Student ID:_____
Student Name:_____
Adviser Name:_____

Catalog: 2023-2024 Undergraduate Catalog
Program: Biology, B.S.
Minimum Credits Required:_____

Biology, B.S.

The 120 credit-hour B.S. in Biology provides a broad foundation in the biological sciences, from microbiology to organismal biology to ecology and global systems. The major is designed for students interested in careers such as medical research, healthcare, education, communications, wildlife management, conservation, public service, environmental law, pre-veterinary, and academic science. Through three concentration options and electives, students can tailor their degree to specific professional interests and goals. As part of the academic program, students complete a capstone research project under the direct guidance of biology faculty. Students with high academic standing who wish to pursue competitive careers in the biological or medical sciences are encouraged to consider the Honors Capstone option.

Core Curriculum: 38 - 51 credit hours

Please review the Core Curriculum page for course options.

Required Core Courses

Students majoring in Biology must take the following liberal arts core courses regardless of whether the core is otherwise met:

Liberal Arts, Mathematics

Choose one of the following:

- MA 120 College Algebra (3)
- MA 125 Precalculus (5)
- MA 241 Calculus & Analytic Geometry I (5)

Liberal Arts, Natural Science with Lab

- CH 135 General Chemistry I (4)

Biology Core Courses (19 credit hours)

Course Name	Term Taken	Grade	Gen Ed
BI 111 - General Biology: Cells & Genes (4)			
BI 112 - General Biology: Ecology & Evolution (4)			
BI 214 - Organismal Biology (4)			
BI 318 - Genetics (3)			
CH 137 - General Chemistry II (4)			

Biology Capstone Research (3-5 Credit Hours)

All Biology Majors must choose either Option 1 or Option 2 to complete the Capstone requirement.

Course Name	Term Taken	Grade	Gen Ed
Option 1, Standard Track: Choose one of the following CURE-designated courses (may not double dip with other program requirements):			
BI 345 - Molecular Cell Biology w/Laboratory (4)			
BI 346 - Biochemistry & Molecular Biology Techniques (3)			
BI 360 - Ecology (3)			
CH 346 - Biochemistry & Molecular Biology Techniques (3)			
CH 321 - Analytical Chemistry (4)			
Option 2, Honors Track: Complete all of the following courses.			
BI 392 - Introduction to Research (1)			
BI 493 - Biology Laboratory Research (1-2)			
BI 499 - Colloquium & Seminar (2-3)			

Biology Concentrations

Students completing a degree in Biology must choose one of the following concentrations to complete their degree program.

General Biology Concentration (23-26 credit hours)

Course Name	Term Taken	Grade	Gen Ed
Choose Two of the Following:			
CH 216 - Organic Chemistry I (5)			
CH 217 - Organic Chemistry II (5)			
MA 155 - Elementary Probability & Statistics (3)			
PH 117 - Physics Concepts (4)			
PH 231 - General Physics I (5)			

PH 232 - General Physics II (5)			
Choose 16 credit hours from the following: (at least 9-credit hours must be 300-level)			
BI 152 - General Microbiology (4)			
BI 220 - Human Anatomy & Physiology (6-8)			
BI 310 - Evolution (3)			
BI 313 - Plant Form & Function (3)			
BI 321 - Immunology (3)			
BI 342 - Biochemistry I (3)			
BI 345 - Molecular Cell Biology w/Laboratory (4)			
BI 346 - Biochemistry & Molecular Biology Techniques (3)			
BI 351 - Introduction to Animal Behavior (3)			
BI 360 - Ecology (3)			
BI 361 - Ecology Laboratory (2)			
BI 363 - Conservation Biology (3)			
BI 380 - Special Topics (1-4)			

Ecology & Environmental Science Concentration (23-24 credit hours)

Course Name	Term Taken	Grade	Gen Ed
BI 115 - Humans & the Environment (4)			
MA 155 - Elementary Probability & Statistics (3)			
Choose One of the Following:			
CH 216 - Organic Chemistry I (5)			
PH 117 - Physics Concepts (4)			
PH 231 - General Physics I (5)			
Choose Three of the Following:			
BI 310 - Evolution (3)			
BI 313 - Plant Form & Function (3)			
BI 351 - Introduction to Animal Behavior (3)			
BI 360 - Ecology (3)			
BI 363 - Conservation Biology (3)			
CH 321 - Analytical Chemistry (4)			
Choose One of the Following:			
BI 152 - General Microbiology (4)			
BI 321 - Immunology (3)			
BI 342 - Biochemistry I (3)			
BI 345 - Molecular Cell Biology w/Laboratory (4)			
BI 346 - Biochemistry & Molecular Biology Techniques (3)			
BI 380 - Special Topics (1-4)			

Pre-Veterinary Concentration (33-40 credit hours)

Course Name	Term Taken	Grade	Gen Ed
BI 152 - General Microbiology (4)			
BI 342 - Biochemistry I (3)			
CH 216 - Organic Chemistry I (5)			
EN 112 - Composition II: Rhetorical Argument (3)			
PH 231 - General Physics I (5)			
PH 232 - General Physics II (5)			
Choose Three of the Following: (at least 6-credit hours must be 300-level)			
BI 220 - Human Anatomy & Physiology (6-8)			
BI 310 - Evolution (3)			
BI 313 - Plant Form & Function (3)			
BI 321 - Immunology (3)			
BI 345 - Molecular Cell Biology w/Laboratory (4)			
BI 346 - Biochemistry & Molecular Biology Techniques (3)			
BI 351 - Introduction to Animal Behavior (3)			

BI 360 - Ecology (3)			
BI 361 - Ecology Laboratory (2)			
BI 363 - Conservation Biology (3)			
BI 380 - Special Topics (1-4)			

Electives (minimum of 7 credit hours)

Technology Requirement

Computer competency will be demonstrated by successful completion of Biology Capstone (Standard or Honors Track) with a "C" grade or better within the major.

Science and Biology Education

Avila University also offers degrees approved by the State of Missouri for those who want to teach Biology. Students who want to teach at the high school level will double major in Biology and Education. Those wanting to teach at the middle school level will major in Middle School Education with a Science concentration.

Available Programs

- Education, B.S.
- Middle School Teacher Education, B.S.

B.S. in Biology with Honors

The Honors Track in Biology emphasizes hands-on experience with research techniques applicable to a broad range of fields in modern biology. Students completing a B.S. in Biology with Honors will be prepared to pursue competitive careers in academic research, private industry, medicine, and related fields. To qualify for honors status, students must:

1. Maintain a 3.0 GPA overall and a 3.3 GPA within the biology major.
2. Complete an honors-level capstone research project (one semester of BI 392, two semesters of BI 493, and one semester of BI 499). The capstone research project must be completed as part of an active research lab and address an original research question.

Students interested in the Honors Program must first enroll as biology majors. They should complete course work within the major that prepares them sufficiently for the demands of Honors Research, with special attention paid to specific area of interest within biology. Students who have maintained a qualifying GPA enroll in BI 392 in their second or third year of study. BI 392 students identify a research mentor to supervise their Honors Capstone Project. They then apply for Honors status by developing, presenting, and defending a research proposal.

Students accepted to the Honors Capstone work closely with Biology Faculty to complete an original laboratory or field research project that spans at least three semesters prior to graduation. The Honors Capstone Project is subject to periodic review and must meet with the Biology Faculty's approval to qualify for honors.

Outcomes

The Bachelor of Science in Biology has the following outcomes:

Outcome 1.

Acquire a foundation of knowledge that includes the historical development of biological thought, cell theory, biogenesis, homeostasis, gene theory, and ecology. Evolution is stressed throughout the curriculum.

Outcome 2.

Learn biology by doing biology. Students will acquire a basic set of laboratory skills. Also, throughout the curriculum, students will be given opportunities to perform independent research projects. Majors will learn to access and critique the primary literature, identify problems, design and implement appropriate procedures using technological tools, work independently or collaboratively, evaluate alternative solutions, and present the results of their work while using the language of the discipline.

Outcome 3.

Explain the limitations of science and properly place biology among the sciences. Apply scientific thought processes to broader intellectual and social issues.

Assessment

The outcomes for the biology major are assessed throughout the curriculum through a combination of course written examinations, laboratory written and oral presentations, laboratory examinations, and completion of a final written report. The final report is based on a laboratory or library research project or an internship in the field. In the tradition of graduate school thesis and dissertation committees, the biology faculty acts as a committee to review and evaluate this final report.

Notes: