

CHEMISTRY MAJOR
Bachelor of Science
Drs. Scott Hurst and Xiaoping Sun, Co-Program Directors
Chemistry Program Mission Statement

The mission of the chemistry program is to educate each student about the nature of chemistry and to prepare the student with sufficient knowledge and skills to pursue productive work in chemistry in a professional or graduate school, or in the workforce, and to pursue enlightened living and community involvement.

Program Description

Chemistry is the study of composition, structure and properties of matter. Our students are given a broad-based education to allow them to pursue a variety of careers. The Chemistry major prepares students to be successful in industry, pharmacy, government facilities and graduate or professional schools. The faculty encourage undergraduate research and students work closely with an academic advisor to provide a curriculum tailored to meet the needs of the students. Chemistry majors are in demand for local industry and their research experiment helps them be successful in their future graduate education.

Chemistry Program Learning Outcomes

The graduate will be able to:

1. Apply the major concepts, principles and theories of chemistry to solve problems.
2. Demonstrate safe and ethical laboratory and synthesis skills to obtain accurate results.
3. Search for chemical literature, perform research, and create new scientific knowledge.
4. Communicate the chemical research results in written or oral presentation.

What You Will Study

The major in chemistry consists of 125-130 credits, including 45 credits of required and elective chemistry courses, 24 credits of required mathematics and physics courses, 7 credits in natural science and biology, and about 27 credits of courses to achieve the General Education requirements.

The science and mathematics curriculum for the chemistry major is shown in the table below:

| REQUIRED CHEMISTRY COURSES – 45 CREDIT HOURS | | |
|---|---------------------------------|-----------|
| CHEM 101 | General Chemistry I and Lab | 4 credits |
| CHEM 102 | General Chemistry II and Lab | 4 credits |
| CHEM 201 | Organic Chemistry I and Lab | 4 credits |
| CHEM 202 | Organic Chemistry II and Lab | 4 credits |
| CHEM 251 | Quantitative Analysis and Lab | 4 credits |
| CHEM 362 | Instrumental Analysis and Lab | 4 credits |
| CHEM XXX | 300 or 400-Level Electives | 6 credits |
| CHEM 410 | Biochemistry | 4 credits |
| CHEM 412 | Physical Chemistry I | 3 credits |
| CHEM 413 | Physical Chemistry II | 3 credits |
| CHEM 494 | Proposal Writing in Chemistry | 1 credit |
| CHEM 495 | Research in Chemical Science | 3 credits |
| CHEM 496 | Seminar in Chemical Science | 1 credit |
| REQUIRED MATHEMATICS COURSES – 16 CREDIT HOURS | | |
| MATH 123 | Pre-Calculus | 4 credits |
| MATH 201 | Calculus I | 4 credits |
| MATH 202 | Calculus II | 4 credits |
| MATH 203 | Calculus III | 4 credits |
| REQUIRED PHYSICS COURSES – 8 CREDIT HOURS | | |
| PHSC 201 | Introductory Physics I and Lab | 4 credits |
| PHSC 202 | Introductory Physics II and Lab | 4 credits |

| REQUIRED BIOLOGY COURSE – 4 CREDIT HOURS | | |
|--|--|-----------|
| BIOL 130 | Introductory Biology for Majors and Lab | 4 credits |
| REQUIRED NATURAL SCIENCE COURSE – 3 CREDIT HOURS | | |
| NSCI 220 or MATH 240 | Statistics in Science and Research or Probability and Statistics | 3 credits |

An AP score of 5 or higher may be used to fulfill the CHEM 101 and CHEM 102 requirement. The initial course in MATH and eligibility to take CHEM 101 will be determined based on math course placement.

A student should consult with his/her academic advisor for selection of 300- or 400-level chemistry elective courses (CHEM XXX).

Please note that many chemistry and biology classes have a lab. Although the lab is registered as a separate class, the credit hour totals above include the lab hours.

Additional Requirements

Students must meet all General Education Requirements required for graduation from the University of Charleston. Students should take care to fulfill prerequisites for upper division courses as noted in the course descriptions. ***In order to graduate, students must earn a C or better in all courses required for the major.***

Successful completion of American Chemical Society (ACS) examinations may be required as part of the course assessments.

Chemistry majors should follow the Research Timeline described above in the section about Natural Sciences & Mathematics Department Requirements.

Admission Requirements

Students must gain general admission to the University of Charleston.

Chemistry Minor

Students can earn a minor in Chemistry by completing 18 credits of Chemistry classes (six of the 18 credits may be classes required for other degrees) in required classes. The required classes are:

CHEM 201, CHEM 201L, CHEM 202, CHEM 202L, CHEM 251, CHEM 251L, CHEM 412, CHEM 410, CHEM 411, and CHEM 420. Majors outside the Natural Science department may be required to take additional hours as prerequisite or co-requisite classes.