

# Biological Sciences

Program Description	Type	Degree
Biology, B.A. with Biology Education Concentration ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/ba-biology-education-concentration/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/ba-biology-education-concentration/</a> )	Degree	B.A.
Biology, B.A. with Natural History Concentration ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/ba-biology-natural-history-concentration/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/ba-biology-natural-history-concentration/</a> )	Degree	B.A.
Biology, B.S. with Biomedical Science Concentration ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-biology-biomedical/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-biology-biomedical/</a> )	Degree	B.S.
Biology, B.S. with Ecology and Conservation Biology Concentration ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-biology-ecb/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-biology-ecb/</a> )	Degree	B.S.
Biology, B.S. with Integrative Organismal Biology Concentration ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-biology-iob/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-biology-iob/</a> )	Degree	B.S.
Microbiology, B.S. ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-microbiology/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/bs-microbiology/</a> )	Degree	B.S.
Accelerated Biochemistry, B.S. ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/chemistry/accelerated-bs-ms-biochemistry/">http://coursecat.isu.edu/undergraduate/scienceengineering/chemistry/accelerated-bs-ms-biochemistry/</a> )	Degree	B.S.
Biochemistry, B.S. ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/chemistry/bs-biochemistry/">http://coursecat.isu.edu/undergraduate/scienceengineering/chemistry/bs-biochemistry/</a> )	Degree	B.S.
Biology, Minor ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/minor-biology/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/minor-biology/</a> )	Minor	
Microbiology, Minor ( <a href="http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/minor-microbiology/">http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/minor-microbiology/</a> )	Minor	

## Mission and Vision

We are a community that advances the understanding of the biological sciences through active discovery, learning, and engagement with society.

Our vision is to inspire our students to wonder about the living world and strive to better understand it.

## Program-level Learning Outcomes

Following the American Association for the Advancement of Science Vision and Change in Undergraduate Biology Education Initiative, students completing our undergraduate programs should have:

1. the ability to apply the process of science
2. the ability to use quantitative reasoning

3. the ability to use modeling and simulation
4. the ability to tap into the interdisciplinary nature of science
5. the ability to communicate and collaborate with other disciplines
6. the ability to understand relationships between science and society

## Program Overview

We offer four undergraduate degrees: the B.A. in Biology, the B.S. in Biochemistry (a joint program with the Department of Chemistry), the B.S. in Biology, and the B.S. in Microbiology. Within the two Biology degrees, students select an area of concentration. Each undergraduate degree program is designed to prepare students with a distinct set of knowledge and skills that will serve as the foundation for a technical or scientific career, further graduate studies, professional schools in a variety of human and animal health fields, or as biology educators. Students should meet with an advisor early in their program to select the most appropriate major and concentration, and identify research or other experiences for professional development.

## Bachelor of Arts in Biology - Concentration in Biological Education

The B.A. in Biology with a Concentration in Biology Education is designed for students who want to pursue teacher certification in biology. The B.A. has fewer courses in Chemistry, Physics, and Mathematics than the B.S. in Biology, and more upper division electives, providing students with greater latitude to design their own program of study. Students who pursue the B.A. in Biology *will not meet the minimum requirements* for admission to most graduate research programs in biological sciences or professional programs in the health sciences.

## Bachelor of Arts in Biology - Concentration in Natural History

The B.A. in Biology with Natural History Concentration is designed for students who want to pursue a career where skills and knowledge of natural history (outdoor or environmental education, interpretation, identification, field studies) are desirable. The B.A. has fewer courses in Chemistry, Physics, and Mathematics than the B.S. in Biology, and more upper division electives, providing students with greater latitude to design their own program of study. Students who pursue the B.A. in Biology *will not meet the minimum requirements* for admission to most graduate research programs in biological sciences or professional programs in the health sciences.

## Bachelor of Science in Biology

The purpose of the B.S. in Biology is to serve students who have a broad interest in the biological sciences and who seek substantial flexibility in the development of their own programs. This degree fosters, in students, knowledge and understanding of major concepts in the discipline as well as the processes of scientific investigation. Students served by this major are those interested in preparing for a career in biology, ecology, conservation or natural history, entering a health-related professional program (i.e., physician assistant, occupational therapist, medical doctor, etc.), certifying to teach in public schools, or developing a variety of laboratory skills. The B.S. in Biology requires significant exposure to biological sciences, as well as concepts in math and the physical sciences, while providing a large number of electives. The consequence is an understanding of the biological sciences and the flexibility and opportunity to specialize in areas of interest to students. Up to 8 credits of Independent

Problems and/or Mentored Research (AMOEBA) can be applied to the student's undergraduate degree. All graduates of this degree program will earn a B.S. in Biology, regardless of the concentration selected.

### **Concentration in Biomedical Sciences (BMS)**

The concentration in Biomedical Sciences (BMS) focuses on developing an understanding of the key disciplines that serve as the foundation for biomedical sciences. This includes substantial coursework in chemistry and physics, as well as electives in mammalian anatomy and physiology, development, and neurobiology. The BMS concentration prepares students for graduate studies in biomedical research as well as admission to medical, dental, veterinary, and other health professional programs (pharmacy, physician assistant, optometry, podiatry).

In addition to completing the core requirements, students in the BMS concentration have the opportunity to select from a broad range of physiology, anatomy, and biomedical courses.

### **Concentration in Integrative Organismal Biology (IOB)**

The concentration in Integrative Organismal Biology (IOB) focuses on understanding of the key disciplines that serve as the foundation of organismal biology: anatomy, physiology, behavior, and diversity and electives in a variety of integrative biology courses. Students may select either an animal or a plant focus, or a combination. The IOB concentration prepares students for graduate studies in various fields of organismal biology (physiology, botany, zoology, evolution, ecology, behavior) and for professional schools (veterinary or OT/PT).

In addition to completing the core requirements, students in the IOB concentration have the opportunity to select from a broad range of physiology, anatomy, and diversity courses.

### **Concentration in Ecology and Conservation Biology (ECB)**

The concentration in Ecology and Conservation Biology (ECB) is for students who seek to understand the fundamental principles of ecology and their applications, with an emphasis on field studies. The ECB concentration prepares students for graduate studies in ecology or applied ecology, and careers in land and resource management (e.g., Bureau of Land Management, US Forest Service, Idaho Department of Fish and Game), environmental studies (e.g., Environmental Protection Agency, US Geological Survey, Department of Environmental Quality), and positions with conservation organizations (e.g., The Nature Conservancy, US Fish and Wildlife Service, World Wildlife Federation). The concentration allows students to select a variety of courses in plant and animal diversity, field biology, and evolution.

In addition to completing the core requirements, students in the ECB concentration have the opportunity to select from a broad range of ecology, diversity, and evolution courses. The concentration requires taxonomic breadth including at least 6 credits of plant biology and 6 credits of animal biology emphasis courses.

## **Bachelor of Science in Microbiology**

The purpose of the B.S. in Microbiology is to serve students who have an interest in microbial diversity, genetics, immunology, and molecular biology principles. This degree fosters, in students, knowledge and understanding of major concepts in the discipline as well as the processes of scientific investigation. Students served by this major are those interested in preparing for a career in a research laboratory, public health agency, or are interested in entering a graduate program or health-related professional program (i.e., medical doctor, dentistry, veterinary etc.). The B.S. in Microbiology requires significant exposure to biological sciences, chemistry and biochemistry, as well as concepts in math and the physical sciences, while providing a large number of electives in courses such

as virology, parasitology, or genetics. The consequence is an understanding of the principles of microbiology and the flexibility and opportunity to specialize in areas of interest to students.

## **Bachelor of Science in Biochemistry**

The curriculum is designed to prepare the student for graduate work in biochemistry and related fields, as well as for admission to medical, dental, or other health professional schools. The graduate is also prepared to go directly into research or industrial positions which require preparation only at the B.S. level.

The purpose of the B.S. in Biochemistry is to serve students who seek to develop a strong background in biochemistry and the supporting sciences of biology, chemistry, and physics. Majors also gain experience in the broad areas of biochemistry, molecular biology, biotechnology, and medical and/or ecological applications of each. Majors gain experience that will prepare them to participate in research development, planning and implementation, and to be competent to carry out standard biochemical and molecular biology techniques in the laboratory. The B.S. in Biochemistry prepares students to be competitive for positions in research, graduate schools, health profession schools, and in the biotechnology industry.

Faculty (<http://coursecat.isu.edu/undergraduate/scienceengineering/biologicalsciences/faculty/>)

BIOL Courses (<http://coursecat.isu.edu/undergraduate/allcourses/biol/>)