

# Plant Science

*Note: MSU's programs in the biological sciences are distributed across multiple departments. MSU does not have a single Department of Biology. For additional options see Biological Sciences (<http://catalog.montana.edu/undergraduate/agriculture/biological-sciences/>) at MSU.*

## Department of Plant Sciences and Plant Pathology

<http://plantsciences.montana.edu/>

Plant Science involves a thorough background in the liberal arts and a comprehensive understanding of the scientific principles underlying plant sciences. Plant systems are the fundamental basis for life on earth and are also a major contributor to the economy. Modern plant science encompasses many areas, impacting such diverse interests as agriculture, biotechnology, and recreational land management.

Faculty members who advise students and teach courses are also active researchers in their respective disciplines. Students learn current knowledge and technology through formal course work and gain valuable first-hand experience in departmental laboratories, greenhouses, and field research farms. Students are encouraged to gain additional learning experiences outside the classroom by working as research assistants in faculty programs, summer jobs, and internships with private industry and government agencies.

Each student works closely with a faculty advisor to formulate a program of study that is appropriate with the student's career goals and also fits into either the Crop Science or Plant Biology options.

## Crop Science Option (<http://catalog.montana.edu/undergraduate/agriculture/plant-science/crop-science-option/>)

Continued increases in food and fiber crop production are essential for the future of humankind. Yet increased production places increased pressure on our soil, water, and other finite resources. The challenge for crop scientists is to implement crop and soil management schemes that maintain and increase production, but at the same time conserve our soil and water resources and preserve the delicate balance in the agroecosystem.

Course requirements in the Crop Science option are designed to acquaint students with the principles underlying crop and soil management. Thus soil fertility, plant physiology, crop production, crop breeding, and pest management, along with courses in the biological and physical sciences are included in this area of study.

Graduates from this option find careers in farming and ranching; as crop production specialists; in pest management; in seed, fertilizer, and chemical industries; with banks and other lending institutions; Cooperative Extension Service and with a government agency such as the Natural Resource Conservation Service.

## Plant Biology Option (<http://catalog.montana.edu/undergraduate/agriculture/plant-science/plant-biology-option/>)

Plant biology provides a broad education in the plant sciences. The expertise of the Plant Sciences faculty provides an opportunity to focus at the cellular and molecular level, but opportunities also exist for emphasis in plant ecology and systematics. Course requirements include beginning and advanced courses in biology, microbiology, biochemistry, physiology, genetics, plant development, ecology, and systematics.

Graduates are prepared for post-graduate school, and academic and professional careers.

## Plant Biotechnology - Plant Systems Option (<http://catalog.montana.edu/undergraduate/agriculture/biotechnology/plant-systems-option/>)

Biotechnology combines traditional approaches of altering biological materials with the rapidly expanding methods of molecular biology. This option is for students with an interest in applying new technology to plant systems. Students in the Plant Biotechnology option concentrate on coursework specific to plant systems and participate in an internship.

## Environmental Horticulture Science Option (<http://catalog.montana.edu/undergraduate/agriculture/environmental-horticulture/environmental-horticulture-science-option/>)

Horticulture is the science and art of growing and maintaining plants for food, enjoyment, and improvement of the human environment. Its application through research has led to improved varieties of plants to benefit our daily lives. Students studying horticulture take fundamental courses in biology, chemistry, and mathematics prior to taking specialized courses such as plant materials, plant physiology, plant pathology, plant reproduction, and arboriculture. Graduates of this program are prepared for careers in such areas as floral and nursery crop production, grounds care, landscape nurseries, and greenhouse businesses; and in research with private companies, public agencies or institutions of higher learning.

Students may also earn an Environmental Horticulture minor (non-teaching) (<http://catalog.montana.edu/undergraduate/agriculture/environmental-horticulture/environmental-horticulture-minor-nonteaching/>).

## Landscape Design Option (<http://catalog.montana.edu/undergraduate/agriculture/environmental-horticulture/landscape-design-option/>)

The landscape design option will prepare students to solve aesthetic and functional landscape problems. Technical and creative studies lead to problem-solving skills which are used to create beautiful, functional, and efficient landscape design solutions. Emphasis is placed on the use of plant materials to solve site problems. Graduates are employed by landscape nurseries, landscape contractors, and planning agencies; others become self-employed as landscape designers and contractors. Many students have chosen to continue advanced studies in programs of landscape architecture.

## Sustainable Crop Production Option (<http://catalog.montana.edu/undergraduate/agriculture/sustainable-food-bioenergy-systems/sustainable-crop-production-option/>)

Students in all four SFBS options (Food Systems, Crop Production, Agroecology, and Livestock Production) take a core curriculum of six courses designed to provide broad exposure to key principles of sustainable food and bioenergy systems. In addition, coursework in each option is specifically designed to create more detailed and subject-specific knowledge in your area of specialization. Students take complementary coursework in political science, economics, business, Native American studies, and engineering. Two internships allow you to gain exposure to 1) hands-on learning in market garden agronomy and food distribution, and 2) an in-depth internship with an experienced mentor in your chosen career field.

## **Undergraduate Programs**

- Crop Science Option (<http://catalog.montana.edu/undergraduate/agriculture/plant-science/crop-science-option/>)
- Plant Biology Option (<http://catalog.montana.edu/undergraduate/agriculture/plant-science/plant-biology-option/>)
- Plant Biotechnology Option (<http://catalog.montana.edu/undergraduate/agriculture/biotechnology/plant-systems-option/>)
- Sustainable Crop Production Option (<http://catalog.montana.edu/undergraduate/agriculture/sustainable-food-bioenergy-systems/sustainable-crop-production-option/>)

## **Undergraduate Minor**

- Genetics Minor (Non-Teaching) (<http://catalog.montana.edu/undergraduate/agriculture/genetics-minor/>)

## **Graduate Programs**

- Plant Sciences and Plant Pathology (<http://catalog.montana.edu/graduate/agriculture/plant-sciences-plant-pathology/>)