DEPARTMENT OF BIOLOGY

http://www.uvm.edu/cas/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, 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. Majors may concentrate on cell and molecular biology, neurobiology, ecology, evolution, environmental biology, marine biology, and pre-professional medical or veterinary biology, or combine any of these. In all programs the focus 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 generous 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 supported by stipends, departmental and university grant programs, and awards. Students consult regularly with departmental faculty advisors to choose a structured set of elective courses to meet their interests and goals.

MAJORS

BIOLOGY MAJORS

Biology B.A. (http://catalogue.uvm.edu/undergraduate/artsandsciences/biology/biologyba/)

Biological Science B.S. (http://catalogue.uvm.edu/undergraduate/artsandsciences/biology/biologicalsciencebs/)

Zoology B.A. (http://catalogue.uvm.edu/undergraduate/artsandsciences/biology/zoologyba/)

Zoology B.S. (http://catalogue.uvm.edu/undergraduate/artsandsciences/biology/zoologybs/)

MINORS

BIOLOGY MINORS

Biology (http://catalogue.uvm.edu/undergraduate/artsandsciences/biology/biologyminor/)

Zoology (http://catalogue.uvm.edu/undergraduate/artsandsciences/biology/zoologyminor/)

GRADUATE

Biology AMP

Biology M.S.

Biology M.S.T.

Biology Ph.D.

See the online Graduate Catalogue (http://catalogue.uvm.edu/graduate/) for more information.

Courses

BIOL 001. Principles of Biology. 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 given for both BIOL 001 and BCOR 011.

BIOL 002. Principles of Biology. 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 given for both BIOL 002 and BCOR 012.

BIOL 003. Human Biology. 3 Credits.
For non-science majors. Selected biological topics relevant to humans, such as cancer, human genetics, environmental toxicants; biological concepts necessary for understanding these problems.

BIOL 004. The Human Body. 0 or 3 Credits.
For non-science majors. Introduction to basic human anatomy and organ system physiology emphasizing normal homeostatic mechanisms and the changes that accompany common disorders and diseases.

BIOL 006. Evolutionary Biology. 3 Credits.
For non-science majors. The process of biological evolution, evidence for evolution, mechanisms of evolutionary change, origin of adaptations, evolution of behavior, social and reproductive behavior.

BIOL 010. First-year Life Sci Seminar. 1 Credit.
Supports first-year Life Science students in their transitions to a college-level science curriculum through exposure to resources, promotion of beneficial study habits, and the establishment of a classroom community.

BIOL 013. Human Biology Laboratory. 1 Credit.
For non-science majors. Optional virtual laboratory available for BIOL 003. Selected biological concepts and topics relevant to humans, such as cancer, human genetics, environmental toxicants.

BIOL 014. The Human Body Laboratory. 1 Credit.
For non-science majors. Optional virtual laboratory for BIOL 004. Introduction to basic human anatomy and organ system physiology emphasizing normal and diseased homeostatic mechanisms.

BIOL 016. Evolutionary Biology Lab. 1 Credit.
Laboratory that accompanies BIOL 006. Co-requisite: BIOL 006.

BIOL 030. First-year Biology Seminar. 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 031. First-year Zoology Seminar. 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 086. D1: Intro to Forensic Biology. 3 Credits.
Covers crime scene investigation, methods of evidence collection and analysis, cause of death, and DNA identification in the context of biases that can influence the processing, interpretation, and use of evidence in the US court system.

BIOL 090. Internship. 1-3 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 092. 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 094. 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 095. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 096. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 098. 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.

BIOL 108. Molecular and Cell Biology. 3 Credits.
Explores the fundamental processes of life. Topics include cellular metabolism; structure and function of organelles; cell cycle; signal transduction; biology of cancer. CHEM 141, BCOR 101 recommended. May not be taken concurrently with, or following receipt of credit for BCOR 103. Prerequisites: BIOL 001 or BCOR 011 and BIOL 002 or BCOR 012; or BCOR 021; also CHEM 031. Pre/Co-requisite: CHEM 032.

BIOL 119. Vertebrate Zoology. 3 Credits.
Explores vertebrate diversity using the tools of evolutionary tree diagrams, structure and function relationships, ecology, and paleontology. Prerequisites: [(BCOR 011 or BIOL 001) and (BCOR 012 or BIOL 002)] or BCOR 021.

BIOL 188. Soundscapes and Behavior Rsch. 3 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 002 or BCOR 012 or BCOR 021.

BIOL 189. 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 190. 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 192. 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 195. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 196. Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.

BIOL 198. 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 199. 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: (BIOL 001 or BCOR 011) and (BIOL 002 or BCOR 012); or BCOR 021.

BIOL 204. Adv Genetics Laboratory. 4 Credits.
Laboratory experiments to provide experience with modern genetic techniques. Bench work and data analysis emphasized. Prerequisite: BCOR 101.

BIOL 205. 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 101, BCOR 103.

BIOL 209. Field Zoology of Arthropods. 0 or 4 Credits.
Collection, identification, and ecology of arthropods. Substantial field collecting. Prerequisite: BCOR 102.
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
<th>Prerequisites/Co-requisites</th>
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<tbody>
<tr>
<td>BIOL 210</td>
<td>Model Systems in Neuroscience. 3 Credits.</td>
<td>3</td>
<td>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 101 and (BCOR 103 or NSCI 111). Cross-listed with: NSCI 210.</td>
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<tr>
<td>BIOL 217</td>
<td>Mammalogy. 0 or 4 Credits.</td>
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<td>Classification, identification, morphology, evolution, and distribution of mammals. Prerequisite: BCOR 102.</td>
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<tr>
<td>BIOL 219</td>
<td>Compar/Func Vertebrate Anatomy. 4 Credits.</td>
<td>4</td>
<td>Structure, function, and phylogeny, with evolutionary and functional trends of all chordate groups. Prerequisite: Two courses from BCOR 101, BCOR 102, BCOR 103.</td>
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<tr>
<td>BIOL 223</td>
<td>Developmental Biology. 3 Credits.</td>
<td>3</td>
<td>An analysis of the cellular, subcellular, molecular, and genetic mechanisms that operate during oogenesis and embryogenesis in invertebrate and vertebrate organisms. Prerequisites: BCOR 101, BCOR 103.</td>
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<tr>
<td>BIOL 242</td>
<td>Research in Hum Biol Diversity. 4 Credits.</td>
<td>4</td>
<td>Lab-based course that explores methods from biology and biological anthropology to study human evolution and diversity through skeletal anatomy and genetic analyses. Heavy focus on research design and proposal development, literature research, data collection and interpretation, and dissemination of results. Prerequisites: BCOR 101 or (ANTH 026 and one 100-level Anthropology course); Minimum Junior standing. Cross-listed with: ANTH 242.</td>
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<tr>
<td>BIOL 254</td>
<td>Population Genetics. 0-4 Credits.</td>
<td></td>
<td>Methods of detecting and investigating genetic variation, as well as its causes and consequences. Applications from medicine, forensics, and environmental biology are emphasized. Prerequisite: BCOR 101 or BCOR 102.</td>
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<tr>
<td>BIOL 255</td>
<td>Comparative Physiology. 0 or 4 Credits.</td>
<td></td>
<td>Physiology at the organ, systems, and organismal levels. Capstone course to consolidate biological concepts. Pre/co-requisites: BCOR 101, BCOR 102, BCOR 103.</td>
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<tr>
<td>BIOL 256</td>
<td>Physiology of Global Change. 4 Credits.</td>
<td>4</td>
<td>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. Pre/Co-requisites: BCOR 101, BCOR 102, BCOR 103.</td>
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<tr>
<td>BIOL 261</td>
<td>Neurobiology. 3 Credits.</td>
<td>3</td>
<td>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 261 and NSCI 261. Prerequisite: BCOR 103.</td>
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<td>BIOL 264</td>
<td>Community Ecology. 3 Credits.</td>
<td>3</td>
<td>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 102; at least Junior standing.</td>
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<tr>
<td>BIOL 265</td>
<td>Developmntl Molecular Genetics. 3 Credits.</td>
<td>3</td>
<td>Current topics in developmental genetics explored through lectures and discussions of current literature; emphasis on molecular approaches. Prerequisite: BCOR 101.</td>
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<tr>
<td>BIOL 266</td>
<td>Neurodevelopment. 3 Credits.</td>
<td>3</td>
<td>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. Pre/co-requisites: BCOR 101 and BCOR 103.</td>
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<tr>
<td>BIOL 269</td>
<td>Plant-Animal Interactions. 3 Credits.</td>
<td>3</td>
<td>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 102.</td>
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<tr>
<td>BIOL 270</td>
<td>Speciation and Phylogeny. 0 or 4 Credits.</td>
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<td>Contribution of modern research in such fields as genetics, systematics, distribution, and serology to problems of evolutionary change. Prerequisite: BCOR 102.</td>
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<td>BIOL 271</td>
<td>Evolution. 3 Credits.</td>
<td>3</td>
<td>Basic concepts in evolution will be covered, including the causes of evolutionary change, speciation, phylogenetics, and the history of life. Pre/co-requisites: BCOR 102 or permission of the Instructor.</td>
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<td>BIOL 274</td>
<td>Marine Mammal Biology. 4 Credits.</td>
<td>4</td>
<td>Travel course that introduces students to the biology of aquatic mammals and gets them involved in field research. Prerequisites: BCOR 102 or WFB 150.</td>
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<td>BIOL 276</td>
<td>Behavioral Ecology. 3 Credits.</td>
<td>3</td>
<td>Adaptive significance of behavior in natural environments. Evolutionary theory applied to behavior and tested with field data. Prerequisite: BCOR 102 or Instructor permission.</td>
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<tr>
<td>BIOL 277</td>
<td>Sociobiology. 3 Credits.</td>
<td>3</td>
<td>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 102.</td>
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<tr>
<td>BIOL 280</td>
<td>Molecular Ecology. 0 or 4 Credits.</td>
<td></td>
<td>Molecular genetic tools and analytical methods used to investigate ecological processes in natural populations of plants and animals. Prerequisite: BCOR 102.</td>
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<td>BIOL 289</td>
<td>Teaching Assistantship. 1-3 Credits.</td>
<td></td>
<td>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.</td>
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**BIOL 290. 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 292. 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 295. Advanced Special Topics. 1-18 Credits.**
See Schedule of Courses for specific titles.

**BIOL 296. Advanced Special Topics. 1-18 Credits.**
See Schedule of Courses for specific titles.

**BIOL 298. 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.