CHEMISTRY

School of Physical Sciences and Technologies

Acting Dean: Dixie Lee Bullock
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CURRICULUM

The chemistry curriculum is designed to foster an understanding of the fundamental principles of chemistry in a variety of applications—medicine, health-care products, energy, food production, body metabolism, structural materials, microelectronics, and the environment. Students learn how chemical knowledge is derived, theorized, and applied in solving problems in everyday life. They perform experiments in a modern chemistry laboratory with state-of-the-art equipment under the guidance of experienced faculty. In addition, students have an opportunity to enhance their understanding of chemical concepts and improve their laboratory skills through a series of computer-aided lessons and exercises. The chemistry curriculum is designed to meet the needs of students who wish to pursue a major in (1) chemistry, biology, marine science, geology, physics, medicine, engineering, or technology; (2) paramedical or allied health science, including nursing, dental hygiene, physical therapy, or nutrition; or (3) liberal arts.

CAREER OPTIONS

Examples of careers for the chemistry major include the following:

- Medicine
- Chemist
- Pharmacist
- Agrochemist
- Biotechnologist
- Ceramics Industry
- Engineer
- Environmental Law
- Forensic Scientist
- Geochemist
- Government Policy
- Metallurgist
- Oceanographer
- Patent Law
- Plastics Industry
- Software Designer
- Space Exploration
- Teaching
- Technical Writer

ASSOCIATE DEGREE

- **Associate in Arts Degree in Chemistry**

Students must complete a minimum of 60 units of credit, including the courses in the major ("Major Requirements") and general education requirements (pages 36-43), with an overall GPA of 2.0 or better. A minimum of 12 units must be completed at Irvine Valley College. See pages 32–35 for further information.

TRANSFER PREPARATION

Courses that fulfill major requirements for an associate degree at Irvine Valley College may not be the same as those required for completing the major at a transfer institution offering a baccalaureate degree. Students who plan to transfer to a four-year college or university should (1) refer to the University Studies major (page 231) and "Transfer Planning" (page 47); (2) consult the catalog of their prospective transfer institution (see the IVC Transfer Center for assistance); and (3) schedule an appointment with an IVC counselor to develop a plan of study before beginning their program. It may be helpful to meet with the department faculty at IVC.

MAJOR REQUIREMENTS: CHEMISTRY

Associate in Arts Degree

Complete the following courses:		Units
* **CHEM 1A**	General Chemistry I	5
CHEM 1B	General Chemistry II	5
CHEM 12A	Organic Chemistry	5
CHEM 12B	Organic Chemistry	5
	TOTAL UNITS:	**20**

* Students who have not successfully completed high school chemistry should complete CHEM 3 prior to enrolling in CHEM 1A.

Recommended electives:
BIO 2, 5; Mathematics (at least first-year calculus); Physics (choose appropriate series, PHYS 2A and 2B or 4A and 4B).

COURSES

CHEM 1A: GENERAL CHEMISTRY I
5 Units
3 hours lecture, 6 hours lab
Transfers: CSU, UC
Prerequisite: Math 253
Recommended Preparation: Recent completion of Chem. 3 or high school chemistry; concurrent enrollment in Chem. 106.
This course is a study of the principles of general chemistry. Topics include atomic and molecular structure, bonding, nomenclature, chemical formulas, chemical equations, stoichiometry, thermochemistry, gases, liquids, solids, and solutions. (CAN CHEM 2; Chem. 1A+1B: CAN CHEM SEQ A) NR

CHEM 1B: GENERAL CHEMISTRY II
5 Units
3 hours lecture, 6 hours lab
Transfers: CSU, UC
Prerequisite: Chem. 1A
This course continues the study of the principles of general chemistry. Topics include kinetics, equilibrium, acids and bases, thermodynamics, electrochemistry, coordination chemistry, nuclear chemistry, organic chemistry, and qualitative analysis. (CAN CHEM 4; Chem. 1A+1B: CAN CHEM SEQ A) NR

CHEM 3: FUNDAMENTAL CHEMISTRY
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU, UC credit proviso (see UC course list)
Recommended Preparation: Math 251
This course is a study of the basic principles of chemistry. It is designed especially for the student who intends to take Chemistry 1A but needs more preparation. Topics include problem-solving and calculation methods, nomenclature, chemical formulas, chemical equations, stoichiometry, thermochemistry, atomic and molecular structure, bonding, gases, solutions, acids, and bases. Laboratory activities will familiarize students with the use of basic equipment.

CHEM 4: INTRODUCTION TO GENERAL & ORGANIC CHEMISTRY & BIOCHEMISTRY
5 Units
4 hours lecture, 3 hours lab
Transfers: CSU, UC credit proviso (see UC course list)
This course introduces major topics of general and organic chemistry, and biochemistry. The course is designed primarily for students planning to enter a nursing program, an allied health or paramedical field, the liberal arts, or environmental technology. The following topics are included: measurements, atomic structure, bonding, nomenclature, solutions, kinetics, thermochemistry, nuclear chemistry, equilibrium, acids and bases, carbohydrates, lipids, proteins, enzymes, nucleic acids, and organic chemistry, including common functional groups, nomenclature, and reactions. NR

CHEM 12A: ORGANIC CHEMISTRY
5 Units
3 hours lecture, 6 hours lab
Transfers: CSU, UC credit proviso (see UC course list)
Prerequisite: Chem. 1B
This is a study of the principles, theories, and reactions of organic chemistry with an emphasis on the relations of structure and reactivity. The course is recommended for students whose major is chemistry or a related field such as medicine, dentistry, pharmacy, biology, biochemistry, or chemical engineering. The following topics are included: stereochemistry, aliphatic and aromatic compounds, preparations and reactions of certain organic compound families, and spectroscopic methods. NR

CHEM 12B: ORGANIC CHEMISTRY
5 Units
3 hours lecture, 6 hours lab
Transfers: CSU, UC
Prerequisite: Chem. 12A
This is a continuation of Chemistry 12A. The following topics are included: preparations and reactions of certain organic compound families, polynuclear and heterocyclic compounds, polymers, lipids, carbohydrates, amino acids, proteins, and biochemical processes. NR

CHEM 106: BASICS OF CHEMISTRY
2 Units
2 hours lecture
Transfers: CSU
Corequisite: Chem. 1A
Recommended Preparation: Prior completion of or concurrent enrollment in Math 253
This course provides the student with a strong background in the basics of chemistry through discussion, problem solving and question sessions. The course introduces the fundamental laws, models and theories of modern chemistry. It includes a study of molecular structure, chemical bonding, states of matter, the behavior of gases, and solutions. NR

CHEM 108: BIOCHEMISTRY FOR HEALTH SCIENCES
4 Units
3 hours lecture, 3 hours lab
Transfers: CSU
This course addresses the application of chemical principles to biological systems, especially at the cellular level of structure and function. Essential topics include the nature of biologically important solutions and colloids; structure, functions and interactions of biological macromolecules; interactions of biological molecules in formation and functions of biological membranes; intracellular metabolism and enzyme functions; and genetic control of biological functions. The course is intended for health science students who have no previous background in sciences. Chemistry 108 is also listed as Biology 108; credit will be given in either area, not both. NR