College of the Environment, Forestry, and Natural Sciences 2020-2021

Department of Biological Sciences

Biology, Bachelor of Science

This degree attracts students who are fascinated by the spectrum of biology, from the tiniest or simplest to the largest or most complex. Students may pursue a number of areas, including plants, animals, their evolution, physiology, or relationships.

Careers

What Can I Do with a Bachelor of Science in Biology?

The biological sciences encompass numerous cutting-edge disciplines. Each offers a multitude of exciting career paths. Prepare for a career in one of a dozen specialties in biology or microbiology, or pursue the growing field of exercise science. You can also train to teach biology in secondary or primary schools. You can prepare for graduate study, for admission to medical, dental, or veterinary school, or for other professional training.

You will also receive plenty of personal attention from faculty--in the classroom, in research laboratories, and in our Biology Advisement Center. Numerous undergraduate research opportunities involve you in the process and application of science. And you can take advantage of our location on the Colorado Plateau, which offers high quality of life with many excellent destinations for field projects and recreation. Our graduates have exceptional placement rates in medical schools, government agencies, and graduate programs. Whatever path you take after graduation, you will be ready to succeed.

Career opportunities that might be pursued:

- Medical corporations
- Biological testing laboratories
- Pharmaceutical companies
- State or federal government agencies

With further education, one of these paths is possible:

- University professor
- Physician
- Researcher
- Crime lab analyst

University Requirements

- To receive a bachelor's degree at Northern Arizona University, you must complete at least 120 units of credit that minimally includes a major, the liberal studies requirements, and university requirements as listed below.
    - All of Northern Arizona University's liberal studies, diversity, junior-level writing, and capstone requirements.
    - All requirements for your specific academic plan(s).
    - At least 30 units of upper-division courses, which may include transfer work.
    - At least 30 units of coursework taken through Northern Arizona University, of which at least 18 must be upper-division courses (300-level or above). This requirement is not met by credit-by-exam, retro-credits, transfer coursework, etc.
    - A cumulative grade point average of at least 2.0 on all work attempted at Northern Arizona University.

The full policy can be viewed here.

Overview

In addition to University Requirements:

- At least 66 units of major requirements
- Up to 9 units of major prefix courses may be used to satisfy Liberal Studies requirements; these same courses may also be used to satisfy major requirements
- Elective courses, if needed, to reach an overall total of at least 120 units

Please note that you may be able to use some courses to meet more than one requirement. Contact your advisor for details.

Minimum Units for Completion	120
Major GPA	C
Highest Mathematics Required	MAT 125
Fieldwork Experience/Internship	Optional
Research	Optional
University Honors Program	Optional
AZ Transfer Students complete AGEC-A	Recommended
Progression Plan Link	View Progression Plan

Purpose Statement

Biology is the study of life and living organisms—their structure & organization, development, evolution, distribution and interactions. The major offers a modern, balanced, and comprehensive treatment of biology, emphasizing critical analysis of information and integration among its sub-disciplines. At NAU, all students take foundations courses that address fundamental biological concepts: cellular & molecular processes, genetics & inheritance, and ecological and evolutionary theory. Then, students complete the major by selecting the courses in biology that best serve their individual interests. Upper-division biology courses hone into areas of physiology, evolution, ecological systems, genetics or cell theory. Our graduates attain the high-level scientific inquiry skills and have practiced the research methods needed to compete in graduate and professional schools and to succeed in the workplace.

Student Learning Outcomes

- Students will be able to communicate scientific information effectively in written and oral forms (including using standard practices in scientific writing), addressing basic biological concepts encompassing a range of sub-disciplines within the field of biology.
- As preparation for a career in the biological sciences, students will be able to collect, analyze and interpret scientific data related to biological problems spanning molecular to organismal biology (e.g., cell biology and genetics, ecology, behavior, etc).
- Students will develop proficiency in the quantitative skills necessary to analyze biological problems (e.g., arithmetic, algebra, dimensional analysis, and basic statistical analysis as applied to biology)
- Students will be able to apply the scientific method as a demonstration that they understand the basic paradigm of scientific inquiry as it relates to general biological problems.
- Students will be able to describe fundamental principles of biology e.g., central dogma, diversity of life, inheritance.
- Students will understand that evolution is the central principle uniting the field of biology, and apply the theory of evolution to explain diverse biological phenomena spanning molecular to organismal biology.
- Students will be able to access and interrogate the primary scientific literature in the biological sciences.
- Students will be able to synthesize material from across a biological sub-discipline and apply this to advanced-level course material (i.e., a Capstone experience); specifically, students will draw from their learning experiences in the fields of ecology, evolution, behavior, physiology, systematics, etc as related to the topic of their capstone course.
- Student will investigate a specific taxonomic group in the form of one or more courses focused on a particular group of organisms with the aim of obtaining deep knowledge of how evolution has shaped the biology of a particular organismal group.
- Students will develop an appreciation for the interdisciplinary role of science as applied to human and environmental challenges across both local and global scales.

Details

Major Requirements

- **Take the following 66 units including 40 units of Biology and Biology-related courses with a Grade of "C" or better:**
    - BIO 181, BIO 181L, BIO 182, BIO 182L (8 units)

- Select one of the following which meets the junior-level writing requirement (3-5 units):
    - BIO 205, BIO 205L, BIO 305W (5 units)
    - BIO 226, BIO 226L, BIO 305W (5 units)
    - BIO 365W (3 units)

  (Note: The Department of Biological Sciences is phasing out the BIO 226, BIO 226L and BIO 305W option and transitioning to the BIO 365W course for its majors).

  Select one of the following which meets the senior capstone requirement (3-4 units):

    - BIO 401C, BIO 426C, BIO 435C, BIO 444C, BIO 471C, BIO 482C, BIO 488C

  Select additional coursework from (23-26 units):

    - Any BIO courses, except BIO 100, BIO 100L, BIO 310, or any BIO recitation (R)
    - Up to 3 units of BIO 300
    - Up to 6 units from BIO 408, BIO 485, BIO 488C, BIO 497, BIO 498
    - Up to 6 units of non-BIO prefix courses from the following:

        - ANT 270, ANT 271, ANT 370, ANT 379,
        - CHM 238L, CHM 320, CHM 320L, CHM 440, CHM 461, CHM 462C, CHM 560
        - CS 486C
        - ENV 360, ENV 440, ENV 440L
        - FOR 212, FOR 213, FOR 222, FOR 240, FOR 250, FOR 255, FOR 340, FOR 381, FOR 382, FOR 445, FOR 452, FOR 453, FOR 454, FOR 504
        - GLG 101, GLG 107, GLG 201, GLG 225, GLG 304, GLG 530
        - GSP 150
        - NTS 356, NTS 425
        - PHI 332
        - PRM 300
        - PSY 320, PSY 350, PSY 355, PSY 370, PSY 432, PSY 670
        - STA 471

- Please note many of the following major requirements also satisfy Liberal Studies requirements.
    - Basic chemistry sequence: CHM 151, CHM 151L, CHM 152, CHM 152L (9 units)
    - Biochemistry course: CHM 360 or CHM 461 (3 units)

- Select one of the following organic chemistry sequences:
  - CHM 230, CHM 230L (4 units)
  - CHM 235, CHM 235L If choosing to complete this sequence, then CHM 238 is recommended. (5 units)

  Select one of the following math combinations:

  - MAT 125 and (STA 270 or PSY 230) (7-8 units)
  - MAT 136 (4 units)

  Select one of the following physics sequences:

  - PHY 111, PHY 112
  - PHY 161, PHY 262, PHY 262L If choosing to complete this sequence, then PHY 263 is recommended. (8 units)

  All prerequisite coursework must also be completed with grades of C or better.

  The Department of Biological Sciences does not allow dual majors within the department.

  General Electives

- Additional coursework is required, if, after you have met the previously described requirements, you have not yet completed a total of 120 units of credit.

  You may take these remaining courses from any academic areas, using these courses to pursue your specific interests and goals. We encourage you to consult with your advisor to select the courses that will be most advantageous to you. (Please note that you may also use prerequisites or transfer credits as electives if they weren't used to meet major, minor, or liberal studies requirements.)

  Additional Information

- Be aware that some courses may have prerequisites that you must also take. For prerequisite information click on the course or see your advisor.

Campus Availability

- Flagstaff
- Scottsdale Cmty Coll