

CHEMISTRY

Bachelor of Science degree with a major in Chemistry

Bachelor of Science degree with a major in Chemistry — concentration in Biochemistry

Bachelor of Arts degree with a major in Chemistry

Minor in Chemistry

Department Chair

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Department of Chemistry

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The Program

Students completing this program will have demonstrated:

- understanding of what chemistry reveals about the nature of physical reality
- proficiency in abstract reasoning
- sound abilities in written and oral communications
- understanding of and use of physical and mathematical models
- understanding of the relationship of experimental observation to chemical theory and knowledge
- proficiency in spatial perception
- critical independent thinking
- chemical knowledge and skills needed in chemistry as well as in other disciplines
- breadth, depth, and rigor characteristic of a professional chemist
- proficiency and skill in performing laboratory techniques and in making and interpreting laboratory observations
- understanding of the theory and operation of fundamental modern laboratory instruments.

Students majoring in chemistry may choose either a Bachelor of Science or a Bachelor of Arts degree. Both degrees offer excellent preparation for graduate study and professional schools.

The BS degree with a major in chemistry fulfills requirements for professional training established by the American Chemical Society. Students may choose the biochemistry concentration, which prepares them for careers in biochemistry and related fields, as well as for graduate study.

Students who choose the BA program find less specialization in chemistry and greater opportunity for study in other fields. This program is recommended for students wanting a standard teaching credential with specialization in secondary school teaching.

Potential careers: analytical chemist, biotechnologist, nutritionist, food and drug inspector, toxicologist, organic or inorganic chemist, medical technologist, genetic engineer, physical chemist, pharmacologist, science librarian, biochemist, forensic chemist, sanitarian, geochemist, environmental consultant, chemical engineer.

Preparation

High school students should take chemistry, English, and mathematics.

REQUIREMENTS FOR THE MAJOR (Bachelor of Science)

For a description of degree requirements to be fulfilled in addition to those listed below for the major, please see "The Bachelor's Degree" section of the catalog, pp. 66-81.

The Upper Division Area B General Education requirement is met by the coursework within the Bachelor of Science degree for either option in the Chemistry major:

Students must complete all courses in the major with a C- or better.

Lower Division Core

Core courses required for all majors.

CHEM 109	(5)	General Chemistry I
CHEM 110	(5)	General Chemistry II
MATH 109	(4)	Calculus I
MATH 110	(4)	Calculus II
MATH 210	(4)	Calculus III
PHYX 109	(4)	General Physics A
PHYX 210	(4)	General Physics B
PHYX 211	(4)	General Physics C

Upper Division Core

Core courses required for all majors.

CHEM 323	(1)	Nuclear Magnetic Resonance Spectroscopy Techniques
CHEM 324	(3)	Organic Chemistry I
CHEM 324L	(2)	Organic Chemistry I Lab
CHEM 325	(3)	Organic Chemistry II
CHEM 325L	(2)	Organic Chemistry II Lab
CHEM 341	(5)	Quantitative Analysis
CHEM 361	(3)	Physical Chemistry I
CHEM 362	(3)	Physical Chemistry II
CHEM 485	(1)	Seminar in Chemistry

Chemistry

Core courses plus

CHEM 310	(3)	Inorganic Chemistry I
CHEM 330	(3)	Molecular Modeling
CHEM 363	(2)	Physical Chemistry II Lab
CHEM 410	(3)	Inorganic Chemistry II
CHEM 410L	(2)	Inorganic Chemistry II Lab
CHEM 438	(4)	Introductory Biochemistry
CHEM 441	(4)	Instrumental Analysis

Biochemistry Concentration

Core courses plus

Lower Division

BIOL 105	(4)	Principles of Biology
BOT 105	(4)	General Botany, or
ZOOL 110	(4)	Introductory Zoology

Upper Division

CHEM 434	(3)	Biochemistry I
CHEM 434L	(2)	Biochemistry I Lab
CHEM 435	(3)	Biochemistry II
CHEM 435L	(2)	Biochemistry II Lab
BIOL 340	(4)	Genetics

Plus one of the following:

BIOL 412	(4)	General Bacteriology
BOT 310	(4)	Gen. Plant Physiology
ZOOL 310	(4)	Animal Physiology

REQUIREMENTS FOR THE MAJOR (Bachelor of Arts)

For a description of degree requirements to be fulfilled in addition to those listed below for the major, please see "The Bachelor's Degree" section of the catalog, pp. 66-81.

Students must earn a minimum grade of C- in all courses with the "CHEM" prefix for the BA Chemistry Major degree.

Lower Division

CHEM 109	(5)	General Chemistry I
CHEM 110	(5)	General Chemistry II

Plus one of these calculus series:

- MATH 105 (3) Calculus for the Biological Sciences & Natural Resources
- MATH 215 (3) Multivariate Calculus for the Biological Sciences & Natural Resources, **or**
- MATH 109 (4) Calculus I
- MATH 110 (4) Calculus II
- MATH 210 (4) Calculus III

Plus one of these physics series:

- PHYX 106 (4) College Physics: Mechanics and Heat
- PHYX 107 (4) College Physics: Electromagnetism & Modern Physics, **or**
- PHYX 109 (4) General Physics A
- PHYX 210 (4) General Physics B
- PHYX 211 (4) General Physics C

Upper Division

CHEM 310 (3) Inorganic Chemistry I
CHEM 323 (1) Nuclear Magnetic Resonance Spectroscopy Techniques
CHEM 324 (3) Organic Chemistry I
CHEM 324L (2) Organic Chemistry I Lab
CHEM 325 (3) Organic Chemistry II
CHEM 325L (2) Organic Chemistry II Lab
CHEM 341 (5) Quantitative Analysis
CHEM 361 (3) Physical Chemistry I

One of the following:

- CHEM 362 (3) Physical Chemistry II
CHEM 363 (2) Physical Chemistry II Lab, **or**
- CHEM 410 (3) Inorganic Chemistry II
CHEM 410L (2) Inorganic Chemistry II Lab, **or**
- CHEM 441 (4) Instrumental Analysis

One of the following:

- CHEM 438 (4) Introductory Biochemistry, **or**
- CHEM 434 (3) Biochemistry I
CHEM 434L (2) Biochemistry I Lab
CHEM 435 (3) Biochemistry II
CHEM 435L (2) Biochemistry II Lab

REQUIREMENTS FOR THE MINOR

A minimum of 8 upper division units must be completed at Humboldt State University.

Students must earn a minimum grade of C- in all courses with the "CHEM" prefix for the BS Chemistry Minor degree.

Lower Division

CHEM 109 (5) General Chemistry I
CHEM 110 (5) General Chemistry II

Upper Division

15 approved units, including at least one of the following sequences:

- CHEM 323 (1) Nuclear Magnetic Resonance Spectroscopy Techniques
CHEM 324 (3) Organic Chemistry I
CHEM 324L (2) Organic Chemistry I Lab
CHEM 325 (3) Organic Chemistry II
CHEM 325L (2) Organic Chemistry II Lab, **or**
- CHEM 341 (5) Quantitative Analysis
CHEM 441 (4) Instrumental Analysis, **or**
- CHEM 361 (3) Physical Chemistry I
CHEM 362 (3) Physical Chemistry II
CHEM 363 (2) Physical Chemistry II Lab, **or**
- CHEM 434 (3) Biochemistry I
CHEM 434L (2) Biochemistry I Lab
CHEM 435 (3) Biochemistry II
CHEM 435L (2) Biochemistry II Lab

For the required 15 units, all of the above courses and the following courses are approved for all students:

CHEM 310 (3) Inorganic Chemistry I
CHEM 330 (3) Molecular Modeling
CHEM 370 (3) Earth System Chemistry
CHEM 410 (3) Inorganic Chemistry II
CHEM 410L (2) Inorganic Chemistry II Lab
CHEM 495 (1-3) Undergraduate Research

The following courses are approved for all students except those listed:

CHEM 228 (4) Brief Organic Chemistry
[not approved for students getting credit for CHEM 324/324L or 325/325L]
CHEM 438 (4) Introductory Biochemistry
[not approved for students getting credit for CHEM 434/434L or 435/435L]

