucleic acids, and metabolism.

**Grade Modes:** Letter Graded

**Degree Applicability:** Applies to Associate Degree

**AA/AS GE:** A2

**Transfer Credit:** CSU, UC

**UC Credit Limitations:** None

**CSU GE-Breadth:** B1, B3

**IGETC:** None

### CHEM R110 Elementary Chemistry 5 Units

*In-Class Hours:* 70 lecture, 52.5 laboratory

*Prerequisites:* Course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process

*C-ID:* CHEM 101

This is an introductory course in chemistry stressing the basic principles of atomic and molecular structure, compound formation and chemical reactivity, the periodic table and states of matter. Quantitative techniques involved in elementary chemical calculations will be emphasized. In addition, the course serves as an introduction to lab techniques with experiments illustrating principles covered in lecture.

**Grade Modes:** Letter Graded

**Field Trips:** May be required

**Degree Applicability:** Applies to Associate Degree

**AA/AS GE:** A2

**Transfer Credit:** CSU, UC

**UC Credit Limitations:** None

**CSU GE-Breadth:** B1, B3

**IGETC:** 5A, 5C

### CHEM R112 Elementary Organic and Biological Chemistry 5 Units

*In-Class Hours:* 70 lecture, 52.5 laboratory

*Prerequisites:* CHEM R110 or CHEM R120

*C-ID:* CHEM 102

The major emphasis of this course will be on general organic chemistry and biological chemistry as they apply to the living systems. The section of organic chemistry includes naming, structure and bonding, classification by functional groups and reactions, polymerization, optical isomerism, and physical properties based on molecular polarity. Biochemistry includes carbohydrates, proteins, and amino acids, fats, enzymes, DNA and RNA, and cell biochemistry. The lab illustrates the principles covered in the lecture.

**Grade Modes:** Letter Graded

**Degree Applicability:** Applies to Associate Degree

**AA/AS GE:** A2

**Transfer Credit:** CSU, UC

**UC Credit Limitations:** None

**CSU GE-Breadth:** B1, B3

**IGETC:** 5A, 5C

**CHEM R120 General Chemistry I 5 Units***In-Class Hours:* 52.5 lecture, 105 laboratory*Prerequisites:* CHEM R110 and a math course taught at the level of intermediate algebra or placement as determined by the college's multiple measures assessment process*C-ID:* CHEM 110

This course introduces fundamental principles and theories of chemistry with special emphasis on calculations of solution chemistry, stoichiometry, chemical equilibrium and oxidation-reduction; includes discussion of quantum mechanical model of the atom, kinetic-molecular theory, and periodic table. The lab is designed to develop quantitative relationships through experiments, and to introduce inorganic preparative procedures and computer analysis of data.

**Grade Modes:** Letter Graded**Field Trips:** May be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** A2**Transfer Credit:** CSU, UC**UC Credit Limitations:** None**CSU GE-Breadth:** B1, B3**IGETC:** 5A, 5C**CHEM R122 General Chemistry II 5 Units***In-Class Hours:* 52.5 lecture, 105 laboratory*Prerequisites:* CHEM R120*C-ID:* CHEM 120S

This course covers solution equilibria, kinetics, electrochemistry, radiochemistry, transition metal chemistry, and descriptive chemistry of the elements. In addition, an introduction to organic chemistry is included. Lab work includes qualitative analysis, thermochemistry, and kinetic studies, and further develops inorganic preparative techniques. Computers are utilized for data acquisition and interpretation.

**Grade Modes:** Letter Graded**Field Trips:** May be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** A2**Transfer Credit:** CSU, UC**UC Credit Limitations:** None**CSU GE-Breadth:** B1, B3**IGETC:** 5A, 5C**CHEM R130 Organic Chemistry I 5 Units***In-Class Hours:* 52.5 lecture, 105 laboratory*Prerequisites:* CHEM R122*C-ID:* CHEM 150

This course studies the fundamental principles of organic chemistry with the emphasis upon the practical application of modern principles to functional groups, reactivity, physical properties, and methods of synthesis of organic compounds. The lab portion of the course will give students the opportunity to engage in experiments that provide concrete examples of materials covered in the lecture portion of the course.

**Grade Modes:** Letter Graded**Field Trips:** May be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** A2**Transfer Credit:** CSU, UC**UC Credit Limitations:** None**CSU GE-Breadth:** B1, B3**IGETC:** 5A, 5C**CHEM R132 Organic Chemistry II 5 Units***In-Class Hours:* 52.5 lecture, 105 laboratory*Prerequisites:* CHEM R130*C-ID:* CHEM 160S

This course is the second half of the Organic Chemistry series with emphasis on oxygen-containing and nitrogen-containing organic substances, polymers, carbohydrates, proteins, lipids, and other biomolecules. The lab will involve multiple-step synthesis from smaller molecules to larger molecules.

**Grade Modes:** Letter Graded**Field Trips:** May be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** A2**Transfer Credit:** CSU, UC**UC Credit Limitations:** None**CSU GE-Breadth:** B1, B3**IGETC:** 5A, 5C**CHEM R199 Directed Studies in Chemistry 1-3 Units***In-Class Hours:* 52.5-157.5 laboratory*Prerequisites:* CHEM R110

This course is designed for students interested in furthering their knowledge of Chemistry on an independent study basis. These studies may require a combination of laboratory and library research. Project findings will be presented in a scientific poster format, video, protocol or research publication.

**Grade Modes:** Letter Graded**Field Trips:** May be required**Degree Applicability:** Applies to Associate Degree**AA/AS GE:** None**Transfer Credit:** CSU**UC Credit Limitations:** None**CSU GE-Breadth:** None**IGETC:** None

- Chemistry, Associate in Science for UC Transfer (<http://catalog.vcccd.edu/oxnard/programs-courses/chemistry/chemistry-as-uctp/>)
- Chemistry, Associate in Arts (<http://catalog.vcccd.edu/oxnard/programs-courses/chemistry/chemistry-aa/>)

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