

# Physical Sciences

## Chemistry

The Department of Chemistry and Biochemistry is a strong and well-funded department, boasting a flourishing research environment and high-quality academic instruction. The department has state-of-the-art research instrumentation, including an assortment of NMR, mass and optical spectrometers. Considerable research effort is also directed toward more applied aspects of environmental and agricultural chemistry.

The Department of Chemistry and Biochemistry participates in several instructional and research programs of an interdisciplinary nature. These include computer modeling of proteins and nucleic acids, environmental impact of industrial and agricultural chemicals, fundamental work in materials science, and the biochemistry portion of the WWAMI medical education program.

The faculty in the department have expertise over a broad range of specialty areas including analytical, biochemistry, inorganic, organic and physical chemistry. In each of these fields, the strength of the MSU Chemistry and Biochemistry Department has been recognized at the international level.

## Degrees

- Bachelor of Science in Chemistry
  - Professional Option
  - Biochemistry Option
  - Teaching Option
- Chemistry/ Biochemistry minor options
- Master of Science in Chemistry
- Master of Science in Biochemistry
- Doctor of Philosophy degree in these possible areas of study: analytical/ physical chemistry; biochemistry; inorganic chemistry and organic chemistry

## Department of Chemistry & Biochemistry

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## Earth Sciences

The geography faculty includes specialties from settlement geography through bioclimatology to GIS, while the interests of the geology faculty range from petrogenesis to paleobiology to applied hydrogeology. The greatest faculty strength is in surficial geology/physical geography, along with a traditional strength in snow science.

The **Mountain Research Center** is a multi- and interdisciplinary center emphasizing applied and theoretical research on mountain environments, especially issues relating to human management. In addition, department faculty, students and programs interact with other major campus centers. The **Montana University System Water Center** is a statewide information, education, and outreach center which parallels the department's geohydrology option and is significant in the water resources minor. And, the **Image and Chemical Analysis Laboratory (ICAL)** supports the department's interests in earth materials.

In addition to the educational and research efforts of its staff and students, the department engages in study of the traditional cartography of Montana and the Yellowstone region as well as the latest in computerized geography. The **Geographic Information and Analysis Center (GIAC)** is a state-of-the-art facility providing Geographic Information Systems hardware, software and human support to the MSU-Bozeman campus and the state.

## Degrees

- Bachelor of Science in Earth Sciences
  - Geography option
  - Geology option
  - Geohydrology option
- Master of Science in Earth Sciences
  - Geology option
  - Geography option
- Master of Science in Land Rehabilitation (interdisciplinary)
- Doctor of Philosophy in Earth Sciences

## Department of Earth Sciences

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## Physics

Physics majors at MSU study some of the most exciting aspects of the world and the universe alongside leading scientists whose commitment to discovery is matched only by their commitment to teaching.

**Solar Physics**—investigates the million-degree solar atmosphere, X-ray flares, spectacular eruptions and the origin of the solar magnetic field.

### Condensed Matter (Solid State)

**Physics**—research opportunities in freshman year fabricating and investigating the behavior of films only a few atoms thick, and studying the interactions of microscopic magnets using the "spin" of an electron to run computers.

**Optics**—collaborations with researchers in the **Optical Technology Center, Spectrum Lab** and at local industries enhance the cross-disciplinary experience of students and prepare them well for both graduate schools and industrial positions.

**Astrophysics, Relativity & Cosmology**—studying some of the most exotic objects and processes in the universe including neutron stars, black holes and the Big Bang.

### Space Science and Engineering

**Technology**—seeks to involve students in the design, fabrication and operation of space flight hardware.

With a degree in physics, graduates will have the opportunity to enter the workforce directly, where their skills will be highly valued by employers, or continue their studies in graduate school where they find that physics provides an excellent background for entering a wide variety of fields such as engineering, computer science, teaching and business.

## Degrees

- Bachelor of Science in Physics
- Master of Science in Physics
- Doctor of Philosophy in Physics

## Department of Physics

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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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### Office of International Programs

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