



Chemistry Major and Minor

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Chemistry is the most central of sciences. It is involved in natural processes occurring in living things, the earth, the oceans, and the atmosphere. The chemical industry provides materials to feed, clothe, and house mankind; drugs to combat disease; and processes to provide energy for societal needs. Chemistry is playing an ever-increasing role in our society, particularly in high technology fields such as molecular biology, microelectronics, drug design, and ceramics. The chemistry curriculum provides a rigorous, comprehensive background in the four primary areas of chemistry. The program is appropriate for students who plan to attend graduate school or pursue American Chemical Society (ACS) certification.

The chemistry degree includes Dietrich School General Education Requirements, core chemistry courses, and electives. These electives include undergraduate research, in collaboration with departmental faculty, and courses in frontier areas of chemistry and related fields. It offers special options for students with specific interests in combining chemistry with other subjects, such as Bioscience. These options involve additional courses in the chosen second discipline with a limited overlap of selected required science courses. These elective courses will allow students to focus free credits into a sequence that gives them an in-depth introduction to the subject and will be relevant to their career goals.

The degree in chemistry prepares students for a career in business or industry, or for advanced study in chemistry. Combined with core biology courses, students frequently select the Chemistry major as the preferred major for admission to the graduate health professions, including medical and dental school. In combination with the education option, the chemistry major is prepared to enter a certification program leading to a career in secondary science teaching. Chemists at all levels of training have a wide variety of industrial and corporate career opportunities: in agricultural chemistry, food chemistry, environmental science, petrochemicals, pharmaceuticals, semiconductors and electronics, and fine chemicals, as well as in basic research. Many opportunities exist for chemistry majors with skills in business (sales, technical marketing, management), communications (technical writing, journalism), and material science (nanoscience, research and development, production and manufacturing). The option programs are specifically designed to meet the demand for professionals trained in these and other interdisciplinary areas.

Required courses for the Chemistry major

The major requires the completion of 61 credits distributed as follows.

Chemistry courses

CHEM 0110 General Chemistry 1 **or** CHEM 0710 UHC General Chemistry 1
CHEM 0120 General Chemistry 2 **or** CHEM 0720 UHC General Chemistry 2
CHEM 0250 Analytical Chemistry
CHEM 0260 Analytical Chemistry Lab
CHEM 0310 Organic Chemistry 1 **or** CHEM 0730 UHC Organic Chemistry 1
CHEM 0320 Organic Chemistry 2 **or** CHEM 0740 UHC Organic Chemistry 2
CHEM 0345 Organic Chemistry **or** CHEM 0750 UHC Organic Chemistry Lab
CHEM 1130 Inorganic Chemistry
CHEM 1140 Inorganic Chemistry Lab
CHEM 1250 Instrumental Analysis
CHEM 1255 Instrumental Analysis Lab
CHEM 1410 Physical Chemistry 1
CHEM 1420 Physical Chemistry 2
CHEM 1430 Physical Chemistry Lab 1
CHEM 1440 Physical Chemistry Lab 2

Other required Natural Science courses

MATH 0220, MATH 0230 Analytic Geometry and Calculus 1 and 2
CHEM 1000 Mathematics for Chemists **or** MATH 0240 Analytical Geometry and Calculus 3
PHYS 0174, PHYS 0175, PHYS 0219 Physics for Science and Engineering 1, 2, and Lab

Science electives (2-credit minimum)

BIOSC: 0350, 0370, 1000, 1500, 1810, 1820, 1830, 1850, 1940
CHEM: 1310, 1380, 1460, 1600, 1605, 1620, 1700, 1710, 1720, 1810, courses above 2000 except 2700
CS: 0401, 0441, 0445
GEOL 1001, 1500
STAT 1000

Note: Students seeking ACS Certification must take either BIOSC 1000 or CHEM 1810.

Grade requirements

A minimum GPA of 2.0 in departmental courses is required for graduation.

Satisfactory/No Credit option

CHEM 0110, CHEM 0120, and all required Mathematics and Physics courses can be taken on an S/NC basis.

Writing (W) requirement

Students must complete at least one W-course in the major.

Honors major requirements

To earn departmental honors in chemistry, the student must have an overall minimum GPA of 3.0;

- maintain a minimum GPA of 3.25 in all required CHEM courses;
- present two credits of CHEM 1710 Undergraduate Research;
- present one credit of CHEM 1711 Undergraduate Research Writing.

Advising

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Checklist and suggested plan of study for the Chemistry major

Fall freshman year

_____ CHEM 0110 / 0710
_____ MATH 0220

Spring freshman year

_____ CHEM 0120 / 0720
_____ MATH 0230 / 0235

Fall sophomore year

_____ CHEM 0310 / 0730
_____ CHEM 1000 / MATH
0240
_____ PHYS 0174 / 0475

Spring sophomore year

_____ CHEM 0320 / 0740
_____ CHEM 0345
_____ PHYS 0175 / 0476
_____ PHYS 0219

Fall junior year

_____ CHEM 0250
_____ CHEM 0260
_____ CHEM 1410
_____ PHYS 0219 / 0577

Spring junior year

_____ CHEM 1250
_____ CHEM 1255
_____ CHEM 1420
_____ CHEM 1430

Fall senior year

_____ CHEM 1130
_____ CHEM 1440
_____ Science Elective

Spring senior year

_____ CHEM 1140
_____ CHEM W course

Curricular options for the Chemistry major

Each option allows for the waiver of CHEM 1140, CHEM 1440, and the science elective.

Bioscience option (14-credit minimum)

_____ BIOSC 0057
_____ BIOSC 0150 / BIOSC 0715
_____ BIOSC 0067
_____ BIOSC 0160 / BIOSC 0716

Two of the following

_____ CHEM 1810 or BIOSC 1000 or BIOSC 1810
_____ BIOSC 0350 / BIOSC 0355

_____ BIOSC 0370

_____ BIOSC 1500

Note: This option allows the student to take PHYS 0110, 0111, and 0212 in lieu of PHYS 0174, 0175, and 0219.

Business option (18-credit minimum)

_____ ECON 0100 or ECON 0110 or ECON 0120
_____ BUSERV 1920 or BUSACC 0030
_____ BUSERV 1925 or BUSACC 0040
_____ BUS _____ (BUSERV/CBA Elective)
_____ BUS _____ (BUSERV/CBA Elective)
_____ BUS _____ (BUSERV/CBA Elective)

Note: This option allows the student to waive CHEM 1420 also.

Communications option (12-credit minimum)

_____ ENGCOMP 0400

Three of the following

_____ COMMRC 0320 _____ ENGWRIT 1330
_____ COMMRC 1105 _____ ENGWRIT 1340
_____ ENGWRIT 0550 _____ ENGWRIT 1394
_____ ENGWRIT 1310 _____ LING 0080
_____ ENGWRIT 1320 _____ LING 1000

Education option: (13-credit minimum)

_____ BIOSC 0057
_____ BIOSC 0150 or BIOSC 0715
_____ IL 1580
_____ PSYED 1001 or PSYED 1003

Note: The note under option 1 also applies to this option.

Material science option

_____ ENGR 0022 _____ CHEM 1605
_____ CHEM 1600 _____ CHEM 1620

International Studies option

Students pursuing this option must complete nine credits of natural science coursework as approved by the departmental advisor.

Checklist for the Chemistry minor

Students must apply for any official Minor they will complete or have completed at the time they apply for graduation.

Core requirements

One of the following courses One of the following courses

_____ CHEM 0110 _____ CHEM 0120
_____ CHEM 0710 _____ CHEM 0720
_____ CHEM 0760 _____ CHEM 0770
_____ CHEM 0960 _____ CHEM 0970

Advanced lecture requirements (3 courses)

_____ CHEM 0250 _____ CHEM 1410
_____ CHEM 0310 or BIOSC _____ CHEM 1420
_____ CHEM 0320 or BIOSC _____ BIOSC 1000
_____ CHEM 1130 _____ BIOSC 1810
_____ CHEM 1250

Laboratory requirements (2 credits)

_____ CHEM 0260 _____ CHEM 1255
_____ CHEM 0345 _____ CHEM 1430
_____ CHEM 1140 _____ CHEM 1440