

# Chemistry

## The Field of Chemistry

A major in chemistry provides

- undergraduate training for students planning professional careers in chemistry, biochemistry, allied professions, and for those contemplating graduate work for advanced degrees
- undergraduate training in chemistry for those planning careers in professions such as medicine, chiropractic, forensic science, dentistry, pharmacy, etc.
- preparation for teachers of chemistry and other sciences in the teaching credential program
- the basic chemical sciences required of students majoring in related fields such as physics, biology, nursing, health science, engineering, geology, agriculture, home economics, and criminology
- graduate instruction in chemistry for the Master of Science degree for students who intend to enter the chemical industry, to pursue further advanced study, or to improve their qualifications as teachers in secondary schools and community colleges

For non-science students, the study of chemistry is designed to stimulate interest in and understanding of the achievements and contributions of chemistry to our civilization.

## The Department of Chemistry

The Bachelor of Science (B.S.) in Chemistry is accredited by the American Chemical Society. Students who satisfactorily complete the program will be recommended by the department for certification as graduate chemists by the American Chemical Society. The Bachelor of Arts (B.A.) degree is recommended for those planning careers in professions such as medicine, chiropractic, dentistry, pharmacy, etc. The Bachelor of Science (B.S.) in Biochemistry is intended for students who plan to pursue a career in biochemical research, chemistry research, and is suitable for student pursuing health professions.

The Department of Chemistry's full-time faculty includes 15 members with Ph.Ds. Faculty members provide students with excellent research opportunities in biochemistry and in analytical, inorganic, organic, and physical chemistry. Faculty members' broad interests have led to interdisciplinary research projects in collaboration with scientists and professors in other science areas such as agricultural chemistry, chemical physics, enology, forensic science, nutritional science, and molecular biology. Research projects have involved local facilities such as the California State Crime Laboratory, Fresno Community Hospital, USDA

Research Station, U.S. Veteran's Administration Hospital, U.S. Forest Laboratory, and Valley Children's Hospital.

All upper-division and graduate chemistry laboratories and support areas are housed in the Science Building. Eight four-station graduate laboratories are well-equipped with access to modern instrumentation. Students have access to computational facilities, including a 108-node Linux cluster and a molecular modeling computer laboratory. The university library collection includes many journal subscriptions in chemistry plus numerous texts and related books.

## Options Available

### Teacher Credential Program

The B.A. in Natural Science serves as a waiver program for the Single Subject Teaching Credential in Science. Graduates with a science credential may teach any introductory science class, i.e., Earth, General, Life, or Physical Science as well as courses in a particular emphasis. Students interested in teaching chemistry in high school may pursue a Bachelor of Arts in Natural Sciences with a chemistry emphasis.

### Concentrations

By the proper selection of elective courses, students may orient their baccalaureate degree programs toward areas such as agricultural chemistry, biochemistry, forensic chemistry, and environmental chemistry.

**California State  
University, Fresno**

**Department of  
Chemistry**

**559.278.2103**

**B.A. in Chemistry**

**B.S. in Chemistry**

**B.S. in Biochemistry**

**B.A. in Natural  
Sciences Teaching  
Credential**

**M.S. in Chemistry**

**Minor in Chemistry**

**FRESNO STATE**

Discovery. Diversity. Distinction.

# Chemistry

## Careers in Chemistry

Traditionally careers in chemistry have included those in chemical and related industries such as aerospace, agriculture, biotechnology, clinical chemistry, chemical engineering, medicine, manufacturing, pharmaceuticals, and other major industries. Academic careers for chemists include teaching at the secondary, community college, or university level. Careers also exist for technically trained people in nontraditional areas such as marketing and sales, scientific information, patent law, and health and safety. The baccalaureate degree provides a strong foundation for studies at medical, dental, veterinary, and pharmacy schools.

## Future Education

A teaching credential is necessary for teaching positions at the junior high and high school levels. Employment at the college or university level usually requires a master's degree or a Ph.D. Careers in technical or health-related fields often require an advanced degree.

## High School Preparation

Students should meet California State University's admission requirements in terms of college preparatory course requirements, grade point average, and test scores. Early development of good study habits is essential.

## College Program

Students should consult the university's *General Catalog* for specific major and university requirements. Community college transfers should consult their catalogs to ensure that courses taken are CSU transferable (baccalaureate level).

## General Education

Students should complete as many of the lower math, physics, and chemistry courses listed (below) as possible during the freshman and sophomore years if they are attending a community college. It is very important for students to begin their math-science program as early as possible. In addition, students should plan to complete as many of the Fresno State General Education requirements as can be included with their required math-science courses. Community colleges can certify up to 39 of the units required in Fresno State's General Education pattern.

## Course Requirements

Since changes may occur, students should consult the *General Catalog* and a Fresno State adviser prior to registering for courses.

### Lower Division

Freshman-Sophomore level courses  
(may be taken at a community college)

General Chemistry and Qualitative Analysis I and II (Fresno State CHEM 1A-1B)

Mathematical Analysis I, II, and III (MATH 75,76,77)

Principles of Physics (PHYS 4A, 4AL, 4B, 4BL, 4C) or General Physics (PHYS 2A, 2B; B A only)

### Upper Division

Junior-Senior level courses  
(to be taken at Fresno State)

The upper-division requirements vary according to concentration selected. A representative listing of upper-division courses is presented here. Students must consult the catalog for specific requirements within each concentration.

Advanced Inorganic Chemistry  
Analytical Chemistry  
Fundamentals of Biochemistry  
Organic Chemistry  
Analytical Measurements Laboratory  
Physical Chemistry

**For additional information, write**

**California State University, Fresno  
Department of Chemistry**

2555 East San Ramon  
M/S SB70  
Fresno, California  
93740-8034

**Visit or call**

**Department of Chemistry**

Science Building,  
Room 380  
559.278.2103

[www.csufresno.edu/chemistry](http://www.csufresno.edu/chemistry)

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**PLEASE NOTE:** This document is for general informational purposes only. The information is subject to change; consult the appropriate department or an academic adviser. Entering freshmen must follow the revised General Education program effective fall 1999 and thereafter. The university catalog and schedule of courses are available online at [www.fresnostate.edu/ClassSchedule](http://www.fresnostate.edu/ClassSchedule) and [www.fresnostate.edu/catalog](http://www.fresnostate.edu/catalog).

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