

# Bachelor of Arts 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.A. Biochemistry major includes one year of biochemistry, as well as upper-division courses in cellular mechanisms and biological physical chemistry.

## 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.

Please note that students completing a B.A. in Biochemistry may not earn a minor in Chemistry.

## Requirements for the B.A. Major in Biochemistry

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

## Major Course Requirements

Code	Title	Hours
<b>General Science Requirements</b>		
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	3
CHEM 130	General Chemistry I	3
CHEM 190 & CHEM 191	Foundations of Chemistry I, Honors and Foundations of Chemistry I Laboratory, Honors	3
Chemistry II. Satisfied by one of the following:		
CHEM 175	Chemistry for the Chemical Sciences II	3
CHEM 135	General Chemistry II	3
CHEM 195 & CHEM 196	Foundations of Chemistry II, Honors and Foundations of Chemistry II Laboratory, Honors	3
Organic Chemistry I. Satisfied by one of the following:		
CHEM 330	Organic Chemistry I	3
CHEM 380	Organic Chemistry I, Honors	3
Organic Chemistry I Laboratory. Satisfied by:		
CHEM 331	Organic Chemistry I Laboratory	1
Organic Chemistry II. Satisfied by:		
CHEM 335	Organic Chemistry II	3
Calculus I and II. Students who plan to attend graduate school should enroll in MATH 125 and MATH 126. Satisfied by one of the following:		
MATH 115 & MATH 116	Calculus I and Calculus II	6
MATH 125 & MATH 126	Calculus I and Calculus II	6
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	6
PHSX 212 & PHSX 236	General Physics II and General Physics II Laboratory	6
Option 2: College Physics I & II		
PHSX 114 & PHSX 115	College Physics I and College Physics II	6
<b>Biochemistry Requirements</b>		
Principles of Molecular & Cellular Biology. Satisfied by one of the following:		4
BIOL 150	Principles of Molecular and Cellular Biology	4
BIOL 151	Principles of Molecular and Cellular Biology, Honors	4
Principles of Organismal Biology. Satisfied by one of the following:		4
BIOL 152	Principles of Organismal Biology	4
BIOL 153	Principles of Organismal Biology, Honors	4
Principles of Genetics. Satisfied by one of the following:		4
BIOL 350	Principles of Genetics	4
BIOL 360	Principles of Genetics, Honors	4
Cell Structure & Function. Satisfied by:		3
BIOL 416	Cell Structure and Function	3

Biochemistry I. Satisfied by:		
BIOL 636	Biochemistry I	4
Introductory Biochemistry Laboratory. Satisfied by:		
BIOL 637	Introductory Biochemistry Laboratory	2
Biochemistry II. Satisfied by:		
BIOL 638	Biochemistry II	4
Advanced Biochemistry Laboratory. Satisfied by:		
BIOL 639	Advanced Biochemistry Laboratory	3
Biological Physical Chemistry. Satisfied by:		
CHEM 510	Biological Physical Chemistry	3
<b>Biochemistry Electives</b>		
Satisfied by completing at least 6 hours of biology courses numbered 400 or higher. These courses 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.		6

**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 37 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.A. 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, or equivalent prior to the freshman year, fall semester.

Please note that students completing a B.A. in Biochemistry may not also earn a minor in Chemistry. Students may earn degrees in more than one major within biological sciences, or in a biological science and an area outside biology by meeting the requirements of both degree programs and taking at least 15 hours of courses unique to each major.

**Freshman**

Fall	Hours Spring	Hours
ENGL 101 (Goal 2.1 (2 crs req), BA Writing I) <sup>1</sup>	3 ENGL 102 (Goal 2.1 (2 crs req), BA Writing II)	3
Goal 3 Social Science	3 MATH 115 (General Science Requirement)	3
CHEM 170 or 130 (General Science Requirement, BA Quantitative Req) <sup>2</sup>	5 CHEM 175 or 135 (General Science Requirement)	5

BIOL 150 or 151 (Goal 3 Natural Science, BA Lab, Major Requirement) <sup>3</sup>	4 BIOL 152 or 153 (Major Requirement)	4
BIOL 105 (General Science Requirement) <sup>*</sup>	1	
	16	15

**Sophomore**

Fall	Hours Spring	Hours
1st Semester Language (BA Second Language)	5 2nd Semester Language (BA Second Language)	5
MATH 116 (General Science Requirement)	3 Goal 2.2 Communication	3
CHEM 330 (General Science Requirement)	3 CHEM 335 (General Science Requirement) <sup>4,5</sup>	3
CHEM 331 (General Science Requirement)	2 Elective or possible minor course (Total Hours)	3
BIOL 350 or 360 (Major Requirement)	4 Elective or possible minor course (Total Hours)	2
	17	16

**Junior**

Fall	Hours Spring	Hours
3rd Semester Language (BA Second Language)	3 4th Semester Language, or 1st semester of Another Language (BA Second Language)	3-5
Goal 4.1 US Diversity (300+ suggested)	3 BIOL 638 (Major Requirement) <sup>4</sup>	4
BIOL 636 (Major Requirement) <sup>4</sup>	4 BIOL 639 (Major Requirement; Goal 6) <sup>4</sup>	3
BIOL 637 (Major Requirement) <sup>4</sup>	2 PHSX 115 (or PHSX 212 and PHSX 236 (General Science Requirement))	4
PHSX 114 (or PHSX 211 and PHSX 216 (Goal 1.1 Critical Thinking; General Science Requirement))	4	
	16	14-16

**Senior**

Fall	Hours Spring	Hours
Goal 3 Arts and Humanities	3 Goal 4.2 Global Awareness	3
Goal 5 Social Responsibility & Ethics	3 BIOL Elective 400+ (Major Requirement) <sup>6</sup>	3
BIOL 416 (Major Requirement)	3 BIOL Elective 400+ (Major Requirement) <sup>6</sup>	3
CHEM 510 (Major Requirement) <sup>4</sup>	3 Elective or possible minor course 300+ (Total Hours)	3
Elective or possible minor course 300+ (Total Hours)	2	
	14	12

Total Hours 120-122

<sup>1</sup> The BA requires completion of two courses of collegiate-level writing instruction. Students who test out of Composition will still need to complete ENGL 102 (or equivalent) and one additional Goal 2.1 course.

- <sup>2</sup> CHEM 170/CHEM 130 and BIOL 150 require a Math ACT score of 26+, a comparable SAT or KU Math Placement Exam score, or credit for a MATH 101 or MATH 104 equivalent course.
- <sup>3</sup> Concurrent or prior enrollment in CHEM 170/CHEM 130 is required.
- <sup>4</sup> CHEM 335 and BIOL 638 and BIOL 639 are offered only in spring; BIOL 636, and BIOL 637 and CHEM 510 are only in fall.
- <sup>5</sup> Most medical schools require the full CHEM 330, CHEM 331, CHEM 335, and CHEM 336 sequence.
- <sup>6</sup> 6 hours of BIOL 400+ electives required. Consult a biochemistry advisor to select major electives.
- <sup>7</sup> Visit this website (<https://collegeadvising.ku.edu/sites/collegeadvising.ku.edu/files/docs/BA.QuantitativeReasoning.pdf>) for a list of courses that fulfill the BA Quantitative Reasoning Requirement.
- \* BIOL 105: Biology Orientation Seminar (1 hour online course) is required for the major. It can be taken the summer prior to your freshman year.

Lippincott Hall, for information about study in one of the many countries (e.g., Scotland, Australia, Switzerland) with special arrangements with KU.

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 3.5 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