

CROP SCIENCE (CRSC)

Department of Plant Agriculture, Ontario Agricultural College

The Crop Science major is designed for students who want to apply the latest advancements in the biological sciences to contemporary problems in the plant production industry with an emphasis on agronomy and cropping systems. This major is appropriate for students who wish to focus on the production of field crops for food, fuel or biomaterials, and breeding improved crop varieties. Students can also incorporate a variety of field trips, experiential learning in the workplace and independent study into their program of studies.

Students interested in adding a business emphasis to their studies are encouraged to consider the Certificate of Business (<https://calendar.uoguelph.ca/undergraduate-calendar/programs-majors-minors/business-bus/#certificatetext>) offered by the Gordon S. Lang School of Business and Economics. This may require an additional semester to complete.

Students interested in organic agriculture should consider the Certificate in Organic Agriculture (<https://calendar.uoguelph.ca/undergraduate-calendar/programs-majors-minors/organic-agriculture-oagr/#text>).

The Co-op program in Crop Science facilitates the transition of students from academic studies to a professional career by enhancing the integration of theory and practice.

Major Requirements (Honours)

This is a major within the degree: Bachelor of Science in Agriculture.

Credit Summary

- In semester 5 students must choose Option A: Production and Management, or Option B: Research.
 - Option A: 14.00 credits from required courses, 3.00 credits of restricted electives, 0.50 credits of humanities and social sciences, and 2.50 credits of free electives.
 - Option B: 15.00 credits from required courses, 3.00 credits of restricted electives, 0.50 credits of humanities and social sciences, and 1.50 credits of free electives.
- A humanities or social science courses (0.50 credits) at the 1000-level or above. See Program Counsellor for acceptable list of courses.

Recommended Program Sequence

Code	Title	Credits
Semester 1		
AGR*1110	Introduction to the Agri-Food Systems	1.00
BIOL*1050	Biology of Plants & Animals in Managed Ecosystems	0.50
CHEM*1040	General Chemistry I	0.50
MATH*1080	Elements of Calculus I	0.50
Semester 2		
AGR*1350	Animal Production Systems and Industry: Dairy, Poultry and Egg	0.50
BIOL*1090	Introduction to Molecular and Cellular Biology	0.50
CHEM*1050	General Chemistry II	0.50
FARE*1400	Economics of the Agri-Food System	1.00

Semester 3

AGR*2320	Soils in Agroecosystems	0.50
AGR*2470	Introduction to Plant Agriculture	0.50
BOT*2100	Life Strategies of Plants	0.50
FARE*2700	Survey of Natural Resource Economics	0.50
MBG*2400	Fundamentals of Plant and Animal Genetics	0.50

Semester 4

AGR*2050	Agroecology	0.50
BIOC*2580	Introduction to Biochemistry	0.50
ENVS*2040	Plant Health and the Environment	0.50
STAT*2040	Statistics I	0.50
0.50 electives or restricted electives		0.50

Option A - Production and Management

Code	Title	Credits
Semester 5		
ENVS*3210	Plant Pathology	0.50
FOOD*3090	Food Science and Human Nutrition	0.50
1.50 electives or restricted electives		1.50

Semester 6

ENVS*4100	Integrated Management of Invasive Insect Pests	0.50
PBIO*3110	Crop Physiology	0.50
1.50 electives or restricted electives		1.50

Semester 7

CROP*4240	Weed Science	0.50
ENVS*4090	Soil Management	0.50
or ENVS*4160	Soil and Nutrient Management	
1.50 electives or restricted electives		1.50

Semester 8

AGR*4600	Agriculture and Food Issues Problem Solving	1.00
CROP*4220	Cropping Systems	0.50
1.00 electives or restricted electives		1.00

Option B - Research

Code	Title	Credits
Semester 5		
AGR*3450	Research Methods in Agricultural Science	0.50
ENVS*3210	Plant Pathology	0.50
FOOD*3090	Food Science and Human Nutrition	0.50
1.00 electives or restricted electives		1.00

Semester 6

ENVS*4100	Integrated Management of Invasive Insect Pests	0.50
PBIO*3110	Crop Physiology	0.50
1.50 electives or restricted electives		1.50

Semester 7

AGR*4450	Research Project I	0.50
CROP*4240	Weed Science	0.50
ENVS*4090	Soil Management	0.50
or ENVS*4160	Soil and Nutrient Management	
1.00 electives or restricted electives		1.00

Semester 8

AGR*4460	Research Project II	1.00
CROP*4220	Cropping Systems	0.50
1.00 electives or restricted electives		1.00

Restricted Electives - Option A and Option B

A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses

Students must take a minimum of 3.00 credits of restricted electives from the following lists:

Crop Production

A minimum of 1.50 credits from:

Code	Title	Credits
AGR*4020	Precision Techniques for Plant Agriculture	0.50
CROP*3300	Grain Crops	0.50
CROP*3310	Protein and Oilseed Crops	0.50
CROP*3340	Managed Grasslands	0.50
ENVS*3080	Soil and Water Conservation	0.50
ENVS*4390	Soil Variability and Land Evaluation	0.50
HORT*4380	Tropical and Sub-Tropical Crops	0.50
OAGR*2070	Introduction to Organic Agriculture	1.00

Pest Management

A minimum of 0.50 from:

Code	Title	Credits
ENVS*3020	Pesticides and the Environment	0.50
ENVS*4180	Insecticide Biological Activity and Resistance	0.50
ENVS*4190	Biological Activity of Herbicides	0.50
PBIO*4070	Biological and Cultural Control of Plant Diseases	0.50

Genetics, Biotechnology and Physiology

A minimum of 0.50 from:

Code	Title	Credits
MBG*3100	Plant Genetics	0.50
MBG*4160	Plant Breeding	0.50
PBIO*3120	Plant Physiology	0.50
PBIO*3750	Plant Tissue Culture	0.50
PBIO*4750	Genetic Engineering of Plants	0.50

Experiential Learning

Students may take these additional courses as part of their restricted electives:

Code	Title	Credits
AGR*2500	Field Course in International Agriculture	0.50
AGR*3010	Special Studies in Agricultural Science I	0.50
CROP*4260	Crop Science Field Trip	0.50
IAEF*3500	Experiential Education	0.50
IAEF*3510	Interdisciplinary Flexible Internship	0.50

Co-op Requirements (Honours)

This is a major within the degree: Bachelor of Science in Agriculture.

Academic and Co-op Work Term Schedule

Year	Fall	Winter	Summer
1	Academic Semester 1	Academic Semester 2	Off
2	Academic Semester 3 COOP*1100	Academic Semester 4	COOP*1000 Work Term I
3	COOP*2000 Work Term II	Academic Semester 5	Off
4	Academic Semester 6	COOP*3000 Work Term III	COOP*4000 Work Term IV
5	Academic Semester 7	Academic Semester 8	N/A

Please refer to the Co-operative Education program policy with respect to work term performance grading, work term report grading and program completion requirements.

For additional program information, students should consult their Co-op Coordinator and Co-op Faculty Advisor, listed on the Co-operative Education website.

Credit Summary

- In semester 5 students must choose Option A: Production and Management, or Option B: Research.
 - Option A: 14.00 credits from required courses, 3.00 credits of restricted electives, 0.50 credits of humanities and social sciences, and 2.50 credits of free electives.
 - Option B: 15.00 credits from required courses, 3.00 credits of restricted electives, 0.50 credits of humanities and social sciences, and 1.50 credits of free electives.
- A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to a Program Counsellor for a list of agricultural science courses.
- A humanities or social science courses (0.50 credits) at the 1000-level or above. See Program Counsellor for acceptable list of courses.
- Co-op Work Terms: 2.00 credits
- Total Credits Required to Graduate: 22.00 credits**

Recommended Program Sequence

Code	Title	Credits
Semester 1 - Fall		
AGR*1110	Introduction to the Agri-Food Systems	1.00
BIOL*1050	Biology of Plants & Animals in Managed Ecosystems	0.50
CHEM*1040	General Chemistry I	0.50
MATH*1080	Elements of Calculus I	0.50
Semester 2 - Winter		
AGR*1350	Animal Production Systems and Industry: Dairy, Poultry and Egg	0.50
BIOL*1090	Introduction to Molecular and Cellular Biology	0.50
CHEM*1050	General Chemistry II	0.50

FARE*1400	Economics of the Agri-Food System	1.00
-----------	-----------------------------------	------

Summer Semester

No academic semester or work term

Semester 3 - Fall

AGR*2320	Soils in Agroecosystems	0.50
AGR*2470	Introduction to Plant Agriculture	0.50
BOT*2100	Life Strategies of Plants	0.50
COOP*1100	Introduction to Co-operative Education	0.00
FARE*2700	Survey of Natural Resource Economics	0.50
MBG*2400	Fundamentals of Plant and Animal Genetics	0.50

Semester 4 - Winter

AGR*2050	Agroecology	0.50
BIOC*2580	Introduction to Biochemistry	0.50
ENVS*2040	Plant Health and the Environment	0.50
STAT*2040	Statistics I	0.50
0.50 electives or restricted electives		0.50

Summer Semester

COOP*1000	Co-op Work Term I	0.50
-----------	-------------------	------

Option A - Production and Management

Code	Title	Credits
------	-------	---------

Fall Semester

COOP*2000	Co-op Work Term II	0.50
-----------	--------------------	------

Semester 5 - Winter

ENVS*4100	Integrated Management of Invasive Insect Pests	0.50
PBIO*3110	Crop Physiology	0.50
1.50 electives or restricted electives		1.50

Summer Semester

No academic semester or work term

Semester 6 - Fall

ENVS*3210	Plant Pathology	0.50
FOOD*3090	Food Science and Human Nutrition	0.50
1.50 electives or restricted electives		1.50

Winter Semester

COOP*3000	Co-op Work Term III	0.50
-----------	---------------------	------

Summer Semester

COOP*4000	Co-op Work Term IV	0.50
-----------	--------------------	------

Semester 7 - Fall

CROP*4240	Weed Science	0.50
ENVS*4090	Soil Management	0.50
or ENVS*4160	Soil and Nutrient Management	
1.50 electives or restricted electives		1.50

Semester 8 - Winter

AGR*4600	Agriculture and Food Issues Problem Solving	1.00
CROP*4220	Cropping Systems	0.50
1.00 electives or restricted electives		1.00

Option B - Research

Code	Title	Credits
------	-------	---------

Fall Semester

COOP*2000	Co-op Work Term II	0.50
-----------	--------------------	------

Semester 5 - Winter

ENVS*4100	Integrated Management of Invasive Insect Pests	0.50
PBIO*3110	Crop Physiology	0.50
1.50 electives or restricted electives		1.50

Summer Semester

No academic semester or work term

Semester 6 - Fall

AGR*3450	Research Methods in Agricultural Science	0.50
ENVS*3210	Plant Pathology	0.50
FOOD*3090	Food Science and Human Nutrition	0.50
1.00 electives or restricted electives		1.00

Winter Semester

COOP*3000	Co-op Work Term III	0.50
-----------	---------------------	------

Summer Semester

COOP*4000	Co-op Work Term IV	0.50
-----------	--------------------	------

Semester 7 - Fall

AGR*4450	Research Project I	0.50
CROP*4240	Weed Science	0.50
ENVS*4090	Soil Management	0.50
or ENVS*4160	Soil and Nutrient Management	
1.00 electives or restricted electives		1.00

Semester 8 - Winter

AGR*4460	Research Project II	1.00
CROP*4220	Cropping Systems	0.50
1.00 electives or restricted electives		1.00

Restricted Electives - Option A and Option B

Students must take a minimum of 3.00 credits of restricted electives from the following lists:

Crop Production

A minimum of 1.50 credits from:

Code	Title	Credits
AGR*4020	Precision Techniques for Plant Agriculture	0.50
CROP*3300	Grain Crops	0.50
CROP*3310	Protein and Oilseed Crops	0.50
CROP*3340	Managed Grasslands	0.50
ENVS*3080	Soil and Water Conservation	0.50
ENVS*4390	Soil Variability and Land Evaluation	0.50
HORT*4380	Tropical and Sub-Tropical Crops	0.50
OAGR*2070	Introduction to Organic Agriculture	1.00

Pest Management

A minimum of 0.50 from:

Code	Title	Credits
ENVS*3020	Pesticides and the Environment	0.50
ENVS*4180	Insecticide Biological Activity and Resistance	0.50
ENVS*4190	Biological Activity of Herbicides	0.50
PBIO*4070	Biological and Cultural Control of Plant Diseases	0.50

Genetics, Biotechnology and Physiology

A minimum of 0.50 from:

Code	Title	Credits
MBG*3100	Plant Genetics	0.50
MBG*4160	Plant Breeding	0.50
PBIO*3750	Plant Tissue Culture	0.50
PBIO*4750	Genetic Engineering of Plants	0.50

Experiential Learning

Student may take these additional courses as part of their restricted electives:

Code	Title	Credits
AGR*2500	Field Course in International Agriculture	0.50
AGR*3010	Special Studies in Agricultural Science I	0.50
CROP*4260	Crop Science Field Trip	0.50