Emphasis-Integrative Biology

B.S. in Biological Science

Description

The B.S. in biological science offers in-depth study of biology and other natural sciences while preparing the student for a variety of careers or for graduate work in many fields including medicine, organismal biology, dentistry, pharmacy, veterinary medicine, education, cell or molecular biology, ecology and conservation biology. This is the degree of choice for those aspiring to be professional scientists. Students may choose one optional emphasis in ecology and evolutionary biology; integrative biology; molecular, cellular, and microbiology; organismal biology; pre-health biological sciences.

Minimum Total Credit Hours: 120

General Education Requirements

Math 261 and 262 are required for the B.S. degree.

Course Requirements

A major in biological science for the B.S. degree consists of a minimum of 42 semester hours of biology including including the introductory courses Bisc 160, 161, 162, 163; ecology (Bisc 322); genetics (Bisc 336); physiology (Bisc 330 or Bisc 438 or Bisc 516); one of the following advanced biology courses (BISC 415, 418, 427, 440, 504, 512, 518, 519, 521, 530, 547, 553); and biology electives to bring the total to 42 credit hours with at least 34 hours at the 300-level or above. Graduating seniors are required to complete the major field achievement test (Bisc 498)

Biology majors may choose to specialize by using their biology electives to add one optional emphasis, which requires a minimum of three courses from the approved list for the emphasis. The same course may not satisfy the biology core courses and an emphasis area. Students who complete relevant special topics, travel course, or research course will consult with the department prior to enrollment in the course to determine if it fulfills a course for an emphasis area.

Seminars and nonmajor courses do not satisfy the minimum or 300-level requirements. In addition, two courses in calculus (Math 261 and 262), 8 hours of general chemistry (Chem 105, 106, 115, and 116), and two semesters of organic chemistry (Chem 221, 222, 225, 226) are required. Bisc 336 and Bisc 330 should be taken during the sophomore year, and Bisc 322 and Bisc 440 should be taken during the junior year.

Other Academic Requirements

Students must achieve a grade of C or better in all course work counted for the major in biological science, and every biology course requires a grade of C or better in all prerequisite courses, including those prerequisite courses from other departments. For example, Bisc 160 and 161 must be passed with a grade of C or better before Bisc 162 and 163 may be taken. In addition, Bisc 160, 161, 162, and 163 must be passed with a grade of C or better before any additional biology course at the 300 level or above is attempted.

Bisc 150, 206, 207, 210, 220, and 492 can not be used toward a major in biological sciences.

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Course Requirements

Emphasis in Integrative Biology:

Requires a minimum of three courses, with one each from Ecology and Evolutionary Biology course list; Molecular, Cellular, and Microbiology course list; and Organismal Biology course list.

Ecology and Evolutionary Biology courses:

- Bisc 301: Evolution
- BISC 305: Science in Practice
- Bisc 320: Introductory Marine Biology
- Bisc 321: Introductory Aquatic Biology
- Bisc 323: Biology of Invasive Species
- Bisc 345: Symbiosis: From Parasitism to Mutualism
- Bisc 352: Coastal Ecology
- Bisc 413: Conservation Biology
- Bisc 417: Evolution and Medicine
- Bisc 435: Research in Freshwater Biology
- Bisc 443: Ecology of Plant Communities of MS
- Bisc 445: Introduction to Coral-Reef Ecology
- Bisc 448: Tropical Studies in Biology
- Bisc 451: Ecotoxicology
- Bisc 504: Biometry
- Bisc 505: Aquatic Microbiology
- Bisc 510: Theoretical Ecology
- Bisc 513: Limnological Methods
- Bisc 514: Population Genetics
- Bisc 515: Conservation Biology: Viable Populations
- Bisc 524: Aquatic Botany

- Bisc 525: Conservation and Restoration Ecology
- Bisc 528: Conservation Physiology
- Bisc 530: Advanced Field Study in Ecology
- Bisc 534: Freshwater Insects
- Bisc 535: Plant-Insect Interactions
- Bisc 540: Chemical Ecology
- Bisc 550: Biological Oceanography
- Bisc 554: Ecological Physiology
- Bisc 560: Microbial Experimental Evolution
- Bisc 566: Evolutionary Biology
- Bisc 567: Evolutionary Biology Laboratory
- Bisc 568: Infectious Disease Ecology

Molecular, Cellular, and Microgiology courses:

- BISC 305: Science in Practice
- Bisc 306: Virology
- Bisc 333: General Microbiology
- Bisc 370: Introductory Molecular Genetics
- Bisc 372: Introductory Cell Biology
- Bisc 414: Immunology and Serology
- Bisc 418: Introduction to Molecular Systematics
- Bisc 436: Human and Vertebrate Genetics
- Bisc 438: Microbial Physiology
- Bisc 439: Developmental Biology
- Bisc 440: Cell and Molecular Biology
- Bisc 503: Topics in Bioinformatics
- Bisc 507: Cell Biology of Cancer
- Bisc 509: Microbial Genetics
- Bisc 511: Applied Microbiology
- Bisc 520: Medical Microbiology
- Bisc 521: Cell Physiology
- Bisc 522: Microbial Ecology
- Bisc 523: Molecular Microbiol. of Soils & Sediment
- Bisc 541: Cell Biol. of Neurodegenerative Disease
- Bisc 542: Microbial Diversity
- Bisc 548: Plant Cell and Developmental Biology
- Bisc 555: Radiation Biology
- Bisc 560: Microbial Experimental Evolution

Organismal Biology courses:

- BISC 305: Science in Practice
- Bisc 310: Human Anatomy
- Bisc 318: Botany
- Bisc 327: Introductory Neuroscience
- Bisc 329: Biology of Fishes
- Bisc 330: Introductory Physiology
- Bisc 331: Comparative Anatomy of the Vertebrates
- Bisc 332: Comparative Embryology of Vertebrates
- Bisc 334: Ornithology
- Bisc 335: Human Reproduction
- Bisc 337: Introductory Entomology
- Bisc 338: Invertebrate Zoology
- Bisc 339: Phycology
- Bisc 342: Plant Diversity
- Bisc 349: Biology of Sharks and Their Relatives
- Bisc 350: Mammalogy
- BISC 352: Coastal Ecology
- Bisc 415: Vertebrate Histology
- Bisc 416: Elementary Parasitology

- Bisc 427: Methods in Comparative Neuroscience
- Bisc 502: Mycology
- Bisc 504: Biometry
- Bisc 512: Animal Behavior
- Bisc 516: Plant Physiology
- Bisc 518: Microtechnique
- Bisc 519: Physiology of Aquatic Animals
- BISC 528: Conservation Physiology
- Bisc 529: Endocrinology
- Bisc 531: Plant Morphology
- Bisc 532: Plant Taxonomy
- Bisc 533: Advanced Neuroscience
- Bisc 538: Hormones and Behavior
- Bisc 543: Functional Neuroanatomy
- Bisc 546: Herpetology
- Bisc 547: Advanced Histology
- Bisc 551: Protozoology
- Bisc 553: Comparative Animal Physiology