

# BIOLOGY BACHELOR OF ARTS

## Program Overview

Biology is the study of life and all its remarkable forms and processes. Drake University's biology program uses an inquiry-based and integrated approach throughout the curriculum. This modern approach engages students in scientific methods and research from the first year of study, giving students a jump-start on developing skills in research, critical thinking, scientific communication, and data analysis.

Coursework toward a Bachelor of Arts or Bachelor of Science in Biology exposes students to microscopic cells, complex ecosystems, and everything in between (and beyond). Drake's biology curriculum is designed to provide students with a strong foundation of biological understanding in four core subject areas. Students also can delve more deeply into disciplines of their choosing in preparation for graduate and professional programs, careers in the health sciences, or other areas in the biological sciences. We are committed to supporting all Drake students in their pursuit to better understand life on earth and build a roadway to success in their own lives after Drake.

The department's diverse and dedicated faculty provide students access to more than 50 different courses, covering biological content from molecules to ecosystems, examining microbes, invertebrates, vertebrates or plants, and covering an array of topics from ethnobotany to kinesiology, histology to animal behavior, and nature photography to experimental design and data analysis. Drake's affiliations with Iowa Lakeside Laboratory and the Gulf Coast Research Laboratory in Mississippi provides opportunities for Drake students to earn credit towards a Biology degree while taking specialized courses such as soil genesis, watershed hydrology, prairie ecology, marine biology and ecology, marine mammals and ichthyology, coastal herpetology and oceanography.

## B.A. Degree Requirements

Students who earn a B.A. degree in biology and who meet the entrance requirements may apply to schools of medicine, dentistry, optometry, podiatry, chiropractic medicine, veterinary medicine, physical therapy, or other health related programs. Further opportunities include advanced study in graduate school or career positions with industry, government or private agencies in biologically related fields such as biotechnology, conservation biology and resource management, food science agriculture, environmental education and forensic science.

The B.A. in Biology requires a minimum of 34 credit hours in biology which includes courses as outlined below, chemistry, physics and math courses outlined below, an average GPA of 2.0 or higher in biology courses, and at least 6 biology courses having laboratory experiences (courses with "L" designations).

Restrictions for Biology credits that can be used to fulfill the required 34 credits:

- A maximum of 16 Biology transfer credits
- BIO 015 cannot be used towards Biology degree requirements

| Code           | Title                                                                         | Hours |
|----------------|-------------------------------------------------------------------------------|-------|
| BIO 012 & 012L | GENERAL/PRE-PROFESSIONAL BIOLOGY I and GENERAL/PRE-PROFESSIONAL BIOLOGY I LAB | 4     |

|                                                     |                                                                                 |     |
|-----------------------------------------------------|---------------------------------------------------------------------------------|-----|
| BIO 013 & 013L                                      | GENERAL/PRE-PROFESSIONAL BIOLOGY II and GENERAL/PRE-PROFESSIONAL BIOLOGY II LAB | 4   |
| BIO 199                                             | SENIOR CAPSTONE EXPERIENCE                                                      | 3   |
| Select one course from each of the five core areas: |                                                                                 |     |
| Molecular and Cellular Processes                    |                                                                                 | 3-4 |
| BIO 105                                             | INTRODUCTION TO GENETICS                                                        |     |
| BIO 165                                             | CELL BIOLOGY                                                                    |     |
| BIO 186                                             | MOLECULAR BIOLOGY                                                               |     |
| Biological Diversity                                |                                                                                 | 4-5 |
| BIO 019 & 019L                                      | INTRODUCTION TO BOTANY and BOTANY LAB                                           |     |
| BIO 092 & 092L                                      | INTRODUCTION TO ETHNOBOTANY and INTRODUCTION TO ETHNOBOTANY LAB                 |     |
| BIO 101 & 101L                                      | COMPARATIVE ANATOMY OF VERTEBRATES and Comparative Anatomy Lab                  |     |
| BIO 103 & 103L                                      | MICROBIOLOGY and MICROBIOLOGY LAB                                               |     |
| BIO 113 & 113L                                      | VERTEBRATE BIOLOGY and VERTEBRATE BIOLOGY LAB                                   |     |
| BIO 123                                             | BIOLOGY OF INVERTEBRATES                                                        |     |
| Systems Biology                                     |                                                                                 | 4-5 |
| BIO 018 & 018L                                      | INTRODUCTION TO ANATOMY AND PHYSIOLOGY and ANATOMY AND PHYSIOLOGY LAB           |     |
| BIO 120 & 120L                                      | ECOSYSTEM ECOLOGY and ECOSYSTEM ECOLOGY LAB                                     |     |
| BIO 127 & 127L                                      | HISTOLOGY and HISTOLOGY LAB                                                     |     |
| BIO 129 & 129L                                      | MAMMALIAN PHYSIOLOGY and MAMMALIAN PHYSIOLOGY LAB                               |     |
| Ecology/Evolution                                   |                                                                                 | 4-5 |
| BIO 114 & 114L                                      | EVOLUTION and EVOLUTION LAB                                                     |     |
| BIO 117 & BIO 118L                                  | ECOLOGY and ECOLOGY LAB                                                         |     |
| BIO 152 & 152L                                      | FIELD BOTANY and FIELD BOTANY LAB                                               |     |
| Career Specialization                               |                                                                                 | 1-6 |
| BIO 021                                             | SPECIAL TOPICS IN BIOLOGY                                                       |     |
| BIO 025                                             | ANIMAL BEHAVIOR                                                                 |     |
| BIO 026L                                            | ETHOLOGICAL METHODS                                                             |     |
| BIO 032                                             | WELLNESS AND NUTRITION                                                          |     |
| BIO 061                                             | NATURE PHOTOGRAPHY                                                              |     |
| BIO 063L                                            | ZOO BIOLOGY LAB                                                                 |     |
| BIO 095                                             | MEDICAL MICROBIOLOGY                                                            |     |
| BIO 098                                             | INTRODUCTION TO PRIMATOLOGY                                                     |     |
| BIO 104                                             | VIROLOGY                                                                        |     |
| BIO 107                                             | BEHAVIOR GENETICS                                                               |     |
| BIO 108                                             | INFECTIOUS DISEASES                                                             |     |
| BIO 110 & 110L                                      | IOWA NATURAL HISTORY and IOWA NATURAL HISTORY LAB                               |     |
| BIO 111                                             | EVOLVED FOODWAYS                                                                |     |
| BIO 116                                             | BIOINFORMATICS                                                                  |     |
| BIO 119 & 119L                                      | HERPETOLOGY and HERPETOLOGY LAB                                                 |     |

|                   |                                                                  |
|-------------------|------------------------------------------------------------------|
| BIO 122<br>& 122L | MAMMALOLOGY<br>and MAMMOLOGY LAB                                 |
| BIO 130<br>& 130L | ORNITHOLOGY<br>and ORNITHOLOGY LAB                               |
| BIO 131<br>& 131L | BIOCHEMISTRY<br>and BIOCHEMISTRY LAB                             |
| BIO 132           | MEDICAL BIOPHYSICS                                               |
| BIO 133<br>& 133L | KINESIOLOGY<br>and KINESIOLOGY LAB                               |
| BIO 134<br>& 134L | EXERCISE PHYSIOLOGY<br>and EXERCISE PHYSIOLOGY LAB               |
| BIO 138           | MEDICAL ASPECTS OF EXERCISE                                      |
| BIO 140           | BIOLOGY RESEARCH AND STATISTICAL<br>METHODS                      |
| BIO 145<br>& 145L | SELECTED TOPICS IN BIOLOGY<br>and SELECTED TOPICS IN BIOLOGY LAB |
| BIO 156           | BIOLOGY SHORT COURSE                                             |
| BIO 167<br>& 167L | POPULATION AND COMMUNITY ECOLOGY<br>and POPULATION ECOLOGY LAB   |
| BIO 176<br>& 176L | NEUROPHYSIOLOGY<br>and NEUROPHYSIOLOGY LAB                       |
| BIO 182<br>& 182L | IMMUNOLOGY<br>and IMMUNOLOGY LAB                                 |
| BIO 185           | HUMAN GENETICS                                                   |
| BIO 188L          | STRUCTURAL BIOLOGY LAB                                           |
| BIO 189           | REGULATORY BIOLOGY                                               |

Select two to four credits, representing a dedicated experiential component to biological study or its application to society, from the following:<sup>1</sup> 2-4

|                   |                                                      |
|-------------------|------------------------------------------------------|
| BIO 064           | MUSEUM CURATION                                      |
| BIO 093L          | LAB/FIELD ASSISTANT <sup>2</sup>                     |
| BIO 109           | ZOO/GREAT APE PRACTICUM                              |
| BIO 112L          | AVIAN WINTER ECOLOGY                                 |
| BIO 124L          | RESEARCH COLLABORATION                               |
| BIO 159           | ZOO/GREAT APE INTERNSHIP                             |
| BIO 187L          | APPLIED MOLECULAR BIOLOGY LAB                        |
| BIO 193L          | SENIOR LAB ASSISTANT <sup>2</sup>                    |
| BIO 195L          | ADVANCED MOLECULAR LIFE LAB                          |
| BIO 196           | BIOLOGY INTERNSHIP                                   |
| BIO 197<br>& 197L | UNDERGRADUATE RESEARCH<br>and UNDERGRADUATE RESEARCH |
| BIO 198           | INDEPENDENT STUDY IN BIOLOGY <sup>2</sup>            |

Select one of the following: 3-4

|                        |                                                                 |
|------------------------|-----------------------------------------------------------------|
| CS 065                 | INTRODUCTION TO COMPUTER SCIENCE I                              |
| BIO 140                | BIOLOGY RESEARCH AND STATISTICAL<br>METHODS                     |
| MATH 050               | CALCULUS I                                                      |
| CHEM 001<br>& CHEM 003 | GENERAL CHEMISTRY I<br>and GENERAL CHEMISTRY I LAB (with lab)   |
| CHEM 002<br>& CHEM 004 | GENERAL CHEMISTRY II<br>and GENERAL CHEMISTRY II LAB (with lab) |
| CHEM 097<br>& CHEM 098 | ORGANIC CHEMISTRY I<br>and ORGANIC CHEMISTRY I LAB (with lab)   |
| CHEM 108<br>& CHEM 110 | ORGANIC CHEMISTRY II<br>and ORGANIC CHEMISTRY II LAB (with lab) |

|                    |                                                                   |              |
|--------------------|-------------------------------------------------------------------|--------------|
| MATH 020           | PRE-CALCULUS: ALGEBRA AND TRIGONOMETRY<br>(or higher MATH course) | 3            |
| PHY 011            | GENERAL PHYSICS I (with lab)                                      | 4            |
| PHY 012            | GENERAL PHYSICS II (with lab)                                     | 4            |
| <b>Total Hours</b> |                                                                   | <b>59-71</b> |

<sup>1</sup> A minimum of 2 credits required, a maximum of 4 credits can be applied to the total requirement of 34.

<sup>2</sup> Subject to approval by the Chair of Biology.

First-year students who plan to major in biology are encouraged to enroll in BIO 015 INTRODUCTION TO BIOLOGY during the fall semester of their first year. BIO 015 INTRODUCTION TO BIOLOGY informs students about the Biology program and the career opportunities in biology; it does not contribute to the 34 required credit hours. Students have the responsibility to develop their program of study and review it with their faculty advisor in biology.

In addition to programmatic requirements, students are responsible for satisfying all requirements of the Drake Curriculum (<https://catalog.drake.edu/archive/2024-2025/undergraduate/academic-information/drake-curriculum/>), including Areas of Inquiry (AOI)

Student must also satisfy university graduation requirements (<https://catalog.drake.edu/archive/2024-2025/undergraduate/academic-information/graduation-requirements/>) for all undergraduate students..