BACHELOR OF SCIENCE IN BIOCHEMISTRY

Why study biology?
Study biology because undergraduates should have the opportunity to explore the breadth of biology that allows them to succeed in their chosen paths beyond the university.

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 Office of International Student and Scholar 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 who have taken BIOL 100 and BIOL 102, have earned an A or B in both courses, and have decided to major in a biological science should consult a UBP advisor to request permission to substitute BIOL 100 and BIOL 102 for BIOL 150.

Majors and Concentrations
Bachelor’s degree requirements in biology are modified as necessary. Current requirements are available in the UBP office and online (http://www.kuub.ku.edu). Major programs are offered in biochemistry, biology, human biology, and microbiology. Students may choose to concentrate in a range of specialties in the biological sciences, such as botany, cellular biology, developmental biology, environmental biology, ecology, entomology, genetics, marine biology, molecular biology, neurobiology, paleontology, physiology, systematics, or zoology (invertebrate or vertebrate).

Requirements for the B.S. Degree in Biochemistry

General Education Requirements
In addition to degree and major requirements, all students must complete the KU Core.

General Science Requirements (37-38)
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 Foundations of Chemistry I, 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 Foundations of Chemistry II, 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 Calculus I 8
- MATH 126 and Calculus II
  - Option 1: General Physics I & II
    - PHSX 211 General Physics I
    - & PHSX 216 and General Physics I Laboratory
  - Option 2: College Physics I & II
    - PHSX 212 General Physics II
    - & PHSX 236 and General Physics II Laboratory

Biochemistry Course Requirements (35)
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
- 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
- BIOL 153 Principles of Organismal Biology, Honors

Principles of Genetics. Satisfied by one of the following:
- BIOL 350 Principles of Genetics
Bachelor of Science in Biochemistry

BIOL 360 Principles of Genetics, Honors
Cell Structure and Function. Satisfied by: 3

BIOL 416 Cell Structure and Function
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 620 Analytical Chemistry
Analytical Chemistry Laboratory. Satisfied by: 2

CHEM 621 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 (12)
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.

Freshman

Fall
Goal 2.1 Written Communication 3
Goal 2.2 Oral Communication 3
BIOL 105 (General Science Requirement) 1
CHEM 170 or 135 (General Science Requirement) 4
CHEM 170 or 130 (Goal 1.2 Quantitative Literacy or Goal 3 Natural Science, General Science Requirement)
BIOL 150 (Goal 3 Natural Science Requirement, Major Requirement) 2

Hours Spring
Goal 2.1 Written Communication (Second Course, 2 Crs Required)
MATH 125 (General Science Requirement) 3
CHEM 175 or 135 (General Science Requirement) 4
5
5
4

Sophomore

Fall
Goal 3 Humanities 3
MATH 126 (General Science Requirement) 3
CHEM 330 (Goal 3 Natural Science, General Science Requirement) 3
CHEM 331 (General Science Requirement) 4
BIOL 350 (General Science Requirement) 4

Hours Spring
Goal 3 Social Science 3
Goal 4.1 US Diversity & Ethics 3
CHEM 335 (General Science Requirement) 3
CHEM 336 (General Science Requirement) 4
BIOL Elective 400+ (Major Requirement) 5

Junior

Fall
Goal 4.2 Global Awareness 3
PHSX 114 or 211 and 216 (Goal 1.1 Critical Thinking, Goal 1.2 Quantitative Literacy, or Goal 3 Natural Science, General Science Requirement)

Hours Spring
3 Goal 5 Social Responsibility & Ethics 3
 Goal 4.5 PHSX 115 or 212 and 236 (General Science Requirement)

BIOL 416 (Major Requirement) 4
BIOL 636 (Major Requirement) 4
BIOL 637 (Major Requirement) 4

16-17
15

Senior

Fall
CHEM 510 or 530 (Major Requirement) 4
CHEM 620 (Major Requirement) 4
CHEM 621 (Major Requirement) 4

Hours Spring
3 BIOL 599 (Goal 6 Integration & Creativity, Major Requirement)
3
3

Final


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.
Bachelor of Science in Biochemistry

<table>
<thead>
<tr>
<th>BIOL Elective 400+ (Major Requirement)</th>
<th>3 Elective (Total Hours)</th>
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<tbody>
<tr>
<td>Elective (Total Hours)</td>
<td>3 Elective (Total Hours)</td>
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Total Hours: 120-121

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 510, CHEM 530, CHEM 620, and CHEM 621 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.

**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.