2008-2009 Undergraduate Calendar

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2008-2009 academic year, including the Summer Semester 2008, the Fall Semester 2008 and the Winter Semester 2009.

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

If you wish to link to the Undergraduate Calendar please refer to the Linking Guidelines.

The University is a full member of:

- The Association of Universities and Colleges of Canada

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Disclaimer

University of Guelph 2008

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The University reserves the right to change without notice any information contained in this calendar, including fees, 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.

The University will not be liable for any interruption in, or cancellation of, any academic activities as set forth in this calendar and related information where such interruption is caused by fire, strike, lock-out, inability to procure materials or trades, restrictive laws or governmental regulations, actions taken by faculty, staff or students of the University or by others, civil unrest or disobedience, or any other cause of any kind beyond the reasonable control of the University.

In the event of a discrepancy between a print version (downloaded) and the Web version, the Web version will apply,

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Introduction

Collection, Use and Disclosure of Personal Information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31_e.htm. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of Training, Colleges and Universities, and Statistics Canada, for statistical and planning purposes, and is disclosed to other individuals or organizations in accordance with the Office of Registrarial Services Departmental Policy on the Release of Student Information. For details on the use and disclosure of this information call the Office of Registrarial Services at the University at (519) 824-4120 or see http://www.uoguelph.ca/registrar/registrar/index.cfm?index.

Statistics Canada - Notification of Disclosure

For further information, please see Statistics Canada's web site at http://www.statcan.ca and Section XIV Statistics Canada.

Address for University Communication

Depending on the nature and timing of the communication, the University may use one of these addresses to communicate with students. Students are, therefore, responsible for checking all of the following on a regular basis:

Email Address

The University issued email address is considered an official means of communication with the student and will be used for correspondence from the University. Students are responsible for monitoring their University-issued email account regularly.See Section I--Statement of Students' Academic Responsibilities for more information.

Home Address

Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through Undergraduate Program Services.

Name Changes

The University of Guelph is committed to the integrity of its student records, therefore, each student is required to provide either on application for admission or on personal data forms required for registration, his/her complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation.

Student Confidentiality and Release of Student Information Policy Excerpt

The University undertakes to protect the privacy of each student and the confidentiality of his or her record. To this end the University shall refuse to disclose personal information to any person other than the individual to whom the information relates where disclosure would constitute an unjustified invasion of the personal privacy of that person or of any other individual. All members of the University community must respect the confidential nature of the student information which they acquire in the course of their work.

Complete policy at http://www.uoguelph.ca/policies.

Table of Contents

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 of the agrifood systems. Students will be involved in co-operative 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 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 communication 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 2007.

B.Sc.(Agr.) Majors:

- Agricultural Economics
- Animal Science
- Crop, Horticulture and Turfgrass Science
- Honours Agricultural Science
- Organic Agriculture
- Urban Landscape Management

Declaration of a Major

All students are admitted into an undeclared major upon entry. Students will be required to select a major by semester 3 through consultation with the Program Counsellor and Faculty Advisors. 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 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 Systems
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 & Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 electives

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 electives

Semester 4

NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
STAT*2040	[0.50]	Statistics I

One of:

CROP*2110	[0.50]	Crop Ecology
HORT*3350	[0.50]	Woody Plant Production and Culture

One of:

ANSC*2340	[0.50]	Structure of Farm Animals
ANSC*3210	[0.50]	Principles of Animal Care and Welfare

0.50 restricted electives

Semester 5

AGEC*2700	[0.50]	Survey of Natural Resource Economics
FOOD*3090	[0.50]	Food Science and Human Nutrition

1.50 electives or restricted electives

Semester 6

EDRD*3400	[0.50]	Sustainable Communities

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

4.50 electives

Option B

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

3.00 electives

Restricted Electives

1. 2 of the following Restricted Electives are required:

BIOC*2580	[0.50]	Introductory Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
GEOL*3130	[0.50]	Agrogeology
MBG*2000	[0.50]	Introductory Genetics
NRS*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 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Suggested Electives in Agricultural Sciences and Related Disciplines

Students who wish to concentrate in particular areas of Agricultural Sciences should consider selecting one of the following course groups.

A list of faculty advisors for the following elective course groupings are available from the B.Sc.(Agr) Program Counsellor.

Students should note that some suggested electives (marked by asterisks**) require other courses as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements.

Agricultural Land Resources

General Recommendations:

EDRD*3450	[0.50]	Watershed Planning Practice

GEOG*2480	[0.50]	Mapping and GIS
GEOL*3060	[0.50]	Groundwater
MET*2020	[0.50]	Agrometeorology
NRS*2120	[0.50]	Introduction to Environmental Stewardship
NRS*3600	[0.50]	Remote Sensing
PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*4090	[0.50]	Soil Management
SOIL*4250	[0.50]	Soils in the Landscape

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

Nutrient Management:

GEOL*2200	[0.50]	Glacial Geology
GEOL*3130	[0.50]	Agrogeology
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3200	[0.50]	Environmental Soil Biology

Source Water Protection:

BIOL*3450	[0.50]	Introduction to Aquatic Environments
GEOG*3610	[0.50]	Environmental Hydrology
GEOL*2200	[0.50]	Glacial Geology
GEOL*3190	[0.50]	Environmental Water Chemistry
ENVB*3280	[0.50]	Waterborne Disease Ecology
ENVB*4020	[0.50]	Water Quality and Environmental Management
ZOO*4350	[0.50]	Biology of Polluted Waters

Agroforestry

BOT*2050	[0.50]	Plant Ecology
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*2100	[0.50]	Problem-Solving in Environmental Biology
ENVB*3230	[0.50]	Agroforestry Systems **
ENVB*3250	[0.50]	Forest Health and Disease **
ENVB*3270	[0.50]	Forest Biodiversity **
ENVB*3300	[0.50]	Applied Ecology and Environment **
ENVB*3330	[0.50]	Ecosystem Processes and Applications **
ENVB*4780	[0.50]	Forest Ecology **
HORT*3230	[0.50]	Plant Propagation
HORT*3260	[0.50]	Woody Plants
HORT*4250	[0.50]	Nursery Production
NRS*2120	[0.50]	Introduction to Environmental Stewardship
PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*4090	[0.50]	Soil Management

Communication, Organizations and Development

General Recommendations:

EDRD*2000	[0.50]	Introduction to Rural Extension
EDRD*2020	[0.50]	Interpersonal Communication
EDRD*3000	[0.50]	Program Development and Evaluation
EDRD*3120	[0.50]	Educational Communication
EDRD*3140	[0.50]	Organizational Communication
EDRD*3180	[0.50]	Social Processes in Mediated Communication
EDRD*4120	[0.50]	Leadership Development in Small Organizations

Communication: Process and Products:

EDRD*3050	[0.50]	Agricultural Communication I
EDRD*3160	[0.50]	International Communication
EDRD*4020	[0.50]	Rural Extension in Change and Development
EDRD*4060	[0.50]	Agricultural Communication II

Rural Organizations and Community Development:

ANTH*2660	[0.50]	Contemporary Native Peoples of Canada **
LARC*2820	[0.50]	Urban and Regional Planning
MCS*1000	[0.50]	Introductory Marketing
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour **
MCS*4050	[0.50]	The Evolution of Capitalism: A Canadian Perspective **
SOC*2080	[0.50]	Rural Sociology **
SOC*2280	[0.50]	Society and Environment **

International Agriculture

General Recommendations:

AGEC*1300	[0.50]	Poverty, Food & Hunger
AGEC*4210	[0.50]	World Agriculture and Economic Development
AGR*2500	[0.50]	Field Trip in International Agriculture
CROP*2110	[0.50]	Crop Ecology
EDRD*3160	[0.50]	International Communication
EDRD*4020	[0.50]	Rural Extension in Change and Development
HORT*4380	[0.50]	Tropical and Sub-Tropical Crops

Tropical Agroecosystems:

ENVB*3300	[0.50]	Applied Ecology and Environment
GEOL*3130	[0.50]	Agrogeology
PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*4090	[0.50]	Soil Management

International Agribusiness and Policy:

AGEC*2410	[0.50]	Agrifood Markets and Policy
AGEC*4000	[0.50]	Agricultural and Food Policy **
ECON*2410	[0.50]	Intermediate Macroeconomics
EDRD*2000	[0.50]	Introduction to Rural Extension

Plant Protection

CROP*4240	[0.50]	Weed Science
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*3090	[0.50]	Insect Diversity and Biology
ENVB*3210	[0.50]	Plant Pathology
ENVB*3250	[0.50]	Forest Health and Disease **
ENVB*4070	[0.50]	Biological and Cultural Control of Plant Diseases
ENVB*4100	[0.50]	Applied Entomology **
ENVB*4130	[0.50]	Chemical Ecology: Principles & Practice **
ENVB*4240	[0.50]	Biological Activity of Pesticides
MICR*3220	[0.50]	Plant Microbiology **
PBIO*4000	[0.50]	Molecular and Cellular Aspects of Plant-Microbe Interactions **

Agriculture (AGR)

OAC Dean's Office

Minor (Honours Program)

The requirement of 5.00 credits for the minor is divided into 2 groups of courses, required courses and restricted electives. Students should ensure that they obtain the necessary prerequisites for required and restricted elective courses. Students should seek academic counselling from the B.Sc.(Agr) Program Counsellor early in their program. This minor is not open to students in the B.Sc.(Agr) Program.

Minor

A minimum of 5.00 credits is required including:

One of:

AGR*1250	[0.50]	Agrifood System Trends & Issues
ENVB*2010	[0.50]	Food Production and the Environment

Three of:

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
AGR*2500	[0.50]	Field Trip in International Agriculture
EDRD*3400	[0.50]	Sustainable Communities
FOOD*3090	[0.50]	Food Science and Human Nutrition

3.00 credits from the following Elective List:

Note: At least 0.50 credits must be at the 4000 level and 1.00 credits at the 3000 level or higher.

Agronomy:

CROP*3300	[0.50]	Grain Crops
CROP*3310	[0.50]	Protein and Oilseed Crops
CROP*3340	[0.50]	Managed Grasslands
CROP*4220	[0.50]	Cropping Systems
CROP*4240	[0.50]	Weed Science
HORT*4380	[0.50]	Tropical and Sub-Tropical Crops
PBIO*3110	[0.50]	Crop Physiology

Animal Science:

ANSC*2330	[0.50]	Horse Management Science
ANSC*2340	[0.50]	Structure of Farm Animals
ANSC*3080	[0.50]	Agricultural Animal Physiology
ANSC*3150	[0.50]	Principles of Farm Animal Care and Welfare
ANSC*4050	[0.50]	Biotechnology in Animal Science
MBG*2000	[0.50]	Introductory Genetics
MBG*3090	[0.50]	Applied Animal Genetics

Environmental Biology:

ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*3210	[0.50]	Plant Pathology
ENVB*4100	[0.50]	Applied Entomology
ENVB*4240	[0.50]	Biological Activity of Pesticides

Horticultural Science:

HORT*3230	[0.50]	Plant Propagation
HORT*3260	[0.50]	Woody Plants
HORT*3280	[0.50]	Greenhouse Production
HORT*3340	[0.50]	Culture of Plants
HORT*4250	[0.50]	Nursery Production
HORT*4300	[0.50]	Postharvest Physiology
PBIO*3110	[0.50]	Crop Physiology
PBIO*3750	[0.50]	Plant Tissue Culture

Organic Agriculture:

CROP*2110	[0.50]	Crop Ecology
OAGR*2300	[0.50]	Organic Marketing
OAGR*2050	[0.50]	Gateway to Organic Agriculture
OAGR*3030	[0.50]	Tutorials in Organic Agriculture 1
OAGR*3130	[0.50]	Tutorials in Organic Agriculture II
OAGR*4160	[0.50]	Design of Organic Production Systems

Resource Management:

NRS*2120	[0.50]	Introduction to Environmental Stewardship
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
MET*2020	[0.50]	Agrometeorology
MET*2030	[0.50]	Meteorology and Climatology
MET*3050	[0.50]	Microclimatology
SOIL*3050	[0.50]	Land Utilization
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*4090	[0.50]	Soil Management
PBIO*4100	[0.50]	Soil Plant Relationships

Agricultural Economics (AGEC)

Department of Food, Agricultural and Resource Economics

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood Systems
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 & 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 electives or restricted electives

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 electives or restricted electives

Semester 5

ECON*3740	[0.50]	Introduction to Econometrics
FOOD*3090	[0.50]	Food Science and Human Nutrition

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 Communities

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 I

0.50 electives or restricted electives

Semester 8

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

1.00 electives or restricted electives

Restricted Electives

1. Students are required to take at least 1.50 additional credits at the 3000 or 4000 level in the following subject areas: AGEC, MCS, 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.
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.

Animal Science (ANSC)

Department of Animal and Poultry Science

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood Systems
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 & Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 electives

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
MICR*2020	[0.50]	Microbial Interactions and Associations
STAT*2040	[0.50]	Statistics I

0.50 electives

Semester 5

ANSC*3080	[0.50]	Agricultural Animal Physiology
ANSC*3120	[0.50]	Introduction to Animal Nutrition
NUTR*3210	[0.50]	Fundamentals of Nutrition
MBG*3090	[0.50]	Applied Animal Genetics

0.50 electives

Semester 6

2.50 electives or restricted electives

Semester 7 & 8

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

Option A:

Semester 7

ANSC*4230	[0.50]	Challenges and Opportunities in Animal Production
POPM*4230	[0.50]	Animal Health

1.50 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 I
POPM*4230	[0.50]	Animal Health

1.00 electives or restricted electives

Semester 8

AGR*4460 [1.00] Research Project II
1.50 electives or restricted electives

Restricted Electives

1. A minimum of 3.00 credits. 1.00 credits required from each of Animal Breeding, Animal Nutrition and Animal Physiology and Behaviour:

   Animal Breeding.

ANSC*4020	[0.50]	Genetics of Companion Animals
ANSC*4050	[0.50]	Biotechnology in Animal Science
MBG*3060	[0.50]	Quantitative Genetics
MBG*4030	[0.50]	Animal Breeding Methods

   Animal Nutrition:

ANSC*3170	[0.50]	Nutrition of Fish and Crustacea
ANSC*3180	[0.50]	Wildlife Nutrition
ANSC*4260	[0.50]	Beef Cattle Nutrition
ANSC*4270	[0.50]	Dairy Cattle Nutrition
ANSC*4280	[0.50]	Poultry Nutrition
ANSC*4290	[0.50]	Swine Nutrition
ANSC*4470	[0.50]	Animal Metabolism
ANSC*4550	[0.50]	Horse Nutrition
ANSC*4560	[0.50]	Pet Nutrition

   Animal Physiology and Behaviour:

ANSC*3210	[0.50]	Principles of Animal Care and Welfare
ANSC*3300	[0.50]	Animal Reproduction
ANSC*4090	[0.50]	Applied Animal Behaviour
ANSC*4100	[0.50]	Applied Environmental Physiology and Animal Housing
ANSC*4130	[0.50]	Reproductive Management and Technology
ANSC*4490	[0.50]	Applied Endocrinology

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

Crop, Horticulture and Turfgrass Sciences (CHAT)

Department of Plant Agriculture

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood Systems
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 & Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 electives

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
MBG*2000	[0.50]	Introductory Genetics

0.50 electives or restricted electives

Semester 4

BIOC*2580	[0.50]	Introductory Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
STAT*2040	[0.50]	Statistics I

One of:

BOT*2050	[0.50]	Plant Ecology (in semester 5)
CROP*2110	[0.50]	Crop Ecology

0.50 to 1.00 electives or restricted electives

Semester 5

BOT*2050	[0.50]	Plant Ecology (if CROP*2110 is not taken in semester 4)
FOOD*3090	[0.50]	Food Science and Human Nutrition

One of:

BOT*3310	[0.50]	Plant Growth and Development (in semester 6)
PBIO*3110	[0.50]	Crop Physiology

1.00 to 2.00 electives or restricted electives

Semester 6

BOT*3310	[0.50]	Plant Growth and Development (if PBIO*3310 is not taken in semester 5)
EDRD*3400	[0.50]	Sustainable Communities

1.50 to 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

One of:

PBIO*4100	[0.50]	Soil Plant Relationships (in semester 8)
SOIL*4090	[0.50]	Soil Management
SOIL*4130	[0.50]	Soil and Nutrient Management

2.00 to 2.50 electives or restricted electives

Semester 8

AGR*4500	[0.50]	Agrifood Industry Problem-Solving
PBIO*4100	[0.50]	Soil Plant Relationships (if 1 of SOIL*4090 or SOIL*4130 is not taken in semester 7)

1.50 to 2.00 electives or restricted electives

Option B

Semester 7

AGR*4450	[1.00]	Research Project I

One of:

PBIO*4100	[0.50]	Soil Plant Relationships (in semester 8)
SOIL*4090	[0.50]	Soil Management
SOIL*4130	[0.50]	Soil and Nutrient Management

1.00 to 1.50 electives or restricted electives

Semester 8

AGR*4460	[1.00]	Research Project II
PBIO*4100	[0.50]	Soil Plant Relationships (if 1 of SOIL*4090 or SOIL*4130 is not taken in semester 7)

1.00 to 1.50 electives or restricted electives

Restricted Electives

1. 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. Those credits at the 3000 level or above selected to satisfy Item # 3 below will be applied to satisfy this minimum 7.00 credit requirement. Refer to the Program Counsellor for the list of agricultural science courses.
2. A humanities or social science course (0.50 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.
3. Six courses (3.00 credits) from the courses listed below without regard to group.

Students who wish to concentrate in particular areas of plant agriculture should consider selecting one of the following course groups.

Crop Science

Choose three courses (1.50 credits) among the following:

CROP*3300	[0.50]	Grain Crops
CROP*3310	[0.50]	Protein and Oilseed Crops
CROP*3340	[0.50]	Managed Grasslands
CROP*4220	[0.50]	Cropping Systems
CROP*4240	[0.50]	Weed Science
HORT*4380	[0.50]	Tropical and Sub-Tropical Crops
OAGR*2050	[0.50]	Gateway to Organic Agriculture

Choose three courses (1.50 credits) among the following:

AGR*2350	[0.50]	Animal Production Systems and Industry
ENVB*3210	[0.50]	Plant Pathology
ENVB*4100	[0.50]	Applied Entomology
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
MET*2020	[0.50]	Agrometeorology
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
OAGR*4160	[0.50]	Design of Organic Production Systems
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4100	[0.50]	Soil Plant Relationships
PBIO*4750	[0.50]	Genetic Engineering of Plants
SOIL*3080	[0.50]	Soil and Water Conservation

Horticultural Science

Choose two courses (1.00 credits) among the following:

HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3280	[0.50]	Greenhouse Production
HORT*3350	[0.50]	Woody Plant Production and Culture
HORT*3510	[0.50]	Vegetable Production
HORT*4420	[0.50]	Fruit Crops

Choose two courses (1.00 credits) among the following:

BOT*3410	[0.50]	Plant Anatomy
HORT*3230	[0.50]	Plant Propagation
HORT*3260	[0.50]	Woody Plants

HORT*4300	[0.50]	Postharvest Physiology
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4100	[0.50]	Soil Plant Relationships
PBIO*4750	[0.50]	Genetic Engineering of Plants

Choose two courses (1.00 credits) among the following:

CROP*4240	[0.50]	Weed Science
ENVB*3210	[0.50]	Plant Pathology
ENVB*4100	[0.50]	Applied Entomology

Turfgrass Science

AGR*3500	[0.50]	Experiential Education
EDRD*2010	[0.50]	Introduction to Landscape Management
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3160	[0.50]	Management of Turfgrass Diseases
HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3050	[0.50]	Management of Turfgrass Insect Pests and Weeds
HORT*4200	[0.50]	Turf, the Environment and Society
HORT*4450	[0.50]	Advanced Turfgrass Science

Choose one of:

CROP*4240	[0.50]	Weed Science
ENVB*3210	[0.50]	Plant Pathology
ENVB*4100	[0.50]	Applied Entomology

Organic Agriculture(OAGR)

Department of Plant Agriculture and Department of Land Resource Science

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood Systems
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 & Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

0.50 electives

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
OAGR*2050	[0.50]	Gateway to Organic Agriculture

Semester 4

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

1.50 electives or restricted electives

Semester 5

AGR*3500	[0.50]	Experiential Education
BOT*2100	[0.50]	Life Strategies of Plants
FOOD*3090	[0.50]	Food Science and Human Nutrition
OAGR*3030	[0.50]	Tutorials in Organic Agriculture 1

0.50 electives or restricted electives

Semester 6

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

1.50 electives or restricted electives

Semester 7

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

1.50 electives or restricted electives

Semester 8

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

1.50 electives or restricted electives

Restricted Electives

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

ANSC*3210	[0.50]	Principles of Animal Care and Welfare
CROP*2110	[0.50]	Crop Ecology
CROP*4240	[0.50]	Weed Science
EDRD*2000	[0.50]	Introduction to Rural Extension
ENVB*2040	[0.50]	Plant Health and the Environment
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
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
PBIO*4100	[0.50]	Soil Plant Relationships
PHIL*2070	[0.50]	Philosophy of the Environment
SOAN*4220	[0.50]	Gender and Change in Rural Canada
SOC*3380	[0.50]	Society and Nature
SOC*4210	[0.50]	Advanced Topics in Rural Sociology

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 credits) 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.

Urban Landscape Management (ULM)

The School of Environmental Design and Rural Development

The Major in Urban Landscape Management is designed to address the need for graduates who can manage not only attractive, but functional and sustainable, urban open spaces. Graduates will have an applied understanding of soil and plant science as they specifically relate to recreational and aesthetic urban open space. Students will learn to address issues in a multidisciplinary and creative manner reflecting environmental, social, political, cultural and economic imperatives.

Field Trips

Participation in organized visits to study site areas and projects sites is obligatory for all students taking certain courses in Urban Landscape Management. To the extent that is possible students will be informed of the dates, destinations and cost of field trips prior to registration. Students who have reason to seek exemption from the requirement may apply to the professor for permission to substitute papers on appropriate topics.

Semester 1

AGR*1100	[0.50]	Introduction to the Agrifood Systems
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 & Issues
BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
ENGL*1200	[0.50]	Reading the Contemporary World

One of:

ANTH*1150	[0.50]	Introduction to Anthropology
PHIL*1010	[0.50]	Introductory Philosophy: Social and Political Issues
PSYC*1100	[0.50]	Principles of Behaviour
SOC*1100	[0.50]	Sociology

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2400	[0.50]	Economics of the Canadian Food System
EDRD*2010	[0.50]	Introduction to Landscape Management
HORT*2450	[0.50]	Introduction to Turfgrass Science

0.50 electives

Semester 4

BOT*2100	[0.50]	Life Strategies of Plants
LARC*2820	[0.50]	Urban and Regional Planning
STAT*2040	[0.50]	Statistics I

1.00 electives or restricted electives

Semester 5

BIOL*2060	[0.50]	Ecology
LARC*2100	[0.50]	Landscape Analysis

1.50 electives or restricted electives

Semester 6

EDRD*3400	[0.50]	Sustainable Communities
EDRD*3140	[0.50]	Organizational Communication
HORT*3350	[0.50]	Woody Plant Production and Culture
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management

0.50 electives or restricted electives

Semester 7

AGR*4450	[1.00]	Research Project I
EDRD*4300	[0.50]	Issues in Landscape Management

1.00 electives or restricted electives

Semester 8

AGR*4460	[1.00]	Research Project II

1.50 electives or restricted 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.

Restricted Electives

1.50 credits from:

AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture
BIOL*3450	[0.50]	Introduction to Aquatic Environments
BIOL*4060	[0.50]	Restoration Ecology
BOT*2050	[0.50]	Plant Ecology
EDRD*3450	[0.50]	Watershed Planning Practice
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*3090	[0.50]	Insect Diversity and Biology
ENVB*3160	[0.50]	Management of Turfgrass Diseases
ENVB*3210	[0.50]	Plant Pathology
ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*4780	[0.50]	Forest Ecology
FOOD*3090	[0.50]	Food Science and Human Nutrition
HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3050	[0.50]	Management of Turfgrass Insect Pests and Weeds
HORT*4450	[0.50]	Advanced Turfgrass Science
NRS*3100	[0.50]	Resource Planning Techniques
NRS*3600	[0.50]	Remote Sensing
PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*2010	[0.50]	Soil Science
SOIL*3050	[0.50]	Land Utilization
SOIL*3200	[0.50]	Environmental Soil Biology

1.00 credits from:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
EDRD*2020	[0.50]	Interpersonal Communication
EDRD*3500	[0.50]	Recreation and Tourism Planning
EDRD*4500	[0.50]	Planning Industrial Ecology
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*3050	[0.50]	Development and the City
HIST*2250	[0.50]	Environment and History
HIST*4640	[0.50]	Canadian Urban History
ISS*2500	[0.50]	Management in Organizations
LARC*4520	[0.50]	Park and Recreation Administration
MCS*2020	[0.50]	Information Management
PHIL*2070	[0.50]	Philosophy of the Environment
PHIL*2100	[0.50]	Critical Thinking
PHIL*2120	[0.50]	Ethics
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*3270	[0.50]	Local Government in Ontario
POLS*3370	[0.50]	Environmental Politics and Governance