

# BIOLOGY, B.A.

Biology is a dynamic science aimed at gaining a better understanding of living organisms and how they interact with the environment. Biological research seeks to answer a broad range of questions, from factors that affect human health to ecological issues.

Saint Louis University's biology program offers courses that emphasize concepts over facts and aim to provide a foundation for careers in the life sciences, health professions, K-12 education and advanced post-graduate study in a broad variety of disciplines. The B.A. in biology degree at Saint Louis University provides maximum flexibility in selecting upper-division courses and is favored by students seeking to have double majors.

SLU's biology program is enriched by interactions with the School of Medicine, Missouri Botanical Garden, Donald Danforth Plant Science Center and Saint Louis Zoo, as well as a growing number of St. Louis-based life science companies. Research experiences and internships provide students with opportunities to study biology beyond the classroom.

The Department of Biology has a field station that provides unique opportunities for students to explore ecology, conservation and environmental science in an Ozark forest ecosystem. The field station offers students opportunities to take a summer class, conduct undergraduate research and participate in a semester-long program of field biology coursework.

Biology students at SLU are encouraged to participate in co-curricular activities. Groups such as Beta Beta Beta, the biology honorary society, and Alpha Epsilon Delta, the pre-professional honor society, are social and academic organizations that further students' interest in biology while exposing them to its relationship with other scientific disciplines.

## Curriculum Overview

The undergraduate curriculum in the Department of Biology is diverse and will meet a variety of interests in the rapidly expanding fields of the biological sciences. It is also designed to provide an intensive educational experience for students in other disciplines who have an interest in biology. In addition to courses offered in Macelwane Hall, the department offers courses at the University's Reis Biological Station located by the Huzzah Creek in the Ozarks.

The Bachelor of Arts degree in biology provides flexibility in selecting upper-level courses and is favored by students interested in double majors.

## Fieldwork and Research Opportunities

Benefits of the biology program include several internship and career opportunities. Advanced undergraduate students with good academic records are encouraged to apply for positions as teaching or learning assistants. In addition to a stipend, students gain teaching experience and the opportunity to help others become interested in the field of biology.

Biology majors can enroll in courses that provide credit for structured internships through collaborations with a variety of local organizations including the Missouri Botanical Garden, Saint Louis Zoo, Sigma Aldrich, Monsanto and firms in the growing biotechnology field.

## Careers

The biology major develops strong critical thinking and problem-solving skills that provide excellent preparation for professional schools, such as:

- Medical school
- Veterinary science school
- Dental school
- Optometry school
- Graduate school in a broad range of disciplines

The skills biology majors gain also open the door to a wide variety of career options in areas such as health care, biotechnology, environmental management, conservation, education and the pharmaceutical industry.

Recent biology majors have been awarded grants from Sigma Xi and the National Science Foundation, as well as prestigious fellowships from the NSF, Fulbright Scholar Program, Mayo Clinic, Smithsonian Institution, NeuroSURF and the American Society for Microbiology.

## Admission Requirements

### Freshman

Begin your application for this program at [www.slu.edu/apply](http://www.slu.edu/apply) (<http://www.slu.edu/apply.php>). Saint Louis University also accepts the Common App.

All applications are thoroughly reviewed with the highest degree of individual care and consideration to all credentials that are submitted. Solid academic performance in college preparatory course work is a primary concern in reviewing a freshman applicant's file.

To be considered for admission to any Saint Louis University undergraduate program, the applicant must be graduating from an accredited high school, have an acceptable HiSET exam score or take the General Education Development (GED) test. Beginning with the 2021-22 academic year, undergraduate applicants will not be required to submit standardized test scores (ACT or SAT) in order to be considered for admission. Applicants will be evaluated equally, with or without submitted test scores.

Begin Your Application (<http://www.slu.edu/apply.php>)

### Transfer

Begin your application for this program at [www.slu.edu/apply](http://www.slu.edu/apply) (<http://www.slu.edu/apply.php>).

Applicants must be a graduate of an accredited high school or have an acceptable score on the GED. An official high school transcript and official test scores are required only of those students who have attempted fewer than 24 transferable semester credits (or 30 quarter credits) of college credit. Those having completed 24 or more of college credit need only submit a transcript from previously attended college(s). In reviewing a transfer applicant's file, the office of admission holistically examines the student's academic performance in college-level coursework as an indicator of the student's ability to meet the academic rigors of Saint Louis University.

### International Applicants

Begin your application for this program at [www.slu.edu/apply](http://www.slu.edu/apply) (<http://www.slu.edu/apply.php>).

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency (<http://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/>)
- Proof of financial support must include:
  - A letter of financial support from the person(s) or sponsoring agency funding the time at Saint Louis University
  - A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include the courses taken and/or lectures attended, practical laboratory work, the maximum and minimum grades attainable, the grades earned or the results of all end-of-term examinations, and any honors or degrees received. WES and ECE transcripts are accepted.

## Scholarships and Financial Aid

There are two principal ways to help finance a Saint Louis University education:

- **Scholarships:** Awarded based on academic achievement, service, leadership and financial need.
- **Financial Aid:** Provided in the form of grants and loans, some of which require repayment.

For priority consideration for merit-based scholarships, apply for admission by Dec. 1 and complete a Free Application for Federal Student Aid (FAFSA) by March 1.

For information on other scholarships and financial aid, visit the student financial services office online at <https://www.slu.edu/financial-aid> (<https://www.slu.edu/financial-aid/>).

## Learning Outcomes

1. Graduates will be able to effectively apply core biological concepts to solve problems.
2. Graduates will be able to critically evaluate scientific information from multiple sources, including that from the primary literature.
3. Graduates will be able to apply biological principles to global societal issues.
4. Graduates will be able to draw valid conclusions from quantitative data.
5. Graduates will be able to formulate hypotheses that address research questions.
6. Graduates will be able to correctly perform common laboratory and/or field techniques.

## Requirements

Biology students must complete a minimum total of **48 credits** for the major.

Code	Title	Credits
<b>Core Requirements</b>		
	College core requirements (p. 3)	57-66
For additional information about core courses ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/#policiestext">http://catalog.slu.edu/colleges-schools/arts-sciences/#policiestext</a> )		
<b>Biology Requirements</b>		

BIOL 1240 & BIOL 1245	General Biology: Information Flow and Evolution and Principles of Biology I Laboratory	4
BIOL 1260 & BIOL 1265	General Biology: Transformations of Energy and Matter and Principles of Biology II Laboratory	4
BIOL 3010	Evolutionary Biology	3
BIOL 3020	Biochemistry and Molecular Biology	3
BIOL 3030	Principles of Genetics	3
BIOL 3040	Cell Structure & Function	3
CHEM 1110 & CHEM 1115	General Chemistry 1 and General Chemistry 1 Laboratory	4
CHEM 1120 & CHEM 1125	General Chemistry 2 and General Chemistry 2 Laboratory	4
MATH 1510	Calculus I	4
<b>Statistics Course</b>		
MATH 1300 or BIOL 4790	Elementary Statistics with Computers or Biometry	3
<b>Biology Elective Courses</b>		<b>13</b>
Select at least one plant science course and a structured laboratory course:		
BIOL 3060	Cell Structure & Function Laboratory	
BIOL 3100	Experiments in Genetics Lab	
BIOL 3220	Biology of Invertebrates	
BIOL 3260	Biology of Plants & Fungi <sup>1</sup>	
BIOL 3280	Ethnobotany <sup>1</sup>	
BIOL 3400	Introduction to Neuroscience I: Cellular, Molecular and Systemic	
BIOL 3420	Comparative Anatomy of the Vertebrates	
BIOL 3450	Economic Botany <sup>1</sup>	
BIOL 3470	General Physiology Laboratory	
BIOL 3480	Exercise Physiology	
BIOL 3490	Plant Physiology <sup>1</sup>	
BIOL 3550	Neuroscience Laboratory	
BIOL 4010	Sex, Evolution, and Behavior	
BIOL 4030	Introduction to Genomics	
BIOL 4050	Molecular Technique Lab	
BIOL 4070	Advanced Biological Chemistry	
BIOL 4090	Plant Ecology <sup>1</sup>	
BIOL 4100	Natural History of Vertebrates	
BIOL 4120	Field Botany <sup>1</sup>	
BIOL 4130	Field Mammalogy	
BIOL 4140	Field Ornithology	
BIOL 4150	Nerve Cell Mechanisms in Behavior	
BIOL 4160	Microbial Ecology and Molecular Evolution	
BIOL 4190	GIS in Biology	
BIOL 4200	Aquatic Ecology	
BIOL 4260	Biology of Amphibians and Reptiles	
BIOL 4280	Biology of Fishes	
BIOL 4320	Cave Biology	
BIOL 4330	Spring Flora of the Ozarks <sup>1</sup>	
BIOL 4360	Animal Behavior	
BIOL 4370	Animal Behavior Lab	
BIOL 4410	Comparative Animal Physiology	

BIOL 4430	Principles of Virology	
BIOL 4440	Vertebrate Histology: Structure and Function of Tissues	
BIOL 4480	Conservation Biology	
BIOL 4510	Behavioral Endocrinology	
BIOL 4520	Biochemical Pharmacology	
BIOL 4540	Human Systemic Physiology	
BIOL 4580	Applied Population Genetics	
BIOL 4600	Developmental Biology	
BIOL 4630	Foundations of Immunobiology	
BIOL 4640	General Microbiology	
BIOL 4650	General Microbiology Laboratory	
BIOL 4670	Population Biology	
BIOL 4700	Molecular Biology	
BIOL 4720	Cancer Biology	
BIOL 4750	General Ecology	
BIOL 4790	Biometry	
BIOL 4910	Internship in Conservation	
BIOL 4911	Integrated Bioinformatics Internship	
BIOL 4912	Internship in Plant Science	
BIOL 4960	Independent Research	
BIOL 4970	Library Project	
BIOL 4980	Advanced Independent Study	
<b>General Electives</b>		<b>6-15</b>
Total Credits		120

<sup>1</sup> Courses that satisfy the plant requirement  
<sup>2</sup> These courses do not count as structured lab courses nor can they satisfy elective requirements

### Independent Research

A total of 3 credits of BIOL 4960 Independent Research (1-3 cr), BIOL 4970 Library Project (1-3 cr), and/or BIOL 4980 Advanced Independent Study (1-4 cr) can be counted toward the B.S. degree. These courses do not count as structured lab courses.

### Non-Course Requirements

All Biology majors are required to participate in first and second year mentoring sessions and meet with their mentor when in residence.

### Continuation Standards

Students must have a minimum of a 2.00 GPA in their major courses (BIOL) and required related credits (Chemistry, Mathematics & Statistics, Physics etc.) by the conclusion of their freshman year. Students that fall below a 2.00 GPA will be placed on probation. If a student fails to obtain at least a 2.00 GPA in their major courses (BIOL) and required related credits by the conclusion of their sophomore year they will not be allowed to continue in the program.

### Bachelor of Arts Core Curriculum Requirements

Code	Title	Credits
<b>Core Components and Credits</b>		
	Foundations of Discourse ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foundations-discourse/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foundations-discourse/</a> )	3
	Diversity in the U.S. ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/cultural-diversity/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/cultural-diversity/</a> )	3

Global Citizenship ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/global-citizenship/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/global-citizenship/</a> )	3
Foreign Language ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foreign-language/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foreign-language/</a> )	0-9
Fine Arts ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/fine-arts/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/fine-arts/</a> )	3
Literature ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/literature/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/literature/</a> )	6
Mathematics ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/mathematics/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/mathematics/</a> )	3
Natural Science ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/sciences/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/sciences/</a> )	6
Philosophy ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/philosophy/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/philosophy/</a> )	9
Social Science ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/social-science/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/social-science/</a> )	6
Theology ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/theology/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/theology/</a> )	9
World History ( <a href="http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/world-history/">http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/world-history/</a> )	6
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Total Credits	57-66

### Graduation Requirements

- Complete a minimum of 120 credits (excluding pre-college level courses [numbered below 1000]).
  - Complete either the College of Arts and Sciences Bachelor of Arts or Bachelor of Science Core Curriculum Requirements
  - Complete Major Requirements: minimum 30 credits required.
  - Complete remaining credits with a second major, minor, certificate, and/or elective credits to reach the minimum of 120 credits required for graduation.
  - Courses listed under the intensive English program do not count toward graduation requirements. EAP 1500 College Composition for International Students (3 cr), EAP 1900 Rhetoric & Research Strategies (3 cr) and EAP 2850 Nation, Identity and Literature (3 cr) count toward graduation requirements as equivalents to Department of English courses.
- In addition to those courses, six credits from EAP/MLNG courses at the 1000 level or higher may count toward graduation requirements
- Achieve at least a 2.00 cumulative grade point average, a 2.00 grade point average in the major(s) and a 2.00 grade point average in the minor/certificate, or related elective credits.
  - Complete department/program-specific academic and performance requirements.
  - Complete at least 50% of the coursework for the major and 75% for the minor/certificate through Saint Louis University or an approved study abroad program.
  - Complete 30 of the final 36 credits through Saint Louis University or an approved study abroad program.
  - Complete an online degree application by the required University deadline.

### Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

Course	Title	Credits
<b>Year One</b>		
<b>Fall</b>		
Participation in First-year Mentoring Events		
BIOL 1240 & BIOL 1245	General Biology: Information Flow and Evolution and Principles of Biology I Laboratory	4
CHEM 1110 & CHEM 1115	General Chemistry 1 and General Chemistry 1 Laboratory	4
A&S Core		3
A&S Core		3
A&S Core		3
Credits		17
<b>Spring</b>		
Participation in First-year Mentoring Events		
BIOL 1260 & BIOL 1265	General Biology: Transformations of Energy and Matter and Principles of Biology II Laboratory	4
CHEM 1120 & CHEM 1125	General Chemistry 2 and General Chemistry 2 Laboratory	4
A&S Core		3
A&S Core		3
A&S Core		3
Credits		17
<b>Year Two</b>		
<b>Fall</b>		
Participation in Second-year Mentoring		
BIOL 3020	Biochemistry and Molecular Biology	3
Elective		3
MATH 1510	Calculus I	4
A&S Core		3
A&S Core		3
Credits		16
<b>Spring</b>		
Participation in Second-year Mentoring		
BIOL 3040	Cell Structure & Function	3
Statistics Elective (p. 4)		3-4
A&S Core		3
A&S Core		3
Credits		12-13
<b>Year Three</b>		
<b>Fall</b>		
BIOL 3010	Evolutionary Biology	3
BIOL 3030	Principles of Genetics	3
Biology Elective		2
A&S Core		3

A&S Core	3	
Credits		14
<b>Spring</b>		
Biology Elective	3	
Laboratory Elective (p. 4)	1-5	
A&S Core	3	
A&S Core	3	
A&S Core	3	
Credits		13-17
<b>Year Four</b>		
<b>Fall</b>		
Plant Elective (p. 5)	3-4	
A&S Core	3	
A&S Core	3	
A&S Core	3	
Elective	3	
Credits		15-16
<b>Spring</b>		
Biology Elective	3	
A&S Core	3	
A&S Core	3	
A&S Core	3	
Elective	3	
Credits		15
Total Credits		119-125

<sup>1</sup> See information in Program Notes

## Program Notes

### Statistics Electives

Code	Title	Credits
MATH 1300	Elementary Statistics with Computers	3
BIOL 4790	Biometry	4

### Laboratory Electives

Code	Title	Credits
BIOL 3060	Cell Structure & Function Laboratory	1
BIOL 3100	Experiments in Genetics Lab	1
BIOL 3260	Biology of Plants & Fungi	4
BIOL 3420	Comparative Anatomy of the Vertebrates	5
BIOL 3470	General Physiology Laboratory	1
BIOL 4050	Molecular Technique Lab	2
BIOL 4100	Natural History of Vertebrates	4
BIOL 4120	Field Botany	5
BIOL 4130	Field Mammalogy	5
BIOL 4140	Field Ornithology	5
BIOL 4160	Microbial Ecology and Molecular Evolution	4
BIOL 4200	Aquatic Ecology	4
BIOL 4260	Biology of Amphibians and Reptiles	4
BIOL 4280	Biology of Fishes	4
BIOL 4320	Cave Biology	4
BIOL 4330	Spring Flora of the Ozarks	4

BIOL 4370	Animal Behavior Lab	1
BIOL 4440	Vertebrate Histology: Structure and Function of Tissues	4
BIOL 4650	General Microbiology Laboratory	2

### Plant Electives

Code	Title	Credits
BIOL 3260	Biology of Plants & Fungi	4
BIOL 3280	Ethnobotany	3
BIOL 3490	Plant Physiology	3
BIOL 3450	Economic Botany	3
BIOL 4090	Plant Ecology	3
BIOL 4120	Field Botany	5
BIOL 4330	Spring Flora of the Ozarks	4