

Bachelor of Science in Biochemistry

Biochemistry

Biochemistry is the study of life at the level of individual molecules. Biochemistry lies at the intersection of cell biology, physiology, organic chemistry, and physical chemistry. The B.S. Biochemistry major includes two semesters of calculus, one year of biochemistry, analytical chemistry, biological physical chemistry, and upper-division courses in cellular mechanisms and related elective courses.

Undergraduate Admission

Admission to KU

All students applying for admission must send high school and college transcripts to the Office of Admissions. Unless they are college transfer students with at least 24 hours of credit, prospective students must send ACT or SAT scores to the Office of Admissions. Prospective first-year students should be aware that KU has qualified admission requirements that all new first-year students must meet to be admitted. Consult the Office of Admissions (<http://admissions.ku.edu>) for application deadlines and specific admission requirements.

Visit the International Support Services (<http://www.iss.ku.edu>) for information about international admissions.

Students considering transferring to KU may see how their college-level course work will transfer on the Office of Admissions (<http://credittransfer.ku.edu>) website.

Admission to the College of Liberal Arts and Sciences

Admission to the College is a different process from admission to a major field. Some CLAS departments have admission requirements. See individual department/program sections for departmental admission requirements.

First- and Second-Year Preparation

Because biology study requires preparation in other sciences, students should begin meeting major requirements in the first year. It is particularly important to take CHEM 130 and CHEM 135 in the first year and, for several majors, to take CHEM 330, CHEM 331, CHEM 335, and CHEM 336 in the second year. Ideally, most majors should also take BIOL 150 and BIOL 152 during the first year, as well as BIOL 105.

Students completing a B.S. in Biochemistry may not complete a minor in Chemistry.

Requirements for the B.S. Degree in Biochemistry

In addition to degree and major requirements for all plans and subplans, all students must complete the KU Core.

Code	Title	Hours
General Science Requirements		
Majors must complete the following general science requirements that serve as foundational courses for this major.		
Biology Orientation Seminar. Satisfied by:		
BIOL 105	Biology Orientation Seminar	1
Chemistry I. Satisfied by one of the following:		
CHEM 170	Chemistry for the Chemical Sciences I	5
CHEM 130	General Chemistry I	
CHEM 190 & CHEM 191	Foundations of Chemistry I, Honors and Foundations of Chemistry I Laboratory, Honors	
Chemistry II. Satisfied by one of the following:		
CHEM 175	Chemistry for the Chemical Sciences II	5
CHEM 135	General Chemistry II	
CHEM 195 & CHEM 196	Foundations of Chemistry II, Honors and Foundations of Chemistry II Laboratory, Honors	
Organic Chemistry I. Satisfied by one of the following:		
CHEM 330	Organic Chemistry I	3
CHEM 380	Organic Chemistry I, Honors	
Organic Chemistry I Laboratory. Satisfied by:		
CHEM 331	Organic Chemistry I Laboratory	2
Organic Chemistry II. Satisfied by one of the following:		
CHEM 335	Organic Chemistry II	3
CHEM 385	Organic Chemistry II, Honors	
Organic Chemistry II Laboratory. Satisfied by:		
CHEM 336	Organic Chemistry II Laboratory	2
Calculus I & II. Satisfied by:		
MATH 125 & MATH 126	Calculus I and Calculus II	8
Physics. Satisfied by one of the following options:		
Option 1: General Physics I & II		
PHSX 211 & PHSX 216	General Physics I and General Physics I Laboratory	8-9
PHSX 212 & PHSX 236	General Physics II and General Physics II Laboratory	
Option 2: College Physics I & II		
PHSX 114 & PHSX 115	College Physics I and College Physics II	
Biochemistry Course Requirements		
Satisfied by completing 35 hours from courses below.		
Principles of Molecular and Cellular Biology. Satisfied by one of the following:		
BIOL 150	Principles of Molecular and Cellular Biology	4
BIOL 151	Principles of Molecular and Cellular Biology, Honors	
Principles of Organismal Biology. Satisfied by one of the following:		
BIOL 152	Principles of Organismal Biology	4
BIOL 153	Principles of Organismal Biology, Honors	
Principles of Genetics. Satisfied by one of the following:		
BIOL 350	Principles of Genetics	4
BIOL 360	Principles of Genetics, Honors	
Cell Structure and Function. Satisfied by:		
BIOL 416	Cell Structure and Function	3

Biochemistry I. Satisfied by:	4
BIOL 636 Biochemistry I	
Introductory Biochemistry Laboratory. Satisfied by:	2
BIOL 637 Introductory Biochemistry Laboratory	
Biochemistry II. Satisfied by:	3
BIOL 638 Biochemistry II	
Advanced Biochemistry Laboratory. Satisfied by:	2
BIOL 639 Advanced Biochemistry Laboratory	
Senior Seminar in Biochemistry. Satisfied by:	1
BIOL 599 Senior Seminar: _____ (Must be taken in senior year)	
Analytical Chemistry. Satisfied by:	3
CHEM 400 Analytical Chemistry	
Analytical Chemistry Laboratory. Satisfied by:	2
CHEM 401 Analytical Chemistry Laboratory	
Physical Chemistry. Satisfied by one of the following:	3
CHEM 510 Biological Physical Chemistry	
CHEM 530 Physical Chemistry I	

Biochemistry Required Electives

Satisfied by completing 12 hours of BIOL courses numbered 400 or higher, which must be selected in consultation with a Biochemistry advisor. No more than 3 hours of BIOL 423 Non-Lab Independent Study and/or BIOL 424 Independent Study (combined) can be applied towards the elective requirement. 12

Major Hours & Major GPA

While completing all required courses, majors must also meet each of the following hour and grade-point average minimum standards:

Major Hours

Satisfied by 47 hours of major courses.

Major Hours in Residence

Satisfied by a minimum of 15 hours of KU resident credit in the major.

Major Junior/Senior Hours

Satisfied by a minimum of 12 hours from junior/senior courses (300+) in the major.

Major Junior/Senior Graduation GPA

Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (<http://clas.ku.edu/undergrad/tools/gpa>).

Below is a sample 4-year plan for students pursuing the B.S. in Biochemistry. To view the list of courses approved to fulfill KU Core Goals, please visit the KU Core website (<http://kucore.ku.edu/courses>).

This degree plan assumes students will have the equivalent of MATH 101 or MATH 104 prior to the freshman year, fall semester.

Freshman

Fall	Hours Spring	Hours
Goal 2.1 Written Communication	3 Goal 2.1 Written Communication (Second Course, 2 Crs Required)	3
Goal 2.2 Oral Communication	3 MATH 125 (General Science Requirement) ³	4

BIOL 105 (General Science Requirement) ¹	1 CHEM 175 or 135 (General Science Requirement) ⁴	5
CHEM 170 or 130 (Goal 1.2 Quantitative Literacy or Goal 3 Natural Science, General Science Requirement)	5 BIOL 152 (Goal 3 Natural Science, Major Requirement)	4
BIOL 150 (Goal 3 Natural Science Requirement, Major Requirement) ²	4	
	16	16

Sophomore

Fall	Hours Spring	Hours
Goal 3 Humanities	3 Goal 3 Social Science	3
MATH 126 (General Science Requirement)	4 Goal 4.1 US Diversity	3
CHEM 330 (Goal 3 Natural Science, General Science Requirement)	3 CHEM 335 (General Science Requirement) ⁴	3
CHEM 331 (General Science Requirement)	2 CHEM 336 (General Science Requirement) ⁴	2
BIOL 350 (General Science Requirement)	4 BIOL Elective 400+ (Major Requirement) ⁵	3
	16	14

Junior

Fall	Hours Spring	Hours
Goal 4.2 Global Awareness	3 Goal 5 Social Responsibility & Ethics	3
PHSX 114 (Goal 1.1 Critical Thinking, Goal 1.2 Quantitative Literacy, or Goal 3 Natural Science, General Science Requirement)	4 PHSX 115 or 212 and 236 (General Science Requirement)	4
BIOL 416 (Major Requirement) ⁴	3 BIOL 638 (Major Requirement) ⁴	3
BIOL 636 (Major Requirement) ⁴	4 BIOL 639 (Major Requirement) ⁴	3
BIOL 637 (Major Requirement) ⁴	2 Elective (Total Hours)	3
	16	16

Senior

Fall	Hours Spring	Hours
CHEM 400 (Major Requirement) ⁴	3 BIOL 599 (Goal 6 Integration & Creativity, Major Requirement)	1
CHEM 401 (Major Requirement) ⁴	2 BIOL Elective 400+ (Major Requirement) ⁵	3
CHEM 510 or 530 (Major Requirement) ⁴	3 BIOL Elective 400+ (Major Requirement) ⁵	3
BIOL Elective 400+ (Major Requirement) ⁵	3 Elective (Total Hours)	3
Elective (Total Hours)	2 Elective (Total Hours)	3
	13	13

Total Hours 120

- ¹ BIOL 105: Biology Orientation Seminar (1 hour online course) can be taken the summer prior to your freshman year.
- ² Concurrent or prior enrollment in CHEM 170/CHEM 130 is required.
- ³ MATH 125 requires MATH 103 or MATH 104, with a grade of C- or higher; or 3 years of college preparatory mathematics including a score of 28 or higher on the ACT Mathematics exam.
- ⁴ BIOL 416, BIOL 636, BIOL 637, CHEM 400, CHEM 401, CHEM 510, and CHEM 530 are Fall only courses. CHEM 175, CHEM 135, CHEM 335, CHEM 336, BIOL 638, and BIOL 639 are Spring only courses.
- ⁵ Satisfied by completing 12 hours of BIOL courses numbered 400 or higher, which must be selected in consultation with a Biochemistry advisor.

Please note:

All students in the College of Liberal Arts and Sciences are required to complete 120 total hours of which 45 hours must be at the Jr/Sr (300+) level.

The same course cannot be used to fulfill more than one KU Core Goal.

However, overlap of a KU Core course with a major or degree-specific requirement is allowed. Overlapping is recommended to allow more opportunities to explore other majors and/or minors.

Departmental Honors

Undergraduate majors are eligible to graduate with honors in biology if they fulfill the following requirements:

1. Complete all course work required for the appropriate degree in biology.
2. Achieve a minimum grade-point average of 3.25 overall and 3.5 in the major.
3. Complete BIOL 499 Introduction to Honors Research with a grade of B or higher.
4. Complete BIOL 699 Biology Honors Research Colloquium with a grade of B or higher.
5. Complete an independent research project under the supervision of a faculty member in an area appropriate to the degree sought.
6. Submit an honors thesis to the honors committee once the research is complete and present the results of the completed research at the honors research symposium.

Students majoring in Human Biology with Anthropology, Applied Behavioral Science, Psychology, or Speech-Language-Hearing concentrations will follow the honors requirements for their respective concentration department.

Specific guidelines and intent forms are available in the Undergraduate Biology Program office and online (<http://www.kuub.ku.edu>). Candidates must declare their intent to graduate with honors at least 2 semesters before graduation.

Study Abroad

Consult an advisor at least 4 months before undertaking study abroad. Consult the Office of Study Abroad (<http://www.studyabroad.ku.edu>), 108 Lippincott Hall, for information about study in one of the many countries (e.g., Scotland, Australia, Switzerland) with special arrangements with KU.