

Program Overview: Bachelor of Science, Chemistry Biochemistry Concentration

About This Major . . .

Biochemistry students gain a unique perspective on the composition, properties, and reactivity of the substances surrounding them, especially in the biological world. Through advanced coursework in chemistry and biology they achieve insight into the chemistry of biological systems and the structural basis of life. Students gain problem-solving skills that can be applied in chemistry and biology labs, in other classes, and in daily life. Biochemistry majors have the opportunity to interact with professors from a diversity of chemistry and biology backgrounds, and students are provided with a wide variety of research opportunities. Through research, students can explore advanced chemistry and biology topics, develop new scientific procedures, and make scientific discoveries. In addition, biochemistry students are trained to independently use modern instrumentation including a 300 MHz NMR, liquid chromatography, mass spectrometer, thermocyclers for DNA replication, and a confocal microscope.

The bachelor's degree in Biochemistry culminates in two courses designed to bridge students' coursework with their entry into the workforce, a medical degree program, or graduate school. The Advanced Laboratory course helps students to synthesize knowledge from various chemical disciplines and apply it to solving chemical problems in a practical manner. This is similar to the type of process that they are likely to experience after graduation. Our Communicating in the World of Chemistry course couples with our Advanced Laboratory course to help students express themselves in a professional manner while applying for and entering their new positions.

For more information on what you can do with this major, go to <http://coloradomesa.edu/career/students/explore/major.html> and select Chemistry under Biological and Physical Sciences.

All CMU baccalaureate graduates are expected to demonstrate proficiency in critical thinking, communication fluency, quantitative fluency, and specialized knowledge/applied learning.

By completing a biochemistry major, you will be able to:

1. demonstrate fluency in the concepts from the major fields of chemistry (organic, physical, analytical, and biochemistry). (Specialized Knowledge)
2. utilize mathematics to solve chemical and biological problems. (Quantitative Fluency)
3. employ proper experimental techniques. (Applied Learning)
4. interpret chemical and biological information from peer-reviewed publications. (Critical Thinking)
5. communicate chemical and biological topics effectively, both verbally and in writing. (Communication Fluency)
6. demonstrate a solid understanding of genetics, cellular, and molecular biology. (Specialized Knowledge)

Program Highlights:

Spread the Word

By joining the Chemistry Club, which stages fun and educational chemistry demonstrations for CMU students and local K-12 students.

Launch your Career

With a position in biochemistry research, medicine, or teaching.

Take the Next Step

By completing an advanced degree in chemistry, biomedical engineering, or pharmacy, or by becoming a medical doctor. The biochemistry concentration builds on the strength of our chemistry, whose majors have gone on to pursue advanced degrees from the University of Denver, Arizona State University, the University of Illinois, and other major research universities.

Program Requirements

A student must follow CMU graduation requirements by completing 120 semester credit hours, including 40 credits of coursework at the 300+ level. See the “Undergraduate Graduation Requirements” in the catalog for additional graduation information. Students should work closely with a faculty advisor when selecting and scheduling courses prior to registration. In general, CMU’s programs of study are based on two curriculum groups:

1. Essential Learning

CMU’s Essential Learning program provides the foundation of skills and information that cuts across all fields of study and the support for advanced concepts that students will later encounter in their majors. Before moving into work at the 300+ level, students complete the Maverick Milestone and its co-requirement, Essential Speech. This pair of courses is a capstone experience where students integrate what they have learned from their foundation courses by making connections between diverse areas of knowledge. The capstone also is an opportunity for students to work with disparate ideas, a critical skill expected of all CMU graduates that will aid them in solving the complex and unscripted problems they will encounter in their personal, professional, and civic lives.

2. What You Will Study in This Major. . .

Foundational Courses

These courses build your problem-solving skills and provide you with concepts and tools that you will apply in your chemistry courses.

- Attributes of Living Systems and Lab
- Calculus I and II
- General Physics I or Fundamental Mechanics and Lab
- General Physics II or Electromagnetism and Optics and Lab

Core Courses

Here you learn the essential knowledge and skills for biochemistry.

- General Chemistry I and II and Labs
- Analytical Chemistry and Labs
- Organic Chemistry I and II and Labs
- Physical Chemistry I
- Advanced Laboratory I
- Communication in Chemistry
- Biochemistry I and II and Lab
- Principles of Genetics and Lab
- Cellular Biology
- Lab Investigations in Cellular Biology

Chemistry Electives

These courses allow you to explore more advanced concepts in areas of chemistry and biology that you find especially interesting.

- | | |
|--------------------------------|----------------------|
| • Inorganic Chemistry I and II | • Immunology |
| • Physical Chemistry II | • Evolution |
| • Advanced Organic Chemistry | • Molecular Genetics |
| • Instrumental Analysis | • Endocrinology |
| • Developmental Biology | • Pharmacology |
| • General Physiology | • Seminar |
| • Microbiology | • Research |

Electives

Electives are an opportunity for you to supplement or complement your core courses with additional work in mathematics and science, or explore any other discipline that may interest you. A strategic selection of electives can help you “cross-pollinate” your understanding of chemistry with concepts from other fields.

Biochemistry majors may take a wide variety of electives, including additional biology or math classes. For example, Zoology, Botany, Ecology, Modern Physics, Quantum Theory, and Differential Equations are electives that complement a CMU

biochemistry major.

