

## 2018-2019 Undergraduate Calendar

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The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2018-2019 academic year, including the Summer Semester 2018, the Fall Semester 2018 and the Winter Semester 2019.

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.

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# Disclaimer

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## University of Guelph 2018

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The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2018-2019 academic year, including the Summer Semester 2018, the Fall Semester 2018 and the Winter Semester 2019.

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, public health emergencies, 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

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### Collection, Use and Disclosure of Personal Information

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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/index.html>. 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 Advanced Education and Skills Development, 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>.

### Disclosure of Personal Information to the Ontario Ministry of Advanced Education and Skills Development

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The University of Guelph is required to disclose personal information such as characteristics and educational outcomes to the Minister of Advanced Education and Skills Development under s. 15 of the Ministry of Advanced Education and Skills Development Act, R.S.O. 1990, Chapter M.19, as amended. The Ministry collects this data for purposes including but not limited to planning, allocating and administering public funding to colleges, universities and other post-secondary educational and training institutions.

Amendments made to the Ministry of Advanced Education and Skills Development Act, authorizing the collection and use of personal information from colleges and universities by the Minister of Advanced Education and Skills Development, which were set out in Schedule 5 of the Childcare Modernization Act, 2014, came into force on March 31, 2015.

The amendments strengthen the ability of the Minister to directly or indirectly collect and use personal information about students as required to conduct research and analysis, including longitudinal studies, and statistical activities conducted by or on behalf of the Ministry for purposes that relate to post-secondary education and training, including,

- i. understanding the transition of students from secondary school to post-secondary education and training,
- ii. understanding student participation and progress, mobility and learning and employment outcomes,
- iii. understanding linkages among universities, colleges, secondary schools and other educational and training institutions prescribed by regulation,
- iv. understanding trends in post-secondary education or training program choices made by students,
- v. understanding sources and patterns of student financial resources, including financial assistance and supports provided by government and post-secondary educational and training institutions,
- vi. planning to enhance the affordability and accessibility of post-secondary education and training and the quality and effectiveness of the post-secondary sector,
- vii. identifying conditions or barriers that inhibit student participation, progress, completion and transition to employment or future post-secondary educational or training opportunities, and
- viii. developing key performance indicators.

Information that the University is required to provide includes but is not limited to: first, middle and last name, Ontario Educational Number, citizenship, date of birth, gender, first three digits of a student's postal code, mother tongue, degree program and major(s) in which the student is enrolled, year of study and whether the student has transferred from another institution.

Further information on the collection and use of student-level enrolment-related data can be obtained from the Ministry of Advanced Education and Skills Development website: <https://www.ontario.ca/page/ministry-advanced-education-and-skills-development> (English) or <https://www.ontario.ca/fr/page/ministere-de-lenseignement-superieur-et-de-la-formation-professionnelle> (French) or by writing to the Director, Postsecondary Finance and Information Management Branch, Postsecondary Education Division, 7th Floor, Mowat Block, 900 Bay Street, Toronto, ON M7A 1L2.

An update on Institutional and Ministry of Advanced Education and Skills Development Act Notice of Disclosure Activities is posted at <https://www.ontario.ca/page/ministry-advanced-education-and-skills-development>

Frequently Asked Questions related to the Ministry's enrolment and OEN data activities are also posted at: <http://www.tcu.gov.on.ca/peps/publications/NoticeOfCollection.pdf>

#### Authority to Disclose Personal Information to Statistics Canada

The Ministry of Advanced Education and Skills Development discloses student-level enrolment-related data it collects from the colleges and universities as required by Statistics Canada in accordance with Section 13 of the Federal Statistics Act. This gives Ministry of Advanced Education and Skills Development Act authority to disclose personal information in accordance with s. 42(1) (e) of FIPPA

### Notification of Disclosure of Personal Information to Statistics Canada

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

### Address for University Communication

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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 Enrolment Services.

### Name Changes

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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

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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 <https://uoguelph.civicweb.net/document/68892/ORSInfoReleasePolicy060610.pdf?handle=FF982F8A9AEA4076BE4F3D88147172B8>.

# Learning Outcomes

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On December 5, 2012, the University of Guelph Senate approved five University-wide Learning Outcomes as the basis from which to guide the development of undergraduate degree programs, specializations and courses:

1. Critical and Creative Thinking
2. Literacy
3. Global Understanding
4. Communicating
5. Professional and Ethical Behaviour

These learning outcomes are also intended to serve as a framework through which our educational expectations are clear to students and the broader public; and to inform the process of outcomes assessment through the quality assurance process (regular reviews) of programs and departments.

An on-line guide to the learning outcomes, links to the associated skills, and detailed rubrics designed to support the development and assessment of additional program and discipline-specific outcomes, are available for reference on the [Learning Outcomes website](#).

## 1. Critical and Creative Thinking

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Critical and creative thinking is a concept in which one applies logical principles, after much inquiry and analysis, to solve problems with a high degree of innovation, divergent thinking and risk taking. Those mastering this outcome show evidence of integrating knowledge and applying this knowledge across disciplinary boundaries. Depth and breadth of understanding of disciplines is essential to this outcome.

In addition, **Critical and Creative Thinking** includes, but is not limited to, the following outcomes: **Inquiry and Analysis; Problem Solving; Creativity; and Depth and Breadth of Understanding.**

## 2. Literacy

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Literacy is the ability to extract information from a variety of resources, assess the quality and validity of the material, and use it to discover new knowledge. The comfort in using quantitative literacy also exists in this definition, as does using technology effectively and developing visual literacy.

In addition, **Literacy** includes, but is not limited to, the following outcomes: **Information Literacy, Quantitative Literacy, Technological Literacy, and Visual Literacy.**

## 3. Global Understanding:

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Global understanding encompasses the knowledge of cultural similarities and differences, the context (historical, geographical, political and environmental) from which these arise, and how they are manifest in modern society. Global understanding is exercised as civic engagement, intercultural competence and the ability to understand an academic discipline outside of the domestic context.

In addition, **Global Understanding** includes, but is not limited to, the following outcomes: **Global Understanding, Sense of Historical Development, Civic Knowledge and Engagement, and Intercultural Competence.**

## 4. Communicating

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Communicating is the ability to interact effectively with a variety of individuals and groups, and convey information successfully in a variety of formats including oral and written communication. Communicating also comprises attentiveness and listening, as well as reading comprehension. It includes the ability to communicate and synthesize information, arguments, and analyses accurately and reliably.

In addition, **Communicating** includes, but is not limited to, the following outcomes: **Oral Communication, Written Communication, Reading Comprehension, and Integrative Communication.**

## 5. Professional and Ethical Behaviour

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Professional and ethical behaviour requires the ability to accomplish the tasks at hand with proficient skills in teamwork and leadership, while remembering ethical reasoning behind all decisions. The ability for organizational and time management skills is essential in bringing together all aspects of managing self and others. Academic integrity is central to mastery in this outcome.

In addition, **Professional and Ethical Behaviour** includes, but is not limited to, the following outcomes: **Teamwork, Ethical Reasoning, Leadership, and Personal Organization and Time Management**

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## Bachelor of Bio-Resource Management Degree (B.B.R.M.)

The University of Guelph offers a 20.00 credit program, normally completed over 8 semesters, leading to a Bachelor of Bio-Resource Management degree (B.B.R.M.).

This degree is a unique blend of applied and theoretical learning, with an emphasis on experiential learning opportunities. This degree offers three majors: Environmental Management, Equine Management and Food Industry Management.

### Program Information

The Bachelor of Bio-Resource Management degree program combines business studies and technical training with a strong emphasis on hands-on learning. A solid foundation in applied aspects of science, technology and business provides graduates with sufficient breadth and expertise to become competent managers in the environmental or equine fields. Students begin studying in one of the following management majors during the first semester: Environmental Management, Equine Management or Food Industry Management.

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 personal development and students are encouraged to identify goals that they wish to accomplish throughout their university career.

### Academic Advising and Counselling

#### Program Counselling

The Bachelor of Bio-Resource Program Counsellor is available to assist in-course students who require information or advice about their program or other academic regulations and who seek information about resources available to students. For information about how to contact a program counsellor, and for more information about program counselling, see Section VII -- Academic Counselling of the current Undergraduate Calendar.

#### Departmental Advising

On entering the program all students are assigned to a faculty advisor who will mentor them throughout their studies. The faculty advisor is familiar with the academic requirements of the program and is aware of career opportunities. Students are strongly encouraged to attend all meetings called by their advisor, and to set up individual meetings with him/her when they have questions or concerns about their performance or progress in the program.

#### Continuation of Study

Students are advised to consult the regulations for Continuation of Study which are outlined in detail in Section VIII -- Undergraduate Degree Regulations & Procedures in the current calendar.

#### Conditions for Graduation

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

#### Schedule of Studies

Courses specified in the Schedule of Studies are required courses and must be successfully completed. A full time course load normally includes 2.50 credits.

### B.B.R.M. Program Regulations

#### Recommendations

Students entering Environmental Management or Equine Management who are deficient in U level Mathematics or Chemistry should consult with the program counsellor.

### Environmental Management Major (EM)

School of Environmental Sciences and Department of Food, Agricultural and Resource Economics

The major in Environmental Management focuses on the development of leaders in the areas of environmental science and technology. The program combines a solid background in environmental science and management with business, using a mix of theoretical and applied study. The flexibility provided in semesters 6 through 8 permits students to develop their understanding of specific areas of environmental science and business or take a variety of areas within the discipline. This flexibility also allows students to participate in international exchanges and semesters abroad. Students have the opportunity to incorporate a variety of field trips, experiential learning in the workplace and independent research projects into their program.

This major will require the completion of 20.00 credits: 12.00 from required courses, 6.00 from restricted electives, and 2.00 free electives. Of these credits, a minimum of 6.00 credits are required at the 3000 level or higher, of which at least 2.00 credits must be at the 4000 level.

#### Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I

ENVS*1030	[1.00]	Introduction to Environmental Sciences
MGMT*2150	[0.50]	Introduction to Canadian Business Management

#### Semester 2

ACCT*1220	[0.50]	Introductory Financial Accounting
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
HROB*2090	[0.50]	Individuals and Groups in Organizations

#### Semester 3

BIOL*2060	[0.50]	Ecology
ENVS*2060	[0.50]	Soil Science
ENVS*2230	[0.50]	Communications in Environmental Science
FARE*2700	[0.50]	Survey of Natural Resource Economics
GEOG*2480	[0.50]	Mapping and GIS

#### Semester 4

ENVM*3500	[1.00]	Environmental Management Integrated Project
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*2080	[0.50]	Introduction to Environmental Microbiology
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Management

#### Semester 5

GEOG*2420	[0.50]	The Earth From Space
One of:		
GEOG*2460	[0.50]	Analysis in Geography
STAT*2060	[0.50]	Statistics for Business Decisions

1.50 electives or restricted electives

#### Semester 6

ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3060	[0.50]	Groundwater

1.50 electives or restricted electives

#### Semester 7

2.50 electives or restricted electives

#### Semester 8

2.50 electives or restricted electives

### Restricted Electives

Students must successfully complete a minimum of 6.00 credits at the 3000 level or higher, of which at least 2.00 credits must be at the 4000 level. Those credits at the 3000 level or above selected to satisfy lists A, B, and C below will be applied to satisfy these minimum credit requirements.

Students should note that some restricted electives require other courses not included among the required courses for the major as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements.

Students should consult with a faculty advisor before Semester 5 in planning their restricted elective choices. Students are advised to pay particular attention to prerequisite requirements when choosing individual courses and seek advice as needed.

1. Students must select a minimum of 6.00 credits from the following lists of restricted electives.

#### List A

Students must select a minimum of 3.00 credits from any of the following courses without regard to group of which at least 1.00 credits must be at the 4000 level:

##### Aquatic Science:

BIOL*3450	[0.50]	Introduction to Aquatic Environments
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
EDRD*3450	[0.50]	Watershed Planning Practice
ENVS*3220	[0.50]	Terrestrial Chemistry
ENVS*4370	[0.50]	Environmental Organic Chemistry
GEOG*3610	[0.50]	Environmental Hydrology

##### Atmospheric Science:

ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*2310	[0.50]	Earth Surface Processes
ENVS*3340	[0.50]	Use and Management of Environmental Data
GEOG*2110	[0.50]	Climate and the Biophysical Environment

##### Conservation and Biodiversity Science:

BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BIOL*3130	[0.50]	Conservation Biology
ENVS*2210	[0.50]	Apiculture and Honey Bee Biology
ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity

ENVS*3000	[0.50]	Nature Interpretation
ENVS*3010	[0.50]	Climate Change Biology
ENVS*3090	[0.50]	Insect Diversity and Biology
ENVS*3230	[0.50]	Agroforestry Systems
ENVS*3250	[0.50]	Forest Health and Disease
ENVS*3270	[0.50]	Forest Biodiversity
ENVS*4070	[0.50]	Pollinator Conservation

ENVS*4230	[0.50]	Biology of Aquatic Insects
ENVS*4260	[0.50]	Field Entomology
ENVS*4350	[0.50]	Forest Ecology
GEOG*3320	[0.50]	Food Systems: Issues in Security and Sustainability
Ecosystem and Resource Management:		
BIOL*4500	[0.50]	Natural Resource Policy Analysis
ENVS*2120	[0.50]	Introduction to Environmental Stewardship
ENVS*2240	[0.50]	Fundamentals of Environmental Geology
ENVS*3030	[0.50]	Conservation Field Course
ENVS*4390	[1.00]	Soil Variability and Land Evaluation
GEOG*2210	[0.50]	Environment and Resources
GEOG*3020	[0.50]	Global Environmental Change
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment
GEOG*3420	[0.50]	Remote Sensing of the Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis
GEOG*4110	[1.00]	Environmental Systems Analysis
GEOG*4220	[0.50]	Local Environmental Management
GEOG*4230	[0.50]	Environmental Impact Assessment

**Plant Health:**

ENVS*3040	[0.50]	Natural Chemicals in the Environment
ENVS*3210	[0.50]	Plant Pathology
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
ENVS*4180	[0.50]	Insecticide Biological Activity and Resistance
ENVS*4190	[0.50]	Biological Activity of Herbicides

**Soil and Nutrient Management:**

ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3310	[0.50]	Soil Biodiversity and Ecosystem Function
ENVS*4090	[0.50]	Soil Management
ENVS*4160	[0.50]	Soil and Nutrient Management
ENVS*4320	[1.00]	Laboratory and Field Methods in Soil Biodiversity
ENVS*4390	[1.00]	Soil Variability and Land Evaluation

**List B**

Students must select a minimum of 1.50 credits from list B. At least 0.50 credits must be at the 4000 level:

Accounting		
ACCT*2230	[0.50]	Management Accounting
ACCT*3230	[0.50]	Intermediate Management Accounting
ACCT*1240	[0.50]	Applied Financial Accounting
ACCT*4230	[0.50]	Advanced Management Accounting
Business and Management:		
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management
Food, Agricultural and Resource Economics:		
FARE*2410	[0.50]	Agri-food Markets and Policy
FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*3310	[0.50]	Operations Management
FARE*4290	[0.50]	Land Economics
FARE*4310	[0.50]	Resource Economics
FARE*4360	[0.50]	Marketing Research
FARE*4370	[0.50]	Food & Agri Marketing Management
Leadership and Communications:		
EDRD*2020	[0.50]	Interpersonal Communication
EDRD*3140	[0.50]	Organizational Communication
EDRD*3400	[0.50]	Sustainable Communities
EDRD*4120	[0.50]	Leadership Development in Small Organizations
HROB*2010	[0.50]	Foundations of Leadership
HROB*4010	[0.50]	Leadership Certificate Capstone

**List C**

Students may also select any of the following courses a restricted electives:

AGR*3450	[0.50]	Research Methods in Agricultural Science
AGR*3500	[0.50]	Experiential Education I
AGR*4450	[1.00]	Research Project I
AGR*4460	[1.00]	Research Project II
AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving
BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*1050	[0.50]	General Chemistry II
ECON*1100	[0.50]	Introductory Macroeconomics
ENVS*3410	[0.50]	Independent Research I
ENVS*3420	[0.50]	Independent Research II
ENVS*3430	[1.00]	Independent Research
ENVS*4410	[1.00]	Advanced Independent Research I
ENVS*4420	[1.00]	Advanced Independent Research II
ENVS*4430	[2.00]	Advanced Independent Research
FARE*4550	[0.50]	Independent Studies I
FARE*4560	[0.50]	Independent Studies II

GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*1350	[0.50]	Earth: Hazards and Global Change

\* Students considering graduate studies are encouraged to take at least 1.00 of these credits.

**Equine Management Major (EQM)**

Department of Animal Biosciences and the Department of Food, Agricultural and Resource Economics

The major in Equine Management focuses on the development of leaders with a genuine regard for all horses and their well-being, a conscious concern for the environment, and a passionate interest in all aspects of the horse industry. The program combines a solid background in business, biological sciences and equine management through practical and theoretical experience. It provides in-depth understanding of the economic, environmental and social dimensions of all equine disciplines with a broad and current knowledge of horse industry issues and develops the skills to gather, access, interpret and apply industry data. In consultation with the faculty advisor, students can participate in international exchange or semester abroad opportunities in semester 6. Students can also incorporate a variety of field trips, experiential learning in the workplace and independent research projects into their program.

This major will require the completion of 20.00 credits: 14.00 from required courses, 5.00 from restricted electives and 1.00 electives. Of these credits, a minimum of 6.00 credits are required at the 3000-level or higher, of which at least 2.00 credits must be at the 4000-level.

**Semester 1 - Fall**

BIOL*1050	[0.50]	Biology of Plants & Animals in Managed Ecosystems
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
ECON*1050	[0.50]	Introductory Microeconomics
EQN*1010	[1.00]	Introduction to Equine Management

**Semester 2 - Winter**

ACCT*1220	[0.50]	Introductory Financial Accounting
ANSC*1210	[1.00]	Principles of Animal Care and Welfare
EQN*2040	[0.50]	Equine Anatomy and Physiology

One of:

CHEM*1040	[0.50]	General Chemistry I
CHEM*1100	[0.50]	Chemistry Today

**Semester 3 - Fall**

ACCT*2230	[0.50]	Management Accounting
ENVS*2060	[0.50]	Soil Science
EQN*2060	[0.50]	Equine Event Management I
EQN*2200	[0.50]	Equine Industry Trends and Issues I

0.50 electives or restricted electives

**Semester 4 - Winter**

EQN*2050	[0.50]	Introduction to Equine Nutrition
EQN*2070	[0.50]	Equine Event Management II
EQN*2150	[0.50]	Equine Facility Management and Design

1.00 electives or restricted electives

**Semester 5 - Fall**

ANSC*3080	[0.50]	Agricultural Animal Physiology
CROP*3340	[0.50]	Managed Grasslands
EQN*3070	[0.50]	Equine Health Management
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives or restricted electives

**Semester 6 - Winter**

EQN*3050	[0.50]	Equine Exercise Physiology
EQN*3150	[0.50]	Equine Exercise Physiology Laboratory

1.50 electives or restricted electives

**Semester 7 - Fall**

EQN*4400	[0.50]	Equine Industry Trends and Issues II
EQN*4500	[1.00]	Equine Integrated Project

1.00 electives or restricted electives

**Semester 8 - Winter**

EQN*3060	[0.50]	Equine Reproduction
EQN*4020	[0.50]	Advanced Equine Nutrition

1.50 electives or restricted electives

**Restricted Electives**

Students must successfully complete a minimum of 6.00 credits at the 3000 level or higher, of which at least 2.00 credits must be at the 4000 level.

Students must select a minimum of 5.00 credits from the following four lists of restricted electives.

Students should note that some restricted electives require other courses not included among the required courses for the major as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements.

1. Students must select a minimum of 1.50 credits from any of the following lists (grouped by topic areas):

Animal Biology:

AGR*2350	[0.50]	Animal Production Systems, Health and Industry
ANSC*4090	[0.50]	Applied Animal Behaviour
ANSC*4100	[0.50]	Applied Environmental Physiology and Animal Housing
ANSC*4490	[0.50]	Applied Endocrinology
ANSC*4650	[0.50]	Comparative Immunology
POP*4230	[0.50]	Animal Health

Genetics:

MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics
MBG*3060	[0.50]	Quantitative Genetics
MBG*4020	[0.50]	Genetics of Companion Animals
MBG*4030	[0.50]	Animal Breeding Methods and Applications

Pasture and Turf Management:

ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3140	[0.50]	Management of Turfgrass Diseases

One of:

ENVS*4090	[0.50]	Soil Management
ENVS*4160	[0.50]	Soil and Nutrient Management
HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3050	[0.50]	Management of Turfgrass Insect Pests and Weeds
HORT*4450	[0.50]	Advanced Turfgrass Science

Advanced Nutrition:

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*1050	[0.50]	General Chemistry II
NUTR*3210	[0.50]	Fundamentals of Nutrition

2. Students must select a minimum of 1.50 credits during semesters 5-8 from any of the following lists (grouped by topic areas):

Accounting:

ACCT*3230	[0.50]	Intermediate Management Accounting
ACCT*4230	[0.50]	Advanced Management Accounting

Business and Management:

HROB*2010	[0.50]	Foundations of Leadership
HROB*2090	[0.50]	Individuals and Groups in Organizations
HROB*4010	[0.50]	Leadership Certificate Capstone
MGMT*2150	[0.50]	Introduction to Canadian Business Management
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management

Food, Agricultural and Resource Economics :

FARE*2700	[0.50]	Survey of Natural Resource Economics
FARE*3310	[0.50]	Operations Management
FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*4220	[0.50]	Advanced Agribusiness Management
FARE*4360	[0.50]	Marketing Research
FARE*4370	[0.50]	Food & Agri Marketing Management
FARE*4290	[0.50]	Land Economics
FARE*4550	[0.50]	Independent Studies I

Marketing:

MCS*1000	[0.50]	Introductory Marketing
MCS*2020	[0.50]	Information Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3000	[0.50]	Advanced Marketing
MCS*3040	[0.50]	Business and Consumer Law
MCS*3620	[0.50]	Marketing Communications

3. Students must select a minimum of 1.00 credits during semesters 5-8 from:

AGR*3010	[0.50]	Special Studies in Agricultural Science I
AGR*4010	[0.50]	Special Studies in Agricultural Science II
AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving
AGR*4450	[1.00]	Research Project I
AGR*4460	[1.00]	Research Project II
ANSC*4610	[0.50]	Critical Analysis in Animal Science

4. Students may also count any of the following courses as restricted electives:

AGR*3500	[0.50]	Experiential Education I
ECON*1100	[0.50]	Introductory Macroeconomics
EDRD*2020	[0.50]	Interpersonal Communication
EDRD*3050	[0.50]	Agricultural Communication I
EDRD*3140	[0.50]	Organizational Communication
EDRD*3400	[0.50]	Sustainable Communities
EDRD*4120	[0.50]	Leadership Development in Small Organizations
EQN*2500	[0.50]	Equine Field Course
PSYC*1000	[0.50]	Introduction to Psychology

### Food Industry Management (FIM)

Department of Food, Agricultural and Resource Economics and Department of Food Science, Ontario Agricultural College

This major focuses on the development of leaders in the areas of Food Industry Innovation and Operations. The program combines a solid background in food science, economics and business, using a mix of theoretical and applied study. Students in this major will be able to create a curriculum uniquely tailored to their career goals. The flexibility provided in semesters 5 through 8 enables students to develop their understanding of specific areas of food science and business. Student participation in international exchanges and international summer research programs is encouraged and supported through academic advising on course selection and substitution. Students have the opportunity to incorporate a variety of field trips, experiential learning in the workplace and independent research projects into their program. The combination of a solid understanding of food science and current business practice with specialized skills and experience provided by this program is unique and greatly valued by prospective employers in this important sector of the Canadian and global economies.

This major will require the completion of 20.00 credits: 14.50 credits of required courses, 3.00 credits from restricted electives, and 2.50 credits of free electives. Of these credits, a minimum of 6.00 credits are required at the 3000 level or higher, of which at least 3.00 credits must be at the 4000 level.

#### Semester 1

ACCT*1220	[0.50]	Introductory Financial Accounting
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1040	[0.50]	General Chemistry I
HROB*2090	[0.50]	Individuals and Groups in Organizations
MATH*1030	[0.50]	Business Mathematics

#### Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
FARE*1400	[1.00]	Economics of the Agri-Food System

0.50 electives

#### Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
FOOD*2150	[0.50]	Introduction to Nutritional and Food Science
MCS*2020	[0.50]	Information Management
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2060	[0.50]	Statistics for Business Decisions

#### Semester 4

ACCT*2230	[0.50]	Management Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
FOOD*2100	[0.50]	Communication in Food Science
FOOD*2620	[0.50]	Food Engineering Principles

0.50 electives or restricted electives

#### Semester 5

FARE*3310	[0.50]	Operations Management
FOOD*3140	[0.50]	Food Processing I
FOOD*3240	[0.50]	Food Microbiology

1.00 electives or restricted electives

#### Semester 6

FOOD*3170	[0.50]	Food Processing II
HROB*2010	[0.50]	Foundations of Leadership

One of:

PHIL*2120	[0.50]	Ethics
PHIL*2600	[0.50]	Business and Professional Ethics

1.00 electives or restricted electives

#### Semester 7

FARE*3320	[0.50]	Supply and Value Chain Management
FARE*4370	[0.50]	Food & Agri Marketing Management

1.50 electives or restricted electives

#### Semester 8

FARE*4330	[0.50]	Advanced Operations Management
FARE*4380	[0.50]	Retailing, Merchandising and Sales
FOOD*4310	[0.50]	Food Safety Management Systems

1.00 electives or restricted electives

#### Restricted Electives

Students should note that some restricted electives require other courses not included among the required courses for the major as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements. Students must take a minimum of 3.00 credits from restricted electives.

A minimum of 1.00 credits from the following list:

FOOD*4070	[0.50]	Food Packaging
FOOD*4110	[0.50]	Meat and Poultry Processing
FOOD*4400	[0.50]	Dairy Processing
FOOD*4520	[0.50]	Utilization of Cereal Grains for Human Food

A minimum of 1.00 credits from the following list:

FARE*3000	[0.50]	Food Industry Analysis and Policy
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FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*4360	[0.50]	Marketing Research
FARE*4500	[0.50]	Decision Science
FOOD*4020	[0.50]	Quality Management in the Food Industry
POLS*3470	[0.50]	Business-Government Relations in Canada

Students may also count any of the courses from the following list as restricted electives:

FOOD*3050	[0.50]	Food Chemistry I
FOOD*3700	[0.50]	Sensory Evaluation of Foods
FOOD*4090	[0.50]	Functional Foods and Nutraceuticals
FOOD*4260	[0.50]	Food Product Development I
FOOD*4270	[0.50]	Food Product Development II

Students may also count any of the research/experiential learning/independent study courses from the following list as restricted electives:

AGR*3010	[0.50]	Special Studies in Agricultural Science I
AGR*3500	[0.50]	Experiential Education I
FARE*4550	[0.50]	Independent Studies I
FARE*4560	[0.50]	Independent Studies II
FOOD*4220	[0.50]	Topics in Food Science
FOOD*4230	[0.50]	Research in Food Science

### **Food Industry Management Co-op (FIM:C)**

Department of Food, Agricultural and Resource Economics and Department of Food Science, Ontario Agricultural College

This major focuses on the development of leaders in the areas of Food Industry Innovation and Operations. The program combines a solid background in food science, economics and business, using a mix of theoretical and applied study. Students in this major will be able to create a curriculum uniquely tailored to their career goals. The flexibility provided in semesters 5 through 8 enables students to develop their understanding of specific areas of food science and business. Student participation in international exchanges and international summer research programs is encouraged and supported through academic advising on course selection and substitution. Students have the opportunity to incorporate a variety of field trips, experiential learning in the workplace and independent research projects into their program. The combination of a solid understanding of food science and current business practice with specialized skills and experience provided by this program is unique and greatly valued by prospective employers in this important sector of the Canadian and global economies.

A principal aim of the Co-op program in Food Industry Management is to facilitate the transition of students from academic studies to a professional career by enhancing the integration of theory and practice.

The Co-op program in Food Industry Management is a five year program, including 3 work terms. Although the schedule includes 3 work terms, students have the option to complete a fourth work term, but must graduate with a Fall, Winter and Summer work term. Please refer to the Co-operative Education program policy with respect to adjusting the schedule listed below.

Students are eligible to participate in a maximum two (2) summer employment processes and must follow the academic work schedule as outlined on the Co-operative Education and Career Services website: <https://www.recruitguelph.ca/cces/>.

In order for students to be eligible to continue in the Co-op program, they must meet a minimum 70% cumulative average requirement after second semester, as well as meet all work term requirements. Please refer to the Co-operative Education program policy with respect to work term performance grading and work term report grading.

For additional program information students should consult with their Co-op Co-ordinator and Co-op Faculty Advisor, listed on the Co-operative Education and Career Services web site.

This major will require the completion of 20.00 credits: 14.50 credits of required courses, 3.00 credits from restricted electives, and 2.50 credits of free electives. Of these credits, a minimum of 6.00 credits are required at the 3000 level or higher, of which at least 3.00 credits must be at the 4000 level.

#### **Semester 1 - Fall**

ACCT*1220	[0.50]	Introductory Financial Accounting
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1040	[0.50]	General Chemistry I
HROB*2090	[0.50]	Individuals and Groups in Organizations
MATH*1030	[0.50]	Business Mathematics

#### **Semester 2 - Winter**

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
FARE*1400	[1.00]	Economics of the Agri-Food System

0.50 electives

#### **Summer Semester**

Off

#### **Semester 3 - Fall**

BIOC*2580	[0.50]	Introduction to Biochemistry
COOP*1100	[0.00]	Introduction to Co-operative Education

FOOD*2150	[0.50]	Introduction to Nutritional and Food Science
MCS*2020	[0.50]	Information Management
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2060	[0.50]	Statistics for Business Decisions

#### **Semester 4 - Winter**

ACCT*2230	[0.50]	Management Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
FOOD*2100	[0.50]	Communication in Food Science
FOOD*2620	[0.50]	Food Engineering Principles

0.50 electives or restricted electives

#### **Summer Semester**

COOP*1000	[0.00]	Co-op Work Term I
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#### **Semester 5 - Fall**

FARE*3310	[0.50]	Operations Management
FOOD*3140	[0.50]	Food Processing I
FOOD*3240	[0.50]	Food Microbiology

1.00 electives or restricted electives

#### **Semester 6 - Winter**

FOOD*3170	[0.50]	Food Processing II
HROB*2010	[0.50]	Foundations of Leadership

One of:

PHIL*2120	[0.50]	Ethics
PHIL*2600	[0.50]	Business and Professional Ethics

1.00 electives or restricted electives

#### **Summer Semester**

Optional

#### **Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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#### **Winter Semester**

COOP*3000	[0.00]	Co-op Work Term III
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#### **Summer Semester**

Off

#### **Semester 7 - Fall**

FARE*3320	[0.50]	Supply and Value Chain Management
FARE*4370	[0.50]	Food & Agri Marketing Management

1.50 electives or restricted electives

#### **Semester 8 - Winter**

FARE*4330	[0.50]	Advanced Operations Management
FARE*4380	[0.50]	Retailing, Merchandising and Sales
FOOD*4310	[0.50]	Food Safety Management Systems

1.00 electives or restricted electives

#### **Restricted Electives**

Students should note that some restricted electives require other courses not included among the required courses for the major as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements. Students must take a minimum of 3.00 credits from restricted electives.

A minimum of 1.00 credits from the following list:

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FOOD*4110	[0.50]	Meat and Poultry Processing
FOOD*4400	[0.50]	Dairy Processing
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A minimum of 1.00 credits from the following list:

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FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*4360	[0.50]	Marketing Research
FARE*4500	[0.50]	Decision Science
FOOD*4020	[0.50]	Quality Management in the Food Industry
POLS*3470	[0.50]	Business-Government Relations in Canada

Students may also count any of the courses from the following list as restricted electives:

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FOOD*4270	[0.50]	Food Product Development II

Students may also count any of the research/experiential learning/independent study courses from the following list as restricted electives:

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AGR*3500	[0.50]	Experiential Education I
FARE*4550	[0.50]	Independent Studies I
FARE*4560	[0.50]	Independent Studies II
FOOD*4220	[0.50]	Topics in Food Science
FOOD*4230	[0.50]	Research in Food Science