DEPARTMENT OF BIOLOGY

http://www.uvm.edu/cas/biology

The Department of Biology is the general biology research and teaching department at the University of Vermont. The department is committed to the active pursuit of scientific understanding through integrative, cutting-edge research in neuroscience, cell biology, genetics, ecology, and evolution. The Biology Department administers several majors, including B.A. degrees in Biology and Zoology and B.S. degrees in Biological Sciences and Zoology. Students pursuing the Biology B.A. degree choose between structured concentrations in Cell and Developmental Biology, Ecology and Evolutionary Biology, or General Biology. All majors provide excellent preparation for many careers and graduate programs, including programs in health and medicine and veterinary science. The department's focus, most particularly in advanced courses, is on learning primarily through smaller classes, analysis of primary literature, hands-on research, and close faculty interaction. UVM Biology professors are respected, internationally known scientists and recipients of important grants each year from organizations including the National Science Foundation, the National Institutes of Health, and the Environmental Protection Agency. Student research is encouraged and is supported by departmental and university awards. Students consult regularly with departmental faculty advisors to choose a structured set of elective courses to meet their interests and professional goals.

MAJORS

BIOLOGY MAJORS

Biology B.A.

Biological Science B.S.

Zoology B.A.

Zoology B.S.

MINORS

BIOLOGY MINORS

Biology

Zoology

GRADUATE

Biology AMP

Biology M.S.

Biology Ph.D.

See the online Graduate Catalogue for more information

Courses

BIOL 1000. AP Biology 1. 4 Credits.
Credit awarded for achieving a certain score on the Biology Advanced Placement (AP) Examination. The necessary score may vary from year to year; consult Transfer Affairs for appropriate specifics. Catamount Core: N2.

BIOL 1005. AP Biology 2. 4 Credits.
Credit awarded for achieving a certain score on the Biology Advanced Placement (AP) Examination. The necessary score may vary from year to year; consult Transfer Affairs for appropriate specifics. Catamount Core: N2.

BIOL 1008. Transfer Bio: Non-Lab Science. 3-6 Credits.
Credit for courses in biology and related life science fields taken at another institution that have been accepted for transfer credit at UVM and approved as fulfilling the N1: Natural Science General Education requirement. Catamount Core: N1.

BIOL 1009. Transfer Bio: Lab Science. 3-8 Credits.
Credit for courses in biology and related life science fields taken at another institution that have been accepted for transfer credit at UVM and approved as fulfilling the N2: Natural Science with lab General Education requirement. Catamount Core: N2.

BIOL 1010. Topics In: First-Year Seminar. 3 Credits.
Intensive first-year seminar focused on specific themes and/or disciplinary perspectives. Emphasis on developing critical reading and writing skills, substantive revision, information literacy, and analytical thinking. First-year seminars are frequently organized to meet one of the disciplinary Catamount Core requirements. Topics vary by offering; periodic offering at intervals that may exceed four years. Catamount Core: N1, WIL1.

BIOL 1020. Topics In: LASP Writing. 3 Credits.
Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program. Catamount Core: N1, WIL1.

BIOL 1025. Topics In: LASP Seminar. 3 Credits.
Intensive course in a broad disciplinary area (humanities, social sciences, arts, or natural sciences). Part of an integrated first-year experience in which students take 2-4 classes exploring aesthetic, humanistic, social, linguistic, environmental, or scientific issues. May repeat for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Co-requisite: Enrollment in the appropriate Liberal Arts Scholars Program. Catamount Core: N1.

BIOL 1029. LASP Program CURE Lab. 1 Credit.
Explores how modern science evolves and how researchers build upon one another's contributions. This Course-based Undergraduate Research Experience (CURE) provides early opportunities to Life Science Scholars to participate in the scientific inquiry process by focusing on the first steps of scientific research: reading, analyzing, and synthesizing scientific literature; and asking scientific questions. Prerequisites: Enrollment in Liberal Arts Scholars Program for Life Science Scholars.

BIOL 1070. Frontiers in Biology. 1 Credit.
Introduces Biology majors to the science and practice of biology, with a particular focus on career development and information literacy skills in the life sciences.

BIOL 1075. Frontiers in Zoology. 1 Credit.
Introduces Zoology majors (B.A./B.S.) to the science and practice of zoology, with a particular focus on career development and information literacy skills in the life sciences.

BIOL 1100. Human Biology w/lab. 0 or 4 Credits.
For nonscience majors. Selected biological concepts and topics relevant to humans, such as cancer, human genetics, environmental toxicants. With virtual laboratory. Credit not awarded for both BIOL 1100 and BIOL 1105. Catamount Core: N2.

BIOL 1105. Human Biology. 3 Credits.
For nonscience majors. Selected biological topics relevant to humans, such as cancer, human genetics, environmental toxicants; biological concepts necessary for understanding these problems. No laboratory. Credit not awarded for both BIOL 1105 and BIOL 1100. Catamount Core: N1.

BIOL 1150. The Human Body w/lab. 0 or 4 Credits.
For nonscience majors. Introduction to basic human anatomy and organ system physiology emphasizing normal and diseased homeostatic mechanisms. With virtual laboratory. Credit not awarded for both BIOL 1150 and BIOL 1155. Catamount Core: N2.

BIOL 1155. The Human Body. 3 Credits.
For nonscience majors. Introduction to basic human anatomy and organ system physiology emphasizing normal homeostatic mechanisms and the changes that accompany common disorders and diseases. No laboratory. Credit not awarded for both BIOL 1155 and BIOL 1150. Catamount Core: N1.

BIOL 1200. Forensic Biology in Court. 3 Credits.
Forensic science is a rapidly changing field that blends expertise in a wide range of natural sciences, social sciences, and the law to better represent the rights of all members of our society. Covers crime scene investigation, methods of evidence collection, and analysis of biological evidence both classical (fingerprints, blood spatter) and modern (DNA profiles and match statistics) contextualized by Constitutional guidelines. Catamount Core: D1, N1.

BIOL 1205. Climate Change Genetics. 3 Credits.
Aimed at non-life science majors. Covers foundational information in genetics and cellular biology to determine which species will survive the challenges of novel environmental conditions due to climate change. Collaborative work on endangered species case studies and critical thinking about the mechanisms that allow for adaptation. Catamount Core: N1.

BIOL 1305. Evolutionary Biology. 3 Credits.
For nonscience majors. The process of biological evolution, evidence for evolution, mechanisms of evolutionary change, origin of adaptations, evolution of behavior, social and reproductive behavior. No laboratory. Credit not awarded for both BIOL 1305 and BIOL 1300. Catamount Core: N1.

BIOL 1310. History of Life on Earth. 3 Credits.
For students with majors outside the sciences. Traces the interaction between physical conditions on earth and evolving life from the origin of the earth to the present. Primary learning objectives include being able to apply the scientific method as a way of understanding the world and to use this framework to understand how humans can have knowledge about past events that they cannot observe directly. Catamount Core: N1.

BIOL 1400. Principles of Biology 1. 0 or 4 Credits.
Principles of cellular biochemistry; cell biology; genetics and evolution. Topics: biochemistry; metabolism, cell structure/function; respiration; photosynthesis; molecular, Mendelian and population genetics; genetics of evolution. Credit not awarded for both BIOL 1400 and BCOR 1400 or BCOR 1425. Catamount Core: N2.

BIOL 1450. Principles of Biology 2. 0 or 4 Credits.
Principles of organismal biology; nature of scientific inquiry, plant form and function, pollination ecology, animal phylogeny illustrated by comparative anatomy and physiology; animal behavior. Credit not awarded for both BIOL 1450 and BCOR 1450. Catamount Core: N2.

BIOL 1990. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 1993. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

BIOL 2100. Soundscapes and Behavior Rsch. 4 Credits.
Students will participate in all aspects of a research project while learning to navigate the messiness of real-world data. Students will develop research questions on topics related to marine soundscape ecology, marine animal bioacoustics, and cetacean ecology, behavior, and conservation. Prerequisites: BIOL 1450, BCOR 1450, or BCOR 1425; or BIOL 1000, BIOL 1005. Catamount Core: N1.

BIOL 2105. Introduction to Marine Science. 3 Credits.
An overview of concepts and process in oceanography, geology, ecology, evolution, organismal biology, and conservation. Some of the topics we will discuss in class include tsunamis, ocean chemistry and physics, and bioluminescence. Prerequisites: BCOR 1400, BIOL 1400, or BIOL 1000; BCOR 1450, BIOL 1450, BIOL 1005, or BCOR 1425. Catamount Core: N1.

BIOL 2300. Vertebrate Zoology. 3 Credits.
Explores vertebrate diversity using the tools of evolutionary tree diagrams, structure and function relationships, ecology, and paleontology. Prerequisites: BCOR 1400, BIOL 1400, or BIOL 1000; BCOR 1450, BIOL 1450, BIOL 1005, or BCOR 1425. Catamount Core: N1.

BIOL 2990. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 2991. Internship: Nat Hst Collection. 1-18 Credits.
On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

BIOL 2995. Undergraduate Research. 1-18 Credits.
Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Pre/co-requisites: Junior/Senior standing; Department permission.

BIOL 3100. Plant-Animal Interactions. 3 Credits.
Ecological and evolutionary interactions among plants and animals. Topics include herbivory, pollination, seed predation, ant-plant interactions, biological control, and anthropogenic effects on plant-animal interactions including the effects of GMOs and global climate change. Prerequisites: BCOR 2100. Catamount Core: N1.

BIOL 3105. Community Ecology. 3 Credits.
Theoretical and empirical analyses of community structure. Topics include population growth, metapopulation dynamics, competition, predation, species diversity, niches, disturbance succession, island biogeography, and conservation biology. Prerequisite: BCOR 2100; minimum Junior standing. Catamount Core: N1.

BIOL 3160. Sociobiology. 3 Credits.
The evolutionary biology of social behavior in animals. Topics include the evolution of sociality, social interactions, and the functional organization of social groups. Prerequisite: BCOR 2100. Catamount Core: N1.

BIOL 3165. Evolution. 3 Credits.
Basic concepts in evolution will be covered, including the causes of evolutionary change, speciation, phylogenetics, and the history of life. Prerequisite: BCOR 2100. Catamount Core: N1.

BIOL 3200. Topics in Ecology & Evolution. 3 Credits.
Exploration of advanced topics in Ecology and Evolution. May be repeated for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisite: BCOR 2100.

BIOL 3400. Topics in General Biology. 3 Credits.
Exploration of advanced topics in General Biology. May be repeated for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisite: BCOR 2100, BCOR 2300, or BCOR 2500.

BIOL 3500. Neurodevelopment. 3 Credits.
Current topics in developmental neurobiology through lectures and discussions of primary literature. The course is designed for advanced undergraduate life science majors and graduate students in the biological sciences. Prerequisites: BCOR 2300, BCOR 2500. Catamount Core: N1.

BIOL 3505. Neurobiology. 3 Credits.
Focus on molecular and cellular aspects of the nervous system. Electrical signaling, synaptic transmission, signal transduction, neural development, plasticity, and disease. Credit not awarded for both BIOL 3505 and NSCI 3505. Prerequisite: BCOR 2500. Catamount Core: N1.

BIOL 3510. Model Systems in Neuroscience. 3 Credits.
Provides students a deeper level of scientific fluency with guidance on how to critically read and understand primary scientific literature and how to communicate those findings, using model systems as our guide. Prerequisites: BCOR 2300 and (BCOR 2500 or NSCI 2105).

BIOL 3530. Cell Biology and Disease. 3 Credits.
Exploration of the fundamental molecular mechanisms that happens in a cell in different disease states. Diseases covered can include Multiple Sclerosis, Alzheimer's, Diabetes, and Osteoporosis. Emphasizes the cellular and molecular basis of these diseases. Prerequisites: BCOR 2500 or NSCI 2105. Catamount Core: N1.

BIOL 3560. Developmental Biology. 3 Credits.
An analysis of the cellular, subcellular, molecular, and genetic mechanisms that operate during oogenesis and embryogenesis in invertebrate and vertebrate organisms. Prerequisites: BCOR 2300, BCOR 2500. Catamount Core: N1.

BIOL 3565. Developmntl Molecular Genetics. 3 Credits.
Current topics in developmental genetics explored through lectures and discussions of current literature; emphasis on molecular approaches. Prerequisite: BCOR 2300.

BIOL 3600. Topics in Cell & Developmental. 3 Credits.
Exploration of advanced topics in Cell and Developmental Biology. May be repeated for credit with different content. Topics vary by offering; periodic offering at intervals that may exceed four years. Prerequisite: BCOR 2300.

BIOL 3990. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 3991. Internship. 1-18 Credits.
On-site supervised work experience combined with a structured academic learning plan directed by a faculty member or a faculty-staff team in which a faculty member is the instructor of record, for which academic credit is awarded. Offered at department discretion.

BIOL 3993. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

BIOL 3995. Undergraduate Research. 1-18 Credits.
Undergraduate student work on individual or small team research projects under the supervision of a faculty member, for which credit is awarded. Offered at department discretion. Pre/co-requisites: Minimum Junior standing; Department permission.

BIOL 4070. Sr Seminar in General Biology. 1 Credit.
The application of previous coursework knowledge and skills to current problems in conservation, agriculture, public health, and medicine where a broad approach can provide new and useful insights. Designed around student-led case studies in areas of active research, primary literature, experimental design, and data analysis. Prerequisites: General Biology concentration; Senior standing.

BIOL 4075. Sr Seminar in Eco and Evo. 1 Credit.
The application of previous coursework knowledge and skills to current problems in conservation, agriculture, public health, and medicine where an eco-evolutionary approach can provide new and useful insights. Designed around student-led case studies in areas of active research, primary literature, experimental design, and data analysis. Prerequisites: Ecology and Evolutionary Biology concentration; Senior standing.

BIOL 4080. Sr Seminar in Cell and Dev. 1 Credit.
In-depth study of core cell signaling pathways and their roles in developmental biology. Based on primary literature and covers historic and current articles; a required senior seminar for Biology (BA) majors with a concentration in Cell and Developmental Biology; relevant to any life science student seeking increased understanding in the topic. Prerequisites: Cell and Developmental Biology concentration; Senior standing.

BIOL 4135. Molecular Ecology. 0 or 4 Credits.
Molecular genetic tools and analytical methods used to investigate ecological processes in natural populations of plants and animals. Prerequisite: BCOR 2100.

BIOL 4245. Mammalogy. 0 or 4 Credits.
Classification, identification, morphology, evolution, and distribution of mammals. Prerequisite: BCOR 2100. Catamount Core: N2.

BIOL 4260. Population Genetics. 0 or 4 Credits.
Exploration of the mathematical principles and biological assumptions that underpin the study of evolutionary processes, offering valuable insights into the origins and implications of heritable variation in nature. Prerequisites: BCOR 2300 or BCOR 2100. Catamount Core: N2.

BIOL 4400. Compar/Func Vertebrate Anatomy. 0 or 4 Credits.
Structure, function, and phylogeny, with evolutionary and functional trends of all chordate groups. Prerequisite: Two courses from BCOR 2300, BCOR 2100, BCOR 2500. Catamount Core: N2.

BIOL 4405. Comparative Physiology. 0 or 4 Credits.
Physiology at the organ, systems, and organismal levels. Capstone course to consolidate biological concepts. Prerequisites: BCOR 2300; BCOR 2100 or BCOR 2500. Catamount Core: N2.

BIOL 4410. Physiology of Global Change. 4 Credits.
A course-based research experience that explores physiological and evolutionary responses to environmental change. Students engage in multiple stages of the scientific process, including laboratory experimentation, data analysis, reading of the scientific literature, and scientific writing. Prerequisites: BCOR 2300; BCOR 2100 or BCOR 2500. Catamount Core: N2.

BIOL 4420. Topics in: Biology CUREs. 0 or 4 Credits.
A Course-based Undergraduate Research Experience (or CURE), is a class where students actively participate in an original research project with unknown outcomes. Unlike traditional laboratory courses with pre-determined results, students work on real-world questions of interest to a Biology faculty member's research program, and their work contributes to the larger body of knowledge in the field. Topics vary by section. Prerequisites: Minimum Junior standing; BCOR 2100, BCOR 2300, or BCOR 2500.

BIOL 4630. Adv Genetics Laboratory. 4 Credits.
Laboratory experiments to provide experience with modern genetic techniques. Bench work and data analysis emphasized. Prerequisite: BCOR 2300. Catamount Core: N2.

BIOL 4635. Adv Genetics & Proteomics Lab. 4 Credits.
Laboratory experiments to provide experience with modern genetic and proteomics techniques. Bench work and data analysis are emphasized. Prerequisites: BCOR 2300, BCOR 2500. Catamount Core: N2.

BIOL 4990. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 4994. Teaching Assistantship. 1-3 Credits.
Undergraduate student service as a teaching assistant, usually in an introductory-level course in the discipline, for which credit is awarded. Offered at department discretion.

BIOL 4996. Honors. 1-6 Credits.
College honors thesis or other department/program honors, under the supervision of a faculty member. Offered at department discretion.