

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

Department of Biological Sciences

Biomedical Science, Bachelor of Science

This program provides rigorous biological training, focused on biomedical science. Students will research, study, and analyze natural systems, their components, and how they work. This program prepares students for entry-level biomedical jobs or further graduate/professional programs in the biomedical sciences.

Careers

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

Are you compassionate and hard-working? Do you dream about helping ill people or animals, or preventing them from becoming ill in the first place? If so, our Biomedical Science program can prepare you for success in your chosen field.

You'll 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. Our graduates have exceptional placement rates in medical schools, government agencies, and graduate programs.

Career opportunities that might be pursued:

- Medical corporations
- Biological testing
- Pharmaceutical research
- State or federal government agencies

With further education, one of these paths is possible:

- Physician
- Dentist
- Pharmacist
- University professor

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 67 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
Research	Optional
University Honors Program	Optional
AZ Transfer Students complete AGEC-A Recommended	
Progression Plan Link	View Progression Plan

Purpose Statement

The Bachelor of Science degree in Biomedical Sciences consists of a Life Sciences Core combined with a broad range of flexible elective options. From anatomy and physiology to human microbiology, students will develop an understanding of biological and chemical systems of the human body — and develop a foundation for a career in a range of health professions.

The Life Sciences Core is designed to provide the student with a strong grounding in biology, chemistry and mathematics. The student, in consultation with an academic advisor and using a basic course schedule as a guideline, may select from elective courses relevant to a range of disciplinary areas and career fields, such as Human Genomics, Immunobiology, Medical Microbiology, Bioinformatics, Bioengineering or design his or her own set of electives approved by one of the program academic advisors.

Numerous undergraduate research opportunities involve you in the process and application of science in research areas at NAU's research centers and institutes, such as the [Center for Bioengineering Innovation \(CBI\)](#), the [Center for Microbial Genetics & Genomics \(MGGen\)](#), the Center for Applied Research and Environmental Endocrinology (CAREE), and at the [Imaging and Histology Core Facility](#). Due to the rigorous nature of our program, our graduates have exceptional placement rates in medical schools, government agencies, and graduate programs.

Student Learning Outcomes

- Students will be able to communicate scientific information effectively, with specialized knowledge of issues in health-related fields within the biosciences.
- As preparation for careers in research and the health sciences, students will be able to collect, analyze and interpret scientific data with application to problems involving human disease, molecular biology, genetics, cell biology and/or microbiology.
- Students will develop proficiency in the quantitative skills necessary to analyze biological problems (e.g., arithmetic, algebra, dimensional analysis, and statistical analysis), with an emphasis of quantitative techniques applicable to biomedical fields.
- Students will be able to apply the scientific method as a demonstration that they understand the basic paradigm of scientific inquiry as it relates health-related questions in the field of biology.
- 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 that human biology (e.g., physiology, behavior, disease, pathogen interactions) is shaped by the evolutionary process.
- Students will be able to access and interrogate the primary scientific literature with knowledge of specialized resources available within the biomedical sciences (e.g., the National Library of Medicine)
- Students will be able to synthesize material from throughout the biomedical discipline (e.g., evolution, genetics, molecular biology, anatomy, physiology, behavior, microbiology) and apply this to advanced-level course material (i.e., a Capstone experience).
- Students will develop an appreciation for the interdisciplinary role of science as applied to human health challenges, including health issues affecting the global community and health disparities among differing communities.
- Students will develop a mastery of one of the following areas, as applied to the biomedical sciences: a) Anatomy and Physiology, b) Genetics and Molecular Biology c) Microbiology and Immunology.

Details

Major Requirements

- Take the following 67 units including 40 units of Biology and Biology-related coursework 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 365W](#) (3 unit)

(Note: The Department of Biological Sciences is phasing out the [BIO 305W](#) course 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 482C](#) (Recommended), [BIO 401C](#), [BIO 420C](#), [BIO 432C](#), [BIO 444C](#), [BIO 465C](#), [BIO 488C](#)

Select additional courses from (23-24 units):

- [BIO 201](#), [BIO 201L](#), [BIO 202](#), [BIO 202L](#), [BIO 344](#), [BIO 416](#), [BIO 450](#) (These 20 units are recommended.)
 - [BIO 300](#) (up to 3 units)
 - [BIO 240](#), [BIO 320](#), [BIO 334](#), [BIO 338](#), [BIO 338L](#), [BIO 343](#), [BIO 346](#), [BIO 350](#), [BIO 375](#), [BIO 376](#), [BIO 424](#), [BIO 434](#), [BIO 451](#), [BIO 460](#), [BIO 460L](#), [BIO 475](#), [BIO 484](#), [BIO 488L](#), [BIO 545](#)
 - [BIO 485](#), [BIO 497](#), or [BIO 498](#) (up to 6 units)
 - Non-BIO prefix courses from: [CHM 238L](#), [CHM 461](#), [CHM 462C](#); [NTS 356](#), [NTS 425](#); [PHI 332](#) (up to 6 units)
- Basic chemistry sequence: [CHM 151](#), [CHM 151L](#), [CHM 152](#), [CHM 152L](#) (9 units)

Biochemistry sequence: [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](#) (5 units)
- [CHM 235](#), [CHM 235L](#), [CHM 238](#) (8 units)

Select one of the following math combinations:

- [MAT 125](#), ([STA 270](#) or [PSY 230](#)) (7-8 units)
- [MAT 136](#) (4 units)

Select one of the following physics sequences:

- [PHY 111](#), [PHY 112](#) (8 units)
- [PHY 161](#), [PHY 262](#), [PHY 262L](#) (8 units)

All prerequisite coursework must 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](#)