

BIOCHEMISTRY B.S.

The Biochemistry Program is a joint program between the Department of Chemistry and Biochemistry and the Division of Biological Sciences. Biochemistry is an interdisciplinary science that integrates chemistry and biology to understand the molecular basis of life. The program offers a B.S. in Biochemistry, a B.S. in Computational Biochemistry, and M.S. and Ph.D. degrees in Biochemistry & Biophysics. The Biochemistry Program is accredited by the American Society for Biochemistry and Molecular Biology (ASBMB).

Undergraduate majors receive a solid foundation in both chemistry and biology. Biochemistry courses are usually taken in the junior year allowing majors to become involved in research with faculty and to take electives in their senior year. The major also introduces students to computer science, an essential tool in modern biochemistry. The B.S. in Biochemistry prepares students for advanced degrees in biochemistry or biophysics, for medical, dental or veterinary schools and for careers in the pharmaceutical and biotechnology industries.

Bachelor of Science - Biochemistry

General Education Requirements

Information regarding these requirements can be found in the General Education Section (<http://catalog.umn.edu/academics/general-education-requirements/>) of the catalog.

Summary

Code	Title	Hours
Lower-Division Core		
Biochemistry		1
Biology		12
General and Organic Chemistry		20
Physics		10
Mathematics		8
Computer Science		3
Upper-Division Core		
Biochemistry		9
Biology		3
Analytical Chemistry		8
Inorganic Chemistry		3
Physical Chemistry		4
Advanced Electives		12
Total Hours		93

Degree Specific Credits: 93

Required Cumulative GPA: 2.0

Lower-Division Core

Rule: Must complete the following subcategories. 54 total credits required.

Biochemistry

Code	Title	Hours
Complete the following course:		
BCH 294	Seminar/Workshop	1
Total Hours		1

Minimum Required Grade: C-

Biology

Code	Title	Hours
Complete all of the following courses:		
BIOB 160N	Principles of Living Systems	3
BIOB 161N	Principles of Living Systems Lab	1
BIOB 260	Cellular and Molecular Biology	4
BIOB 272	Genetics and Evolution	4
Total Hours		12

Minimum Required Grade: C-

General and Organic Chemistry

Code	Title	Hours
Complete all of the following courses:		
CHMY 141N & CHMY 142N	College Chemistry I and College Chemistry I Lab	5
CHMY 143N & CHMY 144N	College Chemistry II and College Chemistry II Lab	5
CHMY 221 & CHMY 222	Organic Chemistry I and Organic Chemistry I Lab	5
CHMY 223 & CHMY 224	Organic Chemistry II and Organic Chemistry II Lab	5
Total Hours		20

Minimum Required Grade: C-

Physics

Code	Title	Hours
Complete all of the following courses:		
PHSX 215N & PHSX 216N	Fundamentals of Physics with Calculus I and Physics Laboratory I with Calculus	5
PHSX 217N & PHSX 218N	Fundamentals of Physics with Calculus II and Physics Laboratory II with Calculus	5
Total Hours		10

Minimum Required Grade: C-

Mathematics

Code	Title	Hours
Complete all of the following courses:		
M 171	Calculus I	4
M 172	Calculus II	4
Total Hours		8

Minimum Required Grade: C-

Computer Science

Code	Title	Hours
Complete the following course:		
CSCI 150	Introduction to Computer Science	3
Total Hours		3

Minimum Required Grade: C-

Upper Division Core

Rule: Must complete the following subcategories. 27 total credits required.

Biochemistry

Code	Title	Hours
Complete all of the following courses:		
BCH 480	Advanced Biochemistry I	3
BCH 482	Advanced Biochemistry II	3
BCH 486	Biochemistry Research Lab	3
Total Hours		9

Minimum Required Grade: C-

Biology

Code	Title	Hours
Complete the following course:		
BIOB 425	Advanced Cellular & Molecular Biology	3
Total Hours		3

Minimum Required Grade: C-

Analytical Chemistry

Code	Title	Hours
Complete all of the following courses:		
CHMY 311	Analytical Chemistry-Quantitative Analysis	4
CHMY 421	Advanced Instrument Analysis	4
Total Hours		8

Minimum Required Grade: C-

Inorganic Chemistry

Code	Title	Hours
Complete the following course:		
CHMY 401	Advanced Inorganic Chemistry	3
Total Hours		3

Minimum Required Grade: C-

Physical Chemistry

Note: Students planning to attend graduate school in biochemistry or biophysics are strongly advised to take the CHMY 373-CHMY 371 sequence

Code	Title	Hours
Complete the following course:		
CHMY 373	Physical Chemistry-Kinetics & Thermodynamics	4
Total Hours		4

Minimum Required Grade: C-

Advanced Electives

Note: No more than 3 credits combined of BIOB 490, CHMY 490, CHMY 498 and BCH 490. No more than 3 credits combined of CHMY 397 and CHMY 494.

Code	Title	Hours
Complete 12 credits from the following courses:		12
BCH 490	Undergraduate Research	
BIOB 301	Developmental Biology	
BIOB 375	General Genetics	
BIOB 410	Immunology	
BIOB 411	Immunology Laboratory	
BIOB 486	Genomics	
BIOB 490	Advanced Undergraduate Research	
BIOH 365	Human Anatomy and Physiology for Health Professions I	
BIOH 370	Human Anatomy and Physiology for Health Professions II	
BIOH 405	Hematology	
BIOH 462	Principles of Medical Physiology	
BIOM 360	General Microbiology	
BIOM 361	General Microbiology Lab	
BIOM 410	Microbial Genetics	
BIOM 411	Experimental Microbial Genetics Lab	
BIOM 427	General Parasitology	
BIOM 428	General Parasitology Lab	
BIOM 435	Virology	
CHMY 371	Physical Chemistry-Quantum Chemistry & Spectroscopy	
CHMY 397	Teaching Chemistry	
CHMY 402	Advanced Inorganic Chemistry Lab	
CHMY 442	Aquatic Chemistry	
CHMY 465	Organic Spectroscopy	
CHMY 466	FT-NMR Option for Undergraduate Research	
CHMY 485	Laboratory Safety	
CHMY 490	Undergraduate Research	
CHMY 494	Seminar/Workshop	
CHMY 498	Internship/Cooperative Education	
CSCI 451	Computational Biology	
PHAR 421	Medicinal Chemistry I	
PHAR 422	Medicinal Chemistry II	
Total Hours		12

Minimum Required Grade: C-

Advanced College Writing Requirement

Rule: To complete the Advanced College Writing Requirement, Biochemistry students may take the following courses or any other stand-alone advanced writing course.

Code	Title	Hours
BCH 482	Advanced Biochemistry II	3
BCH 486	Biochemistry Research Lab	3

Minimum Required Grade: C-