ZOLOGY MAJOR (B.S.)

https://colsa.unh.edu/biological-sciences/program/bs/zoology-major

Description

The Bachelor of Science (B.S.) in Zoology builds from the common background of the biology core curriculum to provide ample time for third- and fourth-year students to concentrate in specialized disciplines such as marine and freshwater biology, behavior, cell and developmental biology, ecology, evolution, fisheries, physiology, and neurobiology while giving students the foundation from which they can specialize in the area of zoology. Undergraduate students are encouraged to conduct field or lab-based research which helps determine advanced education disciplines for graduate studies. Many students ultimately work in the government, environmental agencies, education as well as agricultural, pharmaceutical, and biotechnology industries, where they conduct advanced research and/or teaching. Zoology majors had the second highest income and lowest unemployment rate according to data from the 2016 U.S. Census Bureau’s American Community Survey.

New England Regional Student Program

The bachelor’s degree in zoology is one of the specialized curricula recognized by the New England Board of Higher Education and participates in the New England Regional Student Program. Under this program, students from any of the New England states pay the UNH in-state tuition rate plus 75 percent.

Requirements

Requirements for the Major: Minimum grade of D# or better is required in CHEM 411, PHYS 401, and MATH 424B (if taken); minimum grade of C# or better is required in all other courses. ZOOL 600, BIOL 695, ZOOL 795, or ZOOL 799 may substitute for one elective with academic advisor approval, but only if taken for at least four credits. These four credits may be spread over multiple semesters if they are consecutive and with the same faculty mentor.

Major Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BIOL 411</td>
<td>Introductory Biology Molecular and Cellular</td>
<td>4</td>
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<tr>
<td>BIOL 412</td>
<td>Introductory Biology Evolution; Biodiversity and Ecology</td>
<td>4</td>
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<tr>
<td>BIOL 528</td>
<td>Applied Biostatistics I</td>
<td>4</td>
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<tr>
<td>BIOL 541</td>
<td>Ecology</td>
<td>4</td>
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<tr>
<td>BMCB 658</td>
<td>General Biochemistry &amp; General Biochemistry Lab</td>
<td>5</td>
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<tr>
<td>CHEM 403</td>
<td>General Chemistry I</td>
<td>4</td>
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<tr>
<td>CHEM 404</td>
<td>General Chemistry II</td>
<td>4</td>
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<tr>
<td>CHEM 545</td>
<td>Organic Chemistry</td>
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<td>CHEM 546</td>
<td>Organic Chemistry Laboratory</td>
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<tr>
<td>GEN 604</td>
<td>Principles of Genetics</td>
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<td>or ANSC 612, Genetics of Animals</td>
<td>4</td>
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<tr>
<td>MATH 424B</td>
<td>Calculus for Life Sciences</td>
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<td>or BIOL 963, Data Analysis for Life Science</td>
<td>4</td>
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<td>or BIOL 711, Experimental Design &amp; Analysis</td>
<td>4</td>
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<tr>
<td>PHYS 401</td>
<td>Introduction to Physics I</td>
<td>4</td>
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<tr>
<td>PHYS 402</td>
<td>Introduction to Physics II</td>
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<tr>
<td>ZOOL 400</td>
<td>Professional Perspectives in Zoology</td>
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<tr>
<td>ZOOL 518</td>
<td>Comparative Morphology and Biology of Vertebrates</td>
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<td>ZOOL 625</td>
<td>Principles of Animal Physiology</td>
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<td></td>
<td>&amp; ZOOL 626, Animal Physiology Laboratory</td>
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<tr>
<td>BIOL 780</td>
<td>Capstone Companion Course</td>
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<td>ZOOL 529</td>
<td>Developmental Biology</td>
<td></td>
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<td>ZOOL 613</td>
<td>Animal Behavior</td>
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<td>ZOOL 690</td>
<td>Evolution</td>
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Animal Survey Courses (Choose 1)

- ZOOL 542 Ornithology
- ZOOL 555 Introduction to Entomology
- ZOOL 566 Herpetology
- MEFB 628 Marine Invertebrate Evolution and Ecology
- ZOOL 710 Sharks and Bony Fishes
- NR 712 Mammalogy

Biological Science Electives

Select two courses

- BIOL 720 Plant Animal Interactions (C)                                | 4 |
- BMS 718 Mammalian Physiology                                         | 4 |
- MEFB 503 Introduction to Marine Biology                              | 0 or | 4 |
- MEFB 504 Field Wildlife Forensics                                    | 2 |
- MEFB 628 Marine Invertebrate Evolution and Ecology                   | 5 |
- MEFB 717 Lake Ecology                                                | 4 |
- MEFB 719 Field Studies in Lake Ecology                               | 4 |
- MEFB 785 Biological Oceanography                                     | 3 |
- MEFB 772 Fishes Biology Conservation and Management                  | 4 |
- MEFB 773 Physiology of Fishes                                        | 4 |
- NR 615 Wildlife Habitats                                            | 4 |
- NR 640 Wildlife Population Ecology                                   | 4 |
- NR 642 Introduction to Biogeography                                  | 4 |
- NR 650 Principles of Conservation Biology                            | 4 |
- NR 712 Mammalogy                                                     | 4 |
- NSB 705 Molecular and Cellular Neurobiology (C)                      | 4 |
- NSB 727 Animal Communication (C)                                     | 4 |
- NSB #728 Research Methods in Animal Behavior                        | 4 |
- TECH 797 Undergraduate Ocean Research Project (*)                   | 2 |
- ZOOL 529 Developmental Biology                                      | 0 or | 4 |
- ZOOL 542 Ornithology                                                | 0 or | 4 |
- ZOOL 555 Introduction to Entomology                                 | 4 |
- ZOOL 613 Animal Behavior                                            | 5 |
- ZOOL 666 Herpetology                                                | 4 |
- ZOOL 690 Field Experience (3)                                        | 1-4 |
- ZOOL 690 Evolution                                                  | 4 |
- ZOOL 708 Stream Ecology                                             | 4 |
- ZOOL 710 Sharks and Bony Fishes                                     | 0 or | 4 |
- ZOOL 726 Conservation Behavior                                      | 4 |
- ZOOL 733 Behavioral Ecology (C)                                      | 0 or | 4 |
- ZOOL 736 Genetics and Behavior (C)                                  | 4 |
- ZOOL 770 Senior Seminar in Zoology                                  | 2 |
- ZOOL 777 Neuroethology (C)                                           | 4 |
- ZOOL 795 Independent Investigations in Zoology (3)                   | 1-4 |
- ZOOL 799 Honors Senior Thesis (3)                                    | 1-4 |

Shoals Courses:

- MEFB 500 Coastal Habitat Field Research Methods                     | 4 |
- MEFB 9555 Introduction to Applied Science Communication             | 4 |
- MEFB 956 Marine Parasitology and Disease                             | 4 |
- MEFB 510 Field Ornithology                                           | 4 |
- MEFB 530 Evolution and Marine Diversity                             | 4 |
- MEFB 535 Marine Mammal Biology                                      | 4 |
- MEFB 430 Marine Invertebrates                                        | 4 |
- MEFB 674 Ecology and Marine Environment                             | 4 |
- MEFB 702 Sustainable Marine Fisheries                               | 4 |
- MEFB 714 Field Animal Behavior                                      | 4 |
1 A single course cannot be used for both a core requirement and an elective (e.g., ZOOL 542 cannot be used to fulfill the animal survey requirement and as an elective).
2 This class requires enrollment in both fall and spring sections, 2 credits/semester for a total of 4 credits.
3 A 600, 695, 795, or 799 experience may substitute for one elective with academic advisor approval, but only if taken for at least four credits. These four credits may be spread over multiple semesters if they are consecutive and with the same faculty mentor.

**Capstone Experience**

As part of the University of New Hampshire’s Discovery Program requirements, all students must complete a capstone experience during their senior year (after earning at least 90 credits). The capstone experience for students majoring in ZOOLOGY BS consists of BOTH (1) an approved individual experience AND (2) the successful completion of the BIOL 780 Capstone Companion Course. Students will not be approved for graduation until capstone certification has been granted.

1) The individual experience

The individual experience may be satisfied through various forms of experiential learning (e.g., Honors thesis, mentored research project, internship) or a course denoted with a “(C)” in the courses listed above. The individual experience must fulfill at least one of the University’s capstone criteria:

- synthesizes and applies disciplinary knowledge and skills
- fosters reflection on undergraduate learning and experience
- demonstrates emerging professional competencies
- applies, analyzes, and/or interprets research, data, or artistic expression
- explores areas of interest based on the integration of the prior learning

Before beginning any capstone individual experience, students MUST SUBMIT A COMPLETED CAPSTONE APPROVAL FORM to their Program Coordinator.

Students can obtain this form on the Department’s Capstone page or from their Program Coordinator. Here they will describe their proposed individual experience and how it fulfills at least one of the University’s capstone criteria listed above. If the student is selecting a “(C)” course for their individual experience, they should obtain the course syllabus from the instructor for information about the course’s content and learning objectives.

2) Enrollment in BIOL 780 Capstone Companion Course

Students will also be required to enroll in BIOL 780 Capstone Companion Course (1 cr.) during the semester of their individual experience. BIOL 780 is offered every Fall and Spring semester.

- If the individual experience is a two-semester thesis, BIOL 780 should be taken during the second semester.
- If the individual experience occurs during the summer (e.g., internship), BIOL 780 should be taken during the Fall semester that immediately follows.
- Note: Because BIOL 780 is not offered during the summer, students cannot complete their individual experience during the summer and graduate during that same August. Summer experiences could only be used as individual capstone experiences if completed the summer before the student’s senior year.

**Student Learning Outcomes**

Students demonstrate that they understand basic principles of Zoology.

- Understand the biodiversity and ecological roles of selected animal taxa.
- Demonstrate understanding of animal physiology and structure at the cellular and organismal levels.
- Describe and apply key principles and mechanisms of evolution and genetics.
- Comprehend the relationship between organisms and their environments.

Students demonstrate that they can undertake scientifically valid methods of inquiry.

- Demonstrate proficiency in searching, reading, and understanding scientific literature.

Students demonstrate that they can think critically and analytically.

- Analyze and present data using appropriate quantitative and graphical tools.

Students demonstrate that they can communicate effectively.

- Develop effective written and oral communication skills for conveying scientific information effectively to a wide audience.

Students practice science responsibly and ethically, and acknowledge the influence of cultural and historical biases in the sciences.