

Life Sciences

Cell Biology & Neuroscience

Completion of one of the department's undergraduate degree options provides the foundations for further training in medical school, veterinary medical school, medical technology, physical therapy, dentistry, optometry, pharmacy, other health sciences, biotechnology and other biologically related industries. For those students interested in pursuing careers in academic or clinical research, the program also provides the foundation for entry into postgraduate degree programs in biomedical or basic biological research fields. Finally, the program provides an excellent foundation for those interested in high school teaching.

The academic programs and scientific research interests in the department cover a wide range of topics, with special emphasis on cell biology, neurobiology, developmental biology, physiology, anatomy, biophysics, and neuroinformatics. Together, faculty and students in the department study biological processes that span the continuum from single cells to the entire human body.

The **Center for Computational Biology** at Montana State University offers a new multidisciplinary graduate program designed to focus on integrating knowledge and developing models of biological systems across organizational levels and at multiple spatial and temporal scales. Training will emphasize understanding complex biological systems in terms of structures and interactions of their components, and will integrate computational and mathematical approaches with a wide variety of experimental and analytical techniques. The program boasts a highly productive group of faculty, collectively spanning eight departments and three colleges of MSU-Bozeman.

Degrees

- Bachelor Of Science in Cell Biology
- Bachelor of Science in Neuroscience (Premedicine, Predentistry, Preoptometry options available to prepare students for advanced medical school.)
- Master of Science in Biological Sciences
- Doctor of Philosophy in Biological Sciences

Department of Cell Biology & Neuroscience

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Ecology

The faculty has a strong commitment to undergraduate education, and the graduate program is among the largest and most successful at MSU, with 70 graduate students. Members of the faculty are involved in research spanning a broad range of disciplines, including terrestrial and aquatic ecology, population biology, fish and wildlife management, animal behavior, evolution, community ecology and landscape ecology.

A number of Ecology Department faculty have research emphases in population dynamics modeling for wildlife populations of conservation concern (small populations, declining populations, populations managed under the Endangered Species Act, or under the Marine Mammal Protection Act). The department offers a comprehensive set of graduate courses in this specialty. Funding is available for some new graduate research assistantships for modeling of marine mammal populations.

The **Montana State University Thermal Biology Institute (TBI)** is a multidisciplinary program for studying thermal biology. Current thermophile research programs incorporate macrobiology and microbiology with a complete physicochemical examination of the thermal environments; studies range from the cellular to ecosystem levels. The TBI takes advantage of being located within 90 miles of Yellowstone National Park, one of the world's most complex and diverse geothermal areas and its estimated 10,000 geothermal features. Their work also benefits NASA, the TBI funding agency, as it plans missions to other planets. NASA is interested in the institute's work because TBI looks at two things: the diversity of organisms and the diversity of metabolic lifestyles.

Degrees

- Bachelor of Science in Biological Sciences
 - Options in Ecology and Evolution, Fish and Wildlife Management, Organismal Biology, Biology Teaching
- Master of Science in Biological Sciences
- Master of Science in Fish and Wildlife Management
- Master of Science in Land Rehabilitation (interdisciplinary)
- Doctor of Philosophy in Biological Sciences
- Doctor of Philosophy in Fish and Wildlife Biology

Department of Ecology

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Microbiology Department

Microbiology has become a broad term that encompasses many subdisciplines and fields of study. These include the study of bacteria, fungi, protozoa, algae, parasites and viruses.

An understanding of these various life forms in the environment has created other subdisciplines of microbial ecology, microbial physiology, microbial genetics and molecular biology. The need to control infectious diseases has brought about the fields of pathology and immunology. Bioinformatics is a new area of research in microbiology which analyzes the genomes of life forms.

Microbiology graduates have diverse careers. Survey information indicates that nearly 100 percent of MSU microbiology graduates are employed in the field of microbiology, another field of their choice or are attending graduate school. Professional microbiologists are employed by the mining, health, petroleum, textile, biotechnology, food, agriculture and drug industries, and by university, institutional and governmental departments.

To further enhance career opportunities, undergraduate and graduate research with a faculty mentor is encouraged of all students in the program. The department has modern equipment for instruction and research, including state-of-the-art flow cytometry, phosphorimager, spectrophotometry, cell culture, microscopy and recombinant DNA technology.

The Department of Microbiology at MSU has a mission to provide the highest academic standards for students. The faculty are nationally and internationally recognized for their research, providing a training environment that is both exciting and constantly evolving as new discoveries are made—in both the medical and environmental sciences.

Degrees

- Bachelor of Science in Microbiology
 - Options in Microbiology, Environmental Health, Medical Laboratory Science
- Master of Science in Microbiology
- Doctor of Philosophy in Microbiology

Department of Microbiology

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The College of Letters & Science

The College of Letters and Science provides an excellent liberal arts education in natural sciences, social sciences, mathematics and humanities.

Departments

- Cell Biology and Neuroscience
- Chemistry and Biochemistry
- Earth Sciences
- Ecology
- Economics
- English
- History and Philosophy
- Mathematical Sciences
- Microbiology
- Modern Languages and Literatures
- Native American Studies
- Physics
- Political Science
- Psychology
- Sociology and Anthropology

Minors Also Available In

- Women's Studies
- Native American Studies
- Religious Studies
- Museum Studies

Career Opportunities

Graduates report impressive employment success with nearly three-quarters of them employed upon graduation, while the other quarter go on to attend graduate, medical, or law schools at prestigious universities such as Harvard, Brown, MIT and Columbia.

Exciting Research Centers

- Center for Biofilm Engineering
- Center for Bison and Wildlife Health
- Center for Computational Biology
- Center for the Development of Bioactive Compounds
- Geographic Information and Analysis Center
- Montana Water Center
- Northern Rocky Mountain Science Center
- Optical Technology Center
- The Spectrum Lab
- Thermal Biology Institute



MONTANA STATE UNIVERSITY ♦ BOZEMAN

Marks of Excellence

MSU is one of the top six schools in the nation in the number of prestigious Barry M. Goldwater science scholarships won by its students. (Behind MSU are schools such as Brown, Stanford, Yale and MIT.) Most of the 39 Goldwater Scholarship recipients were students in the College of Letters and Science.

Faculty in the College of Letters and Science have an impressive record for winning highly competitive national grants, over \$22,000,000 last year, to support research and scholarship. Letters & Science undergraduates have the unique opportunity to work individually with faculty on original research and scholarship opportunities that some students may only get in graduate school.

Multidisciplinary Undergraduate Summer Research Program

- Ten-week interdisciplinary research program involving work at the interface between biology and the physical and computational sciences.
- Work in laboratories of NIH and NSF-funded faculty mentors representing eight departments (Cell Biology & Neuroscience, Chemistry & Biochemistry, Computer Science, Electrical and Computer Engineering, Mathematics, Microbiology, Plant Sciences, Veterinary Molecular Biology) and the Center for Computational Biology.
- Participate in summer workshops and symposia featuring nationally prominent interdisciplinary scientists.
- Work with graduate student mentors from the Complex Biological Systems graduate program.

Services for Students

The College of Letters and Science emphasizes quality teaching and advising. Faculty are encouraged to evaluate and improve their instructional methods and to keep abreast of developments in their fields. Each student in the college is assigned a faculty advisor who oversees the student's program of study throughout his/her college career.

The College Seminar for first-year students is a great introduction to the university environment, where students meet with faculty and an undergraduate teaching assistant in small groups.

Students can pursue research with distinguished faculty from across campus or within research centers that specialize in work on laser technology, computational biology, mountain ecosystems, paleontology, geographic systems, local governments, rural health issues, industrial and organizational psychology, biofilm engineering, organic chemistry, economic development and others. The Undergraduate Scholars Program at MSU offers students assistance, academic credit and funding for research and creative activities.

College of Letters & Science

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