

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 plays an ever-increasing role in our society, particularly in high technology fields such as molecular biology, microelectronics, drug design and ceramics. The bachelor's degree in chemistry consists of core courses in four primary areas: analytical, organic, physical, and inorganic, and electives such as polymer science. We also offer 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, together with an allowed waiver of selected required science courses. The option courses will allow you to focus some free credits into a sequence that will give you an in-depth introduction to the subject, and will be directly relevant to your career goals. We stress that none of these special options requires more than 120 credits to graduate.

The degree in chemistry prepares students for careers in business and industry, or for graduate study in chemistry. Combined with core biology courses, the chemistry major is frequently selected 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 prepares a student 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, fine chemicals, as well as in basic research. Many opportunities are available for chemistry majors with skills in business (sales, technical marketing, management), communications (technical writing, journalism), and education. The option programs are designed specifically to meet the demand for professionals trained in these and other interdisciplinary fields.

Required courses for the Chemistry major

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 major requires the completion of 61 credits distributed as follows.

Chemistry courses

CHEM 0110 General Chemistry 1
CHEM 0120 General Chemistry 2
CHEM 0250 Analytical Chemistry
CHEM 0260 Analytical Chemistry Lab
CHEM 0310 Organic Chemistry 1
CHEM 0320 Organic Chemistry 2
CHEM 0345 Organic Chemistry
CHEM 1000 Mathematics for Chemists *
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

* May take MATH 0240 in place of this course.

Mathematics and Physics courses

MATH 0220, 0230 Analytic Geometry and Calculus 1, 2
PHYS 0174, 0175, 0219 Physics for Science and Engineering 1, 2, and Lab

Science electives (2-credit minimum)

BIOSC: 0350, 0355, 0370, 1000, 1500, 1810, 1820, 1830
CHEM: 1260, 1310, 1380, 1450, 1460, 1480, 1600, 1605, 1620, 1700, 1710, 1720, 1810, courses above 2000 except 2700

CS: 0441, 0445

GEOL: 1001, 1500, 2521

MATH: 0250, 1180, 1185

STAT: 1151

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.

Related area: The combination of: MATH 0220; MATH 0230; and CHEM 1000 **or** MATH 0240 will satisfy the related area requirement for the CHEM 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: George C. Bandik
Director of Undergraduate Studies
CHVRN 107
412-624-8212
bandik@pitt.edu

Checklist and suggested plan of study for the Chemistry major

Fall freshman year

_____ CHEM 0110 **or** 0710
_____ MATH 0220

Spring freshman year

_____ CHEM 0120 or 0720
_____ MATH 0230 or 0235

Fall sophomore year

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

Spring sophomore year

_____ CHEM 0320 or 0740
_____ CHEM 0345
_____ PHYS 0175 or 0476

Fall junior year

_____ CHEM 0250
_____ CHEM 0260
_____ CHEM 1410
_____ PHYS 0219 or 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

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 0050
_____ BIOSC 0150 / BIOSC 0715
_____ BIOSC 0060
_____ 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 / ECON 0110 / ECON 0120
_____ BUSERV 1920 / BUSACC 0030
_____ BUSERV 1925 / 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
_____ COMMRC 1105
_____ ENGVRT 0550
_____ ENGVRT 1310
_____ ENGVRT 1320
_____ ENGVRT 1330
_____ ENGVRT 1340
_____ ENGVRT 1394
_____ LING 0080
_____ LING 1000

Education option: (13-credit minimum)

_____ BIOSC 0050
_____ BIOSC 0150 / BIOSC 0715
_____ IL 1580
_____ PSYED 1001 / PSYED 1003

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

Material science option

_____ ENGR 0022 **or** CHEM 1540
_____ CHEM 1600
_____ CHEM 1605
_____ CHEM 1620

Checklist for the Chemistry minor

Note: 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

_____ CHEM 0110
_____ CHEM 0710
_____ CHEM 0760
_____ CHEM 0960

One of the following

_____ CHEM 0120
_____ CHEM 0720
_____ CHEM 0770
_____ CHEM 0970

Advanced lecture requirements (3 courses)

_____ CHEM 0310 / BIOSC 0730 Organic
_____ CHEM 0320 / BIOSC 0740
_____ CHEM 0250 Analytical
_____ CHEM 1250
_____ CHEM 1410 Physical
_____ CHEM 1420
_____ CHEM 1130 Inorganic
_____ CHEM 1810
_____ BIOSC 1000 / BIOSC 1810

Laboratory requirements (2 credits)

_____ CHEM 0345
_____ CHEM 0260 Analytical
_____ CHEM 1255
_____ CHEM 1430 Physical
_____ CHEM 1440
_____ CHEM 1140 Inorganic