

Biochemistry

View Chemistry & Biochemistry Department website

Biochemistry is involved with the exploration of the molecular processes of life and reflects the intersection of chemistry and biology needed to understand these processes. The biochemistry major is designed to meet the needs of students interested in this interdisciplinary subject. Students completing a biochemistry major will be prepared for careers in the pharmaceutical and biotechnology industries, for pursuit of graduate degrees in biochemistry or chemistry and for entry into medical, veterinary, dental or pharmacy schools. This degree program follows guidelines suggested by the American Society for Biochemistry and Molecular Biology for an undergraduate degree in biochemistry.

Learning Outcomes

- Correctly use the fundamental concepts of biochemistry
- Execute research using scientific approaches, and safely perform experiments using appropriate techniques and equipment
- Express scientific information through written and oral communication at a level appropriate to the audience
- Demonstrate the ability to identify, locate and evaluate Biochemistry related primary literature
- Integrate professional ethics while conducting experiments, performing data analysis, and communicating results
- Work collaboratively with other students and faculty members on classwork and in the laboratory
- Use problem solving and critical thinking skills
- Employ chemical waste management and minimization and describe the role of biochemistry in modern issues of sustainability

Degree Requirements for the Major

General College Requirements

General College Requirements (see “Curriculum” section), including the following requirements to satisfy the major:

Required Courses

Chemistry Courses (24 credit hours)

- CHEM 106: General Chemistry II
- CHEM 311: Organic Chemistry I
- CHEM 312: Organic Chemistry II
- CHEM 420: Biochemistry I
- CHEM 425: Biochemistry II
- CHEM 451: Physical Chemistry I

Biology Courses (14 credit hours)

- BIOL 105: Principles of Biology I
- BIOL 105L: Principles of Biology I Lab
- BIOL270: Genetics
- BIOL270L: Genetics Lab
- BIOL 471: Molecular Biology

Cognate Courses (16 credit hours)

- MATH 151: Calculus I
- MATH 152: Calculus II
- PHYS 141: General Physics I (Recommended) or PHYS151: Fundamentals of Physics 1
- PHYS 142: General Physics II (Recommended) PHYS152: Fundamentals of Physics 2

St. Mary's Project

Every biochemistry major must complete a St. Mary's Project. This project may be in biochemistry or in another major discipline or study area. The guidelines in the selected area apply. The project must be proposed to a mentor and to the chair of the Department of Chemistry and Biochemistry at least three weeks before the last day of classes of the second semester of the student's junior year, and must be approved by the mentor and the department chair.

Minimum Grade and GPA Requirements

Students must earn a grade of C- or better in all courses listed above, and maintain an overall GPA of 2.00 or better in these required courses.

Note: Students earning a degree in biochemistry may not pursue a second major in chemistry.

Sequence of Study

The following model is suggested as a sequence of study that satisfies the above requirements:

- **First Year:**

Core Curriculum requirements, CHEM 103 (or earned a 4 or 5 on Chemistry AP exam), CHEM 106, BIOL 105, BIOL 105L.

- **Second Year:**

Core Curriculum requirements, CHEM 311, CHEM 312, BIOL270, BIOL270L, MATH 151, MATH 152.

- **Third Year:**

Core Curriculum requirements, CHEM 420, CHEM 425, PHYS 141, PHYS 142, BIOL 471.

- **Fourth Year:**

St. Mary's Project, CHEM 451, electives.

Faculty

Geoffrey M. Bowers, Ruth Bowers, Daniel T. Chase, Andrew S. Koch, Randolph K. Larsen, Pamela S. Mertz (Department Chair), Kelly Neiles, Shanen Sherrer, Troy Townsend