

Augustana College

Biochemistry

Courses required for the first year: CHEM 131 and CHEM 132 or CHEM 235
Courses recommended for the first year: MATH 160, 220, or 230 depending on math placement
Contact: Patrick Crawford, Ph.D. (Associate professor and Co-chair) patrickcrawford@augustana.edu and Pamela Trotter, Ph.D. (Professor) pamtrotter@augustana.edu

The Major in Biochemistry

MAJOR IN BIOCHEMISTRY. 28 credits in CHEM beyond CHEM-132/235, including CHEM-255, CHEM-322, CHEM-361, CHEM-441, CHEM-442, and one Senior Inquiry chosen from CHEM-474, CHEM-475 or CHEM-476. 12 credits in BIOL, including BIOL-130, BIOL-250, and one biology elective. Required supporting courses: PHYS-151/152 or 211/212 and MATH-160, 220, and 230. Recommended supporting courses: CHEM-365, CHEM-455, CHEM 435, COMP 211 and COMP-212.

Biology Electives for BCHM Major

BIOL 343	Microbiology
BIOL 360	Comparative Physiology
BIOL 362	Human Physiology
BIOL 373	Developmental Biology
BIOL 375	Molecular Biology
BIOL 392	Cancer Biology
BIOL 348	Cell signaling and Regulation
BIOL 371	Introduction to Biomolecular Research

Required Courses

Course Number	Course Name	Learning Perspective	Prerequisites	Credits
CHEM 131*	General Chemistry I	PN	None	4
CHEM 132*	General Chemistry II	PN	CHEM 131 or CHEM 235	4
CHEM 235*	Introduction to Inorganic Chemistry	PN	Two years high school chemistry or instructor permission	4

CHEM 255	Quantitative Analysis		CHEM 132 or CHEM 235	4
CHEM 321	Organic Chemistry I		CHEM 132 or CHEM 235	4
CHEM 322	Organic Chemistry II		CHEM 321	4
CHEM 361	Physical Chemistry I		CHEM 131 or 235, PHYS 152 or 212, MATH 220 and 230	4
CHEM 441	Biochemistry I		CHEM 322 and BIOL 130	4
CHEM 442	Biochemistry II		CHEM 441 and BIOL 130	4
CHEM 471	Inquiry in Chemistry		CHEM 322	2
CHEM 474, 475, or 476	Senior Inquiry		CHEM 471**	2

*Placement in first-year chemistry courses depends on previous preparation. See below for more details.

**May be taken as a co-requisite

Additional Courses (or Required Supporting Courses)

Course Number	Course Name	Learning Perspective	Prerequisites	Credits
MATH 160	Calculus		Math placement or MATH 140	4
MATH 220 and 230	Integration Methods and Infinite Series		MATH 160	2+2
PHYS 151 or 211	Principles of Physics I or Foundational Physics I	PN	PHYS 211 requires MATH 160	4
PHYS 152 or 212	Principles of Physics II or Foundational Physics II	PN	PHYS 212 requires MATH 220 (prerequisite) MATH 260 (co-requisite)	4
BIOL 130	Molecules to Cells			4
BIOL 250	Genetics		BIOL 130 and 140	4
BIOL Elective	See list above			4

Major Overview

Biochemistry is ideal for the student interested in the chemistry of living things and the close examination of the molecules that carry out such functions as metabolism, movement, and gene expression. A degree in biochemistry prepares a student for many fields beyond biochemistry or biomedical sciences, as it is the core basis for many more applied fields such as biotechnology, molecular genetics, immunology, pharmacology, toxicology and forensic science. A biochemistry major is ideal preparation for graduate study in such applied fields.

The degree is also appropriate for students interested in health professions (i.e. medicine, dentistry), as well as students interested in the biotechnology and pharmaceutical industries. A biochemistry background could also be useful for students interested in business, law, regulation, journalism or technical writing related to the molecular life sciences. The biochemistry major includes courses in chemistry, biology, mathematics and physics.

A note on selecting first-year chemistry courses:

Students with a strong high school chemistry background (i.e. two years of chemistry, AP chemistry) and who are considering majoring in chemistry or biochemistry should take CHEM 235 since this will put them on track to take Organic Chemistry I (CHEM 321) or Quantitative Analysis (CHEM 255) during spring semester of their first year.

Students seeking to complete a year of general chemistry for professional school have several options:

1. Students with a typical high school science background (one year of chemistry) should plan to complete CHEM 131 and CHEM 132 (General Chemistry I and II).
2. Students who have earned AP scores of 4 or 5 in chemistry can receive credit for CHEM 132. In order to complete a year of general chemistry (required by many professional schools) they should take CHEM 131 or CHEM 235 (Introductory Inorganic Chemistry; preferred).
3. There will be one section of CHEM 131 offered each spring semester and CHEM 132 offered each fall semester (starting fall 2020) to accommodate student scheduling needs and provide flexibility.

Updated March 2020