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Real-world thinking.



**MINNESOTA STATE  
UNIVERSITY**  
MANKATO

## **BIOLOGY** *College of Science, Engineering and Technology*

### **WHAT DEGREES AND PROGRAMS DO WE OFFER?**

A degree that prepares students for professional school (medicine, dental, chiropractic, pharmacy, etc.), graduate school, or direct entry into a career in the biological sciences. Students have a variety of options for emphasis within this degree.

**BS in Biology — Cytotechnology.** This emphasis prepares you to work in the laboratory analysis and diagnosis of human tissue and fluid samples. A cytotechnologist works closely with a pathologist and evaluates a microscopic study of cells for evidence of disease and cancer.

**BS in Biology — Ecology option.** Ecology is the study of relationships between organisms and their environment. Career titles available with this option include ecologist, naturalist, wildlife biologist, natural resource manager, first biologist, marine biologist, conservational training or graduate school.

**BS in Biology — Life Science Teaching.** A degree that provides training leading to life science teaching certification at the junior high and high school level.

**BS in Biology — Biomedical Sciences.** The purpose of this option is to prepare the student for a career in biomedicine. The option fulfills the science course requirements for most medical, osteopathic, dental, and chiropractic schools as well as the science course requirements for graduate education in biomedicine.

**BS in Biology — Microbiology.** Microorganisms impact every area of life. The option exposes students to a variety of topics in microbiology and teaches numerous skills needed to work with microorganisms. Training in microbiology prepares students for employment in industry (ex. quality assurance, vaccine production) and government (ex. laboratory technicians).

**BS in Biology — Plant Science.** The Plant Science option includes the study of cells, genetics, anatomy, physiology, taxonomy, and ecology of terrestrial and aquatic vascular plants, mosses, algae and fungi. An option in plant sciences prepares undergraduate students for careers in education, biotechnology, field biology, pharmaceutical companies and government agencies.

**BS in Biology — Nuclear Medicine Technology.** Nuclear Medicine Technology is a highly specialized allied healthcare field that utilizes radioactive materials in diagnosis, treatment of disease, and medical research.

**BS in Biology — Toxicology.** Toxicology is the study of the harmful effects of chemicals, radiation, and other stressors on biological systems. The purpose of this option is to train students in the theory and hands-on research techniques of an interdisciplinary biological science at the undergraduate level in a field where there are few programs in the United States. Graduates can and have proceeded into research and testing of pharmaceuticals, and pesticides, and environmental toxicology in industry, government, or academic institutions.

**BS in Biology — Zoology.** Zoology is a major branch of the biological sciences that involves the study of animals. Study in this area focuses on organismal diversity, animal structures and the functions, genetics, development, evolution, behavior, and ecological interactions. Occupations that may be available to graduates include: Animal Husbandry, Museum/Zoo Guide, Animal Laboratory Technician, Animal Trainer, Pest Control Technician, Museum Curator, Entomologist, Environmental Consultant, Field Researcher, Science Writer, Physician, Veterinarian, Wildlife Rehabilitator, Zoo Keeper, and Zoologist.

Corresponding minors are available for those students wishing to take a limited concentration in biology.

### **PRE-PROFESSIONAL**

- Pre-med
- Pre-dental
- Pre-veterinary

### **CAREER OPPORTUNITIES AVAILABLE FOR STUDENTS COMPLETING THIS PROGRAM**

A major in one of the biological sciences can lead you to exciting frontiers in the years ahead. Trend followers predict a growth in biological science careers well into this century. Individuals with many types of biology backgrounds will be needed to shape the future of our planet.

Biology encompasses the widest range of possible career opportunities in the sciences. Major employers are educational institutions, governments, businesses, foundations, and industry. Of these areas, the demand is rising most quickly in business and industry. Within this broad range, major employers for our recent graduates have been in bio-sales; biotechnology; industries, government agencies and foundations that deal with health, environment, and natural resources; education; plant science; pollution control; hospitals; museums and zoological gardens; and industrial microbiology.

### Career opportunities

In Minnesota, average growth in employment is expected in the next few years. Nationwide, above average job growth is projected. Nevertheless, there are a large number of qualified applicants so competition for positions will usually be keen. Employment opportunities are most favorable for those with advanced degrees. Cutbacks in financial support by the federal government will limit opportunities in many areas of medical research. However, growing opportunities are available in the fields of genetic research, products produced by biological methods, and protection of the environment.

## STUDENT EXPERIENCE/ PROGRAM REQUIREMENTS

### Faculty credentials

We have 23 faculty, all holding their terminal degrees. We have no courses taught by teaching assistants. Teaching assistants are common in the laboratory components of our first and second year courses. Third and fourth year courses are all taught by faculty.

### Faculty awards and grants

Over the last five years, our faculty have received more than \$1,000,000 in funding from external agencies such as the National Science Foundation and the National Institutes of Health.

### Faculty/Student Ratio

1:22

### Scholarships

There are approximately 15 scholarships available for upper level students through the Department of Biological Sciences and the College of Science, Engineering, and Technology.

### Internships

An internship is recommended but not required. Many opportunities, some involving stipends, are available for this type of training experience.

### Student/faculty opportunities for collaboration

All of the faculty encourage students to work with them on a wide variety of research projects. Many students include an Individual Study as part of their selected coursework.

### Specialized equipment/facilities available

Excellent facilities and modern sophisticated equipment make it possible to place a strong emphasis in all areas of laboratory and field biology. There are excellent modern teaching and research laboratories available for student and faculty use. Many students gain valuable experience working with faculty on special research projects.

### Clubs and organizations

Our most active student organizations are Biology Club, Wildlife Club, and Pre-Med Club.

## BACKGROUND PREPARATION

A student intending to major in the biological sciences needs a strong, balanced college preparatory program with courses in mathematics and the sciences, particularly biology and chemistry.

## FOR MORE INFORMATION PLEASE CONTACT

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800-627-3529 or 711 (MRS/TTY)

### Website

[www.mnsu.edu/biology](http://www.mnsu.edu/biology)

You are encouraged to visit the campus.

To arrange for a visit, please call:  
Office of Admissions: 507-389-1822  
Toll-Free: 800-722-0544

## SAMPLE CURRICULUM (BIOLOGY, BS)

Required General Education		Major Common Core	
BIOL 105 General Biology I (4) CHEM 201 General Chemistry I (5) ENG 271W Technical Communication (4)		BIOL 106 General Biology II (4) BIOL 211 Genetics (4)	
Major Emphasis			
General, Non-Specialized (44-60) Biomedical Sciences (60-62)	Biology Cytotechnology (68-69) Ecology (75-79)	Microbiology (50-59) Plant Science (47-56)	Toxicology (72) Zoology (47-56)

For additional information about course requirements, please visit <https://mankato.mnsu.edu/academics/academic-catalog/>

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