

What Can I Do With a Major In...

Biotechnology, Microbial Systems Option?

Biotechnology-Microbial programs² You will learn how to use scientific principles and technical skills in support of biologists and biotechnologists in research, industrial, and government settings. The program includes instruction in fermentation technology, cell culturing, protein purification, biologic synthesis, assaying and testing, quality control, industrial microbiology, bioprocessing, chromatography and bio-separation, genetic technology, laboratory and hazardous materials safety, and computer applications. The goal for this program is to promote research, education and technology transfer for applications in biotechnology in order to benefit of the environment, agriculture, engineering and veterinary medicine. This program will provide academic opportunities leading to an undergraduate Bachelor of Science degree or a Master's degree. The professors and staff in the program will engage in teaching and research in areas such as cell, molecular, and developmental biology, biochemistry and genetics, . Majors have the opportunity through coursework, laboratories and research experience to develop the knowledge and skills necessary to enter into a career in biotechnology or to proceed to graduate education.

Programs at Montana State University² The B.S. in Biotechnology, Microbial Systems option, is an interdisciplinary degree offered by the College of Agriculture. Students pursue a basic science curriculum the first two years and then choose an area of emphasis for the junior and senior year. The Microbial Systems option is administered by the Department of Microbiology in the College of Letters and Sciences. Specialty courses are offered in general, medical, food and water, environmental, ecological and biochemical microbiology as well as in immunology, virology, molecular biology and microbial physiology and genetics. In addition to science courses students should have basic skills in computer use, math ability and in both verbal and written communications. MSU offers a great opportunity for undergraduate research, in fact, a research and creative experience is required of all MSU students. The Department of Microbiology has always been a strong supporter of undergraduate research in our laboratories in order to provide opportunities for students to gain experience in the laboratory outside of class. Students are encouraged to look over our faculty and their research interests to find a good fit with their own interests and career goals. Some students take a single semester of research credits while others stay in a laboratory for several semesters or years. Some student researchers then present their findings at various student, or professional, science conferences. A Bachelor of Science degree in Biotechnology will prepare students for a career in the diverse areas of biotechnology including academic institutions, government agencies or industrial settings. Experience in biotechnology offers the chance to pursue a wide diversity of careers including: laboratory technician, teaching, basic research, development of medical treatments, law enforcement officer, public relations, sales, environmental regulation, energy production, waste management, and crop and livestock production. Students will also be prepared to enter graduate or medical professional schools for further study.

Characteristics associated with success¹ strong interest in understanding why things work as they do, curiosity about the logic and laws of nature, and a need to ask questions and find answers.

You should¹:

- Be able to problem solve
- Be able to use computers
- Have good observational skills
- Be logical and organized
- Be skilled in mathematics and in science
- Be able to express yourself, both orally and in writing
- Be creative

Occupations in this field require ability to¹: have laboratory skills, problem solving skills, professional ethics, communication skills, writing skills, and the knowledge of scientific literacy.

Related occupations include¹:

- Bioinformatics Specialist
- Biotechnical Scientist
- Consultant
- Biochemist
- Fisheries/Marine Biologist
- Pharmacologist (human and vet)
- Research Associate
- Clinical Research Associate
- Industry Researcher
- Ecologist
- Professor/Teacher
- Microbiologist
- Veterinarian
- Biophysicist
- Laboratory Technician
- Health policy Consultant
- Pharmacologist
- Medical Professional

What Can I Do With a Major In...

Biotechnology, Microbial Systems Option?

MSU graduates (Bachelor's degree) were hired in the following selected fields³:

Senior Laboratory Technician-University of Minnesota
Lab Technician-University of Montana
Program Officer-Montana Department of Public Health & Human Resources
Unit Clerk of the ER-Bozeman Deaconess Hospital

Salary averages of survey respondents: (# of respondents in parentheses)³

2010: MT: Insufficient Data	Out of State: Insufficient Data
2009: MT: Insufficient Data	Out of State: Insufficient Data
2008: MT: \$27,640 (3)	Out of State: Insufficient Data
2007: MT: Insufficient Data	Out of State: Insufficient Data

The Microbial Systems option has graduated 13 students from 2007-2010.

In the field of "Biological Scientist" the median⁴ wages for the State of Montana are estimated at \$61,700. In 2008 there were 430 positions in Montana and growth is forecasted through 2018 at 4%⁵. Nationally, the median⁴ wages are estimated at \$68,200. In 2008 there were 31,700 positions with an expected growth forecast of 19% through 2018. Job openings nationally, due to both growth and net replacement is estimated at 1,610 annually nationally and 10 in the State of Montana.

Graduates from this program entered programs of further education at these institutions:

No graduates are known to have entered programs of further education at this time.

Other Sources of Information:

Montana State University- Bozeman: College of Agriculture: www.montana.edu/wwwcat/programs/biot.html
Montana State University- Department of Microbiology: <http://www.montana.edu/wwwmb/>
ACT, Inc. Discover: <http://actapps.act.org/eDISCOVER>
Cornell University- Biotechnology Department: www.biotech.cornell.edu
University of Missouri- Biotechnology Department: www.umsl.edu/bulletin/as/biotechnology.html
CareerOneStop- www.onetonline.org

***Insufficient Data:** Each year the Career, Internship & Student Employment Services Office at Montana State University conducts a survey to determine placement rates and salary survey information from recent MSU graduates. Graduates were requested to participate in the survey to provide relevant information regarding the transition from college to career/graduate school. At times, there are limited or no respondents. Statistics, therefore, are not always based upon the response of the total sample group and are sometimes listed as "Insufficient Data".

For more information contact:



Montana State University
177 Strand Union Building
Bozeman, MT 59717
(406) 994-4353
www.montana.edu/careers

¹Copyright © 2007, University of Oregon. All rights reserved. Created by "intoCareers", a unit of the University of Oregon. Montana information copyright © 2007 Montana Career Information System. All rights reserved. Discover © 2008 by ACT, Inc. All rights reserved.

² Montana State University College of Agriculture

³ Montana State University Career & Internship Services

Number of graduates/number of respondents: 2007: 3/3; 2008: 6/3; 2009: 1/0; 2010: 3/0

⁴50% of reported wages fall below the Median wage and 50% above and include entry to senior level positions. This is not an average.

⁵Copyright © 2012 State of Minnesota. CareerOneStop. All rights reserved.