

2005-2006 Undergraduate Calendar

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2005-2006 academic year, including the Summer Semester 2005, the Fall Semester 2005 and the Winter Semester 2006.

For your convenience the Undergraduate Calendar is available in PDF format.

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Disclaimer

University of Guelph 2005

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The University reserves the right to change without notice any information contained in this calendar, including any rule or regulation pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or diplomas in any or all of its programs. The publication of information in this calendar does not bind the University to the provision of courses, programs, schedules of studies, or facilities as listed herein.

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Bachelor of Science in Agriculture [B.Sc.(Agr.)]

The B.Sc.(Agr.) degree program is a 4 year honours science program designed to provide a fundamental education in the science of agriculture. The curriculum includes courses in the agricultural sciences, the physical, biological and social sciences, and in the arts.

Program Information

Agricultural scientists must be effective communicators and problem solvers, self-directed in their learning, and have a global perspective on the agrifood systems. A series of 9 or 10 agricultural science (AGR*XXXX) courses throughout the program enables students to further develop their abilities in communications, analysis and problem solving, computer applications and to increase their interpersonal skills. Students will be involved in cooperative group learning activities and will experience courses that are multidisciplinary and integrate the teaching activities of many faculty and departments.

Students will have the option of completing a broad agricultural program (honours agricultural science) or identifying another major in which they take a minimum of 6.00 credits.

The curriculum provides opportunities for students to select courses that will help them prepare for professional careers as entrepreneurs, scientists, marketing specialists, financial managers, technical advisors, or communications specialists. Students will have a comprehensive understanding of the food system when they graduate. They will be able to integrate their knowledge of production agriculture, environmental management, resource allocation and business management as it applies to the food system nationally and globally.

Students will be encouraged to integrate their academic program with a well-planned series of employment activities in the summer months and to develop their leadership and interpersonal skills in on-campus and community activities. There is a strong commitment in the curriculum to the philosophy of "whole person development" and students are encouraged to identify personal goals that they wish to accomplish in each of these areas of their development.

Graduates meet the educational requirements for membership in the Ontario Institute of Agrologists. The Ontario Institute of Agrologists is the professional organization in agriculture in the Province of Ontario. Professional institutes in the various provinces in Canada and the scientific societies in agriculture collectively comprise the Agricultural Institute of Canada. The program received full accreditation from the Agricultural Institute of Canada in April 1999.

Students may graduate with a degree in honours agricultural science. Students who wish to specialize in 1 of the major areas of study may do so by completing the courses identified for each major.

Additional Majors:

Agricultural Economics
Agroecosystem Management
Agronomy
Animal Science
Horticultural Science
Organic Agriculture

Declaration of a Major

All students are considered to be registered in honours agricultural science in the first 3 semesters of the program. Those who wish to select a different major may do so when they are selecting their courses for semester 4 or later. The course requirements are listed for each major in the following section.

Students may, with appropriate approvals, elect to complete Minors associated with other degree programs as listed in the undergraduate calendar.

Study Abroad

The B.Sc.(Agr.) degree program is similar in many respects to programs offered at faculties of agricultural science in other provinces in Canada. Students are strongly encouraged to consider studying for 1 or 2 semesters in other faculties of agricultural science in Canada and in selected countries around the world.

Students interested in studying at another institution program should consult the B.Sc.(Agr.) Program Counsellor to discuss their plans, and refer to the scholarship section for financial support.

For more specific information on these opportunities refer to Section V--International Study in this calendar, or contact the OAC Dean's Office.

Doctor of Veterinary Medicine

Students in the B.Sc.(Agr.) program normally apply for admission to the D.V.M. program after semester 4 or later. Applications must be submitted to the Admissions Services, Office of Registrarial Services. Students should consult the D.V.M. Section of the calendar. Students who do not gain admission to the D.V.M. program are eligible to continue in the B.Sc.(Agr.) program through to graduation.

Students planning to enter the D.V.M. program are advised to include 12U biology, 12U chemistry, and 12U physics in addition to calculus in secondary school.

Continuation of Study

Students are advised to consult the regulations for continuation of study within the program which are outlined in detail in Section VIII--Undergraduate Degree Regulations & Procedures.

Conditions of Graduation

To qualify for the degree Bachelor of Science (Agriculture), the student must successfully complete a minimum of 20.00 credits as set out in the Schedule of Studies listed below. In addition, students must meet the continuation of study requirements at the time of graduation and have a minimum of 60% cumulative average.

Honours Agriculture (AGRS)

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood System
BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*1250	[0.50]	Agrifood System Trends and Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 elective

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2400	[0.50]	Economics of the Canadian Food System
AGR*2470	[0.50]	Introduction to Plant Agriculture

0.50 restricted elective

Semester 4

SOIL*2200	[0.50]	Environmental Issues in Agroecosystems
STAT*2040	[0.50]	Statistics I

One of:

CROP*2110	[0.50]	Crop Ecology
HORT*3340	[0.50]	Culture of Plants

One of:

ANSC*2340	[0.50]	Structure of Farm Animals
ANSC*2360	[0.50]	Challenges and Opportunities in Animal Production
ANSC*3150	[0.50]	Principles of Farm Animal Care and Welfare

Note: ANSC*2360 is a Fall offering and ANSC*2340, ANSC*3150 are Winter offerings. 0.50 restricted elective

Semester 5

AGEC*2700	[0.50]	Survey of Natural Resource Economics
FOOD*3070	[0.50]	Introduction to Food Processing

1.50 electives or restricted electives

Semester 6

EDRD*3400	[0.50]	Sustainable Rural Communities
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2.00 electives

Semester 7 & 8

Students must choose either Option A or B in Semester 7 and 8

Option A:

AGR*4500	[0.50]	Agrifood Industry Problem-Solving
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4.50 electives

Option B

AGR*4450	[1.00]	Research Project in Agriculture I
AGR*4460	[1.00]	Research Project in Agriculture II

3.00 electives

Restricted Electives

1. 2 of the following Restricted Electives are required:

BOT*2100	[0.50]	Life Strategies of Plants
BIOC*2580	[0.50]	Introductory Biochemistry
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
GEOL*3130	[0.50]	Agrogeology
MBG*2000	[0.50]	Introductory Genetics
SOIL*2120	[0.50]	Introduction to Environmental Stewardship

2. 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.

3. A humanities or social science course (0.50 credit) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Agricultural Economics (AGEC)

Department of Agricultural Economics and Business.

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood System
BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*1250	[0.50]	Agrifood System Trends and Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ECON*1100	[0.50]	Introductory Macroeconomics
ENGL*1200	[0.50]	Reading the Contemporary World

Semester 3

AGR*2400	[0.50]	Economics of the Canadian Food System
ECON*2310	[0.50]	Intermediate Microeconomics

Two of:

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture

0.50 elective or restricted elective

Semester 4

AGEC*2410	[0.50]	Agrifood Markets and Policy
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics
ECON*2770	[0.50]	Introductory Mathematical Economics

0.50 elective or restricted elective

Semester 5

ECON*3740	[0.50]	Introduction to Econometrics
FOOD*3070	[0.50]	Introduction to Food Processing

One of:

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture

1.00 electives or restricted electives

Semester 6

EDRD*3400	[0.50]	Sustainable Rural Communities
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2.00 electives or restricted electives

Semester 7 & 8**Students must choose either Option A or B in Semester 7 and 8****Option A:**

Semester 7

AGEC*3030	[0.50]	The Firm and Markets
AGEC*4500	[0.50]	Decision Science

1.50 electives or restricted electives

Semester 8

AGEC*4000	[0.50]	Agricultural and Food Policy
AGR*4500	[0.50]	Agrifood Industry Problem-Solving

1.50 electives or restricted electives

Option B

Semester 7

AGEC*3030	[0.50]	The Firm and Markets
AGEC*4500	[0.50]	Decision Science
AGR*4450	[1.00]	Research Project in Agriculture I

0.50 elective or restricted elective

Semester 8

AGEC*4000	[0.50]	Agricultural and Food Policy
AGR*4460	[1.00]	Research Project in Agriculture II

1.00 electives or restricted electives

Restricted Electives

- Students are required to take at least 1.50 additional credits at the 3000 or 4000 level in the following subject areas: AGECE, COST, ECON, or in an area otherwise approved by the faculty advisor. At least 1.00 of these additional credits must be at the 4000 level.
- 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.

Agroecosystem Management (AGMN)

Department of Land Resource Science.

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood System
BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*1250	[0.50]	Agrifood System Trends and Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 elective

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2400	[0.50]	Economics of the Canadian Food System
AGR*2470	[0.50]	Introduction to Plant Agriculture
SOIL*2120	[0.50]	Introduction to Environmental Stewardship

Semester 4

MET*2020	[0.50]	Agrometeorology
SOIL*2200	[0.50]	Environmental Issues in Agroecosystems
STAT*2040	[0.50]	Statistics I

1.00 electives or restricted electives

Semester 5

FOOD*3070	[0.50]	Introduction to Food Processing
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*3170	[0.50]	Soil Processes in Landscape

1.00 electives or restricted electives

Semester 6

EDRD*3400	[0.50]	Sustainable Rural Communities
GEOL*3130	[0.50]	Agrogeology
GEOL*3060	[0.50]	Groundwater

One of:

GEOG*2480	[0.50]	Mapping and GIS
SOIL*3600	[0.50]	Remote Sensing

0.50 elective or restricted elective

Semester 7 & 8**Students must choose either Option A or B in Semester 7 and 8****Option A:**

Semester 7

One of:

SOIL*4110	[0.50]	Natural Resources Management Field Camp
SOIL*4210	[0.50]	Earth and Atmospheric Science Field Camp

2.00 electives or restricted electives

Semester 8

AGR*4500	[0.50]	Agrifood Industry Problem-Solving
PBIO*4100	[0.50]	Soil Plant Relationships

1.50 electives or restricted electives

Option B

Semester 7

AGR*4450	[1.00]	Research Project in Agriculture I
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One of:

SOIL*4110	[0.50]	Natural Resources Management Field Camp
SOIL*4210	[0.50]	Earth and Atmospheric Science Field Camp

1.00 electives or restricted electives

Semester 8

AGR*4460	[1.00]	Research Project in Agriculture II
PBIO*4100	[0.50]	Soil Plant Relationships

1.00 electives or restricted electives

Restricted Electives

- A minimum of 2.00 credits from one or more groupings in Land Resource Science from the list below:

Climate & Agroecosystems Management:

GEOG*3020	[0.50]	Global Environmental Change
GEOL*2200	[0.50]	Glacial Geology
MET*2030	[0.50]	Meteorology and Climatology
MET*3050	[0.50]	Microclimatology
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
SOIL*4090	[0.50]	Soil Management

Nutrient Management:

GEOL*2200	[0.50]	Glacial Geology
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics

SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management
Organic Agriculture		
CROP*2050	[0.50]	Gateway to Organic Agriculture
CROP*2110	[0.50]	Crop Ecology
GEOL*2200	[0.50]	Glacial Geology
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management
Tropical Agroecosystem Management:		
AGEC*4210	[0.50]	World Agriculture and Economic Development
AGR*2500	[0.50]	Field Trip in International Agriculture
AGR*4000	[0.50]	Seminar in International Agriculture
GEOL*2110	[0.50]	Earth Material Science
HORT*4380	[0.50]	Tropical and Sub-Tropical Horticultural Crops
SOIL*4090	[0.50]	Soil Management

Natural Resource Management:

ENVB*2030	[0.50]	Current Issues in Forest Science
GEOG*3610	[0.50]	Environmental Hydrology
GEOL*2200	[0.50]	Glacial Geology
SOIL*3050	[0.50]	Land Utilization
SOIL*3100	[0.50]	Resource Planning Techniques
ENVB*4780	[0.50]	Forest Ecology

Source Water Protection:

BIOL*3450	[0.50]	Introduction to Aquatic Environments
ENVB*4020	[0.50]	Water Quality and Environmental Management
GEOG*3610	[0.50]	Environmental Hydrology
GEOL*2200	[0.50]	Glacial Geology
GEOL*3190	[0.50]	Environmental Water Chemistry
UNIV*3400	[0.50]	Watershed Planning Practice
ZOO*4350	[0.50]	Biology of Polluted Waters

2. 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.

3. A humanities or social science course (0.50 credit) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Note: In this major there are fees charged to cover partial costs of some field trips. Students in need of financial assistance should approach the Chair of the department offering the course.

Agronomy (AGRO)

Departments of Plant Agriculture, Crop Science Division, and Land Resource Science.

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood System
BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*1250	[0.50]	Agrifood System Trends and Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 elective

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2400	[0.50]	Economics of the Canadian Food System
AGR*2470	[0.50]	Introduction to Plant Agriculture
BOT*2100	[0.50]	Life Strategies of Plants

Semester 4

BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
STAT*2040	[0.50]	Statistics I

1.00 electives or restricted electives

Semester 5

FOOD*3070	[0.50]	Introduction to Food Processing
MBG*3100	[0.50]	Plant Genetics
PBIO*3110	[0.50]	Crop Physiology
SOIL*3080	[0.50]	Soil and Water Conservation

0.50 elective or restricted elective

Semester 6

EDRD*3400	[0.50]	Sustainable Rural Communities
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2.00 electives or restricted electives

Semester 7 & 8

Students must choose either Option A or B in Semester 7 and 8

Option A:

Semester 7

CROP*4240	[0.50]	Weed Science
SOIL*4090	[0.50]	Soil Management

1.50 electives or restricted electives

Semester 8

AGR*4500	[0.50]	Agrifood Industry Problem-Solving
CROP*4220	[0.50]	Cropping Systems

1.50 electives or restricted electives

Option B

Semester 7

AGR*4450	[1.00]	Research Project in Agriculture I
CROP*4240	[0.50]	Weed Science
SOIL*4090	[0.50]	Soil Management

0.50 elective or restricted elective

Semester 8

AGR*4460	[1.00]	Research Project in Agriculture II
CROP*4220	[0.50]	Cropping Systems

1.00 electives or restricted electives

Restricted Electives

1. Select two of the following Agronomy major electives:

CROP*3300	[0.50]	Grain Crops
CROP*3310	[0.50]	Protein and Oilseed Crops
CROP*3340	[0.50]	Managed Grasslands

2. 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.

3. A humanities or social science course (0.50 credit) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Highly Recommended courses:

CROP*2110	[0.50]	Crop Ecology
ENVB*3210	[0.50]	Plant Pathology
ENVB*4100	[0.50]	Applied Entomology
MBG*4160	[0.50]	Plant Breeding
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4750	[0.50]	Genetic Engineering of Plants

Animal Science (ANSC)

Department of Animal and Poultry Science.

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood System
BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*1250	[0.50]	Agrifood System Trends and Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 elective

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2400	[0.50]	Economics of the Canadian Food System
AGR*2470	[0.50]	Introduction to Plant Agriculture
MBG*2000	[0.50]	Introductory Genetics

Semester 4

ANSC*2340	[0.50]	Structure of Farm Animals
BIOC*2580	[0.50]	Introductory Biochemistry
STAT*2040	[0.50]	Statistics I

1.00 electives or restricted electives

Semester 5

ANSC*2360	[0.50]	Challenges and Opportunities in Animal Production
ANSC*3080	[0.50]	Agricultural Animal Physiology
NUTR*3210	[0.50]	Fundamentals of Nutrition
FOOD*3070	[0.50]	Introduction to Food Processing
MBG*3090	[0.50]	Applied Animal Breeding

Semester 6

ANSC*3150	[0.50]	Principles of Farm Animal Care and Welfare
ANSC*4120	[0.50]	Fundamentals of Animal Reproduction

EDRD*3400 [0.50] Sustainable Rural Communities
1.00 electives or restricted electives

Semester 7 & 8

Students must choose either Option A or B in Semester 7 and 8

Option A:

Semester 7
2.50 electives or restricted electives

Semester 8
AGR*4500 [0.50] Agrifood Industry Problem-Solving
2.00 electives or restricted electives

Option B

Semester 7
AGR*4450 [1.00] Research Project in Agriculture I
1.50 electives or restricted electives

Semester 8
AGR*4460 [1.00] Research Project in Agriculture II
1.50 electives or restricted electives

Restricted Electives

1. A minimum of 2.50 credits from one or more of the following areas:

Animal Breeding:

ANSC*4050 [0.50] Recombinant DNA in Animal Science
MBG*3060 [0.50] Quantitative Genetics
MBG*4030 [0.50] Animal Breeding Methods

Animal Nutrition:

ANSC*3120 [0.50] Introduction to Animal Nutrition
ANSC*4160 [0.25] Beef Cattle Nutrition
ANSC*4170 [0.25] Dairy Cattle Nutrition
ANSC*4180 [0.25] Poultry Nutrition
ANSC*4190 [0.25] Swine Nutrition
ANSC*4470 [0.50] Animal Metabolism
ANSC*4500 [0.25] Horse Nutrition
ANSC*4510 [0.25] Pet Nutrition
NUTR*3340 [0.50] Nutrition of Fish and Crustacea
NUTR*3350 [0.50] Wildlife Nutrition

Animal Physiology and Behaviour:

ANSC*4070 [0.50] Applied Animal Behaviour
ANSC*4080 [0.50] Environmental Management and Animal Productivity
ANSC*4130 [0.50] Reproductive Management and Technology
ANSC*4480 [0.50] Applied Endocrinology

Applied Animal Science:

ANSC*2330 [0.50] Horse Management Science
ANSC*4160 [0.25] Beef Cattle Nutrition

2. 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.
3. A humanities or social science course (0.50 credit) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Horticultural Science (HORT)

Department of Plant Agriculture, Horticultural Science Division.

Semester 1

AGR*1100 [0.50] Introduction to the Agrifood System
BIOL*1030 [0.50] Biology I
CHEM*1040 [0.50] General Chemistry I
ECON*1050 [0.50] Introductory Microeconomics
MATH*1080 [0.50] Elements of Calculus I

Semester 2

AGR*1250 [0.50] Agrifood System Trends and Issues
BIOL*1040 [0.50] Biology II
CHEM*1050 [0.50] General Chemistry II
ENGL*1200 [0.50] Reading the Contemporary World

0.50 elective

Semester 3

AGR*2320 [0.50] Soils in Agroecosystems
AGR*2400 [0.50] Economics of the Canadian Food System
AGR*2470 [0.50] Introduction to Plant Agriculture
BOT*2100 [0.50] Life Strategies of Plants

0.50 elective or restricted elective

Semester 4

BIOC*2580 [0.50] Introductory Biochemistry
STAT*2040 [0.50] Statistics I

1.50 electives or restricted electives

Semester 5

FOOD*3070 [0.50] Introduction to Food Processing
HORT*3230 [0.50] Plant Propagation
HORT*3510 [0.50] Vegetable Production
PBIO*3110 [0.50] Crop Physiology

0.50 elective or restricted elective

Semester 6

EDRD*3400 [0.50] Sustainable Rural Communities
HORT*3280 [0.50] Greenhouse Production

1.50 electives or restricted electives

Semester 7 & 8

Students must choose either Option A or B in Semester 7 and 8

Option A:

Semester 7
HORT*4420 [0.50] Fruit Crops
SOIL*4090 [0.50] Soil Management

1.50 electives or restricted electives

Semester 8

AGR*4500 [0.50] Agrifood Industry Problem-Solving
HORT*4300 [0.50] Postharvest Physiology

1.50 electives or restricted electives

Option B

Semester 7
AGR*4450 [1.00] Research Project in Agriculture I
HORT*4420 [0.50] Fruit Crops
SOIL*4090 [0.50] Soil Management

0.50 elective or restricted elective

Semester 8

AGR*4460 [1.00] Research Project in Agriculture II
HORT*4300 [0.50] Postharvest Physiology

1.00 electives or restricted electives

Restricted Electives

1. Select two of the following Horticulture major electives:

CROP*4240 [0.50] Weed Science
ENVB*3210 [0.50] Plant Pathology
ENVB*4100 [0.50] Applied Entomology
PBIO*3750 [0.50] Plant Tissue Culture
PBIO*4750 [0.50] Genetic Engineering of Plants

2. 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.
3. A humanities or social science course (0.50 credit) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Organic Agriculture(OAGR)

Department of Plant Agriculture and Department of Land Resource Science.

Semester 1

AGR*1100 [0.50] Introduction to the Agrifood System
BIOL*1030 [0.50] Biology I
CHEM*1040 [0.50] General Chemistry I
ECON*1050 [0.50] Introductory Microeconomics
MATH*1080 [0.50] Elements of Calculus I

Semester 2

AGR*1250 [0.50] Agrifood System Trends and Issues
BIOL*1040 [0.50] Biology II
CHEM*1050 [0.50] General Chemistry II
ENGL*1200 [0.50] Reading the Contemporary World

0.50 elective

Semester 3

AGR*2320 [0.50] Soils in Agroecosystems
AGR*2350 [0.50] Animal Production Systems and Industry
AGR*2400 [0.50] Economics of the Canadian Food System
AGR*2470 [0.50] Introduction to Plant Agriculture
CROP*2050 [0.50] Gateway to Organic Agriculture

Semester 4

STAT*2040 [0.50] Statistics I
GEOL*3130 [0.50] Agrogeology

1.50 elective or restricted electives

Semester 5

AGR*3500 [0.50] Experiential Education
BOT*2100 [0.50] Life Strategies of Plants
FOOD*3070 [0.50] Introduction to Food Processing
SOIL*3030 [0.50] Tutorials in Organic Agriculture I

0.50 elective or restricted electives

Semester 6

CROP*3130 [0.50] Tutorials in Organic Agriculture II
EDRD*3400 [0.50] Sustainable Rural Communities

1.50 elective or restricted electives

Semester 7

AGEC*2300 [0.50] Organic Marketing
SOIL*4160 [0.50] Design of Organic Production Systems

1.50 elective or restricted electives

Semester 8

AGR*4500 [0.50] Agrifood Industry Problem-Solving
REXT*4180 [0.50] Social Issues in Organic Agriculture

1.50 elective or restricted electives

Restricted Electives

1. A minimum of 2.00 credits from the list of restricted electives below:

ANSC*2360 [0.50] Challenges and Opportunities in Animal Production
ANSC*3150 [0.50] Principles of Farm Animal Care and Welfare
CROP*2110 [0.50] Crop Ecology
CROP*4240 [0.50] Weed Science
ENVB*2040 [0.50] Biology of Plant Pests
ENVB*3210 [0.50] Plant Pathology
ENVB*3300 [0.50] Applied Ecology and Environment
ENVB*4100 [0.50] Applied Entomology
GEOG*3320 [0.50] Agriculture and Society
HORT*3260 [0.50] Woody Plants
PBIO*4100 [0.50] Soil Plant Relationships
PHIL*2070 [0.50] Philosophy of the Environment
REXT*2000 [0.50] Introduction to Rural Extension
SOAN*4220 [0.50] Canadian Rural Women
SOC*3380 [0.50] Society and Nature
SOC*4210 [0.50] Advanced Topics in Rural Sociology
SOIL*2200 [0.50] Environmental Issues in Agroecosystems
SOIL*3170 [0.50] Soil Processes in Landscape

2. 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.

3. A humanities or social science course (0.50 credit) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Note: In this major there are fees charged to cover partial costs of some field trips. Students in need of financial assistance should approach the Chair of the department.**Electives****List A - Preferred Electives in Humanities and Social Science**

0.50 credit at the 2000 level or above from the College of Arts or the College of Social and Applied Human Sciences.

List B - Electives in Agricultural Science and Related Disciplines

A list of faculty advisors for the following elective course groups is available from the Dean's Office, O.A.C.

Agricultural Economics and Business*Department of Agricultural Economics and Business*

Business Management:

AGEC*2220 [0.50] Financial Accounting
AGEC*2230 [0.50] Management Accounting
AGEC*3310 [0.50] Operations Management
AGEC*3320 [0.50] Financial Management
AGEC*4370 [0.50] Marketing Management

Farm Management:

AGEC*2220 [0.50] Financial Accounting
AGEC*2230 [0.50] Management Accounting
AGEC*4220 [0.50] Advanced Farm Management
AGEC*4500 [0.50] Decision Science

Finance:

AGEC*2220 [0.50] Financial Accounting
AGEC*2230 [0.50] Management Accounting
AGEC*3320 [0.50] Financial Management
ECON*3560 [0.50] Theory of Finance

Operations:

AGEC*2220 [0.50] Financial Accounting
AGEC*2230 [0.50] Management Accounting
AGEC*3310 [0.50] Operations Management
AGEC*4500 [0.50] Decision Science

Prices and Policy:

AGEC*3030 [0.50] The Firm and Markets

AGEC*4000 [0.50] Agricultural and Food Policy
ECON*2770 [0.50] Introductory Mathematical Economics
ECON*3740 [0.50] Introduction to Econometrics
Resource and Environmental Economics:
AGEC*2700 [0.50] Survey of Natural Resource Economics
AGEC*4290 [0.50] Land Economics
AGEC*4310 [0.50] Resource Economics
ECON*2410 [0.50] Intermediate Macroeconomics
Sales and Marketing:
AGEC*4240 [0.50] Futures and Options Markets
AGEC*4360 [0.50] Marketing Research
AGEC*4370 [0.50] Marketing Management
AGEC*4410 [0.50] Sales and Sales Management

Agronomy*Department of Plant Agriculture, Crop Science Division, and Department of Land Resource Science*

Crop Management Systems:

CROP*4220 [0.50] Cropping Systems
CROP*4240 [0.50] Weed Science
One of:
CROP*3300 [0.50] Grain Crops
CROP*3310 [0.50] Protein and Oilseed Crops
CROP*3340 [0.50] Managed Grasslands

Crop Physiology:

BOT*4380 [0.50] Metabolism in the Whole Life of Plants
PBIO*3110 [0.50] Crop Physiology
PBIO*4100 [0.50] Soil Plant Relationships
PBIO*4600 [0.75] Plant Environment Interaction and Stress Physiology

Plant Biotechnology:

MBG*4160 [0.50] Plant Breeding
PBIO*3750 [0.50] Plant Tissue Culture

One of:

MBG*3100 [0.50] Plant Genetics
PBIO*4030 [0.50] Plant Cell Biology

Plant Genetic Resources:

MBG*3100 [0.50] Plant Genetics
MBG*4160 [0.50] Plant Breeding

One of:

MBG*4200 [0.50] Transmission Genetics
MBG*4240 [0.50] Applied Molecular Genetics

Soil Management and Fertility:

GEOL*4130 [0.50] Clay and Humic Chemistry
SOIL*3060 [0.50] Environmental Soil Chemistry
SOIL*3200 [0.50] Environmental Soil Biology

One of:

CROP*4260 [0.50] Crop Science Field Trip
SOIL*3600 [0.50] Remote Sensing
SOIL*4090 [0.50] Soil Management
SOIL*4110 [0.50] Natural Resources Management Field Camp

Waste Management/Agriculture:

CHEM*3360 [0.50] Environmental Chemistry and Toxicology
SOIL*3060 [0.50] Environmental Soil Chemistry
SOIL*3200 [0.50] Environmental Soil Biology
SOIL*4090 [0.50] Soil Management

Water Management/Agriculture:

ENGG*2550 [0.50] Water Management
GEOL*3060 [0.50] Groundwater
SOIL*3070 [0.50] Environmental Soil Physics

Animal and Poultry Science*Department of Animal and Poultry Science*

Animal Breeding:

ANSC*4050 [0.50] Recombinant DNA in Animal Science
MBG*3060 [0.50] Quantitative Genetics
MBG*4030 [0.50] Animal Breeding Methods

Animal Nutrition:

ANSC*3120 [0.50] Introduction to Animal Nutrition
ANSC*4160 [0.25] Beef Cattle Nutrition
ANSC*4170 [0.25] Dairy Cattle Nutrition
ANSC*4180 [0.25] Poultry Nutrition
ANSC*4190 [0.25] Swine Nutrition
ANSC*4500 [0.25] Horse Nutrition
ANSC*4510 [0.25] Pet Nutrition
NUTR*3340 [0.50] Nutrition of Fish and Crustacea
NUTR*3350 [0.50] Wildlife Nutrition

Animal Physiology and Behaviour:

ANSC*4070 [0.50] Applied Animal Behaviour

ANSC*4080	[0.50]	Environmental Management and Animal Productivity
ANSC*4120	[0.50]	Fundamentals of Animal Reproduction
ANSC*4130	[0.50]	Reproductive Management and Technology
ANSC*4480	[0.50]	Applied Endocrinology

Environmental Biology*Department of Environmental Biology*

Environmental Stress Physiology:

BOT*4380	[0.50]	Metabolism in the Whole Life of Plants
PBIO*4100	[0.50]	Soil Plant Relationships
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants
PBIO*4600	[0.75]	Plant Environment Interaction and Stress Physiology

Pest Management:

CROP*4240	[0.50]	Weed Science
ENVB*2040	[0.50]	Biology of Plant Pests
ENVB*3210	[0.50]	Plant Pathology
ENVB*4100	[0.50]	Applied Entomology

Food Science*Department of Food Science*

Food Business:

AGEC*4410	[0.50]	Sales and Sales Management
COST*2600	[0.50]	Fundamentals of Consumer Behaviour
COST*3010	[0.50]	Quality Management
FOOD*4700	[0.50]	Food Product Development

Food Science:

FOOD*4070	[0.50]	Food Packaging
FOOD*4120	[0.75]	Food Analysis
FOOD*4350	[0.50]	Processing Plant Technology

Food Technology:

FOOD*4110	[0.50]	Meat and Poultry Processing
FOOD*4400	[0.50]	Dairy Processing
FOOD*4520	[0.50]	Cereal Technology

Horticultural Science*Department of Plant Agriculture, Horticultural Science Division*

Fruit/Vegetable Horticulture:

HORT*3280	[0.50]	Greenhouse Production
HORT*3510	[0.50]	Vegetable Production
HORT*4300	[0.50]	Postharvest Physiology
HORT*4380	[0.50]	Tropical and Sub-Tropical Horticultural Crops
HORT*4420	[0.50]	Fruit Crops

Ornamental Horticulture:

HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3220	[0.50]	Turf Management
HORT*3260	[0.50]	Woody Plants
HORT*3340	[0.50]	Culture of Plants
HORT*4250	[0.50]	Nursery Production

Urban Horticulture & Environmental Management:

ENVB*2040	[0.50]	Biology of Plant Pests
ENVB*3030	[0.50]	Pesticides and the Environment
HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3340	[0.50]	Culture of Plants
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants

Interdepartmental/Interdisciplinary

Animal Health:

ANSC*3080	[0.50]	Agricultural Animal Physiology
POPM*3240	[0.50]	Epidemiology
POPM*4230	[0.50]	Animal Health

Aquatic Health:

PATH*4100	[0.50]	Diseases of Aquatic Animals
ZOO*4110	[0.50]	Principles of Fish and Wild Life Management

Biotechnology:

MICR*4260	[0.50]	Microbial Technology
PBIO*3750	[0.50]	Plant Tissue Culture

International Development:

AGEC*4210	[0.50]	World Agriculture and Economic Development
AGR*2500	[0.50]	Field Trip in International Agriculture
AGR*4000	[0.50]	Seminar in International Agriculture
GEOL*3130	[0.50]	Agrogeology
REXT*3060	[0.50]	International Communication
REXT*4020	[0.50]	Rural Extension in Change and Development

Toxicology:

BIOM*3090	[0.50]	Principles of Pharmacology and Toxicology
TOX*2000	[0.50]	Principles of Toxicology
TOX*3300	[0.50]	Analytical Toxicology

Land Resource Science

Agroforestry:

BOT*2050	[0.50]	Plant Ecology
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*4780	[0.50]	Forest Ecology
HORT*3260	[0.50]	Woody Plants
SOIL*4090	[0.50]	Soil Management
Atmospheric Science:		
GEOG*2110	[0.50]	Climate and the Biophysical Environment
MET*2020	[0.50]	Agrometeorology
MET*2030	[0.50]	Meteorology and Climatology
MET*3050	[0.50]	Microclimatology
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry

Computer-Assisted Resource Analysis:

CIS*1500	[0.50]	Introduction to Programming
GEOG*2480	[0.50]	Mapping and GIS
GEOG*4480	[0.50]	Applied Geographic Information Systems
SOIL*3600	[0.50]	Remote Sensing
SOIL*4170	[0.50]	Soil Processes in the Landscape
One of:		
ENGG*3340	[0.50]	Geographic Information Systems in Environmental Engineering
GEOG*3480	[0.50]	GIS and Spatial Analysis

Natural Resource Management:

GEOG*3320	[0.50]	Agriculture and Society
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
SOIL*3050	[0.50]	Land Utilization
SOIL*3100	[0.50]	Resource Planning Techniques
SOIL*4110	[0.50]	Natural Resources Management Field Camp
Soil Science:		
GEOL*4130	[0.50]	Clay and Humic Chemistry
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4070	[0.50]	Problems in Land Resource Science
SOIL*4090	[0.50]	Soil Management
SOIL*4170	[0.50]	Soil Processes in the Landscape

Terrestrial Ecology:

BOT*2050	[0.50]	Plant Ecology
CROP*2110	[0.50]	Crop Ecology
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4290	[0.50]	Microbial Ecology
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management

Rural Extension Studies

Communications:

GEOG*3320	[0.50]	Agriculture and Society
REXT*3040	[0.50]	Communication Process
REXT*3080	[0.50]	Technology in Extension
Human Resource and Community Development:		
REXT*2000	[0.50]	Introduction to Rural Extension
REXT*3000	[0.50]	Program Development and Evaluation
REXT*3100	[0.50]	Teaching and Learning in Non-Formal Education
REXT*4100	[0.50]	Leadership Development in Rural Organization