

## Chemistry Major and Minor

[www.chem.pitt.edu](http://www.chem.pitt.edu)

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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 computer science (programming, database management, information science). 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

0110, 0120 General Chemistry 1, 2  
0250, 0260 Analytical Chemistry and Lab  
0310, 0320 Organic Chemistry 1, 2  
0330, 0340 Organic Chemistry Lab 1, 2  
1130, 1140 Inorganic Chemistry and Lab  
1250, 1255 Instrumental Analysis and Lab  
1410, 1420 Physical Chemistry 1, 2  
1430, 1440 Physical Chemistry Lab 1, 2

#### Mathematics and Physics courses

0220, 0230, 0240 Analytic Geometry and Calculus 1, 2, 3  
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, 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 BIOSC 1000.

**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 (1) **W-course** in the major.

**Related area:** Mathematics satisfies 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](mailto:bandik@pitt.edu)

## Checklist and 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 0330  
\_\_\_\_\_ MATH 0240  
\_\_\_\_\_ PHYS 0174 or 0475

### Spring sophomore year

\_\_\_\_\_ CHEM 0320 or 0740  
\_\_\_\_\_ CHEM 0340 or 0750  
\_\_\_\_\_ 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

## 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 1590 Biological  
\_\_\_\_\_ BIOSC 1000 / BIOSC 1810

## Laboratory requirements (2 courses)

\_\_\_\_\_ CHEM 0330 Organic  
\_\_\_\_\_ CHEM 0340 / CHEM 0750  
\_\_\_\_\_ CHEM 0260 Analytical  
\_\_\_\_\_ CHEM 1255  
\_\_\_\_\_ CHEM 1430 Physical  
\_\_\_\_\_ CHEM 1440  
\_\_\_\_\_ CHEM 1140 Inorganic  
\_\_\_\_\_ CHEM 1595 Biological

## 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

\_\_\_\_\_ BIOSC 0350 / BIOSC 0355  
\_\_\_\_\_ BIOSC 0370  
\_\_\_\_\_ BIOSC 1000  
\_\_\_\_\_ BIOSC 1500  
\_\_\_\_\_ BIOSC 1810

**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  
\_\_\_\_\_ ENGWRIT 0550  
\_\_\_\_\_ ENGWRIT 1310  
\_\_\_\_\_ ENGWRIT 1320  
\_\_\_\_\_ ENGWRIT 1330  
\_\_\_\_\_ ENGWRIT 1340  
\_\_\_\_\_ ENGWRIT 1394  
\_\_\_\_\_ LING 0080  
\_\_\_\_\_ LING 1000

### Education option: (13-credit minimum)

\_\_\_\_\_ ADMPS 1001  
\_\_\_\_\_ BIOSC 0050  
\_\_\_\_\_ BIOSC 0150 / BIOSC 0715  
\_\_\_\_\_ IL 1430  
\_\_\_\_\_ PSYED 1001 / PSYED 1003

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

### Material science option

\_\_\_\_\_ ENGR 0022  
\_\_\_\_\_ CHEM 1600  
\_\_\_\_\_ CHEM 1605  
\_\_\_\_\_ CHEM 1620

### Photonics option

\_\_\_\_\_ PHYS 1361  
\_\_\_\_\_ EE 1259 / PHYS 1225 / PHYS 1351  
\_\_\_\_\_ CHEM 1470  
\_\_\_\_\_ CHEM 1472