

# Bachelor of Arts in Biology

## Biology

Biology is the study of living systems and is the broadest biological sciences major available at KU. The B.A. Biology degree provides students with much flexibility in their major course choices and can include ecology, microbiology, organismal physiology, and biochemistry.

## 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.

### 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.A. Major in Biology

### Major Course Requirements

Code	Title	Hours
<b>General Science Requirements</b>		
Biology Orientation Seminar. Satisfied by:		
BIOL 105	Biology Orientation Seminar	1
Chemistry I. Satisfied by one of the following:		
CHEM 130	General Chemistry I	5
CHEM 195 & CHEM 196	Foundations of Chemistry II, Honors and Foundations of Chemistry II Laboratory, Honors	
Chemistry II. Satisfied by one of the following:		
CHEM 135	General Chemistry II	5
CHEM 195 & CHEM 196	Foundations of Chemistry II, Honors and Foundations of Chemistry II Laboratory, Honors	
Organic Chemistry I. Satisfied by the following:		
CHEM 330	Organic Chemistry I	3
Organic Chemistry I Laboratory. Satisfied by:		
CHEM 331	Organic Chemistry I Laboratory	2
Calculus. Satisfied by one of the following:		
MATH 115 & MATH 116	Calculus I and Calculus II	4-6
MATH 125	Calculus I	
MATH 145	Calculus I, Honors	
Physics I. Satisfied by one of the following:		
PHSX 114	College Physics I	4-5
PHSX 211 & PHSX 216	General Physics I and General Physics I Laboratory	
Physics II. Satisfied by one of the following:		
PHSX 115	College Physics II	4
PHSX 212 & PHSX 236	General Physics II and General Physics II Laboratory	
<b>Biology Core Requirements</b>		
Principles of Molecular & Cellular Biology. Satisfied by one of the following:		
BIOL 150	Principles of Molecular and Cellular Biology	3
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	3
BIOL 153	Principles of Organismal Biology, Honors	
Introductory Biology Lab for STEM Majors. Satisfied by:		
BIOL 154	Introductory Biology Lab for STEM Majors	2
Principles of Genetics. Satisfied by one of the following:		
BIOL 350	Principles of Genetics	4
BIOL 360	Principles of Genetics, Honors	
Evolutionary Biology. Satisfied by:		
BIOL 412	Evolutionary Biology	4
Senior Seminar in Biology. Satisfied by:		
BIOL 599	Senior Seminar: _____ (Must be taken in senior year.)	1

Diversity of Organisms / Principles of Ecology / Introduction to Systematics. Satisfied by one of the following: 3

- BIOL 413 History and Diversity of Organisms
- BIOL 414 Principles of Ecology
- BIOL 428 Introduction to Systematics

Fundamentals / Development / Function. Satisfied by two of the following: 6

- BIOL 400 Fundamentals of Microbiology  
or BIOL 401 Fundamentals of Microbiology, Honors
- BIOL 416 Cell Structure and Function  
or BIOL 536 Cell Structure and Function (Honors)
- BIOL 417 Biology of Development
- BIOL 501 Physiological Adaptations of Plants to Extreme Environments
- BIOL 544 Comparative Animal Physiology  
or BIOL 546 Mammalian Physiology
- BIOL 600 Introductory Biochemistry, Lectures

**Electives and Laboratory Requirements**

Satisfied by completing 10 hours of BIOL courses numbered 400 or higher which include at least 4 hours of laboratory credit. Courses listed above which have not been used to fulfill the above requirements may be used as electives. 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 with no more than 2 hours of BIOL 424 being applied towards the laboratory requirement. 10

**Biology Electives**

Satisfied by completing at least 6 hours of biology courses numbered 400 or higher.

**Biology Laboratory Electives**

Satisfied by completing at least 4 hours of biology lab courses numbered 400 or higher. No more than 2 hours of BIOL 424 may be applied towards the laboratory requirement.

**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 36 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 BA in Biology. 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.

**Freshman**

Fall	Hours	Spring	Hours
BIOL 150 or 152 (Goal 3 Natural Science, Major Requirement) <sup>3</sup>	3	BIOL 150 or 152 (Goal 3 Natural Science, Major Requirement) <sup>3</sup>	3
CHEM 130 (General Science Requirement, BA Quantitative Reasoning (QR)) <sup>2</sup>	5	CHEM 135 (General Science Requirement)	5
BIOL 105 (General Science Requirement) <sup>1</sup>	1	MATH 115 (General Science Requirement) <sup>2</sup>	3
ENGL 101 (Goal 2.1 Written Communication/BA Writing I) <sup>1</sup>	3	ENGL 102 (Goal 2.1 Written Communication/BA Writing II)	3
BIOL 154 (or Elective)	2	BIOL 154 (or Elective)	2
	<b>14</b>		<b>16</b>

**Sophomore**

Fall	Hours	Spring	Hours
1st Semester Language (BA Second Language)	5	2nd Semester Language (BA Second Language)	5
BIOL 350 or 360 (Major Requirement)	4	Goal 3 Arts and Humanities	3
CHEM 330 (General Science Requirement) <sup>5</sup>	3	BIOL 412 (Major Requirement) <sup>4</sup>	4
CHEM 331 (General Science Requirement)	2	Second Area of Study/ Elective/Degree/Junior-Senior Hours <sup>10</sup>	3
MATH 116 (General Science Requirement)	3		
	<b>17</b>		<b>15</b>

**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 3 Social Science	3	Goal 2.2 Communication	3
PHSX 114 (or PHSX 211 & 216 (Goal 1.1 Critical Thinking, General Science Requirement))	4-5	PHSX 115 (or PHSX 212 & 236 (General Science Requirement))	4
BIOL Selective 400+ (Major Requirement) <sup>6</sup>	3	BIOL Selective 400+ (Major Requirement) <sup>6</sup>	3
Second Area of Study/ Elective/Degree/Junior-Senior Hours <sup>10</sup>	3		
	<b>16-17</b>		<b>13-15</b>

**Senior**

Fall	Hours	Spring	Hours
Goal 4.2 Global Awareness (300+ suggested)	3	Goal 4.1 US Diversity (300+ suggested)	3
Goal 5 Social Responsibility & Ethics	3	BIOL 599 (Major Requirement, Goal 6 Integration & Creativity) <sup>8</sup>	1

BIOL Selective 400+ (Major Requirement) <sup>6</sup>	3 BIOL Elective 400+ (Major Requirement) <sup>7</sup>	3
BIOL Elective 400+ (Major Requirement) <sup>7</sup>	3 BIOL Lab Elective 400+ (Major Requirement) <sup>7</sup>	2
BIOL Lab Elective 400+ (Major Requirement) <sup>7</sup>	2 Second Area of Study/ Elective/Degree/Junior-Senior Hours <sup>10</sup>	3
	Second Area of Study/ Elective/Degree/Junior-Senior Hours <sup>10</sup>	3
<b>14</b>		<b>15</b>

**Total Hours 120-123**

- <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> Requires a Math ACT Score of 26+, a comparable SAT or KU Math Placement Exam score, or credit for MATH 101 or MATH 104 equivalent course. MATH 125 can be taken instead of MATH 115 and MATH 116 to fulfill the math requirement.
- <sup>3</sup> Concurrent or prior enrollment in CHEM 130 is required. BIOL 151 is the honors equivalent of BIOL 150 and offered in the fall semesters. BIOL 153 is the honors equivalent of BIOL 152 and offered in the spring semesters.
- <sup>4</sup> BIOL 412 is offered only in the spring.
- <sup>5</sup> Most medical schools require the full CHEM 330, CHEM 331, CHEM 335 and CHEM 336 sequence.
- <sup>6</sup> Biology major electives: choose from BIOL 413, BIOL 414, and BIOL 428 AND choose two from BIOL 400, BIOL 416, BIOL 417, BIOL 501, BIOL 544 or BIOL 546, and BIOL 600. BIOL 413, BIOL 414, and BIOL 544 are only offered in the fall. BIOL 428, BIOL 417, and BIOL 546 are only offered in the spring.
- <sup>7</sup> 10 credit hours of BIOL 400+ level courses, including at least 4 hours of lab credit. See the degree requirements page in the catalog for limits on using BIOL 423 and/or BIOL 424 for this requirement.
- <sup>8</sup> BIOL 599 is approved to fulfill Goal 6. This goal can also be fulfilled by completion of an approved educational experience, or an approved integration of courses and/or experiences. See your advisor for more information.
- <sup>9</sup> Visit this website (<https://collegeadvising.ku.edu/ba-quantitative-reasoning-courses/>) for a list of courses that fulfill the BA Quantitative Reasoning requirement.
- <sup>10</sup> Hour requirements (incl. 45 jr/sr hrs) are typically met through KU core, degree, major, second area of study and/or elective hours. Students completing the BGS with a major must choose a secondary area of study. Individual degree mapping is done in partnership with your advisor.
- \* 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.

Please note:

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.

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