

BIOCHEMISTRY, BS

Bachelor of Science in Biochemistry (315002BS)

More on the Biochemistry major (<https://www.uakron.edu/chemistry/undergraduate.dot>)

Chemistry is an experimental science that seeks to understand the structure and function of molecules. Chemists synthesize new materials, and study their properties and how they interact with other compounds. The BS degree offered by the department prepares students for independent laboratory work and research.

The following information has official approval of **The Department of Chemistry** and **The Buchtel College of Arts & Sciences**, but is intended only as a supplemental guide. Official degree requirements are established at the time of transfer and admission to the degree-granting college. Students should refer to the Degree Progress Report (Stellic) which is definitive for graduation requirements. *Completion of this degree within the identified time frame below is contingent upon many factors, including but not limited to: class availability, total number of required credits, work schedule, finances, family, course drops/withdrawals, successfully passing courses, prerequisites, among others.* The transfer process is completed through an appointment with your academic advisor.

Three year accelerated option: for first time students who have earned credits for at least the first year of courses. Credits can be earned through qualifying scores on appropriate Advanced Placement (AP) exams or through [College Credit Plus](#) Program (CCP) courses. Credits for qualifying AP scores or CCP courses are determined by the appropriate academic department. Departments may assign varied course credit, depending on the student's score on an AP exam or [grade in a CCP](#) course. Students may also receive credit by examination or via placement tests, where appropriate.

Requirements Summary

Code	Title	Hours
	General Education Requirements (https://bulletin.uakron.edu/undergraduate/general-education/) [*]	31-29
	College of Arts & Sciences Requirements	8
	Chemistry Requirements	33-35
	Biology Requirements	24
	Physics Requirements	8
	Mathematics Requirements	8
	Biochemistry Electives	8
Total Hours		120

* Several courses required for the major also satisfy General Education requirements. The University minimum of 36 credits are required for General Education and credit for these courses will apply to multiple requirements.

Recommended General Education Courses

Code	Title	Hours
Students pursuing a bachelor's degree must complete the following General Education coursework. Diversity courses may also fulfill major or Breadth of Knowledge requirements. Integrated and Applied Learning courses may also fulfill requirements in the major.		
Students are not required to enroll in the specific courses listed below. However, to facilitate successful degree completion, the academic department strongly encourages completion of the following recommendations.		
Academic Foundations		12
<i>Mathematics, Statistics and Logic: 3 credit hours</i>		
MATH 221	Analytic Geometry-Calculus I	
MATH 222	Analytic Geometry-Calculus II	
<i>Speaking: 3 credit hours</i>		
<i>Writing: 6 credit hours</i>		
Breadth of Knowledge		22
<i>Arts/Humanities: 9 credit hours</i>		
<i>Natural Sciences: 7 credit hours</i>		
CHEM 151	Principles of Chemistry I	
CHEM 152	Principles of Chemistry I Laboratory	
CHEM 153	Principles of Chemistry II	
BIOL 111	Principles of Biology I	
BIOL 112	Principles of Biology II	
PHYS 261	College Physics I	
& PHYS 262	and College Physics II	
PHYS 291	Elementary Classical Physics I	
& PHYS 292	and Elementary Classical Physics II	
<i>Social Sciences: 6 credit hours</i>		
Diversity		
Domestic Diversity		
Global Diversity		
Integrated and Applied Learning		2
<i>Select one class from one of the following subcategories:</i>		
Complex Issues Facing Society		
Capstone		
<i>Review the General Education Requirements page for detailed course listings.</i>		
Total Hours		36

College of Arts & Sciences Requirements

Code	Title	Hours
Degree requirements for this Bachelor of Science in Arts & Sciences include the demonstration of ability to use another language by completion of the first year of a foreign language.		
<i>1 Year Language Proficiency</i>		8
101	Beginning I	
102	Beginning II	
SLPA 222	Survey of Deaf Culture in America (American Sign Language option only)	
Students must also complete a minimum of 40 credits (excluding workshops) consisting of either:		
Upper-level (300/400) courses both in and outside of the student's major;		

or other courses outside the major department approved by the student's major department chair (permission should be obtained prior to enrollment); these may not include workshops

Chemistry Requirements ¹

Code	Title	Hours
CHEM 151	Principles of Chemistry I	3
CHEM 152	Principles of Chemistry I Laboratory	1
CHEM 153	Principles of Chemistry II	3
CHEM 154	Qualitative Analysis	2
CHEM 263	Organic Chemistry Lecture I	3
CHEM 264	Organic Chemistry Lecture II	3
CHEM 265	Organic Chemistry Laboratory I	2
CHEM 266	Organic Chemistry Laboratory II	2
CHEM 370	Biochemistry Laboratory	2
CHEM 401	Biochemistry Lecture I	3
CHEM 402	Biochemistry Lecture II	3
CHEM 480	Advanced Chemistry Laboratory III ³	2
Select one of the following:		4-6
CHEM 305	Physical Chemistry for the Biological Sciences	
-or-		
CHEM 313 & CHEM 314	Physical Chemistry Lecture I and Physical Chemistry Lecture II	
Total Hours		33-35

¹ Complete with a grade of C- or better

² Biochemistry majors meet the prerequisite requirements for this course

Biology Requirements

Code	Title	Hours
BIOL 111	Principles of Biology I	4
BIOL 112	Principles of Biology II	4
BIOL 211	General Genetics	3
BIOL 212	Genetics Laboratory	1
BIOL 311	Cell & Molecular Biology	4
BIOL 480	Molecular Biology	3
BIOL 485	Cell Physiology	3
BIOL 486	Cell Physiology Laboratory	2
Total Hours		24

Physics Requirement

Code	Title	Hours
Select one of the following:		8
PHYS 261 & PHYS 262	College Physics I and College Physics II	
-or-		
PHYS 291 & PHYS 292	Elementary Classical Physics I and Elementary Classical Physics II	
Total Hours		8

Mathematics Requirement

Code	Title	Hours
MATH 221	Analytic Geometry-Calculus I	4
MATH 222	Analytic Geometry-Calculus II	4
Total Hours		8

Biochemistry Electives

Code	Title	Hours
Select at least eight credits of the following:		8
BIOL 331	Microbiology	
BIOL 437	Immunology	
BIOL 481	Advanced Genetics	
BIOL 497	Biological Problems	
CHEM 199	Introductory Seminar in Chemistry	
CHEM 380	Advanced Chemistry Laboratory I ¹	
CHEM 381	Advanced Chemistry Laboratory II ¹	
CHEM 399	Internship in Chemistry	
CHEM 423	Analytical Chemistry I	
CHEM 424	Analytical Chemistry II	
CHEM 463	Advanced Organic Chemistry	
CHEM 472	Advanced Inorganic Chemistry	
CHEM 497	Honors Project in Chemistry ²	
CHEM 499	Research Problems in Chemistry ²	
STAT 401	Probability and Statistics for Engineers	
PLYS 407		
PLYS 497	Honors Project in Polymer Science	
PLYS 499	Research Problems in Polymer Science	
Total Hours		8

¹ Biochemistry majors meet the prerequisite requirements for this course.

² Course may be repeated for up to eight credits.

Recommended Sequence

1st Year		Hours
Fall Semester		
	Writing Requirement	3
BIOL 111	Principles of Biology I	4
CHEM 151	Principles of Chemistry I	3
CHEM 152	Principles of Chemistry I Laboratory	1
MATH 149	Precalculus Mathematics	4
Hours		15
Spring Semester		
	Writing Requirement	3
BIOL 112	Principles of Biology II	4
CHEM 153	Principles of Chemistry II	3
CHEM 154	Qualitative Analysis	2
MATH 221	Analytic Geometry-Calculus I	4
Hours		16

2nd Year**Fall Semester**

CHEM 263	Organic Chemistry Lecture I	3
CHEM 265	Organic Chemistry Laboratory I	2
BIOL 211	General Genetics	3
BIOL 212	Genetics Laboratory	1
MATH 222	Analytic Geometry-Calculus II	4
Select one of the following:		4
PHYS 261	College Physics I	
PHYS 291	Elementary Classical Physics I	
Hours		17

Spring Semester

CHEM 264	Organic Chemistry Lecture II	3
CHEM 266	Organic Chemistry Laboratory II	2
BIOL 311	Cell & Molecular Biology ¹	4
	Humanities Requirement ³	3
Select one of the following:		4
PHYS 262	College Physics II	
PHYS 292	Elementary Classical Physics II	
Hours		16

3rd Year**Fall Semester**

CHEM 305	Physical Chemistry for the Biological Sciences	4
CHEM 401	Biochemistry Lecture I	3
	Social Science Requirement ³	3
	Speaking Requirement	3
Select one of the following:		3-4
	Beginning Language I	
SLPA 101	American Sign Language I	
Hours		16-17

Spring Semester

CHEM 402	Biochemistry Lecture II	3
CHEM 370	Biochemistry Laboratory	2
BIOL 480	Molecular Biology ¹	3
	Arts Requirement ³	3
	Complex Issues Requirement ^{3,4}	3
Select one of the following:		3-4
	Beginning Language II	
SLPA 102	American Sign Language II	
Hours		17-18

4th Year**Fall Semester**

CHEM 480	Advanced Chemistry Laboratory III	2
CHEM:3xx/4xx	Upper Level Biochem Elective ^{1,5}	4
	Arts/Humanities Requirement ³	3
	Social Science Requirement ³	3
	Global Diversity Requirement ^{3,4}	3
Hours		15

Spring Semester

BIOL 485	Cell Physiology	3
BIOL 486	Cell Physiology Laboratory	2

CHEM:3xx/4xx	Upper Level Biochem Elective ^{1,5}	4
	Domestic Diversity Requirement ^{3,4}	3
Hours		12
Total Hours		124-126

¹ The above order in which you take the 300/400 level Biology and Chemistry courses is **suggested**. **Such courses are not necessarily offered every year.**

² Students pursuing Biochemistry can choose to take CHEM 305 Physical Chemistry for Biosciences, or CHEM 313 and 314 Physical Chemistry Lecture I and II. CHEM 313 is offered in the Fall and CHEM 314 is offered in the Spring.

³ These courses fulfill General Education requirements. Unless a course is specified, refer to the General Education guide at <https://bulletin.uakron.edu/undergraduate/general-education/>. It is recommended that General Education courses be selected to satisfy major or minor requirements, or to double dip between multiple tiers (i.e. Chemistry majors are encouraged to take SOCIO 100 Introduction to Sociology and/or SOWK 244/344 Death and Dying to satisfy the Domestic Diversity Requirement, as well as part of the Social Science Requirement).

⁴ If requirement has been satisfied by previous coursework, credits should still be filled as general electives.

⁵ Students pursuing Biochemistry must take at least 8 credits to fulfill Upper Level Chemistry course requirements. Options for electives include BIOL 331, BIOL 437, BIOL 481, BIOL 497, CHEM 199, CHEM 380, CHEM 381, CHEM 399, CHEM 423, CHEM 424, CHEM 463, CHEM 472, CHEM 497, CHEM 499, STAT 401, PLYS 407, PLYS 497, PLYS 499