UNIVERSITY OF MINNESOTA
Driven to Discover℠

Twin Cities Campus

Applied Plant Science B.S.

Agronomy & Plant Genetics

College of Food, Agricultural and Natural Resource Sciences

- **Students will no longer be accepted into this program after Fall 2013. Program requirements below are for current students only.**
- **Students interested in this major should consider Plant Science or Food Systems depending on their interest area.**

- Program Type: Baccalaureate
- Requirements for this program are current for Spring 2019
- Required credits to graduate with this degree: 120
- Required credits within the major: 73 to 82
- This program requires summer terms.
- Degree: Bachelor of Science

The applied plant science major provides options for a broad course of study in plant sciences, as well as options to concentrate more specifically within an area of individual interest. It provides a solid science background and integrates knowledge of science, environment, production and industry in preparation for continuing study in graduate school or careers in improvement of the quality and benefits of plants and plant products; industry, government, and universities as research scientists; agencies and organizations concerned with natural resource management; advisory, inspection and certification services; bio-safety and food security; related fields of biology and agricultural education.

Students choose from three areas of emphasis: agroecology, plant improvement, and plant utilization.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

All major requirements must be taken A-F (unless only offered S-N), and students must earn a grade of at least C-.

Students develop a plan of study that fulfills the required science core (43-49 credits) and area electives (12-17 credits). Students enroll in a set of three common courses in their freshman year and a series of three integrative courses in each of the following three years. The last course in the series is the senior capstone course. After fulfilling CLE and major requirements, students should have between 15 and 22 credits available for electives.

Science Foundation Courses

PMB 2022 - General Botany (3.0 cr)
PHYS 1101W - Introductory College Physics I [PHYS, WI] (4.0 cr)
BIOL 1009 - General Biology [BIOL] (4.0 cr)
or BIOL 1001 - Introductory Biology: Evolutionary and Ecological Perspectives [BIOL] (4.0 cr)
AGRO 4005 *{Inactive}*[WI] (4.0 cr)
or PMB 3002 - Plant Biology: Function (2.0 cr)
PMB 3005W - Plant Function Laboratory [WI] (2.0 cr)
or PLSC 3005W - Introduction to Plant Physiology [WI] (4.0 cr)
CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
UNKNOWN
UNKNOWN
CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)

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Major Courses
AGRO 1103 - Crops, Environment, and Society [ENV] (4.0 cr)
AGRO 1661W - Engaging Plant Science [WI] (2.0 cr)
AGRO 4660 *{Inactive}*(2.0 cr)
AGRO 4096W - Professional Experience Program: Internships [WI] (2.0 cr)
or AGRO 4094W - Undergraduate Directed Thesis Research [WI] (2.0 cr)
AGRO 3660 - Plant Genetic Resources: Identification, Conservation, and Utilization (3.0 cr)
Take 1 or more course(s) from the following:
•CFAN 1501 *{Inactive}*[TS] (3.0 cr)
•CFAN 3001 *{Inactive}*(3.0 cr)
•AGRO 3203W - Environment, Global Food Production, and the Citizen [GP, WI] (3.0 cr)
•AGRO 4103 *{Inactive}*[GP] (3.0 cr)

Program Sub-plans
Students are required to complete one of the following sub-plans.

Agroecology
Agroecology
SOIL 2125 - Basic Soil Science [PHYS, ENV] (4.0 cr)
BIOC 2011 - Biochemistry for the Agricultural and Health Sciences (3.0 cr)
or BIOC 3021 - Biochemistry (3.0 cr)
BIOL 3407 *{Inactive}*(3.0 cr)
or BIOL 3408W *{Inactive}*[WI] (3.0 cr)
or ESPM 3108 - Ecology of Managed Systems [ENV] (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)
MATH 1031 - College Algebra and Probability [MATH] (3.0 cr)
or MATH 1142 - Short Calculus [MATH] (4.0 cr)
or STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
Electives
Take 17 or more credit(s) including 4 or more sub-requirements(s) from the following:
Take 1 or more course(s) from the following:
•AGRO 2501 - Plant Identification for Urban and Rural Landscapes (1.0 cr)
•ENT 5021 - Insect Biodiversity and Evolution (4.0 cr)
•ENT 5371 *{Inactive}*(3.0 cr)
•PMB 4321 - Minnesota Flora (3.0 cr)
•Take 1 or more course(s) from the following:
•AGRO 4505 - Biology, Ecology, and Management of Invasive Plants (3.0 cr)
•ENT 1005 - Insect Biology with Lab [BIOL] (4.0 cr)
•ENT 5211 - Insect Pest Management (3.0 cr)
•ENT 5341 - Biological Control of Insects and Weeds (3.0 cr)
•PLPA 2001 - Introductory Plant Pathology (3.0 cr)
•*UNKNOWN*
•*UNKNOWN*
•PLPA 5103 - Plant-Microbe Interactions (3.0 cr)
•*UNKNOWN*
•PLPA 5480 - Principles of Plant Pathology (3.0 cr)
•Take 1 or more course(s) from the following:
•AGRO 3131 *{Inactive}*(3.0 cr)
•AGRO 4605 - Strategies for Agricultural Production and Management (3.0 cr)
•HORT 3131 - Student Organic Farm Planning, Growing, and Marketing (3.0 cr)
•HORT 5052 *{Inactive}*(3.0 cr)
•SOIL 3416 - Plant Nutrients in the Environment (3.0 cr)
•Take 1 or more course(s) from the following:
•AGRO 5321 - Ecology of Agricultural Systems (3.0 cr)
•ESPM 3221 - Soil Conservation and Land-Use Management (3.0 cr)
•ESPM 3612W - Soil and Environmental Biology [WI] (4.0 cr)
•HORT 5031 *{Inactive}*(3.0 cr)
•HORT 5032 *{Inactive}*(3.0 cr)
•HORT 5071 - Ecological Restoration (4.0 cr)
•PLPA 2001 - Introductory Plant Pathology (3.0 cr)

Plant Utilization

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Plant Utilization
BIOC 3021 - Biochemistry (3.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)
CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)
STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
MATH 1142 - Short Calculus [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)

Electives
Take 12 or more credit(s) from the following:
•AGRO 4401 *{Inactive}*(4.0 cr)
•BBE 4744 - Engineering Principles for Biological Scientists (4.0 cr)
•BIOL 3407 *{Inactive}*(3.0 cr)
•EEB 3001 - Ecology and Society [ENV] (3.0 cr)
•FSCN 1102 - Food: Safety, Risks, and Technology [CIV] (3.0 cr)
•FSCN 1112 - Principles of Nutrition [TS] (3.0 cr)
•FSCN 4121 - Food Microbiology (3.0 cr)
•FSCN 4332 *{Inactive}*(3.0 cr)
•FSCN 4612W - Advanced Human Nutrition [WI] (4.0 cr)
•FSCN 5441 *{Inactive}*(2.0 cr)
•FSCN 5531 - Grains: Introduction to Cereal Chemistry and Technology (2.0 cr)
•HORT 5031 *{Inactive}*(3.0 cr)
•HORT 5032 *{Inactive}*(3.0 cr)
•HORT 5052 *{Inactive}*(3.0 cr)
•BBE 4001 - Chemistry of Biomass and Biomass Conversion to Fuels and Products [ENV] (4.0 cr)
or PMB 4516W - Plant Cell Biology: Writing Intensive [WI] (3.0 cr)
or PMB 4601 - Topics in Plant Biochemistry (3.0 cr)
or PMB 5516 *{Inactive}*(3.0 cr)

Plant Improvement

Plant Improvement
AGRO 4401 *{Inactive}*(4.0 cr)
BIOC 3021 - Biochemistry (3.0 cr)
CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)
CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)
UNKNOWN
CHEM 2301 - Organic Chemistry I (3.0 cr)
BIOL 4003 - Genetics (3.0 cr)
or GCD 3022 - Genetics (3.0 cr)
STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
MATH 1031 - College Algebra and Probability [MATH] (3.0 cr)
or MATH 1142 - Short Calculus [MATH] (4.0 cr)

Electives
Take 12 or more credit(s) from the following:
•BBE 3013 - Engineering Principles of Molecular and Cellular Processes (3.0 cr)
•BIOC 4025W - Laboratory in Biochemistry [WI] (2.0 cr)
•BIOC 4125 - Laboratory in Molecular Biology and Biotechnology (3.0 cr)
•EEB 3001 - Ecology and Society [ENV] (3.0 cr)
•HORT 4071W - Applications of Biotechnology to Plant Improvement [WI] (3.0 cr)
•HORT 5031 *{Inactive}*(3.0 cr)
•HORT 5032 *{Inactive}*(3.0 cr)
•HORT 5052 *{Inactive}*(3.0 cr)
•PMB 5301 *{Inactive}*(3.0 cr)
•PMB 5412 - Plant Physiology and Development (3.0 cr)
•PMB 5514 *{Inactive}*(3.0 cr)
•PLPA 5103 - Plant-Microbe Interactions (3.0 cr)
•PLPA 5300 - Current Topics in Molecular Plant Pathology (1.0 cr)
•SOIL 2125 - Basic Soil Science [PHYS, ENV] (4.0 cr)
•PMB 4516W - Plant Cell Biology: Writing Intensive [WI] (3.0 cr)
or PMB 5516 *{Inactive}*(3.0 cr)
or PMB 4601 - Topics in Plant Biochemistry (3.0 cr)
or BBE 4001 - Chemistry of Biomass and Biomass Conversion to Fuels and Products [ENV] (4.0 cr)

Honors UHP

This is an honors sub-plan.

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Students admitted to the University Honors Program (UHP) must fulfill UHP requirements in addition to degree program requirements. Honors courses used to fulfill degree program requirements will also fulfill UHP requirements.

Current departmental honors course offerings are listed at:
http://www.honors.umn.edu/academics/curriculum/dept_courses_current.html

Honors students complete an honors thesis project in the final year, most often in conjunction with an honors thesis course, or with an honors directed studies or honors directed research course. Students select honors courses and plan for a thesis project in consultation with their UHP adviser and their departmental faculty adviser.

As part of their honors program, CFANS students complete CFAN 3100H; they must submit their project for this faculty-mentored honors experience to the honors committee for approval prior to registration.

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