



COLLEGE OF LETTERS AND SCIENCES

BACHELOR OF SCIENCE IN BIOLOGY

Tackle Today's Challenges with the Tools of Science

From molecules to ecosystems, the biological universe is one of amazement and challenge. With a Bachelor of Science in Biology from National University, you'll be equipped to stake your claim in the worlds of emerging diseases, genetic studies, physiology and biodiversity, threats to species and ecosystem functioning, and global population increase and sustainability. The vocational choices for biology degree holders are broad and fascinating. Careers include those in medical professions, genetics, molecular and cell biology, biotechnology, microbiology, conservation biology, evolutionary biology, ecology, animal and plant science, as well as science writing, editing, and education.

The program is designed to promote your complete academic development: so science courses involve writing and diversity, as well as fundamentals of critical thinking. If you'd like to include an interdisciplinary approach to your academic training, this degree allows for the integration of study in the life sciences, with coursework in the physical and earth sciences, as well as applied fields such as forensics.

Online and On-campus Programs
 Monthly Starts and Accelerated Classes
 WSCUC Accredited

As an NU student, you can also consider the Bachelor of Science in Biology to Master of Forensic Science Transition program for your future. Clearly, your pursuit of a Bachelor of Science in Biology is an open door to the endless passions and discoveries of the scientific world.

Program highlights:

- Explore the biological processes at all levels of organization: molecular, cellular and microbial, and more
- Grasp the unifying concepts in biology, including cell theory, genetics, and evolution
- Describe the structure and function of organisms and their roles in the natural world
- Demonstrate relevant computer and technology literacy, including the ability to access research databases
- Evaluate historical developments and biology research in the context of contemporary research and challenges

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NATIONAL
 UNIVERSITY

MAJOR IN BIOLOGY

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The Bachelor of Science in Biology offers personal and academic fulfillment and growth as students discover the amazing world of biology. This degree prepares students for graduate and professional study, careers in life science education, research, health sciences, and applied biology. The BS in Biology provides a solid foundation in all levels of biological organization, from molecules to ecosystems. Such a comprehensive curriculum is crucial to meeting modern challenges in science, which include new and emerging diseases, rapid advances in our understanding of genetics, physiology and biodiversity, threats to species and ecosystem functioning, and global population increase and sustainability. A degree in biology is common preparation for careers in the various medical professions, genetics, molecular and cell biology, biotechnology, microbiology, conservation biology, evolutionary biology, ecology, animal and plant science, as well as science writing, editing and education.

Students who wish to include an interdisciplinary approach to their academic training should look closely at the benefits provided by this major. In addition to meeting requirements for a BS in Biology, this degree allows for the integration of study in the life sciences with coursework in the physical and earth sciences, as well as applied fields such as forensics. Furthermore, in keeping with the College of Letters and Sciences commitment to the complete academic development of its students, science courses involve writing and diversity components, as well as fundamental critical thinking components.

Bachelor of Science in Biology to Master of Forensic Science Transition Program

This transition program allows students who are enrolled in the BS Biology program with a cumulative grade point average of at least 3.0, and who are within completing their last six courses, to register for two courses in the MFS program as electives for the bachelor's degree. The two graduate courses are restricted to those that do not require a prerequisite. Students must complete all transition program coursework with a grade of B or better. The number of courses required to earn an MFS degree for transition program students is reduced from 12 to as few as 10 courses. Graduate-level coursework taken as part of the Biology program cannot be applied as graduate credit to the Master of Forensic Science program, nor will it transfer as graduate-level credit to any other university because it becomes part of the undergraduate degree program. Students must enroll in and complete the first class in the master's degree within 6 months of the conferral date of their undergraduate degree. The MFS program must be completed within 4 years with no break in enrollment of 12 months or more. Further rules and requirements for transition programs are located in the university catalog.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Discuss biological processes at all of levels of organization: molecular, cellular and microbial, organismal, population, and ecosystem.
- Explain the importance of unifying concepts in biology, including cell theory, genetics, and evolution.
- Describe the structure and function of Earth's organisms, as well as their roles in the natural world.
- Apply the scientific method in laboratory-based and field-based inquiry.
- Demonstrate effective oral, visual, and written communication and quantitative skills, including the critical analysis of data and scientific literature.
- Demonstrate computer and technology literacy, including the ability to access databases within the context of course research and project development.
- Evaluate historical developments and research in biology, as well as current and contemporary research and challenges.

Degree Requirements

To receive a Bachelor of Science, with a Major in Biology, students must complete at least 180 quarter units as articulated below, 45 of which must be completed in residence at National University, 76.5 of which must be completed at the upper-division level, and a minimum 70.5 units of the University General Education requirements. In the absence of transfer credit, additional general electives may be necessary to satisfy total units for the degree. Refer to the section on undergraduate admission requirements for specific information regarding admission and evaluation. All students receiving an undergraduate degree in Nevada are required by state law to complete a course in Nevada Constitution.

*Completion of BIO 100, 100A, 201, 201A, 202, 202A, 203, and 203A is equivalent to the course sequence BIO 161, 162, 163, 169A for fulfillment of the BS Biology degree.

Preparation for the Major

(16-17 courses; 60-61.5 quarter units)

- MTH 210* Probability and Statistics
Prerequisite: Accuplacer test placement evaluation or MTH 12A and MTH 12B
- MTH 215* College Algebra & Trigonometry
Prerequisite: Accuplacer test placement evaluation or MTH 12A and MTH 12B

OR

- MTH 216A* College Algebra I (3 quarter units)
Prerequisite: Accuplacer test placement evaluation MTH 12A and MTH 12B

AND

- MTH 216B* College Algebra II (3 quarter units)
Prerequisite: MTH 216A
- CHE 141* General Chemistry 1
Prerequisite: MTH 215 or equivalent
- CHE 142* General Chemistry 2
Prerequisite: CHE 141
- CHE 143 General Chemistry 3
Prerequisite: CHE 142, Corequisite: CHE 149A
- BIO 161* General Biology 1
- BIO 162* General Biology 2
Prerequisite: BIO 161
- BIO 163 General Biology 3
Prerequisite: BIO 161, Corequisite: BIO 169A, BIO 162
- PHS 171* General Physics 1
Prerequisite: MTH 215 or MTH 216A and MTH 216B
- PHS 172* General Physics 2
Prerequisite: PHS 171
- PHS 173 General Physics 3
Prerequisite: PHS 171 and PHS 172, Corequisite: PHS 179A
- CHE 150 Introductory Organic Chemistry
Prerequisite: CHE 101 and CHE 101A or CHE 141 and CHE 142 and CHE 143 and CHE 149A
- CHE 150A Introductory Organic Chem Lab (1.5 quarter units)
Corequisite: CHE 150
- BIO 169A General Biology Lab (1.5 quarter units)
Prerequisite: BIO 161 and BIO 162, Corequisite: BIO 163
- CHE 149A General Chemistry Laboratory (1.5 quarter units)
Corequisite: CHE 143
- PHS 179A General Physics Lab (1.5 quarter units)
Prerequisite: PHS 171, PHS 172 and PHS 173

* May be used to satisfy a General Education requirement.

Requirements for the Major

(12 courses; 42 quarter units)

- BIO 330 Ecology
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143 and CHE 149A
- BIO 305 Genetics
Prerequisite: BIO 163, BIO 169A, CHE 143 and CHE 149A
- BIO 310 Evolution
Prerequisite: BIO 161, BIO 162, BIO 163 and BIO 169A
- BIO 406 Cellular Biology
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143 and CHE 149A, Corequisite: BIO 406A
- BIO 406A Cellular Biology Lab (1.5 quarter units)
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143 and CHE 149A, Corequisite: BIO 406
- BIO 407 Molecular Biology
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143 and CHE 149A, Corequisite: BIO 407A, BIO 305
- BIO 407A Molecular Biology Lab (1.5 quarter units)
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143, CHE 149A and BIO 305, Corequisite: BIO 407
- BIO 414 Invertebrate Zoology
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143 and CHE 149A, Corequisite: BIO 414A
- BIO 414A Invertebrate Zoology Lab (1.5 quarter units)
Corequisite: BIO 414
- BIO 416 Vertebrate Zoology
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143 and CHE 149A, Corequisite: BIO 416A

- BIO 416A Vertebrate Zoology Laboratory (1.5 quarter units)
Corequisite: BIO 416
- BIO 440 Botany
Prerequisite: BIO 161, BIO 162, BIO 163, BIO 169A, CHE 141, CHE 142, CHE 143 and CHE 149A

Upper-Division Electives

(7 courses; 31.5 quarter units)

Students may select only 300, 400, or 500 level in the College of Letters and Sciences to complete the total of 76.5 quarter units of upper-division courses for the degree. Suggested upper-division courses are given below.

- BIO 420 Animal Behavior
Prerequisite: BIO 161, BIO 162, BIO 163 and BIO 100A
- BIO 430 Immunology
Prerequisite: BIO 406 and BIO 407
- BIO 450 Natural History of California
Prerequisite: BIO 161, BIO 162, BIO 163 and BIO 100A, or BIO 100 and BIO 100A
- BIO 460 Marine Biology
Prerequisite: BIO 161 with a minimum grade of C, BIO 162 with a minimum grade of C and BIO 163 with a minimum grade of C
- BIO 461 Marine Biology Field Studies
Recommended preparation: BIO 162 with a minimum grade of C
- BIO 470 Bioinformatics
Prerequisite: BIO 161 with a minimum grade of C-, BIO 162 with a minimum grade of C-, BIO 163 with a minimum grade of C-, Corequisite: BIO 470A
- BIO 470A Bioinformatics Lab (1.5 quarter units)
Corequisite: BIO 470
- BIO 480 Studies in Field Biology
- CHE 350 Organic Chemistry I
Prerequisite: CHE 142, Corequisite: CHE 350A
- CHE 350A Organic Chemistry I Lab (1.5 quarter units)
Corequisite: CHE 350
- CHE 351 Organic Chemistry II
Prerequisite: CHE 350, Corequisite: CHE 351A
- CHE 351A Chemistry II Lab (1.5 quarter units)
Corequisite: CHE 351
- CHE 360 Biochemistry I
Prerequisite: CHE 350, CHE 350A and CHE 351
- CHE 361 Biochemistry II
Prerequisite: CHE 360
- EES 322 Oceanography
- EES 335 Environmental Science
- MTH 317 Mathematical Modeling
Prerequisite: MTH 215 or MTH 216A and MTH 216B and MTH 210
- SCI 303 GIS: Geographic Info Systems
- SCI 400 History of Science
Prerequisite: One 4.5 quarter unit science course from the natural sciences.
- SCI 490 Guided Study (variable units)

Approved transition program students may select up to two (2) FSC courses from below to meet up to 9 quarter units of the elective requirement.

- FSC 630 Forensic Pathology I
- FSC 633 Advanced Forensic Toxicology
- FSC 634 Forensic Serology and DNA
- FSC 635 Forensic Anthropology
- FSC 642 Forensic Pathology II
Prerequisite: FSC 630