2016-2017 Undergraduate Calendar

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2016-2017 academic year, including the Summer Semester 2016, the Fall Semester 2016 and the Winter Semester 2017.

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 2016

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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, 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,

Published by: Enrolment Services

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/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 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.

Disclosure of Personal Information to the Ontario Ministry of Training, Colleges and Universities

The University of Guelph is required to disclose personal information such as characteristics and educational outcomes to the Minister of Training, Colleges and Universities under s. 15 of the Ministry of Training, Colleges and Universities 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 MTCU Act, authorizing the collection and use of personal information from colleges and universities by the Minister of Training Colleges and Universities, 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 Training Colleges and Universities website: http://www.tcu.gov.on.ca (English) or http://www.tcu.gov.on.ca/fre/ (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 MTCU Notice of Disclosure Activities is posted at http://www.tcu.gov.on.ca/pepg/publications/Noticeof Collection.pdf

Frequently Asked Questions related to the Ministry’s enrolment and OEN data activities are also posted at: http://www.tcu.gov.on.ca/pepg/publications/FAQs.html

Authority to Disclose Personal Information to Statistics Canada

The Ministry of Training, Colleges and Universities 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 MTCU authority to disclose personal information in accordance with s. 42(1) (e) of FIPPA

Notification of Disclosure of Personal Information to Statistics Canada

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

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

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

Learning Outcomes

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

Critical and creative thinking is a concept in which one applies logical principles, after much inquiry and analysis, to solve problems in 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

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:

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

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

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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X. Degree Programs

Specializations and Their Degrees

Specializations and the Degree under which they are offered.

Specialization Name	Specialization Acronym	Honours Program Major	Honours Program Minor	Honours Program Area of Emphasis	General Program	Co-op Program
Accounting	ACCT	BCOMM				BCOMM
Adult Development	ADEV	BASC				BASC
Agriculture	AGR		BSAG BAS			
Agricultural Science	AGRS	BSAG				
Animal Biology	ABIO	BSC				
Animal Science	ANSC	BSAG				
Anthropology	ANTH	BA	BA BAS		BA	
Applied Human Nutrition	AHN	BASC				
Applied Plant Science	APSC			BSCH.PLSC		
Art History	ARTH	BA	BA BAS			
Biochemistry	BIOC	BSC	BSC BAS			BSC
Biodiversity	BIOD	BSC				
Bioinformatics	BINF			BSCH		
Biological & Medical Physics	BMPH	BSC				BSC
Biological and Pharmaceutical Chemistry	BPCH	BSC				BSC
Biological Engineering	BIOE	BENG				BENG
Biological Science	BIOS	BSC			BSC	
Biology	BIOL		BSC BAS			
Biomathematical or Biostatistical Modelling	BBM			BSCH		
Bio-Medical Science	BIOM	BSC				
Biomedical Engineering	BME	BENG				BENG
Biomedical Toxicology	BTOX	BSC				BSC
Biotechnology	BIOT		BSC BAS			
Botany	BOT			BSCH.PLSC		
Business	BUS		BA			
Business Economics	BECN		BA BSC BAS			
Chemical Physics	CHPY	BSC				BSC
Chemistry	CHEM	BSC	BSC BAS			BSC
Child, Youth and Family	CYF	BASC				BASC
Classical Studies	CLAS	BA	BA BAS			
Computer Engineering	CENG	BENG				BENG
Computer Science	CS	BCOMP		BA BSCH		BCOMP
Computing					BCOMP	
Computing & Information Science	CIS		BA BSC BAS			
Criminal Justice & Public Policy	CJPP	BA	BA BAS			
Crop, Horticulture and Turfgrass Sciences	CHAT	BSAG				
Ecology	ECOL	BSES	BSC BAS			BSES
Economic & Business Development	EBD			BAH.ID		

Specialization Name	Specialization Acronym	Honours Program Major	Honours Program Minor	Honours Program Area of Emphasis	General Program	Co-op Program
Economics	ECON	BA	BA BAS	BA BSCH		BA
Electricity & Systems	EAS			BSCH		
Engergy & Mass Transfer	EMT			BSCH		
Engineering Systems & Computing	ESC	BENG				BENG
English	ENGL	BA	BA BAS		BA	
Environmental Biology	ENVB	BSC				
Environment & Development	EAD			BAH.ID		
Environmental Economics & Policy	EEP	BSES				
Environmental Engineering	ENVE	BENG	BENG			BENG
Environmental Geoscience & Geomatics	EGG	BSC				
Environmental Governance	EGOV	BA				
Environmental Management	EM	BBRM				
Environment and Resource Management	ERM	BSES				BSES
Environmental Sciences	ENVS	BSES				BSES
Equine Management	EQM	BBRM				
European Culture & Civilization	ECC		BA BAS	BAH.EURS		
European Business Studies	EBS			BAH.EURS		
European Studies	EURS	BA				
Family & Child Studies	FCS		BA BAS			
Finance	FIN			BCOMM.MEF		
Food and Agricultural Business	FAB	BCOMM				BCOMM
Food, Agricultural and Resource Economics	FARE	BA				
Food Engineering	FENG		BENG			
Food Science	FOOD	BSC				BSC
French Studies	FREN	BA	BA BAS		BA	
Gender and Development	GAD			BAH.ID		
GIS & Environmental Analysis	GIS		BSC BAS			
Geography	GEOG	BA	BA BAS		BA	
German	GERM		BA BAS			
Historical Perspectives in Development	HPD			BAH.ID		
History	HIST	BA	BA BAS		BA	
Hotel & Food Administration	HAFA	BCOMM				BCOMM
Human Kinetics	HK	BSC				
Individual Studies	IS	BA				
Individualized	IN			BA BSCH		
Information Systems & Human Behaviour	ISHB	BA				
International Development	ID	BA	BA BAS		BA	
Italian	ITAL		BA BAS			
Landscape Architecture		BLA				
Latin American Studies	LAS			BAH.ID		
Leadership and Organizational Management	LOM	BCOMM				
Marine & Freshwater Biology	MFB	BSC				
Management Economics & Finance	MEF	BCOMM				BCOMM
Marketing Management	MKMN	BCOMM				BCOMM

Specialization Name	Specialization Acronym	Honours Program Major	Honours Program Minor	Honours Program Area of Emphasis	General Program	Co-op Program
Marketing	MKTG		BA BAS			BCOMM
Mathematical Economics	MAEC	BA				BA
Mathematical Science	MSCI	BSC	BSC BAS	BA		
Mathematics	MATH		BA BSC BAS		BA	
Media & Cinema Studies	MCST		BA			
Microbiology	MICR	BSC	BAS BSC			BSC
Mechanical Engineering	MECH	BENG				BENG
Molecular Biology & Genetics	MBG	BSC	BSC BAS			
Museum Studies	MS		BA BAS			
Music	MUSC	BA	BA BAS		BA	
Nanoscience	NANO	BSC				BSC
Neuroscience	NEUR		BSC BAS			
Nutritional & Nutraceutical Sciences	NANS	BSC	BSC BAS			
Organic Agriculture	OAGR	BSAG				
Philosophy	PHIL	BA	BA BAS		BA	
Physical Science	PSCI	BSC			BSC	
Physics	PHYS	BSC	BSC BAS			BSC
Plant Biotechnology	PBTC			BSCH.PLSC		
Plant Environmental Science	PESC			BSCH.PLSC		
Plant Science	PLSC	BSC	BSC BAS			
Political Economy & Administrative Change	PEAC			BAH.ID		
Political Science	POLS	BA	BA BAS		BA	
Psychology	PSYC	BA	BA BAS			BA
Psychology: Brain & Cognition	PBC	BSC	BSC BAS			
Public Management	PMGT	BCOMM				BCOMM
Real Estate & Housing	REH	BCOMM				BCOMM
Rural & Agricultural Development	RAD			BAH.ID		
Signal Processing	SP			BSCH		
Sociology	SOC	BA	BA BAS		BA	
Spanish and Hispanic Studies	SPAH	BA	BA BAS		BA	
Software Engineering	SENG	BCOMP				BCOMP
Statistics	STAT		BA BSC BAS	BA	BA	
Studio Art	SART	BA				
Theatre Studies	THST	BA	BA BAS		BA	
Theoretical Physics	THPY	BSC				
Tourism Management	TMGT	BCOMM				
Veterinary Medicine		DVM				
Water Resources Engineering	WRE	BENG				BENG

Specialization Name	Specialization Acronym	Honours Program Major	Honours Program Minor	Honours Program Area of Emphasis	General Program	Co-op Program
Wildlife Biology & Conservation	WBC	BSC				
Zoology	ZOO	BSC	BSC BAS			

Bachelor of Applied Science (B.A.Sc.)

Program Information

The University of Guelph offers an 8 semester (20.00 credits) honours program leading to a Bachelor of Applied Science (B.A.Sc.) degree. Students must select one of the 3 following major areas of study:

Adult Development (ADEV)

Applied Human Nutrition (AHN)

Child, Youth and Family (CYF)

Co-operative Education is available in the following programs:

Adult Development (Co-op) (ADEV:C)

Child, Youth and Family (Co-op) (CYF:C)

Elective offerings enable students to select courses which support or complement their primary field of study.

The program is interdisciplinary and provides a distinctive and integrated focus of applied social science in each of the 3 majors. Courses from the traditional disciplines in other departments in the University are coupled with courses offered by faculty members in the Department of Family Relations and Applied Nutrition whose own backgrounds reflect the interdisciplinary nature of the program.

Laboratory, practicum and field experiences enhance the students' opportunities to grasp the contributions of the social, physical and biological sciences to significant facets of human behaviour and experience, whether in family, community, or in educational settings.

Academic Counselling

Program Counselling

A B.A.Sc. program counsellor is available to assist prospective students in the selection of their major and initial courses, and to respond to questions regarding any other aspects of their anticipated program. The program counsellor will also assist in-course students who need information or advice about their program or other academic regulations, who seek information on services and resources available to students or who are contemplating transfer into or out of their current major or degree program.

Academic Advising

On entering the program all students are assigned to a departmental advisor by major. Co-operative Education students in all majors are also assigned to an advisor. This advisor is thoroughly familiar with the academic requirements of the program and is also knowledgeable about career opportunities which relate to a student's specific major. Students are strongly encouraged to attend all meetings called by their departmental advisors, and to set up individual meetings with them when they have questions or concerns about their major, or their performance 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.

Conditions for Graduation

To qualify for the degree Bachelor of Applied Science, the student must satisfy the following conditions:

- the student must have successfully completed the schedule of studies requirements for the specified major
- the student must have a cumulative average of 60% or higher
- the student must have a term academic standing of Eligible to Continue

Schedule of Studies

Courses specified in the Schedule of Studies are required courses and must be completed successfully. A full course load normally includes 2.50 credits (normally 5 courses). The requirements for each major are set out below.

Special Expenses

Expenses for field trips can range from $20 to $30 per semester in the first 4 semesters and from $25 to $50 in each of the last 4 semesters. In certain courses modest expenses will be incurred for supplies and where appropriate for laboratory costs. According to recent Ontario legislation, agencies licensed by the Ministry of Community and Social Services which care for, or provide service to, children or vulnerable adults are required to do criminal reference checks on all their employees. Students enrolled in practica or field placement courses may be required to submit to the agency with which they are placed, personal information about any criminal convictions and pending criminal charges. The cost of acquiring this criminal reference check (Canadian Police Information Check) will be the responsibility of each student.

Adult Development (ADEV)

Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences.

The Adult Development major focuses on health and well-being from young adulthood to old age within the context of changing family relationships and diverse social and cultural influences. Courses focus on current research and theory in adult development and aging, family relationships, human sexuality, social policy and community services. Field placements and community service learning opportunities enable students to gain knowledge, skills and values appropriate for work with individuals and groups in a variety of settings.

Graduates of this program are pursuing careers in a variety of settings including family and community service agencies; government policy-making, administration, and health promotion divisions; support services delivery for seniors and their families; health care agencies; employee and family assistance programs; and local social planning councils. This program provides a solid foundation for the pursuit of graduate studies in fields such as: family relations and human development, social work, human sexuality, gerontology, physical, occupational and recreation therapy programs, family law and mediation, couple and family therapy, education, health promotion, social policy and human resource management (business).

This interdisciplinary program is designed to provide students with an understanding of the influence of psychological, social, biological and economic factors on individual development, capabilities, health and relationships across the lifespan. It is one of several majors in the Department that share an over-arching goal of applying knowledge to promote individual and family well-being. This major offers a high degree of flexibility for students, who may choose to deepen their studies in one or more of the core content areas in the major (adulthood and aging, family and social relationships, human sexuality, or health and well-being) and/or to choose electives in a related or complementary field.

Program Requirements

All students in the Adult Development major must successfully complete a minimum of 20.00 passed credits, including the core of 10.50 required credits as outlined in the Schedule of Studies.

Some students may wish to select courses that provide a broad background appropriate for careers in teaching, social work, health promotion, couple and family relationships, physical, occupational and recreation therapy, nursing, business, public service management or other areas of work. Students interested in pursuing graduate education are encouraged to complete an undergraduate thesis in their senior year and to participate in faculty research projects.

In addition to the core requirements and options, there are courses in various departments throughout the University which may be taken as electives. Lists of suggested electives that relate to particular careers or areas of interest and requirements for admission to various graduate programs, including Faculties of Education, are available from the B.A.Sc. Program Counsellor.

Students must meet the continuation of study requirements at the time of graduation and have a minimum 60.00% cumulative average.

Students may take one minor in addition to the Adult Development major. See the University of Guelph Calendar, Section X, Degree Programs, Specialization and Their Degrees for list of minors : http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c10/index.shtml. The 60.00% requirement applies to each major and minor.

Double Counting of Courses

A maximum of 50 percent of the courses applied to a minor may be courses taken in fulfillment of the major where required courses are the same.

Counselling on Minors

The B.A.Sc. program counsellor assists students in the selection of minors, interpreting program and academic regulations.

Academic departments offer the minors and assign faculty advisors to assist students with academic planning (e.g., a faculty advisor in the Psychology department handles queries about a minor in Psychology). Students should consult the appropriate faculty advisor, along with the B.A.Sc. Program Counsellor, when declaring a minor or requiring advice on the completion of specialization requirements. The list of faculty advisors is available on the Undergraduate Academic Information Centre website: http://www.uoguelph.ca/uaic/students_faculty.shtml or contact the B.A.Sc. Program Counsellor for further information.

Major

Semester 1

FRHD*1100	[0.50]	Life: Health and Well-Being
NUTR*1010	[0.50]	Introduction to Nutrition
PSYC*1000	[0.50]	Introduction to Psychology
One of:		
ANTH*1150	[0.50]	Introduction to Anthropology
SOC*1100	[0.50]	Sociology
0.50 electives		

Semester 2

FRHD*1010	[0.50]	Human Development
FRHD*1020	[0.50]	Couple and Family Relationships
One of:		
BIOM*2000	[0.50]	Concepts in Human Physiology
MBG*1000	[0.50]	Genetics and Society

1.00 electives

Semester 3

FRHD*2060	[0.50]	Adult Development and Aging
FRHD*2100	[0.50]	Development of Human Sexuality
FRHD*3070	[0.50]	Research Methods: Family Studies
STAT*2080	[0.50]	Introductory Applied Statistics I

0.50 electives

Semester 4

FRHD*2350	[0.50]	Principles of Program Design in the Human Services
FRHD*3150	[0.50]	Strategies for Behaviour Change
STAT*2090	[0.50]	Introductory Applied Statistics II

1.00 electives

Semester 5

FRHD*3400	[0.50]	Communication and Counselling Skills

2.00 electives

Semester 6

FRHD*3040	[0.50]	Parenting and Intergenerational Relationships
FRHD*3290	[1.00]	Practicum I: Adult Development

1.00 electives

Note: FRHD*3290 may be taken in Semester 5 or Semester 6

Semester 7

FRHD*4310	[0.50]	Professional Issues *

2.00 electives

Semester 8

FRHD*4250	[0.50]	Aging and Health

One of:

FRHD*4260	[0.50]	Social Policy and Gerontology
FRHD*4320	[0.50]	Social Policies for Children, Youth and Families

1.50 electives

Electives - Recommended and Program Options

Students planning to pursue graduate studies are encouraged to take FRHD*4810 and FRHD*4910 (undergraduate thesis courses). Students entering into human services after graduation are encouraged to take FRHD*4290 (4th year practicum course). Students who intend to pursue studies or careers in the following areas, Adult Development and Aging, Family and Social Relations, Human Sexuality and Health or Research may wish to include electives from the following list:

Adult Development and Aging Interest

FRHD*3060	[0.50]	Principles of Social Gerontology
FRHD*4190	[0.50]	Assessment in Gerontology
FRHD*4290	[1.00]	Practicum II: Adult Development
NUTR*3150	[0.50]	Aging and Nutrition

Family and Social Relations Interest

FRHD*3090	[0.50]	Poverty and Health
FRHD*4020	[0.50]	Family Theory
FRHD*4290	[1.00]	Practicum II: Adult Development

Human Sexuality and Health Interest

FRHD*4200	[0.50]	Issues in Human Sexuality
FRHD*4290	[1.00]	Practicum II: Adult Development
PSYC*3690	[0.50]	Community Mental Health

Research Interest

FRHD*4810	[0.50]	Thesis I
FRHD*4910	[1.00]	Thesis II

Graduate and Professional Studies

Students have successfully used the B.A.Sc. degree to gain admission into graduate programs in human development/family science, couple and family therapy, social work, education, applied psychology, sociology, anthropology, occupational therapy, physiotherapy, speech and language, and social policy. If you plan to enter a graduate program after completing the Adult Development major of the B.A.Sc. degree program you will need to select certain courses as part of your undergraduate program to meet graduate program admission requirements. Sometimes these requirements are quite particular which means that you must plan your course selections early and carefully.

Although graduate programs differ in their entrance requirements, most graduate programs require that you have taken (at least): one course in research methods; two undergraduate statistics courses; and have completed an undergraduate thesis.

For many of the programs you will be required to take Graduate Record Exams (GREs) in the specific field of study. **You are strongly advised to contact the graduate programs that interest you early in your program to determine the specific entrance requirements of each program.**

* Exchange/Study Abroad Opportunities

Students interested in study abroad experience could consider this in either Semester 5 or 7. If it is in Semester 5, then students could defer FRHD*3400 to Winter Semester 6 with the Practicum FRHD*3290 (with permission). If the study abroad experience is preferred in Semester 7, the Professional Issues course (FRHD*4310) could be taken in Semester 5 (with permission).

Adult Development (Co-op) (ADEV:C)

Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences.

The Adult Development Co-op major focuses on health and well-being from young adulthood to old age within the context of changing family relationships and diverse social and cultural influences. Courses focus on current research and theory in adult development and aging, family relationships, human sexuality, social policy and community services. Work placements and community service learning opportunities enable students to gain knowledge, skills and values appropriate for work with individuals and groups in a variety of settings.

Graduates of this program are pursuing careers in a variety of settings including family and community service agencies; government policy-making, administration, and health promotion divisions; support services delivery for seniors and their families; health care agencies; employee and family assistance programs; and local social planning councils. This program provides a solid foundation for the pursuit of graduate studies in fields such as: family relations and human development, social work, human sexuality, gerontology, physical, occupational and recreation therapy programs, family law and mediation, couple and family therapy, education, health promotion, social policy and human resource management (business).

This interdisciplinary program is designed to provide students with an understanding of the influence of psychological, social, biological and economic factors on individual development, capabilities, health and relationships across the lifespan. It is one of several majors in the Department that share an over-arching goal of applying knowledge to promote individual and family well-being. This major offers a high degree of flexibility for students, who may choose to deepen their studies in one or more of the core content areas in the major (adulthood and aging, family and social relationships, human sexuality, or health and well-being) and/or to choose electives in a related or complementary field.

Program Requirements

All students in the Adult Development Co-op major must successfully complete a minimum of 20.00 passed credits, including the core of 10.50 required credits as outlined in the Schedule of Studies. Students in the Co-op program must also complete COOP*1100 in the third semester.

Some students may wish to select courses that provide a broad background appropriate for careers in teaching, social work, health promotion, couple and family relationships, physical, occupational and recreation therapy, nursing, business, public service management or other areas of work. Students interested in pursuing graduate education are encouraged to complete an undergraduate thesis in their senior year and to participate in faculty research projects.

In addition to the core requirements and options, there are courses in various departments throughout the University which may be taken as electives. Lists of suggested electives that relate to particular careers or areas of interest and requirements for admission to various graduate programs, including Faculties of Education, are available from the B.A.Sc. Program counsellor.

Conditions for Graduation from the B.A.Sc. Co-operative Education Program

Conditions for graduation are the same as the corresponding regular B.A.Sc. program. In addition, all work reports and work performance evaluations must have a grade of satisfactory or better.

Major

Semester 1 - Fall

FRHD*1100	[0.50]	Life: Health and Well-Being
NUTR*1010	[0.50]	Introduction to Nutrition
PSYC*1000	[0.50]	Introduction to Psychology

One of:

ANTH*1150	[0.50]	Introduction to Anthropology
SOC*1100	[0.50]	Sociology

0.50 electives

Semester 2 - Winter

FRHD*1010	[0.50]	Human Development
FRHD*1020	[0.50]	Couple and Family Relationships

One of:

BIOM*2000	[0.50]	Concepts in Human Physiology
MBG*1000	[0.50]	Genetics and Society

1.00 electives

Semester 3 - Fall

COOP*1100	[0.00]	Introduction to Co-operative Education
FRHD*2100	[0.50]	Development of Human Sexuality
FRHD*2060	[0.50]	Adult Development and Aging

FRHD*3070 [0.50] Research Methods: Family Studies
FRHD*3400 [0.50] Communication and Counselling Skills
STAT*2080 [0.50] Introductory Applied Statistics I

Semester 4 - Winter

FRHD*3150 [0.50] Strategies for Behaviour Change
FRHD*2350 [0.50] Principles of Program Design in the Human Services
STAT*2090 [0.50] Introductory Applied Statistics II
1.00 electives

Summer Semester

COOP*1000 [0.00] Co-op Work Term I

Fall Semester

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

Semester 5 - Winter

FRHD*3040 [0.50] Parenting and Intergenerational Relationships
FRHD*3290 [1.00] Practicum I: Adult Development
FRHD*4250 [0.50] Aging and Health
One of:
FRHD*4260 [0.50] Social Policy and Gerontology
FRHD*4320 [0.50] Social Policies for Children, Youth and Families

Semester 6 - Summer

2.50 electives

Semester 7 - Fall

FRHD*4310 [0.50] Professional Issues
2.00 electives

Winter Semester

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

Semester 8 - Summer

2.50 electives

Electives that Complement the Major

Students planning to pursue graduate studies are encouraged to take FRHD*4810 and FRHD*4910 (undergraduate thesis courses). Students entering into human services after graduation are encouraged to take FRHD*4290 (4th year practicum course). Students who intend to pursue studies or careers in the following areas, Adult Development and Aging, Family and Social Relations, Human Sexuality and Health or Research may wish to include electives from the following lists:

FRHD*3060 [0.50] Principles of Social Gerontology
FRHD*4190 [0.50] Assessment in Gerontology
FRHD*4290 [1.00] Practicum II: Adult Development
FRHD*4020 [0.50] Family Theory
PSYC*3690 [0.50] Community Mental Health
FRHD*4810 [0.50] Thesis I
FRHD*4910 [1.00] Thesis II
NUTR*3150 [0.50] Aging and Nutrition

Graduate and Professional Studies

Students have successfully used the B.A.Sc. degree to gain admission into graduate programs in human development/family science, couple and family therapy, social work, education, applied psychology, sociology, anthropology, physical, occupational and recreation therapy, speech and language, and social policy. If you plan to enter a graduate program after completing the Adult Development Co-op major of the B.A.Sc. degree program you will need to select certain courses as part of your undergraduate program to meet graduate program admission requirements. Sometimes these requirements are quite particular which means that you must plan your course selections early and carefully.

Although graduate programs differ in their entrance requirements, most graduate programs require that you have taken (at least): one course in research methods; two undergraduate statistics courses; and have completed an undergraduate thesis.

For many of the programs you will be required to take Graduate Record Exams (GREs) in the specific field of study. **You are strongly advised to contact the graduate programs that interest you early in your program to determine the specific entrance requirements of each program.**

Applied Human Nutrition (AHN)

Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences.

The Applied Human Nutrition major recognizes both the biological and the social facets of human nutrition. It focuses on nutrition from a preventive, maintenance and therapeutic perspective, all of which require a thorough understanding of the related biological sciences and of selected aspects of the behavioral sciences. Students learn about nutrition and its application to the maintenance of health and the prevention and treatment of disease. They also learn about individual and social behaviour, particularly in family settings, and the implications of behavioral factors in the establishment of good nutrition status from conception through to old age.

The B.A.Sc. Applied Human Nutrition program is accredited by the Dietitians of Canada.

All students in the Applied Human Nutrition major must include the core of 14.50 required and 1.50 restricted electives in the minimum of 20.00 passed credits. Students normally register for courses according to the semesters indicated below for Fall and Winter sequencing.

Those students wishing to compete for admission to a post-graduate dietetic internship will be assisted by faculty advisors in the selection of courses that will meet the academic requirement of the Dietitians of Canada and the College of Dietitians of Ontario for eligibility for internship and/or membership.

Successful completion of the requirements will allow students to compete for a limited number of dietetic internship positions. Most graduates completing dietetic internships are employed in hospitals and other health care agencies such as community health centres and long-term care facilities. Others find employment in a wider range of vocations including those associated with health and education in the government or private sectors, or with the food industry. Still others proceed to graduate study in fields such as nutrition, public health nutrition, medicine or education.

Major

Semester 1

CHEM*1040 [0.50] General Chemistry I
FRHD*1100 [0.50] Life: Health and Well-Being
PSYC*1000 [0.50] Introduction to Psychology
One of:
HTM*2700 [0.50] Understanding Foods
NUTR*1010 [0.50] Introduction to Nutrition
0.50 electives

Note: HTM*2700 is recommended for Semester 1 if capacity allows, but may also be taken in Semester 2 by choosing NUTR*1010 in Semester 1

Semester 2

CHEM*1050 [0.50] General Chemistry II
HROB*2100 [1.00] Managing People in Organizations
One of:
HTM*2700 [0.50] Understanding Foods
NUTR*1010 [0.50] Introduction to Nutrition
One of:
FRHD*1020 [0.50] Couple and Family Relationships
SOC*1100 [0.50] Sociology
*****See note in Semester 1

Semester 3

BIOC*2580 [0.50] Introduction to Biochemistry
HTM*2030 [0.50] Control Systems in the Hospitality Industry
NUTR*2050 [0.50] Nutrition Through the Life Cycle
STAT*2080 [0.50] Introductory Applied Statistics I
One of:
CIS*1200 [0.50] Introduction to Computing
MCS*2020 [0.50] Information Management

Note: HTM*2030 may be taken in Semester 4.

Semester 4

MICR*2420 [0.50] Introduction to Microbiology
NUTR*3210 [0.50] Fundamentals of Nutrition
STAT*2090 [0.50] Introductory Applied Statistics II
1.00 electives or restricted electives

Semester 5*

BIOM*3200 [1.00] Biomedical Physiology
FRHD*3070 [0.50] Research Methods: Family Studies
1.00 electives or restricted electives

* students planning to apply for a dietetic internship must take HTM*3090. HTM*3090 is recommended in Semester 5 in place of elective or restricted elective if capacity allows, but it may also be taken in Semester 6. If taken in Semester 6 take FRHD*3400 in Semester 5.

Semester 6

FRHD*3400 [0.50] Communication and Counselling Skills
NUTR*3070 [0.50] Nutrition and Physical Activity Interventions
NUTR*3090 [1.00] Clinical Nutrition I
0.50 electives or restricted electives

Semester 7

FRHD*4310 [0.50] Professional Issues
NUTR*4010 [0.50] Nutritional Assessment
NUTR*4040 [0.50] Clinical Nutrition II
NUTR*4070 [0.50] Nutrition Education
0.50 electives or restricted electives

Semester 8

NUTR*4900 [0.50] Selected Topics in Human Nutrition
2.00 electives or restricted electives

Note: With approval from the instructor, students may substitute NUTR*4810 and NUTR*4910 for NUTR*4900.

Restricted Electives

In addition to the 14.00 required credits listed above, students must take 1.50 restricted electives, including one 3000 level course, from the following list:

FOOD*2010	[0.50]	Principles of Food Science
One of		
FOOD*2400	[0.50]	Introduction to Food Chemistry
FOOD*3030	[0.50]	Food Chemistry I
FOOD*3050	[0.50]	Food Chemistry I
One of		
FOOD*2410	[0.50]	Introduction to Food Processing
FOOD*3160	[0.75]	Food Processing I
One of		
FOOD*2420	[0.50]	Introduction to Food Microbiology
FOOD*3230	[0.75]	Food Microbiology
FOOD*3240	[0.50]	Food Microbiology
FOOD*3430	[0.50]	Introduction to Food Analysis
FOOD*3700	[0.50]	Sensory Evaluation of Foods
HTM*2740	[0.50]	Cultural Aspects of Food
HTM*3780	[0.50]	Managing Food in Canada
NUTR*3110	[0.50]	Food Security
NUTR*3150	[0.50]	Aging and Nutrition

Note: Some of the restricted electives require prerequisites that are not included in the major.

Electives

There are 4.00 electives throughout the major which may be fulfilled by electing courses in any subject provided that the student has the prerequisite courses and can schedule them. Some electives and restricted elective courses are intended to contribute to a liberal education, while others permit students to work toward specific academic and career goals. faculty advisors will assist students in selection of courses that will meet the requirements of the Dietitians of Canada for eligibility for Internship and/or membership, and when requested, can assist in selection of electives to complement the core requirements.

Child, Youth and Family (CYF)

Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences.

The Child, Youth and Family major, administered by the Department of Family Relations and Applied Nutrition, examines the psychological, social and physical conditions which influence the growth and development of children and adolescents. While the primary focus of the major is on children and youth, the program regards the family as a primary context of development and as the key to successful interventions for children with developmental, behavioural, or socio-emotional difficulties. Through the effective use of elective courses, the core requirements in the major can be supplemented to create a program of study which will prepare graduates for a variety of careers in child and youth services. Graduates are pursuing child and youth-related careers in a variety of settings including child and youth treatment facilities, elementary schools, paediatric wards in hospitals, family and community service agencies, and child care centres. Students interested in working with children ten years of age and younger may apply for membership in the College of Early Childhood Educators; see further details on required courses below. Further academic preparation may be required for certain careers. Many graduates go on to pursue graduate education in fields such as family studies, human development, psychology, counselling psychology, social work, speech pathology, and occupational therapy.

Articulation Agreements

The University of Guelph is a partner in several Articulation Agreements concerning the Child, Youth and Family major. Students who enter the B.A.Sc. Child, Youth and Family major with advanced standing through an articulation agreement should identify themselves to the B.A.Sc. Program Counsellor for specific guidance around their Schedule of Studies (see Section IV of this calendar).

Students in the Child, Youth and Family major who are interested in proceeding to teachers college should refer to Section IV--Admissions Information, Articulation Agreements for information about admission to the Bachelor of Education program at Nipissing University.

Program Requirements

All students in the Child, Youth and Family major must include the following core of 11.50 required credits and 0.50 restricted electives to a minimum of 20.00 passed credits. Students are encouraged to plan their use of electives carefully in order to focus their program on one or a combination of the career options open to graduates. Discussion with a faculty advisor regarding the various choices possible from within the major is strongly recommended. Students will normally register for courses according to the semesters indicated below for Fall and Winter sequencing. Students who register for Summer semesters and other students for whom the semester offerings present difficulty may, where they have the approval of their faculty advisor, take some courses in alternative semesters.

Minors

Students may take one minor in addition to the Child, Youth and Family major. See the University of Guelph Calendar, Section X, Degree Programs, Specialization and Their Degrees for list of minors : http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c10/index.shtml. The 60.00% requirement applies to each major and minor.

Double Counting of Courses

A maximum of 50 percent of the courses applied to a minor may be courses taken in fulfillment of the major where required courses are the same.

Counselling on Minors

The B.A.Sc. program counsellor assists students in the selection of minors, interpreting program and academic regulations.

Academic departments offer the minors and assign faculty advisors to assist students with academic planning (e.g., a faculty advisor in the Psychology department handles queries about a minor in Psychology). Students should consult the appropriate faculty advisor, along with the B.A.Sc. Program Counsellor, when declaring a minor or requiring advice on the completion of specialization requirements. The list of faculty advisors is available on the Undergraduate Academic Information Centre website: http://www.uoguelph.ca/uaic/students_faculty.shtml or contact the B.A.Sc. Program Counsellor for further information.

Major

Semester 1

FRHD*1100	[0.50]	Life: Health and Well-Being
NUTR*1010	[0.50]	Introduction to Nutrition
PSYC*1000	[0.50]	Introduction to Psychology
One of:		
ANTH*1150	[0.50]	Introduction to Anthropology
SOC*1100	[0.50]	Sociology

0.50 electives

Semester 2

BIOM*2000	[0.50]	Concepts in Human Physiology
FRHD*1020	[0.50]	Couple and Family Relationships
MBG*1000	[0.50]	Genetics and Society
One of:		
FRHD*2260	[0.50]	Infant Development
FRHD*2280	[0.50]	Adolescent Development

0.50 electives

Semester 3

FRHD*2100	[0.50]	Development of Human Sexuality
FRHD*2110	[0.50]	Exceptional Children and Youth
FRHD*3070	[0.50]	Research Methods: Family Studies
STAT*2080	[0.50]	Introductory Applied Statistics I
One of:		
FRHD*2060	[0.50]	Adult Development and Aging
FRHD*2270	[0.50]	Development in Early and Middle Childhood

Semester 4

FRHD*3150	[0.50]	Strategies for Behaviour Change
STAT*2090	[0.50]	Introductory Applied Statistics II
One of:		
FRHD*2040	[0.50]	Principles of Program Design for Children
FRHD*2300	[0.50]	Principles of Program Design for Youth

1.00 electives

Semester 5

FRHD*3180	[0.50]	Observation and Assessment Laboratory
FRHD*3400	[0.50]	Communication and Counselling Skills
One of:		
FRHD*3200	[1.00]	Practicum - Child
FRHD*3250	[1.00]	Practicum in Youth

0.50 electives

Note: FRHD*3200 and FRHD*3250 may be taken in Semester 6

Semester 6

FRHD*3040	[0.50]	Parenting and Intergenerational Relationships

2.00 electives

Semester 7

FRHD*4310	[0.50]	Professional Issues

2.00 electives or restricted electives

Semester 8

FRHD*4320	[0.50]	Social Policies for Children, Youth and Families

2.00 electives or restricted electives

Restricted Electives

In addition to the 11.50 required credits, 0.50 must be taken from the Department of Family Relations and Applied Nutrition at the 4000 level. (excluding FRHD*4170).

Electives - Recommended and Program Options

Child and Youth Services

It is highly recommended that students planning to work in child and youth services complete the following Youth stream courses:

FRHD*2300	[0.50]	Principles of Program Design for Youth
FRHD*2270	[0.50]	Development in Early and Middle Childhood
FRHD*2280	[0.50]	Adolescent Development
FRHD*3250	[1.00]	Practicum in Youth
FRHD*4170	[1.00]	Practicum - Child, Youth and Family (in a placement site designated as Youth)
FRHD*4180	[0.50]	Assessment and Intervention
FRHD*4400	[0.50]	Youth, Risk and Resilience

Students who intend to pursue a career in child and youth services may wish to choose electives from the following list:

EDRD*3120	[0.50]	Educational Communication
FRHD*3090	[0.50]	Poverty and Health
FRHD*3190	[0.50]	Administration of Programs for Children
FRHD*4020	[0.50]	Family Theory
FRHD*4200	[0.50]	Issues in Human Sexuality
FRHD*4810	[0.50]	Thesis I
FRHD*4910	[1.00]	Thesis II
NUTR*2050	[0.50]	Nutrition Through the Life Cycle
PSYC*3440	[0.50]	Cognitive Development
PSYC*3450	[0.50]	Social and Personality Development
PSYC*3720	[0.50]	Psychology of Learning Difficulties and Disabilities
PSYC*3850	[0.50]	Intellectual Disabilities
SOAN*2290	[0.50]	Identities and Cultural Diversity
SOC*1500	[0.50]	Crime and Criminal Justice
SOC*3040	[0.50]	Sociology of Social Welfare

Early Childhood Education

Students planning to apply for membership in the College of Early Childhood Educators (CECE) need to complete the following Child stream courses:

FRHD*2040	[0.50]	Principles of Program Design for Children
FRHD*2260	[0.50]	Infant Development
FRHD*2270	[0.50]	Development in Early and Middle Childhood
FRHD*3190	[0.50]	Administration of Programs for Children
FRHD*3200	[1.00]	Practicum - Child
FRHD*4020	[0.50]	Family Theory
FRHD*4170	[1.00]	Practicum - Child, Youth and Family (in a placement site designated as Child)
FRHD*4180	[0.50]	Assessment and Intervention
FRHD*4210	[0.50]	Senior Seminar in Early Education and Care

Students who intend to pursue a career in early childhood education may wish to choose electives from the following list:

ENGL*2740	[0.50]	Children's Literature
FRHD*3090	[0.50]	Poverty and Health
FRHD*4810	[0.50]	Thesis I
FRHD*4910	[1.00]	Thesis II
NUTR*2050	[0.50]	Nutrition Through the Life Cycle
PSYC*3720	[0.50]	Psychology of Learning Difficulties and Disabilities
PSYC*3850	[0.50]	Intellectual Disabilities
SOAN*2290	[0.50]	Identities and Cultural Diversity
THST*3030	[0.50]	Theatre for Young Audiences

Education - Primary / Junior / Intermediate

Graduates interested in elementary school teaching need additional study at a Faculty of Education. For those who wish to teach primary (junior kindergarten to grade 3) or junior (grades 4 to 6), each faculty of education may have certain required courses for admission. Often recommended are courses in visual or performing arts, mathematics, languages, physical or natural sciences, history or geography. Students interested in intermediate (grades 7 to 10) level teaching need to acquire a teachable subject in a specific discipline. Normally, this requirement consists of six semester courses in an area of concentration. **Students are strongly advised to contact the Faculties of Education that interest them early in their programs to determine the specific requirements.**

Graduate and Professional Studies

Students have successfully used the B.A.Sc. degree to gain admission into graduate programs in social work, applied psychology, sociology, anthropology, occupational therapy, speech and language, and social policy. If you plan to enter a graduate program after completing the Child, Youth and Family major of the B.A.Sc. degree program you will need to select certain courses as part of your undergraduate program to meet graduate program admission requirements. Sometimes these requirements are quite particular which means that you must plan your course selections early and carefully. In our program you would include FRHD*4810 and FRHD*4910.

Although graduate programs differ in their entrance requirements, most graduate programs require that you have taken (at least): one course in research methods; two undergraduate statistics courses; and have completed an undergraduate thesis.

For many of the programs you will be required to take Graduate Record Exams (GREs) in the specific field of study. **You are strongly advised to contact the graduate programs that interest you early in your program to determine the specific entrance requirements of each program.**

Child, Youth and Family (Co-op) (CYF:C)

Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences.

All students in the Child, Youth and Family Co-op major must include the following core of 11.50 required credits and 0.50 restricted electives to a minimum of 20.00 passed credits.

The first four semesters are as for the students in the regular program. Students in the co-op program must also complete COOP*1100 in the third academic semester. Thereafter the schedule is as follows:

Major

Semester 1

FRHD*1100	[0.50]	Life: Health and Well-Being
NUTR*1010	[0.50]	Introduction to Nutrition
PSYC*1000	[0.50]	Introduction to Psychology
One of:		
ANTH*1150	[0.50]	Introduction to Anthropology
SOC*1100	[0.50]	Sociology
0.50 electives		

Semester 2

BIOM*2000	[0.50]	Concepts in Human Physiology
FRHD*1020	[0.50]	Couple and Family Relationships
MBG*1000	[0.50]	Genetics and Society
One of:		
FRHD*2260	[0.50]	Infant Development
FRHD*2280	[0.50]	Adolescent Development
0.50 electives		

Semester 3

COOP*1100	[0.00]	Introduction to Co-operative Education
FRHD*2100	[0.50]	Development of Human Sexuality
FRHD*2110	[0.50]	Exceptional Children and Youth
FRHD*3070	[0.50]	Research Methods: Family Studies
STAT*2080	[0.50]	Introductory Applied Statistics I
One of:		
FRHD*2060	[0.50]	Adult Development and Aging
FRHD*2270	[0.50]	Development in Early and Middle Childhood

Semester 4

FRHD*3150	[0.50]	Strategies for Behaviour Change
FRHD*3400	[0.50]	Communication and Counselling Skills
STAT*2090	[0.50]	Introductory Applied Statistics II
One of:		
FRHD*2040	[0.50]	Principles of Program Design for Children
FRHD*2300	[0.50]	Principles of Program Design for Youth
0.50 electives		

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Fall Semester

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

Semester 5 - Winter

FRHD*3040	[0.50]	Parenting and Intergenerational Relationships
FRHD*4320	[0.50]	Social Policies for Children, Youth and Families
One of:		
FRHD*3200	[1.00]	Practicum - Child
FRHD*3250	[1.00]	Practicum in Youth
0.50 electives		

Semester 6 - Summer

2.50 electives

Semester 7 - Fall

FRHD*3180	[0.50]	Observation and Assessment Laboratory
FRHD*4310	[0.50]	Professional Issues
1.50 electives or restricted electives		

Winter Semester

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

Semester 8 - Summer

2.50 electives

Restricted Electives

0.50 restricted electives from the Department of Family Relations and Applied Nutrition at the 4000 level (excluding FRHD*4170).

Bachelor of Arts (B.A.)

The University of Guelph offers general and honours programs leading to the B.A. degree. The General Program consists of a minimum of 15.00 credits requiring the equivalent of 6 semesters of successful full time study. The Honours Program consists of a minimum of 20.00 credits requiring the equivalent of 8 semesters of successful full time study. A student may register in Summer, Fall and Winter semesters. The normal course load is 2.50 credits per semester for a full time student on regular status. Students may register for 0.50 credit more at their own discretion. Part time study consists of 1.50 credits or fewer per semester.

Program Information

A student's selection of courses must follow the B.A. Program Regulations (including Distribution Requirements), a pattern of study for either the General or Honours degree (below), and the detailed schedule(s) of studies which follow for any special subject(s) studied.

Academic Counselling

Program Counselling

Students are urged to seek the assistance of the counsellors in the B.A. Counselling Office regarding their program and academic regulations, selecting courses, services and resources available on campus, and when they are experiencing difficulties that affect their academic progress.

Departmental Advising

Every academic department has advisors available to assist students in their course selection planning. Students should seek the advice of the faculty advisor when declaring a major, area of concentration, or minor, regarding course scheduling and completing the requirements for the specializations.

Students encountering difficulties within a course should first consult the instructor of the course. Co-operative education students in Economics and Psychology will also have a departmental Co-op Academic Advisor and Co-ordinator, and should consult Co-operative Education Services regarding scheduling work terms and the COOP*1000 course.

Academic Residence Requirements

1. At least 5.00 of the credits required for graduation by the student's program must be taken at the University of Guelph.
2. At least 60% of the 3000 and 4000 level courses required for graduation must be taken at the University of Guelph.

University of Guelph courses include courses taken on exchange and on study abroad programs. Letter of Permission courses are not included.

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 and Procedures of this calendar.

Conditions for Graduation

In addition to meeting the general and honours degree requirements listed below under Program Regulations, students will not normally be eligible to graduate while on probationary or required-to-withdraw status.

Distribution Requirements

The distribution requirements are designed to provide the student with exposure to and some understanding of a range of disciplines in the Arts, Social Sciences and Mathematical and Natural Sciences. Courses taken to satisfy the distribution requirements may also be counted toward a specialization in the general or honours program.

The B.A. Distribution Requirements (requirements 1, 2, and 3) need not be completed immediately but are a graduation requirement.

The distribution requirement of 8 courses (minimum 4.00 credits) is as follows:

1. A minimum of 1.50 credits over at least 2 different subject areas in the humanities:
   - ARTH Art History
   - CHIN Mandarin
   - CLAS Classical Studies
   - ENGL English
   - EURO European Studies
   - FREN French Studies
   - GERM German Studies
   - GREK Greek
   - HIST History
   - HUMN Humanities
   - ITAL Italian Studies
   - LAT Latin
   - LING Linguistics
   - MUSC Music
   - PHIL Philosophy
   - PORT Portuguese
   - SART Studio Art
   - SPAN Spanish and Hispanic Studies
   - THST Theatre Studies
   - WMST Women's Studies
2. A minimum of 1.50 credits over at least two of the following subject areas in the social sciences:
   - ANTH Anthropology
   - ECON Economics
   - GEOG Geography
   - IDEV International Development
   - ISS Interdisciplinary Social Science
   - POLS Political Science
   - PSYC Psychology
   - SOAN Sociology and Anthropology
   - SOC Sociology
   - WMST Women's Studies
3. 1.00 credits in natural and/or mathematical sciences from the list below.

Natural and Mathematical Science Courses Acceptable for B.A. Distribution Requirements

Students must take 1.00 credits in natural and/or mathematical science courses to fulfill the B.A. science requirements. Students should choose their courses from the list below or any course for which those listed serve as prerequisites. Students are advised to fulfill this requirement before their final semester. Any problems related to this requirement should be discussed with a B.A. Program Counsellor.

Courses recommended for students with limited preparation (e.g.. lacking 4U credit in a specific area):

AGR*2150	[0.50]	Plant Agriculture for International Development
BIOL*1020	[0.50]	Introduction to Biology
BIOL*1500	[0.50]	Humans in the Natural World
BIOM*2000	[0.50]	Concepts in Human Physiology
BOT*1200	[0.50]	Plants and Human Use
CHEM*1060	[0.50]	Introductory Chemistry
CHEM*1100	[0.50]	Chemistry Today
CIS*1000	[0.50]	Introduction to Computer Applications
ENVS*1060	[0.50]	Principles of Geology
ENVS*2060	[0.50]	Soil Science
ENVS*2130	[0.50]	Eating Sustainably in Ontario
ENVS*2210	[0.50]	Apiculture and Honey Bee Biology
ENVS*2270	[0.50]	Impacts of Climate Change
FOOD*2010	[0.50]	Principles of Food Science
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*1350	[0.50]	Earth: Hazards and Global Change
HORT*1120	[0.50]	Grape and Wine Science
HORT*1130	[0.50]	Science of Gardening
MBG*1000	[0.50]	Genetics and Society
MUSC*1090	[0.50]	Physics of Music
NUTR*1010	[0.50]	Introduction to Nutrition
PHYS*1600	[0.50]	Contemporary Astronomy
PHYS*1810	[0.50]	Physics of Music

Other acceptable courses which require 4U or university preparation:

BIOL*1XXX	[0.00]	Any BIOL course at the 1000 level
CHEM*1XXX	[0.00]	Any CHEM course at the 1000 level
CIS*1XXX	[0.00]	Any CIS course at the 1000 level
ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*2250	[0.50]	Geology of Natural Disasters
MATH*1XXX	[0.00]	Any MATH course at the 1000 level
PHYS*1XXX	[0.00]	Any PHYS course at the 1000 level
STAT*2XXX	[0.00]	Any STAT course at the 2000 level

Double Counting of Courses

A maximum of 50 percent of the courses in a second specialization may be courses taken in fulfillment of the first specialization where required courses are the same. (Specializations can include majors, minors, areas of concentrations and certificates.)

Program Regulations

The General Degree Program provides the opportunity for a sound general education in the arts and social sciences, mathematics and sciences, while allowing for concentration of studies in one or more subjects.

The Honours Degree Program provides depth of study in one specialization, strengthening written and oral communication skills, research and analytical abilities, as well as ensuring a breadth of study in the arts, social sciences, mathematics and sciences.

General Degree Requirements (BAG)

To graduate from a general program a student must:

1. earn 15.00 credits. These must include courses that fulfill the distribution requirements (see B.A. Distribution Requirements). At least 4.00 credits must be at the 3000 level or above. Not more than 6.00 credits at the introductory (1000) level may be counted towards the 15.00 credits requirement.
2. 9.00 of the required 15.00 credits must be in courses offered by the College of Arts, the departments of Economics, Geography, Political Science, Psychology, Sociology and Anthropology (in the College of Social and Applied Human Sciences and the College of Business and Economics), School of Computer Science, or the Department of Mathematics and Statistics.
3. no more than 11.00 credits in any one subject or discipline, as indicated by the course prefix code, can be counted towards a general degree.

While students are encouraged to complete the requirements of one or more areas of concentration, this is not a graduation requirement.

The requirements for each area of concentration are set out separately in the pages following the list of Honours and General Specializations Available in the B.A. Degree.

Honours Degree Requirements (BAH)

To graduate from an honours program a student must:

1. earn 20.00 credits. These must include courses that fulfill the distribution requirements (see B.A. Distribution Requirements), and courses that fulfill the requirements of at least 1 major. At least 7.00 credits must be at the 3000 level or above. Not more than 6.00 credits from courses at the introductory (1000) level may be counted towards the 20.00 credits requirement.
2. Honours B.A. students, except those completing a major in Food, Agricultural, and Resource Economics, must take a minimum of 12.00 credits in courses offered by the College of Arts or the departments of Economics, Geography, Political Science, Psychology, Sociology and Anthropology (in the College of Social and Applied Human Sciences and the College of Business and Economics), the School of Computer Science or the Department of Mathematics and Statistics.
3. no more than 14.00 credits in any one subject or discipline, as indicated by the course prefix code, can be counted towards an Honours Degree.
4. fulfill the course and credit requirements of at least one major with a cumulative average of at least 70% in all course attempts at the University of Guelph in that major. Grades in all courses in the discipline area of the major are included in the cumulative average. Grades from those courses in other disciplines listed as options toward the major are also included in the average. (This condition does not apply to majors in the interdisciplinary programs of International Development and European Studies, where only courses in the core and chosen area of emphasis will be counted toward the specialization average.) Students may take more than one major. They may also take one or more minors. The 70% requirement applies to each major and minor.

The requirements for each major and minor are set out separately in the pages following the list of Honours and General Specializations Available in the B.A. Degree.

University recognition that a student has graduated with a particular major or minor requires a cumulative average of 70% for all course attempts at this University in that major or minor.

Students failing to meet the graduation requirements of the Honours Program may apply to graduate with a General Degree if the requirements for the General Degree are met. Students should note that a specialization is not required to graduate with a General Degree.

Semester One Requirements

It is recommended that students select 1000 level courses as follows:

- Required courses for a chosen or intended specialization (major, minor, area of concentration).
- Electives (this could include arts/humanities, social sciences, natural/mathematical sciences, or electives from another area).

For more information on course selection, students can access the New Student Registration Handbook at:https://www.uoguelph.ca/registrar/undergraduate/registrationhandbook/index

Special Study Options

Study at Other Universities

Students contemplating study at another university for credit towards a Bachelor of Arts degree at the University of Guelph should refer to the general regulations governing Letters of Permission in Section VIII--Degree Regulations & Procedures in this calendar.

Students must obtain approval for the Letter of Permission prior to undertaking studies at another institution. Approval of the request depends on good standing in the program with a minimum average of 60%.

The normal limit of credits taken on a Letter of Permission is 2.50 based on Guelph credits.

Students with a specialization in languages who want to undertake a program of study in Quebec or abroad should consult the appropriate faculty advisor or the Director of the School of Languages and Literatures.

Study Abroad

The University of Guelph offers many other Study Abroad and Exchange opportunities for students to enrich their learning experience. Bachelor of Arts students are encouraged to participate in any of the diverse options available. Courses taken while on exchange or study abroad can be used as electives or core requirements. For further information on the programs available, please refer to Section V - International Study. Students are advised to meet with a B.A. Program Counsellor to discuss the feasibility of participating in an exchange or semester abroad.

Honours and General Specializations Available in the B.A. Degree

General Program Areas of Concentration

Anthropology
English
French Studies
Geography
History
International Development
Mathematics
Music
Philosophy
Political Science
Sociology
Spanish and Hispanic Studies
Statistics
Theatre Studies

The schedule of studies for each area of concentration is given on the following pages under its subject heading.

Honours Program Majors

Anthropology
Art History
Classical Studies
Criminal Justice and Public Policy
Economics*
English
Environmental Governance
European Studies
Food, Agricultural and Resource Economics
French Studies
Geography
History
Individual Studies
Information Systems and Human Behaviour
International Development
Mathematical Economics*
Mathematical Science
Music
Philosophy
Political Science
Psychology*
Sociology
Spanish and Hispanic Studies
Studio Art
Statistics
Theatre Studies

Subjects marked with an asterisk (*) may be available as Co-operative Education programs. The schedule of studies for each major is given on the following pages under its subject heading.

Honours Program Minors

Anthropology
Art History
Business
Business Economics
Classical Studies
Computing and Information Science
Criminal Justice and Public Policy
Economics
English

European Culture and Civilization
Family and Child Studies
French Studies
Geography
German
History
International Development
Italian
Marketing
Mathematics
Media and Cinema Studies
Museum Studies
Music
Philosophy
Political Science
Psychology
Sociology
Spanish and Hispanic Studies
Theatre Studies

The schedule of studies for each minor is given on the following pages under its subject heading.

Anthropology (ANTH)

Department of Sociology and Anthropology, College of Social and Applied Human Sciences

The Department of Sociology and Anthropology offers three types of courses: sociology courses with the prefix SOC*; anthropology courses with the prefix ANTH*; and departmental courses with the prefix SOAN*. The departmental category of courses recognizes the fact that the disciplines of sociology and sociocultural anthropology have developed in tandem and it is possible to identify large areas of overlap and convergence in the work of practitioners both historically and in the present. Departmental courses include most of the core theory and methods courses as well as many elective courses. They contribute equally to the subject matter of sociology as well as the subject matter of sociocultural anthropology for purposes of the undergraduate programs of study in both disciplines. Please see the listings for all courses required for the Anthropology program.

Courses will normally be offered in the semesters designated. Please check with the department for information about additional semester offerings. In addition to regularly scheduled courses, students may elect to do independent study. A student who wishes to do a reading course should first consult the professor with whom he/she wishes to work. Please note, a student is allowed a total of 1.00 credits only for reading courses.

Area of Concentration (General Program)

A minimum of 5.00 credits is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
ANTH*2160	[0.50]	Social Anthropology
ANTH*2230	[0.50]	Regional Ethnography
ANTH*3690	[0.50]	Engaging Anthropological Theory
ANTH*3770	[0.50]	Kinship, Family, and Power
SOAN*2120	[0.50]	Introductory Methods

One of:

MUSC*2270	[0.50]	World Music
PHIL*2100	[0.50]	Critical Thinking

1.00 additional credits in ANTH
0.50 additional credits in SOAN

Note: 1.00 credits of these additional credits must be completed at the 3000 level or above.

Major (Honours Program)

A minimum of 9.00 credits is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
ANTH*2160	[0.50]	Social Anthropology
ANTH*2230	[0.50]	Regional Ethnography
ANTH*3690	[0.50]	Engaging Anthropological Theory
ANTH*3770	[0.50]	Kinship, Family, and Power
ANTH*4700	[0.50]	Issues in Contemporary Anthropological Theory
SOAN*2120	[0.50]	Introductory Methods
SOAN*3070	[0.50]	Qualitative and Observational Methods

Two of:

LING*1000	[0.50]	Introduction to Linguistics
MUSC*2270	[0.50]	World Music
PHIL*2100	[0.50]	Critical Thinking

2.00 additional credits in ANTH
2.00 additional credits in SOAN

Note: 1.00 of these additional credits must be completed at the 4000 level.

Note: SOAN*3120 is recommended, especially for students planning to enter graduate programs.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
ANTH*2160	[0.50]	Social Anthropology
ANTH*2230	[0.50]	Regional Ethnography
ANTH*3690	[0.50]	Engaging Anthropological Theory
ANTH*3770	[0.50]	Kinship, Family, and Power
SOAN*2120	[0.50]	Introductory Methods

One of:

MUSC*2270	[0.50]	World Music
PHIL*2100	[0.50]	Critical Thinking

1.00 additional credits in ANTH
0.50 additional credits in SOAN

Note: 1.00 of these additional credits must be completed at the 3000 level or above.

Art History (ARTH)

School of Fine Art and Music, College of Arts

The School provides for concentrated study in Art History or Studio Arts, or for a more balanced study combining the two disciplines. Both Studio Art and Art History degree programs require some work in both the programs. Many Art History courses are also open to non specialized students.

The Art History program covers historical perspectives on the visual arts, study of the methodologies of art history and critical theory, and consideration of contemporary issues in the practice and display of art. Students pursuing a Major or Minor in Art History are required to take a minimum number of courses at the 2000, 3000 and 4000 level.

Students majoring in other programs who are also interested in the study of Art History are encouraged to consider the Minor offered in Museum Studies. Specific requirements for the Art History Honours Major and Minor are listed below.

Student Counselling

The students who elect to take a substantial number of courses in Art History with the objective of graduate work are advised to obtain counselling from faculty regarding their choices. It is important to know that graduate studies in Art History will usually require a reading knowledge of at least 2 languages other than English. German, French, Italian and Latin are among the most useful choices. Cognate electives in other disciplines in the College of Arts (such as History) will almost certainly prove an asset.

Art History Core Requirements

All students are required to complete the following core courses [1.00 credits]:

ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II

Major (Honours Program)

A minimum of 9.00 credits is required, including:

ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II
ARTH*2220	[0.50]	The Visual Arts Today
ARTH*2480	[0.50]	Introduction to Art Theory and Criticism
ARTH*2540	[0.50]	Medieval Art
ARTH*2550	[0.50]	The Italian Renaissance
ARTH*2600	[0.50]	Early Modern Art

1.50 credits from:

ARTH*2050	[0.50]	Modern Latin American Art
ARTH*2060	[0.50]	Aboriginal Arts in the Americas
ARTH*2070	[0.50]	Art of the USA
ARTH*2120	[0.50]	Introduction to Museology
ARTH*2150	[0.50]	Art and Archaeology of Greece
ARTH*2280	[0.50]	Modern Architecture
ARTH*2290	[0.50]	History of Photographic Media
ARTH*2490	[0.50]	History of Canadian Art
ARTH*2580	[0.50]	Late Modern Art: 1900-1950
ARTH*2950	[0.50]	Baroque Art

2.00 credits from:

ARTH*3010	[0.50]	Contemporary Canadian Art
ARTH*3060	[0.50]	Public Art
ARTH*3150	[0.50]	Space: Roman Art and Urbanism
ARTH*3200	[0.50]	Colour: Practice & Meanings in Western Art
ARTH*3210	[0.50]	Critical Issues in Art History
ARTH*3220	[0.50]	Nationalism & Identity in Art
ARTH*3320	[0.50]	Lives: Aspects of Western Art
ARTH*3330	[0.50]	Display: Visual Culture in Western Europe
ARTH*3340	[0.50]	Studies in Renaissance and Baroque Art
ARTH*3520	[0.50]	Idea: Art Since 1950
ARTH*3600	[0.50]	Topics in the Long Eighteenth Century
ARTH*3620	[0.50]	Museum Studies
ARTH*3780	[0.50]	Gender and Art

2.00 credits from 4000-level seminar courses:

ARTH*4310	[1.00]	Topics in Art & Visual Culture I
ARTH*4320	[1.00]	Topics in Art & Visual Culture II
ARTH*4330	[1.00]	Topics in Art & Visual Culture III
ARTH*4340	[1.00]	Topics in Art & Visual Culture IV
ARTH*4350	[1.00]	Topics in Art & Visual Culture V

Students may count either ARTH*4600 "Individual Study: Art History" or ARTH*4800 "Experiential Learning" towards their major. Neither of these courses meets the requirement of 2.00 credits from seminar courses.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II

4.00 additional credits in Art History including at least 2.00 credits at the 3000 or 4000 level.

Business (BUS)

College of Business and Economics, Department of Management

The study of business is complementary to virtually any career or professional endeavour. The minor in Business is intended to enhance the business literacy of non-business students. Through a combination of core and elective courses, students from different disciplines will develop foundational knowledge and understanding of the core functional areas of business, and be invited to explore and apply this in relation to their primary area of study. **Note:** The minor in Business is not open to students enrolled in the Bachelor of Commerce program.

Minor (Honours Program)

A minimum of 5.00 credits is required (all 3.00 required credits, plus 2.00 credits of restricted electives of which at least 1.00 credits must be at the 3000 level or above).

Required courses (3.00 credits):

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1050	[0.50]	Introductory Microeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*1000	[0.50]	Introductory Marketing
MGMT*2150	[0.50]	Introduction to Canadian Business Management
MGMT*3020	[0.50]	Corporate Social Responsibility

Restricted Electives (2.00 credits of which at least 1.00 credits are at the 3000 level or above):

ACCT*2230	[0.50]	Management Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2200	[0.50]	Industrial Relations
ECON*2720	[0.50]	Business History
EDRD*3140	[0.50]	Organizational Communication
EDRD*3160	[0.50]	International Communication
EDRD*4120	[0.50]	Leadership Development in Small Organizations
ENGG*3240	[0.50]	Engineering Economics
ENGG*4050	[0.50]	Quality Control
ENGG*4070	[0.50]	Life Cycle Assessment for Sustainable Design
ENGG*4510	[0.50]	Assessment & Management of Risk
FARE*3030	[0.50]	The Firm and Markets
FARE*3310	[0.50]	Operations Management
FARE*4360	[0.50]	Marketing Research
FARE*4370	[0.50]	Food & Agri Marketing Management
HROB*2010	[0.50]	Foundations of Leadership
HROB*3000	[0.50]	Human Resources Management
HTM*3120	[0.50]	Service Operations Analysis
MCS*2020	[0.50]	Information Management
MCS*2100	[0.50]	Personal Financial Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3000	[0.50]	Advanced Marketing
MCS*3040	[0.50]	Business and Consumer Law
MGMT*3320	[0.50]	Financial Management
MGMT*4050	[0.50]	Business Consulting
MGMT*4060	[0.50]	Business Consulting
MGMT*4260	[0.50]	International Business
PHIL*2600	[0.50]	Business and Professional Ethics
POLS*2250	[0.50]	Public Administration and Governance
POLS*3470	[0.50]	Business-Government Relations in Canada
PSYC*3070	[0.50]	Psychology in Human Resource Management
PSYC*3080	[0.50]	Organizational Psychology
PSYC*4330	[0.50]	Advanced Topics in I/O Psychology
SOAN*2040	[0.50]	Globalization of Work and Organizations

Note: not all restricted elective courses identified in this list will necessarily be open to all students in the Business minor. Some courses (noted by the *asterisk*) have priority access restrictions, or may be limited to students enrolled in the major from which the courses are drawn. In some cases a Course Waiver Request form signed by the instructor may be required in order for students to add these courses to their schedule. Please consult with the department offering the course about possible access. Some courses may also have prerequisites which are identified in course descriptions in the academic calendar.

Business Economics (BECN)

Department of Economics and Finance, College of Business and Economics

Interdisciplinary study in Business Economics is offered as a minor in the honours program. Students in this program will be counselled by the Department of Economics and Finance. It is possible for students to pursue a more intensive program in the area of business and economics; see the heading Economics (ECON) or Mathematical Economics (MAEC) in the B.A. degree and the heading Management Economics (MEF) in the B.Comm. degree.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

ACCT*1220	[0.50]	Introductory Financial Accounting
ACCT*2230	[0.50]	Management Accounting
ECON*1050	[0.50]	Introductory Microeconomics *
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2560	[0.50]	Theory of Finance

One of:

IPS*1500	[1.00]	Integrated Mathematics and Physics I
MATH*1030	[0.50]	Business Mathematics
MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

One of:

ECON*2740	[0.50]	Economic Statistics
PSYC*1010	[0.50]	Quantification in Psychology
SOAN*2120	[0.50]	Introductory Methods
STAT*2040	[0.50]	Statistics I
STAT*2060	[0.50]	Statistics for Business Decisions
STAT*2080	[0.50]	Introductory Applied Statistics I
STAT*2120	[0.50]	Probability and Statistics for Engineers

One of:

ECON*3660	[0.50]	Economics of Equity Markets
ECON*4400	[0.50]	Economics of Organizations and Corporate Governance
ENGG*3240	[0.50]	Engineering Economics
FARE*3310	[0.50]	Operations Management
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*1000	[0.50]	Introductory Marketing
MCS*3040	[0.50]	Business and Consumer Law
MGMT*3320	[0.50]	Financial Management

* FARE*1040 and FARE*1400 may replace this course if it is required for the major.

Classical Studies (CLAS)

School of Languages and Literatures, College of Arts

The program in Classical Studies is intended particularly for students interested in Greek and Roman culture, society and history.

Core Requirements

a. CLAS*1000, plus EITHER (GREK*1100, GREK*1110, GREK*2020) OR (LAT*1100, LAT*1110, LAT*2000)

b. one of CLAS*2000, CLAS*2150, CLAS*2350, CLAS*3100

c. one of CLAS*3000, CLAS*3010, CLAS*3020

d. one of CLAS*3030, CLAS*3040

e. one of CLAS*3150, HIST*2850, PHIL*2140

Major (Honours Program)

A minimum of 8.00 credits is required, including:

a. the Classical Studies Core

b. CLAS*4000, CLAS*4150, CLAS*4400

c. 2.50 additional credits in Classics, 1.00 of which may be taken from the following as part of the program:

d.	ENGL*1410	[0.50]	Major Writers
	HIST*2200	[0.50]	The Medieval World
	LING*1000	[0.50]	Introduction to Linguistics

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

a. the Classical Studies Core

b. two of CLAS*4000, CLAS*4150, CLAS*4400

Computing and Information Science (CIS)

School of Computer Science, College of Physical and Engineering Science

A knowledge of Computing is a complement to most areas of study. The Minor in Computing and Information Science is directed towards students who wish to supplement their studies in another area with some experience in Computing. Students interested in pursuing a Major in Computing can do so through the Bachelor of Computing Degree Program.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

CIS*1500	[0.50]	Introduction to Programming
CIS*1910	[0.50]	Discrete Structures in Computing I
CIS*2170	[0.75]	User Interface Design
CIS*2430	[0.50]	Object Oriented Programming
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration

0.50 additional credits from CIS courses at the 2000 level or above

0.50 additional credits from CIS courses at the 3000 level or above

Criminal Justice and Public Policy (CJPP)

Department of Sociology and Anthropology, and the Department of Political Science, College of Social and Applied Human Sciences

Criminal Justice and Public Policy is offered as a minor in the honours program and as a major in the honours program. It is designed to provide students seeking a career in the criminal justice system, or planning to pursue an advanced degree with a knowledge base that will enable them to pursue their career objectives. The program offers a unique blend of sociological courses dealing with the criminal justice system as well as courses in Political Science dealing with public policy formation and implementation. It also provides students with the conceptual and methodological tools needed for further study.

Students who are not admitted directly into the CJPP major and subsequently wish to declare the specialization must apply directly to the department. In order to be eligible, applicants must have a cumulative average of 70% or better in the following foundation courses:

POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250 or POLS*2300		
POLS*2350	[0.50]	Law from a Political Science Perspective
SOAN*2120	[0.50]	Introductory Methods
SOC*1500	[0.50]	Crime and Criminal Justice
SOC*2700	[0.50]	Criminological Theory

Students wishing to declare the CJPP minor must also meet the above requirement.

Students from other institutions who transfer to the University of Guelph and wish to declare the CJPP major or minor must also meet the above requirement. If an external transfer student is granted credit for one or more of the foundation courses listed above, then he or she must attain a cumulative average of 70% or better in the remaining required CJPP foundation courses.

Major (Honours Program)

A minimum of 9.00 credits is required, including:

PHIL*1010	[0.50]	Introductory Philosophy: Social and Political Issues
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250 or POLS*2300		
POLS*2350	[0.50]	Law from a Political Science Perspective
SOAN*2120	[0.50]	Introductory Methods
SOC*1500	[0.50]	Crime and Criminal Justice
SOC*2700	[0.50]	Criminological Theory

0.50 credits from the following:

POLS*3650	[0.50]	Research Methods II: Quantitative Methods
SOAN*3120	[0.50]	Quantitative Methods

1.50 credits from the following:

SOC*2070	[0.50]	Social Deviance
SOC*2760	[0.50]	Homicide
SOC*3490	[0.50]	Law and Society
SOC*3710	[0.50]	Youth Justice
SOC*3730	[0.50]	Courts and Society
SOC*3740	[0.50]	Corrections and Penology
SOC*3750	[0.50]	Police in Society

1.50 credits from the following:

POLS*3130	[0.50]	Law, Politics and Judicial Process
POLS*3140	[0.50]	Politics and the Charter of Rights
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3250	[0.50]	Public Policy: Challenges and Prospects
POLS*3300	[0.50]	Governing Criminal Justice
POLS*3440	[0.50]	Corruption, Scandal and Political Ethics
POLS*3670	[0.50]	Comparative Public Policy and Administration

0.50 credits from the following:

HIST*3130	[0.50]	Popular Culture and Punishment, 1700-1900
PHIL*3040	[0.50]	Philosophy of Law
PHIL*3230	[0.50]	Issues in Social and Political Philosophy
PSYC*3020	[0.50]	Psychology of Law

1.50 credits from the following:

POLS*4050	[1.00]	Advanced Topics in Law and Politics
POLS*4060	[0.50]	Advanced Topics Lecture in Law and Politics
POLS*4070	[1.00]	Courts and Parliament
POLS*4100	[1.00]	Women, Justice and Public Policy
POLS*4160	[1.00]	Multi-Level Governance in Canada
POLS*4250	[1.00]	Topics in Public Management
POLS*4260	[1.00]	Topics in Public Policy
POLS*4270	[0.50]	Advanced Lecture in Public Management
POLS*4280	[0.50]	Advanced Lecture in Public Policy
POLS*4310	[0.50]	Advanced Lecture in Women, Justice and Public Policy
POLS*4740	[1.00]	Advanced Topics in Rights and Liberties
POLS*4780	[0.50]	Advanced Lecture in Rights and Liberties
POLS*4970	[0.50]	Honours Political Science Research I
POLS*4980	[0.50]	Honours Political Science Research II
SOC*4010	[0.50]	Violence and Society
SOC*4030	[0.50]	Advanced Topics in Criminology
SOC*4200	[0.50]	Advanced Topics in Criminal Justice
SOC*4900	[0.50]	Honours Sociology Thesis I
SOC*4910	[0.50]	Honours Sociology Thesis II

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

PHIL*1010	[0.50]	Introductory Philosophy: Social and Political Issues
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250 or POLS*2300		
POLS*2350	[0.50]	Law from a Political Science Perspective
SOAN*2120	[0.50]	Introductory Methods
SOC*1500	[0.50]	Crime and Criminal Justice
SOC*2700	[0.50]	Criminological Theory

1.50 credits from the following list, including 0.50 SOC and 0.50 POLS:

POLS*3130	[0.50]	Law, Politics and Judicial Process
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3300	[0.50]	Governing Criminal Justice
POLS*3250	[0.50]	Public Policy: Challenges and Prospects
POLS*3440	[0.50]	Corruption, Scandal and Political Ethics
POLS*3670	[0.50]	Comparative Public Policy and Administration
SOC*2070	[0.50]	Social Deviance
SOC*2760	[0.50]	Homicide
SOC*3490	[0.50]	Law and Society
SOC*3710	[0.50]	Youth Justice
SOC*3730	[0.50]	Courts and Society
SOC*3740	[0.50]	Corrections and Penology
SOC*3750	[0.50]	Police in Society

Economics (ECON)

Department of Economics and Finance, **College of Business and Economics**

The Department of Economics and Finance offers courses in economic theory, applied economics and quantitative methods. Students may take courses leading to a B.A. in the honours. It is possible to combine Economics with various other disciplines such as mathematics and statistics, business administration, political science, geography and history. Students are urged to consult the department's program planning guide and the department's advisors for detailed information about courses and programs and about the course of study most appropriate as preparation for graduate work in economics or business administration, for professional degrees such as the Bachelor's degree in Law, and for careers in business and government.

Core Requirements

ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics

One of:

MATH*1030	[0.50]	Business Mathematics
MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

Major (Honours Program)

A minimum of 9.50 credits in Economics is required, including:

The Economics core requirements

ECON*2770	[0.50]	Introductory Mathematical Economics
ECON*3710	[0.50]	Advanced Microeconomics
ECON*3740	[0.50]	Introduction to Econometrics
ECON*3810	[0.50]	Advanced Macroeconomics
ECON*4710	[0.50]	Advanced Topics in Microeconomics

ECON*4810 [0.50] Advanced Topics in Macroeconomics
One of:
- ECON*2720 [0.50] Business History
- ECON*3550 [0.50] North American Economic History
- ECON*3720 [0.50] History of the World Economy Since 1850
- ECON*3730 [0.50] Europe and the World Economy to 1914
- ECON*4720 [0.50] Topics in Economic History

3.00 additional credits in Economics at the 3000 or 4000 level, at least 1.50 of which must be at the 4000 level

Note: Students contemplating graduate studies in Economics should take ECON*4640, Applied Econometrics and ECON*4840, Applied Econometrics II.

Minor (Honours Program)

A minimum of 5.00 credits in Economics is required, including:

a. the Economics core

b. 2.00 other credits in Economics at the 3000 or 4000 level

Notes:

1. ECON*3740 is recommended.
2. Students wishing to pursue a more structured Economics minor should take ECON*3710 as well as ECON*3740.
3. ECON*4800 may not be counted at the 4000 level for purposes of satisfying the minimum 4000 level credit requirements in the B.A. Honours Economics major. Only one of ECON*4900 or ECON*4910 may count in the B.A. program towards the minimum 4000 level requirement.

Economics (Co-op) (ECON:C)

Department of Economics and Finance, **College of Business and Economics**

The Economics Co-op program provides an integrated academic/work experience for students with co-operating employer organizations. Students in the program complete 4-5 work terms while fulfilling the requirements of their honours Economics program.

All co-op students must complete the Economics core plus an introductory computer science course (CIS*), ECON*2770 and ECON*3740 in their first 4 semesters. Admission in the co-op program is limited to students of high academic standing and will be considered only at semester 1 entry or at the end of semester 2. The first 2 work terms normally follow completion of the first 4 semesters of academic study. Students will only be permitted to take these work terms if they are eligible to continue in the Honours Economics program, have completed the required courses and are maintaining a satisfactory standing in their Economics program. The 3rd and 4th work terms will normally follow the 6th academic semester. For further information on the Economics Co-op program students are urged to consult the department's Program Guide and Co-operative Education Programs in Section X-degree Programs in this calendar.

Students should review the Economics section in the schedule of studies for additional program information.

Major (Honours Program)

Semester 1

ECON*1050 [0.50] Introductory Microeconomics
One of:
- Math*1000 0.50 Introductory Calculus
- MATH*1030 [0.50] Business Mathematics
- MATH*1080 [0.50] Elements of Calculus I
- MATH*1200 [0.50] Calculus I

1.50 electives

Semester 2 (Winter)

ECON*1100 [0.50] Introductory Macroeconomics
One computer science course
1.50 electives

Summer Semester

Optional -- at the discretion of the student.

Semester 3 (Fall)

COOP*1100 [0.00] Introduction to Co-operative Education
ECON*2310 [0.50] Intermediate Microeconomics
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*2740 [0.50] Economic Statistics
ECON*2770 [0.50] Introductory Mathematical Economics
0.50 electives

Semester 4 (Winter)

ECON*3740 [0.50] Introduction to Econometrics
One economic history course*
1.50 electives

Summer Semester

COOP*1000 [0.00] Co-op Work Term I

Fall Semester

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

Semester 5 (Winter)

ECON*3810 [0.50] Advanced Macroeconomics
1.00 credits in Economics at the 3000 level
1.00 electives

Summer Semester

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

Semester 6 (Fall)

ECON*3710 [0.50] Advanced Microeconomics
0.50 credits in Economics at the 4000 level (ECON*4640 is recommended)
1.50 electives

Winter Semester

COOP*4000 [0.00] Co-op Work Term IV

Summer Semester

COOP*5000 [0.00] Co-op Work Term V

Semester 7 (Fall)

ECON*4710 [0.50] Advanced Topics in Microeconomics
0.50 credits in Economics at the 4000 level
1.00 electives
0.50 restricted electives

Semester 8 (Winter)

ECON*4810 [0.50] Advanced Topics in Macroeconomics
0.50 credits in Economics at the 4000 level
1.50 electives
*the economic history course may be taken in any semester

English (ENGL)

School of English and Theatre Studies, College of Arts

The School of English and Theatre Studies offers courses in the B.A. Program in English that focus on the study of literature and related texts across a broad range of theoretical, historical, and geographical sites. The School also welcomes non-majors into its courses at the 1000, 2000, and 3000 levels, suitable to other majors within the College of Arts and beyond. Certain courses in Theatre Studies (THST) and in Literature in Translation (CLAS, GERM, HUMN, SPAN) may be counted towards a degree in English. Consult the School of English and Theatre Studies for details.

First-year students registered in or considering one of the programs in English should register for ENGL*1080 in the first semester and ENGL*2080 in the second semester.

Area of Concentration (General Program)

A minimum of 5.00 English credits is required in the English core and the English electives. English elective courses must be chosen to fulfill the Distribution Requirements for the Area of Concentration.

English core - 2.00 credits as follows:

1. ENGL*1080, ENGL*2080, core seminar (variable content), ENGL*2120
2. one additional core seminar (variable content): ENGL*2130, ENGL*3940, ENGL*3960

English electives - 3.00 credits to include:

1. 2.50 credits from 2000/3000 level lecture courses
2. 0.50 credits from any other lecture or seminar course

Distribution Requirements for the Area of Concentration:

The electives and core seminars must be chosen to ensure that 0.50 credits are completed in each of the following three fields:

- Medieval and Early Modern Literature
- 18th-and 19th -century Literature
- 20th-and 21st -century Literature

Of these 1.50 credits, at least 0.50 must be in Canadian Literature.

Note: Please visit the School of English and Theatre Studies website: http://www.uoguelph.ca/sets/ for a list of courses that fulfill these requirements. This list is updated every semester.

Major (Honours Program)

A minimum of 8.50 English credits is required in the English core and the English electives. English elective courses must be chosen to fulfill the Distribution Requirements for the Major.

English core - 3.00 credits as follows:

1. ENGL*1080, ENGL*2080
2. four core seminars (variable content): ENGL*2120, ENGL*2130, ENGL*3940, ENGL*3960

English electives - 5.50 credits to include:

- 2.50 credits from 2000/3000 level lecture courses
- 1.00 credits from 4000 level courses
- 2.00 credits from any other lecture or seminar courses

Distribution Requirements for the Major:

The electives and core seminars must be chosen to ensure that 1.00 credits are completed in each of the following fields:

- Medieval and Early Modern Literature
- 18th-and 19th -century Literature
- 20th-and 21st -century Literature

Of these 3.00 credits, at least 0.50 credits must be in Canadian Literature.

A maximum of 2.00 credits at the 4000 level may be counted towards a major in English.

Note: Please visit the School of English and Theatre Studies website: http://www.arts.uoguelph.ca/sets for a list of courses that fulfill these requirements. This list is updated every semester.

Honours students interested in a more concentrated program or contemplating graduate work in English are strongly advised to:

- attain a good reading knowledge of another language, such as French
- take ENGL*3380 (Studies in the History of Literary Production), ENGL*3690 (History of Literary Criticism), ENGL*4890 (Contemporary Literary Theory)
- take 2.00 credits from 4000-level seminars (2 seminars at 1.00 credits each)

The M.A. program in English at Guelph gives preference to qualified applicants with a broad experience in literary and cultural studies and related disciplines.

Minor (Honours Program)

The program of study and requirements are the same as for the Area of Concentration in the General Program.

Environmental Governance (EGOV)

Department of Geography

Environmental governance refers to the processes through which societies make decisions that affect the environment. Governments have long been dominant players in this context. However, in Canada and around the world, the ability of governments alone to address environmental problems is being called into question. As a result, contemporary environmental governance increasingly involves citizens, non-government organizations, and businesses.

The Major in Environmental Governance introduces students to the challenges of environmental governance. Through completing courses from the disciplines of geography, political science, agricultural economics, and economics, students will receive: a solid foundation in the processes and mechanisms of environmental governance in Canada and elsewhere; an understanding of geographical, political, and economic factors that shape governance in Canada and around the world; and exposure to innovative approaches to environmental governance that address persistent and emerging societal concerns. Students completing the major will have the skills and experiences needed to participate effectively in environmental governance in a variety of settings. Hence, they will find careers in the public sector, in environmental non-government organizations, and, increasingly, in the private sector.

Completion of required courses, and careful selection from among optional courses, will facilitate students completing a minor in Geography, Political Science, or Economics. Minors in other programs also may complement the Major in Environmental Governance.

Major (Honours Program)

A minimum of 11.50 credits, consisting of 11.00 credits from the courses specified below, plus 0.50 credits from other 4000 level courses in Geography; Political Science; Food, Agricultural and Resource Economics (Agricultural Economics); or Economics:

ECON*1050	[0.50]	Introductory Microeconomics
EDRD*2650	[0.50]	Introduction to Planning and Environmental Law
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1350	[0.50]	Earth: Hazards and Global Change
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*3020	[0.50]	Global Environmental Change
GEOG*3210	[0.50]	Management of the Biophysical Environment
GEOG*4210	[0.50]	Environmental Governance
GEOG*4220	[0.50]	Local Environmental Management
GEOG*4230	[0.50]	Environmental Impact Assessment
MGMT*3020	[0.50]	Corporate Social Responsibility
POLS*1150	[0.50]	Understanding Politics
POLS*2250	[0.50]	Public Administration and Governance
POLS*3250	[0.50]	Public Policy: Challenges and Prospects
POLS*3370	[0.50]	Environmental Politics and Governance
One of:		
GEOG*2030	[0.50]	Environment and Development
GEOG*2230	[0.50]	Economic Geography
One of:		
ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics
One of:		
HIST*2250	[0.50]	Environment and History
PHIL*2070	[0.50]	Philosophy of the Environment
SOC*3380	[0.50]	Society and Nature
One of:		
ECON*2740	[0.50]	Economic Statistics
GEOG*2460	[0.50]	Analysis in Geography
STAT*2040	[0.50]	Statistics I
One of:		
FARE*3170	[0.50]	Cost-Benefit Analysis
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3270	[0.50]	Local Government in Ontario
POLS*3470	[0.50]	Business-Government Relations in Canada
POLS*3790	[0.50]	The Political Economy of International Relations
One of:		
FARE*4290	[0.50]	Land Economics
FARE*4310	[0.50]	Resource Economics

At least 0.50 additional credits at the 4000 level from Geography; Political Science; Food, Agricultural and Resource Economics (FARE); or Economics. Students are advised to contact an Environmental Governance Faculty Advisor for a list of recommended 4000 level courses.

* Note: Courses marked with an asterisk* may require the completion of additional prerequisites not included in the requirements for the Environmental Governance major. Students should consult the most recent Undergraduate Calendar (Chapter XII – Course Descriptions) for specific prerequisites.

European Culture and Civilization (ECC)

The minor in European Culture and Civilization is designed for students interested in the interdisciplinary study of European culture and history. If offers a combination of languages, history of European culture, literature, the arts, philosophy, history and political science.

Note: the minor is not open to European Studies majors.

Minor (Honours Program)

Note: some of the courses below (the language courses, some 3000 and 4000 level courses in lists A, B, C, D) have prerequisites not included in the minor.

A minimum of 5.00 credits, at least 1.00 of which must be at the 3000 level or above, is required, including:

1.

EURO*1200	[0.50]	European Culture from the Mid 18th to the Mid 19th Century
EURO*2200	[0.50]	European Culture from the Mid 19th Century to the 1920's
EURO*3300	[0.50]	Before the Fall of the Berlin Wall

2. 2.00 credits in one language chosen from the following list:

FREN*1300	[0.50]	French Language II
FREN*2020	[0.50]	France: Literature and Society
FREN*2500	[0.50]	French Translation I
FREN*2520	[0.50]	French Composition I
FREN*2550	[0.50]	Contemporary France
FREN*3090	[0.50]	Classics of French Literature
FREN*3500	[0.50]	French Translation II
FREN*3520	[0.50]	French Composition II
OR		
GERM*2050	[0.50]	Introduction to Literature
GERM*2400	[0.50]	Contemporary Germany
GERM*2490	[0.50]	Intermediate German I
GERM*2500	[0.50]	Intermediate German II
GERM*3540	[1.00]	Advanced German
OR		
ITAL*2050	[0.50]	Introduction to Literature
ITAL*2090	[1.00]	Intermediate Italian
ITAL*3060	[0.50]	Advanced Italian
ITAL*3150	[0.50]	Medieval Italian Literature
ITAL*3400	[0.50]	Renaissance Lovers and Fools
OR		
SPAN*2000	[0.50]	Intermediate Spanish I
SPAN*2010	[0.50]	Intermediate Spanish II
SPAN*2040	[0.50]	Culture of Spain
SPAN*2990	[0.50]	Hispanic Literary Studies
SPAN*3500	[0.50]	Advanced Spanish I
SPAN*3530	[0.50]	Business Spanish

3. 1.50 credits; 0.50 credits from three of the following Groups A, B, C and D from the following list:

Group A

CLAS*1000	[0.50]	Introduction to Classical Culture
CLAS*2000	[0.50]	Classical Mythology
CLAS*2350	[0.50]	The Classical Tradition
FREN*3030	[0.50]	Good and Evil
FREN*3110	[0.50]	Storytelling in the Francophone World
FREN*3140	[0.50]	Women in Literature, Art and Film

FREN*3160	[0.50]	Songs, Lyrics and Poetry in French
FREN*3170	[0.50]	Fictions of Childhood
HIST*2850	[0.50]	Ancient Greece and Rome
HUMN*3020	[0.50]	Myth and Fairy Tales in Germany
HUMN*3400	[0.50]	Renaissance Lovers and Fools
HUMN*3470	[0.50]	Holocaust & WWII in German Lit. & Film

Note: Other Hispanic literature courses may be counted in this section provided the course-content is European-centered. Please see the ESP coordinator for further information.

Group B

HIST*1010	[0.50]	The Early Modern World
HIST*2200	[0.50]	The Medieval World
HIST*2510	[0.50]	Modern Europe Since 1789
HIST*2820	[0.50]	Modern France Since 1750
HIST*3230	[0.50]	Spain and Portugal, 1085 to 1668
HIST*3350	[0.50]	Modern Germany
HIST*3540	[0.50]	World War II
HIST*3570	[0.50]	Women in Modern Europe
HIST*3750	[0.50]	The Reformation
HIST*3820	[0.50]	Early Modern France
HIST*4090	[1.00]	Modern European History
HIST*4470	[0.50]	Special History Project Seminar I
HIST*4580	[1.00]	The French Revolution

Group C

ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II
ARTH*2550	[0.50]	The Italian Renaissance
ARTH*2580	[0.50]	Late Modern Art: 1900-1950
ARTH*2600	[0.50]	Early Modern Art
ARTH*3320	[0.50]	Lives: Aspects of Western Art
ARTH*3330	[0.50]	Display: Visual Culture in Western Europe
ARTH*3340	[0.50]	Studies in Renaissance and Baroque Art
MUSC*1060	[0.50]	Amadeus to Zeppelin: Music and Culture I
MUSC*2010	[0.50]	The Musical Avant-Garde

Note: other music history courses may be counted if students with knowledge of music are granted waivers by instructor. The substitution(s) must also be approved by the ESP coordinator.

Group D

PHIL*2140	[0.50]	History of Greek and Roman Philosophy
PHIL*2160	[0.50]	Modern European Philosophy to Hume
PHIL*3060	[0.50]	Medieval Philosophy
PHIL*3080	[0.50]	History of Modern European Philosophy from Kant
PHIL*3200	[0.50]	Contemporary European Philosophy
POLS*2000	[0.50]	Political Theory
POLS*2100	[0.50]	Comparative Politics
POLS*2200	[0.50]	International Relations
POLS*3450	[0.50]	European Governments and Politics

European Studies (EURS)

Interdisciplinary Program

The European Studies program is designed for students who seek a career in International Relations - especially in International Business and Administration - between Canada and Europe. It offers a combination of languages, specially designed courses in European thought, letters and history and specialization in either European Business or European Culture and Civilization

Successful completion of the European Studies major requires proficiency in one of the following languages (French, German, Italian or Spanish). In order to demonstrate language proficiency, students have two options: they may study for a year at a European University, in the country where their chosen core language is spoken, or they may write a final research paper in the chosen core language within a required fourth year European Studies course (see EURO*4740). It is highly recommended that students spend their third year studying at a European university, in the country where their chosen core language is spoken. The benefits of such an experience are considerable, both academically and personally. One specific academic outcome of a successful year abroad will be recognition that the student has fulfilled the program's core language requirement. For students who have spent one year studying at a European university in a country where their chosen core language is spoken, a course taken in that year involving a major academic paper or exam in the core language will, upon approval of the Co-ordinator of European Studies, be substituted for EURO*4740. See the Coordinator for the European Studies program for more information. See also the course description for EURO*4740.

Major (Honours Program)

A minimum of 12.50 credits is required, including:

a. the three components of the European Studies core (8.00 credits)

b. 4.50 credits in either the European Culture and Civilization or the European Business Studies area of emphasis

Core Requirements

1.

EURO*1100	[0.50]	European Film
EURO*1200	[0.50]	European Culture from the Mid 18th to the Mid 19th Century
EURO*2200	[0.50]	European Culture from the Mid 19th Century to the 1920's
EURO*3300	[0.50]	Before the Fall of the Berlin Wall
EURO*4050	[0.50]	Contemporary Europe. New Landscapes in the Post-Cold War Era
EURO*4740	[0.50]	Research Project in European Studies

Note: in order to demonstrate language proficiency, students must write a research paper (EURO*4740) in their core language unless they have spent one year studying at a European university, in the country where their chosen core language is spoken. Where that is the case, a course taken in that year involving a major academic paper of exam in the core language will, upon approval of the Co-ordinator for European Studies, EURO*4740.

2. 3.00 credits in one language:

FREN*1300	[0.50]	French Language II
FREN*2020	[0.50]	France: Literature and Society
FREN*2500	[0.50]	French Translation I
FREN*2520	[0.50]	French Composition I
FREN*2550	[0.50]	Contemporary France
FREN*3090	[0.50]	Classics of French Literature
FREN*3500	[0.50]	French Translation II
FREN*3520	[0.50]	French Composition II
OR		
GERM*2050	[0.50]	Introduction to Literature
GERM*2400	[0.50]	Contemporary Germany
GERM*2490	[0.50]	Intermediate German I
GERM*2500	[0.50]	Intermediate German II
GERM*3540	[1.00]	Advanced German
OR		
ITAL*2050	[0.50]	Introduction to Literature
ITAL*2090	[1.00]	Intermediate Italian
ITAL*3060	[0.50]	Advanced Italian
ITAL*3150	[0.50]	Medieval Italian Literature
ITAL*3400	[0.50]	Renaissance Lovers and Fools
OR		
SPAN*2000	[0.50]	Intermediate Spanish I
SPAN*2010	[0.50]	Intermediate Spanish II
SPAN*2040	[0.50]	Culture of Spain
SPAN*2990	[0.50]	Hispanic Literary Studies
SPAN*3220	[0.50]	Literature and Arts I: Spain Pre-1936
SPAN*3500	[0.50]	Advanced Spanish I
SPAN*3530	[0.50]	Business Spanish

3.

HIST*2510	[0.50]	Modern Europe Since 1789
HROB*2090	[0.50]	Individuals and Groups in Organizations
POLS*2200	[0.50]	International Relations
POLS*3450	[0.50]	European Governments and Politics

Areas of Emphasis

European Business

Required courses:

ACCT*1220	[0.50]	Introductory Financial Accounting
ACCT*2230	[0.50]	Management Accounting
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
MGMT*3320	[0.50]	Financial Management
MGMT*4000	[0.50]	Strategic Management

1.50 credits chosen from:

ECON*2200	[0.50]	Industrial Relations
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2560	[0.50]	Theory of Finance
ECON*3660	[0.50]	Economics of Equity Markets
ECON*3720	[0.50]	History of the World Economy Since 1850
ECON*3730	[0.50]	Europe and the World Economy to 1914
FARE*3310	[0.50]	Operations Management
FARE*4370	[0.50]	Food & Agri Marketing Management
HROB*3000	[0.50]	Human Resources Management
HTM*1000	[0.50]	Introduction to Hospitality and Tourism Management
HTM*2170	[0.50]	Responsible Tourism Policy and Planning
HTM*3030	[0.50]	Beverage Management
HTM*3160	[0.50]	Destination Management and Marketing
HTM*4050	[0.50]	Wine and Oenology
HTM*4170	[0.50]	International Tourism
MCS*1000	[0.50]	Introductory Marketing

MCS*2100	[0.50]	Personal Financial Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3000	[0.50]	Advanced Marketing
MCS*3040	[0.50]	Business and Consumer Law
STAT*2060	[0.50]	Statistics for Business Decisions

European Culture and Civilization

Students must take 4.50 credits including at least 0.50 credits from each of the following four groups. The remaining 2.50 credits may be chosen from any of the courses in the four groups.

Group A

CLAS*1000	[0.50]	Introduction to Classical Culture
CLAS*2000	[0.50]	Classical Mythology
CLAS*2350	[0.50]	The Classical Tradition
FREN*3030	[0.50]	Good and Evil
FREN*3110	[0.50]	Storytelling in the Francophone World
FREN*3140	[0.50]	Women in Literature, Art and Film
FREN*3160	[0.50]	Songs, Lyrics and Poetry in French
FREN*3170	[0.50]	Fictions of Childhood
HIST*2850	[0.50]	Ancient Greece and Rome
HUMN*3020	[0.50]	Myth and Fairy Tales in Germany
HUMN*3400	[0.50]	Renaissance Lovers and Fools
HUMN*3470	[0.50]	Holocaust & WWII in German Lit. & Film

Note: Other Spanish and Hispanic literature courses may be counted in this section provided the course-content is European-centered. Please see the ESP coordinator for further information.

Group B

HIST*1010	[0.50]	The Early Modern World
HIST*2200	[0.50]	The Medieval World
HIST*2820	[0.50]	Modern France Since 1750
HIST*3230	[0.50]	Spain and Portugal, 1085 to 1668
HIST*3350	[0.50]	Modern Germany
HIST*3540	[0.50]	World War II
HIST*3570	[0.50]	Women in Modern Europe
HIST*3750	[0.50]	The Reformation
HIST*3820	[0.50]	Early Modern France
HIST*4090	[1.00]	Modern European History
HIST*4470	[0.50]	Special History Project Seminar I
HIST*4580	[1.00]	The French Revolution

Group C

ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II
ARTH*2550	[0.50]	The Italian Renaissance
ARTH*2580	[0.50]	Late Modern Art: 1900-1950
ARTH*2600	[0.50]	Early Modern Art
ARTH*3320	[0.50]	Lives: Aspects of Western Art
ARTH*3330	[0.50]	Display: Visual Culture in Western Europe
ARTH*3340	[0.50]	Studies in Renaissance and Baroque Art
MUSC*1060	[0.50]	Amadeus to Zeppelin: Music and Culture I
MUSC*2010	[0.50]	The Musical Avant-Garde

Note: other music history courses may be counted if students with knowledge of music are granted waivers by instructor. The substitution(s) must also be approved by the ESP coordinator.

Group D

PHIL*2140	[0.50]	History of Greek and Roman Philosophy
PHIL*2160	[0.50]	Modern European Philosophy to Hume
PHIL*3060	[0.50]	Medieval Philosophy
PHIL*3080	[0.50]	History of Modern European Philosophy from Kant
PHIL*3200	[0.50]	Contemporary European Philosophy
POLS*2000	[0.50]	Political Theory
POLS*2100	[0.50]	Comparative Politics

Study Abroad

Year 3 or year 4 will provide students with the opportunity to continue their studies abroad. Students will select up to 6.00 credits which can be included in the area of emphasis, as electives, or both. They are subject to approval by the program coordinator and the departmental advisor. Courses taken in Europe will not count towards the specialization average.

Practicum Opportunity:

EURO*3700is available for those students wishing to participate in a practicum experience as part of the year abroad. The practicum must be a job or volunteer experience that contributes to the student's area of study and intended career. It must be approved in advance by the Coordinator. A final report, written in the student's chosen language, is a requirement of this course.

Family and Child Studies (FCS)

Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences

Family and Child Studies is offered as a minor in the honours program. It is designed to provide students with an opportunity to pursue interdisciplinary studies which have a specific focus on human development over the life span and on the applied questions which relate to the needs of children and the functioning of families. Elective courses may be chosen to emphasize the family, the child, or a combination of the two. Students seeking counselling should consult with a faculty advisor in the Department of Family Relations and Applied Nutrition.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

FRHD*1010	[0.50]	Human Development
FRHD*1020	[0.50]	Couple and Family Relationships
FRHD*2270	[0.50]	Development in Early and Middle Childhood
FRHD*3040	[0.50]	Parenting and Intergenerational Relationships
NUTR*1010	[0.50]	Introduction to Nutrition

A further 2.50 credits offered by the Department of Family Relations and Applied Nutrition (FRHD or NUTR*2050), of which at least 1.00 must be at the 3000 level or above.

Note: where students are required to complete PSYC*2450 for their program of study, FRHD*2270 will not be required in the FCS minor, PSYC*2450 will be substituted for FRHD*2270.

Food, Agricultural and Resource Economics (FARE)

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

Food and Agriculture connect people with the world's natural resource base and are at the heart of global issues. In this major, students will acquire the analytical and management skills needed to develop the capacity to effectively deal with emerging issues and challenges, such as food, security and sustainability. Building on the understanding of economic theory and applied methods in both the Canadian and world context, a variety of job opportunities arise in industry, government agencies and non-governmental organizations.

Beyond the core offering, the major provides the flexibility for students to pursue thematic areas of study, as well as an opportunity to take additional liberal arts courses. In addition, this major provides excellent background for those students planning to undertake graduate work in food, agricultural or resource economics and other fields of applied economics.

Major (Honours Program)

A minimum of 11.00 credits, consisting of the 9.50 credits specified below plus 1.50 credits of restricted electives, is required, including:

ACCT*1220	[0.50]	Introductory Financial Accounting
AGR*1110	[1.00]	Introduction to the Agri-Food Systems
FARE*1300	[0.50]	Poverty, Food & Hunger
FARE*1400	[1.00]	Economics of the Agri-Food System
FARE*2410	[0.50]	Agrifood Markets and Policy
FARE*2700	[0.50]	Survey of Natural Resource Economics
FARE*3030	[0.50]	The Firm and Markets
FARE*4000	[0.50]	Agricultural and Food Policy
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics
ECON*2770	[0.50]	Introductory Mathematical Economics
ECON*3740	[0.50]	Introduction to Econometrics

One of:

FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*4360	[0.50]	Marketing Research
FARE*4500	[0.50]	Decision Science

One of:

MATH*1030	[0.50]	Business Mathematics
MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

1.50 additional credits, at least of which 0.50 credits must be at the 4000 level, chosen from the following list of thematic streams with the Food, Agricultural and Resource Economics specialization:

Food and Agribusiness Management:

FARE*4220	[0.50]	Advanced Agribusiness Management
FARE*4240	[0.50]	Futures and Options Markets
FARE*4370	[0.50]	Food & Agri Marketing Management
MGMT*3320	[0.50]	Financial Management

International Agricultural Development Economics:

ECON*2650	[0.50]	Introductory Development Economics
FARE*3250	[0.50]	Food and International Development

FARE*4210	[0.50]	World Agriculture, Food Security and Economic Development

Resource Economics:

ECON*4930	[0.50]	Environmental Economics
FARE*4290	[0.50]	Land Economics
FARE*4310	[0.50]	Resource Economics

Notes: A student may obtain permission to substitute certain other courses for the ones listed if the substitute courses fit with the students program. Approval from a departmental advisor is required.

Unless taken to satisfy the requirements of another program, no student may receive credit in this program for more than one of the following statistics prerequisites ECON*2740, STAT*2040, STAT*2060, or STAT*2080.

French Studies (FREN)

School of Languages and Literatures, College of Arts

All language courses carry 0.50 credits. Please note that students with Ontario Grade 12 credit or its equivalent in French are not normally admitted into FREN*1090, FREN*1100 or FREN*1150. Francophone students usually start the program with second-year courses conditional upon approval by the Faculty Advisor. Students majoring in French are advised to take elective courses in another Romance language and in Latin.

It is also recommended that students include LING*1000 among the electives in order to derive the maximum benefit from their studies. Except where stated otherwise, literary texts are, at all levels, studied in the original language. Students registering in French courses are expected to have the appropriate academic background.

Area of Concentration (General Program)

A minimum of 5.00 French credits taught in French is required, including:

FREN*1200	[0.50]	French Language I
FREN*1300	[0.50]	French Language II
FREN*2020	[0.50]	France: Literature and Society
FREN*2060	[0.50]	Quebec: Literature and Society
FREN*2520	[0.50]	French Composition I

2.50 additional credits in French

Major (Honours Program)

A minimum of 8.00 French credits taught in French is required, including:

FREN*1200	[0.50]	French Language I
FREN*1300	[0.50]	French Language II
FREN*2020	[0.50]	France: Literature and Society
FREN*2060	[0.50]	Quebec: Literature and Society
FREN*2520	[0.50]	French Composition I

at least 1.50 credits at the 4000 level
4.00 additional credits in French

Minor (Honours Program)

A minimum of 5.00 French credits taught in French is required, including:

FREN*1200	[0.50]	French Language I
FREN*1300	[0.50]	French Language II
FREN*2020	[0.50]	France: Literature and Society
FREN*2060	[0.50]	Quebec: Literature and Society
FREN*2520	[0.50]	French Composition I

2.50 additional credits in French

Notes:

1. Students are strongly urged to take at least 0.50 language credits each semester semester and they must plan to take a 4th year course in their 3rd year.
2. Students of French are encouraged to take advantage of the French residence on this campus. Applications for accommodation in the Maison Française should be made well in advance of registration.
3. FREN*1090, FREN*1100, FREN*1150, are not counted toward a specialization in French.
4. Native speakers of French (or non-francophone equivalent) will not normally be admitted into FREN*1200 and FREN*1300. It is recommended they start their program with FREN*2020, FREN*2060, FREN*2500, or FREN*2520 with the approval of the Faculty Advisor.

Studies in Quebec or Abroad

The French program encourages students to spend 1 or 2 semesters in a French-speaking province or country, or to pursue their studies in an immersion program at the university level. A letter of permission is required (see Section VIII--Undergraduate Degree Regulations & Procedures). Students may also take advantage of federal-provincial programs such as the Explore program Year in Nice.

Year in Nice

A special year-long program in Nice, France, is offered to Guelph students at semester levels 5 and 6. All courses for which transfer credits have been arranged are credited at Guelph without the need for letters of permission; students pay only Guelph academic fees and are eligible for OSAP. For further information see the Head of French Studies.

Geography (GEOG)

Department of Geography, College of Social and Applied Human Sciences

The Department of Geography provides students with a broad range of courses in Human and Physical Geography which focus on the nature and evolution of the numerous and complex physical and human environment systems of the world. Students are required to select courses from both the human and physical fields. Within the program of studies it is possible for students through course selection to follow a particular line of interest in, for example, Rural Geography, Resource Management, Urban and Economic Geography, Biophysical Resources or Geomorphology.

The 1000 level courses provide a foundation for the Geography programs and are prerequisites or are strongly recommended for many of the 2000 level courses. The 2000 level systematic courses are prerequisite to the corresponding advanced courses at the 3000 and 4000 level. All students should obtain a copy of the department program planning guide and consult with faculty before planning their course of studies.

Students contemplating graduate or professional programs of study following completion of the honours program should consult a faculty advisor for advice on additional courses that they should take.

The department also offers a B.SC. honours Earth Surface Science program (jointly with Land Resources Science), a B.SC.(ENV.) honours Environmental Geography Major program, and a B.SC. honours program Minor in Geographic Information Systems and Environmental Analysis which are described in the schedule of studies for each of the programs (Section X). Geography B.A. honours Majors are eligible to take the B.SC. Minor. All Geography students are encouraged to consult with a faculty advisor regarding course selection.

The following courses may be counted as Geography credits: ENVS*2030, ENVS*2060, ENVS*4220 , GEOL*2150 , MET*2030 , SOIL*2010 .

Area of Concentration (General Program)

A minimum of 5.00 credits in Geography is required, including:

GEOG*1200	[0.50]	Society and Space
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Two of:

GEOG*2000	[0.50]	Geomorphology
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*2230	[0.50]	Economic Geography
GEOG*2260	[0.50]	Applied Human Geography

One of:

GEOG*2460	[0.50]	Analysis in Geography
GEOG*2480	[0.50]	Mapping and GIS

2.00 credits at the 3000 level or above

Major (Honours Program)

A minimum of 9.00 credits in Geography is required, including:

GEOG*1200	[0.50]	Society and Space
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*2000	[0.50]	Geomorphology
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*2230	[0.50]	Economic Geography
GEOG*2260	[0.50]	Applied Human Geography
GEOG*2460	[0.50]	Analysis in Geography
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3480	[0.50]	GIS and Spatial Analysis
GEOG*4880	[0.50]	Contemporary Geographic Thought

3.00 additional credits in Geography at the 3000 level or above including at least 1.50 credits at the 4000 level.

Minor (Honours Program)

A minimum of 5.00 credits in Geography is required, including:

Two of:

GEOG*1200	[0.50]	Society and Space
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Two of:

GEOG*2000	[0.50]	Geomorphology
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*2230	[0.50]	Economic Geography

One of:

GEOG*2260	[0.50]	Applied Human Geography
GEOG*2460	[0.50]	Analysis in Geography
GEOG*2480	[0.50]	Mapping and GIS

2.50 credits in Geography at the 3000 or 4000 level, 0.50 of which must be at the 4000 level.

German (GERM)

School of Languages and Literatures, College of Arts

All language courses carry 0.50 credits. Students with two years of high school German or equivalent may not be admitted into GERM*1100. Students with 12U German credit or its equivalent may be admitted into GERM*1110 only with the approval of the department. All language students are advised to include LING*1000 among their electives in order to derive the maximum benefit from their studies. Except where stated otherwise, literary texts are, at all levels, studied in the original language. Students registering in these courses will be expected to have the appropriate knowledge.

Study Abroad

The School of Languages and Literatures encourages students in the German program to spend 1 or 2 semesters in a German speaking country to continue their studies at the University level. Credit for programs of study successfully completed may be applied towards the University of Guelph degree requirements.). For more information, contact the Centre for International Program or the School of Languages and Literatures.

Minor (Honours Program)

A minimum of 5.00 credits in German is required.
Upon passing both the German designation and its Humanities co-requisites, students may also count HUMN*3020 and HUMN*3470 toward the German minor.
Students enrolled in the German program must contact the School of Languages and Literatures for an up-to-date sequence of course offerings.

History (HIST)

Department of History, College of Arts

Courses marked (H) are designed as honours courses. Students in a general program wishing to take these must obtain the permission of instructors concerned. All other courses may be taken by both general and honours students. Students wishing to take a 3000 level course must have pass standing in at least 5.00 credits in university courses.

Students wishing to take a 4000 level course must have pass standing in at least 10.00 university credits. Access to all 4000 level history courses is restricted to students in the B.A. Honours program with at least a 70% average in all history course attempts. Students should note the prerequisite requirements of upper level courses in planning their individual programs.

Students entering semester 1 are advised to choose from 1000 level courses. Second semester students wishing to take an advanced level History course should select that course from the History core.

Core Requirements

HIST*1050 [0.50] Invitation to History
HIST*2100 [0.50] Pre-Confederation Canada
HIST*2450 [0.50] The Practising Historian
HIST*2600 [0.50] Post-Confederation Canada
One of:
- HIST*1010 [0.50] The Early Modern World
- HIST*1150 [0.50] The Modern World
- HIST*1250 [0.50] Science and Technology in a Global Context

0.50 credits from each of a) Pre-Modern; b) Developing World; and c) Thematic. Course lists available in the Department of History and at:http://www.uoguelph.ca/history/.

Area of Concentration (General Program)

A minimum of 5.00 credits in History is required, including:

a. at least 1.50 credits in History must be at the 3000 level (excluding HIST*3470)

b. students should take the History Core Requirements

Note: With the permission of the department, students may select as part of their program 0.50 credits outside the History Department such as ECON*2420, ECON*3730, EURO*4050.

Major (Honours Program)

A minimum of 8.50 credits in History courses is required, including:

HIST*1050 [0.50] Invitation to History
HIST*2100 [0.50] Pre-Confederation Canada
HIST*2450 [0.50] The Practising Historian
HIST*2600 [0.50] Post-Confederation Canada
One of:
- HIST*1010 [0.50] The Early Modern World
- HIST*1150 [0.50] The Modern World
- HIST*1250 [0.50] Science and Technology in a Global Context

0.50 credits from each of a) Pre-Modern; b) Developing World; and c) Thematic. Course lists available in the Department of History and at http://www.uoguelph.ca/history/.

4.50 additional credits in History including 2.00 at the 4000 level

Minor (Honours Program)

A minimum of 5.00 credits in History is required, including:

HIST*1050 [0.50] Invitation to History
HIST*2100 [0.50] Pre-Confederation Canada
HIST*2450 [0.50] The Practising Historian
HIST*2600 [0.50] Post-Confederation Canada
One of:
- HIST*1010 [0.50] The Early Modern World
- HIST*1150 [0.50] The Modern World
- HIST*1250 [0.50] Science and Technology in a Global Context

0.50 credits from each of a) Pre-Modern; b) Developing World; and c) Thematic. Course lists available in the Department of History and at http://www.uoguelph.ca/history/.

1.00 additional credits in History at the 3000 or 4000 level

Note: Honours students in History may, with the permission of the department, take up to 1.00 credits from outside the department such as ECON*2420, ECON*3730, EURO*4050.

Students considering graduate work are advised to take 2.00 - 3.00 additional upper level History credits perhaps including the Special History Project Seminar (HIST*4470, HIST*4970) and to acquire a reading knowledge of a foreign language.

Honours students must complete HIST*2450 by the end of their third semester to be eligible for 3000 level History courses.

Individual Studies (IS)

Interdisciplinary Program

B.A. Counselling Office, Room 130, MacKinnon Building, Ext. 52140.

Honours B.A. students have the option of doing an Individual Studies Major. Students in the Individual Studies Major have the opportunity to determine the goals and methods of their studies. Areas of study can include courses in any of the colleges and where the University of Guelph has faculty expertise to assist students. Students are encouraged to develop an interdisciplinary perspective, and to explore the methods of inquiry which provide depth of knowledge in a specific subject.

A student submitting a proposal for the Individual Studies Major must submit the complete proposal to the B.A. Program Counsellor before the third week of classes of semester four. The B.A. Program Committee will consider proposals once, and will approve, approve with revisions, or deny the proposal. Proposals cannot be resubmitted.

Proposals will not be considered unless they articulate a detailed rationale for a coherent program of studies that is significantly different from any existing major and minor combination at the University of Guelph, and unless the proposal meets the following criteria:

a. minimum of 9.00 credits

b. minimum of 4.00 credits at the 3000 level and above, including at least 1.00 credits at the 4000 level

c. minimum of 1.00 credits in methods and/or theory

d. maximum of 1.50 credits at the 1000 level

e. a senior level Directed Readings or Special Project course must be completed. When appropriate, the Committee will identify a faculty member as the supervisor for a student's course of study.

A student wishing to submit a proposed program of studies for the Individual Studies Major must prepare a proposal that will include the following:

a. a clear statement of theme or areas of study

b. a clear statement of the contribution of the major to a post-graduation field of work or study

c. a clearly set out rationale for inclusion of the specific courses and how they relate to or develop the theme or areas of study

d. a list of required "core" courses and "restricted electives" following the above criteria. When proposing core and restricted elective credits, students should keep in mind the prerequisites for their desired 3000 and 4000 level courses

Note: Students undertaking the Individual Studies Major must fulfill the requirements of the B.A. Honours Program as set out in Section X. The B.A. Program Counsellor is the academic counsellor. The Individual Studies designation will appear on the student's transcript upon graduation, but the title or subject of the major will not.

Information Systems and Human Behaviour (ISHB)

Interdisciplinary Program

As computers and communications play progressively more subtle and significant roles in society, this program of study brings together the elements of 3 disciplines to provide students with an understanding of technical, behavioural and social aspects of information technology. This program of study is a co-operative effort of the School of Computer Science, Department of Psychology, and Department of Sociology and Anthropology. Students in this program will be advised by the program coordinator in the School of Computer Science.

Major (Honours Program)

School of Computing Science Courses

CIS*1500 [0.50] Introduction to Programming
CIS*1910 [0.50] Discrete Structures in Computing I
CIS*2430 [0.50] Object Oriented Programming
CIS*2500 [0.50] Intermediate Programming

CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration
CIS*2910	[0.50]	Discrete Structures in Computing II
CIS*3530	[0.50]	Data Base Systems and Concepts
CIS*3750	[0.75]	System Analysis and Design in Applications
CIS*4300	[0.50]	Human Computer Interaction

Psychology Courses

PSYC*1000	[0.50]	Introduction to Psychology
PSYC*2360	[0.50]	Introductory Research Methods
PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*2650	[0.50]	Cognitive Psychology
PSYC*3080	[0.50]	Organizational Psychology

0.50 additional Psychology credits a the 3000 level or above.

One of:

SOAN*2040	[0.50]	Globalization of Work and Organizations
PSYC*2310	[0.50]	Introduction to Social Psychology

One of:

PSYC*3330	[0.50]	Memory
PSYC*3340	[0.50]	Psycholinguistics

0.50 electives from a 4000 level Psychology course

Sociology and Anthropology Courses

ANTH*1150	[0.50]	Introduction to Anthropology
SOC*1100	[0.50]	Sociology
SOAN*3070	[0.50]	Qualitative and Observational Methods

0.50 electives from a 4000 level course in ANTH, SOAN or SOC

Statistics Courses

STAT*2040	[0.50]	Statistics I

International Development (ID)

Interdisciplinary Program

Faculty Advisor: Room 045 MacKinnon Building, ext 56175.

The International Development program provides students with an opportunity to pursue interdisciplinary and comparative studies of long-term change and international inequality.

A broad coverage of the process of international development, from the perspectives of history and social science, forms the basis for more in-depth study on such topics as economic growth, the biophysical environment, gender, agriculture and rural life, politics and administration, and the Latin American region.

The primary participating departments are Economics, Geography, Political Science, and Sociology and Anthropology.

Area of Concentration (General Program)

A minimum of 5.00 credits is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
IDEV*2500	[0.50]	International Development Studies
POLS*2080	[0.50]	Development and Underdevelopment

2.50 credits from the following Restricted Elective list, as indicated below. A minimum of 0.50 credits must be taken from each group and at least 1.50 credits must be taken at the 3000 level. Students are advised to check prerequisites for their desired upper level courses.

Geography

GEOG*2030	[0.50]	Environment and Development
GEOG*3020	[0.50]	Global Environmental Change
GEOG*3050	[0.50]	Development and the City
GEOG*3320	[0.50]	Food Systems: Issues in Security and Sustainability

Sociology/Anthropology

ANTH*3670	[0.50]	Indigenous Peoples: Global Context
SOAN*3240	[0.50]	Gender & Global Inequality I
SOAN*3250	[0.50]	Social Change in Latin America
SOAN*3680	[0.50]	Perspectives on Development

Economics or Food, Agricultural and Resource Economics

ECON*2100	[0.50]	Economic Growth and Environmental Quality
ECON*2650	[0.50]	Introductory Development Economics
ECON*3720	[0.50]	History of the World Economy Since 1850
ECON*3730	[0.50]	Europe and the World Economy to 1914
FARE*1300	[0.50]	Poverty, Food & Hunger
FARE*3250	[0.50]	Food and International Development

Political Science and History

HIST*2340	[0.50]	Migrations in the Atlantic World, 1500-1850
HIST*2890	[0.50]	Early Islamic World
HIST*2910	[0.50]	Modern Asia
HIST*2920	[0.50]	Republican Latin America
HIST*3070	[0.50]	Modern India
HIST*3150	[0.50]	History and Culture of Mexico
HIST*3320	[0.50]	Modern China
HIST*3360	[0.50]	History and Culture of Brazil
HIST*3410	[0.50]	Pre-Colonial Africa
HIST*3580	[0.50]	Women's History in Asia
HIST*3590	[0.50]	Ancient & Medieval India
HIST*3830	[0.50]	Modern Middle East
HIST*3910	[0.50]	Africa Since 1800
POLS*3000	[0.50]	Politics of Africa
POLS*3060	[0.50]	Politics of the Middle East and North Africa
POLS*3080	[0.50]	Politics of Latin America
POLS*3160	[0.50]	Women and Politics in the Third World
POLS*3320	[0.50]	Politics of Aid & Development
POLS*3490	[0.50]	Conflict and Conflict Resolution
POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*3790	[0.50]	The Political Economy of International Relations
POLS*3890	[0.50]	Government and Politics of India

Major (Honours Program)

A minimum of 12.50 credits is required, including the core of 7.50 credits and one of seven areas of emphasis for 5.00 credits. The areas are: Economic and Business Development, Gender and Development, Rural and Agricultural Development, Environment and Development, Latin American Studies, Political Economy and Administrative Change, and Historical Perspectives in Development. Students must select an area of emphasis by the end of the 4th semester of university study.

International Development students are encouraged to acquire at least one foreign language and to work or study abroad.

With the permission of the International Development Studies faculty advisor, students may replace 0.50 credits from their area of emphasis with IDEV*3200, or 1.00 credits from their area of emphasis with IDEV*4190 and IDEV*4200.

Note: When selecting courses, students should keep in mind the prerequisites for their desired 3000 and 4000 level courses.

Core Requirements

ANTH*1150	[0.50]	Introduction to Anthropology
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2650	[0.50]	Introductory Development Economics
GEOG*2030	[0.50]	Environment and Development
GEOG*3050	[0.50]	Development and the City
IDEV*2500	[0.50]	International Development Studies *
IDEV*4500	[1.00]	International Development Seminar **
POLS*2080	[0.50]	Development and Underdevelopment

One of:

IDEV*3010	[0.50]	Case Studies in International Development

0.50 credits from relevant semester abroad, exchange program or experience abroad for credit, as approved by International Development advisor***

One of:

HIST*2930	[0.50]	Women and Cultural Change
SOAN*2400	[0.50]	Introduction to Gender Systems
WMST*1000	[0.50]	Introduction to Women's Studies
WMST*2000	[0.50]	Women and Representation

One of:

ECON*3720	[0.50]	History of the World Economy Since 1850
ECON*3730	[0.50]	Europe and the World Economy to 1914

One of:

EDRD*4020	[0.50]	Rural Extension in Change and Development
FARE*1300	[0.50]	Poverty, Food & Hunger
FARE*3250	[0.50]	Food and International Development
SOC*2080	[0.50]	Rural Sociology

One of:

POLS*3320	[0.50]	Politics of Aid & Development
POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*3790	[0.50]	The Political Economy of International Relations

* students normally complete IDEV*2500 before Semester 5

** students normally complete IDEV*4500 in their final year of study

*** Students should check the Course planning guide on http://www.ids.uoguelph.ca/ for more information and are encouraged to discuss their plans with the advisor well in advance.

Areas of Emphasis

Environment and Development

GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics
HIST*2250	[0.50]	Environment and History

HIST*3460 [0.50] Natural Disasters in Global History
PHIL*2070 [0.50] Philosophy of the Environment
POLS*3370 [0.50] Environmental Politics and Governance
SOC*2280 [0.50] Society and Environment
SOC*3380 [0.50] Society and Nature

Choose Option A or B

Option A - Biophysical Environment

GEOG*2460 [0.50] Analysis in Geography

Two of:

GEOG*2110 [0.50] Climate and the Biophysical Environment
GEOG*2480 [0.50] Mapping and GIS
GEOG*3020 [0.50] Global Environmental Change
GEOG*3110 [0.50] Biotic and Natural Resources
GEOG*3610 [0.50] Environmental Hydrology

Two of:

GEOG*3480 [0.50] GIS and Spatial Analysis
GEOG*4110 [1.00] Environmental Systems Analysis
GEOG*4210 [0.50] Environmental Governance
GEOG*4220 [0.50] Local Environmental Management
GEOG*4230 [0.50] Environmental Impact Assessment
GEOG*4250 [0.50] Coastal Processes
GEOG*4480 [1.00] Applied Geomatics

Option B - Human Environment

GEOG*2260 [0.50] Applied Human Geography

Two of:

GEOG*2480 [0.50] Mapping and GIS
GEOG*3020 [0.50] Global Environmental Change
GEOG*3090 [0.50] Gender and Environment
GEOG*3320 [0.50] Food Systems: Issues in Security and Sustainability
GEOG*3490 [0.50] Tourism and Environment
GEOG*3600 [0.50] Geography of a Selected Region

Two of:

GEOG*3480 [0.50] GIS and Spatial Analysis
GEOG*4200 [0.50] Social Life of Cities
GEOG*4210 [0.50] Environmental Governance
GEOG*4220 [0.50] Local Environmental Management
GEOG*4230 [0.50] Environmental Impact Assessment
GEOG*4390 [0.50] Seminar in Rural Geography
GEOG*4480 [1.00] Applied Geomatics

Economic and Business Development

ACCT*1220 [0.50] Introductory Financial Accounting
ECON*2310 [0.50] Intermediate Microeconomics *
ECON*2410 [0.50] Intermediate Macroeconomics *
ECON*2740 [0.50] Economic Statistics *

Two of:

ECON*4720 [0.50] Topics in Economic History
ECON*4830 [0.50] Economic Development
ECON*4880 [0.50] Topics in International Economics
ECON*4890 [0.50] History of Economic Thought
ECON*4900 [0.50] Special Study in Economics
ECON*4930 [0.50] Environmental Economics
FARE*4290 [0.50] Land Economics
FARE*4310 [0.50] Resource Economics

1.50 additional credits at the 2000 level or above in ECON or FARE, at least 0.50 being in ECON and at least 1.00 being at the 3000 level or above.

0.50 additional credits with a regional focus at the 2000 level or above in ANTH, GEOG, HIST, IDEV, ISS, POLS, SOAN or SOC. See the Course planning guide on http://www.ids.uoguelph.ca/ for a list of appropriate courses.

* Entry into ECON*2310, ECON*2410 and ECON*2740 requires a 1000-level MATH course.

Gender and Development

ANTH*2160 [0.50] Social Anthropology
SOAN*2120 [0.50] Introductory Methods
SOAN*3240 [0.50] Gender & Global Inequality I
SOAN*4230 [0.50] Gender & Global Inequality II

One of the following not taken as part of the core:

ANTH*2230 [0.50] Regional Ethnography
SOC*2080 [0.50] Rural Sociology

One of:

SOAN*3070 [0.50] Qualitative and Observational Methods
SOAN*3120 [0.50] Quantitative Methods

One of:

ANTH*3400 [0.50] The Anthropology of Gender
ANTH*3670 [0.50] Indigenous Peoples: Global Context
ANTH*3690 [0.50] Engaging Anthropological Theory
ANTH*3770 [0.50] Kinship, Family, and Power
SOAN*3100 [0.50] Gender Perspectives on Families and Households

Two of the following not taken as part of the core, at least 0.50 credits being at the 3000 level:

ENGL*2880 [0.50] Women in Literature
GEOG*3090 [0.50] Gender and Environment
HIST*2800 [0.50] The History of the Modern Family
HIST*2930 [0.50] Women and Cultural Change
HIST*3020 [0.50] Sexuality and Gender in History
HIST*3580 [0.50] Women's History in Asia
PHIL*2060 [0.50] Philosophy of Feminism I
POLS*2150 [0.50] Gender and Politics
POLS*3160 [0.50] Women and Politics in the Third World
POLS*3710 [0.50] Politics and Sexuality
WMST*2000 [0.50] Women and Representation

0.50 additional credits at the 4000 level in ANTH, SOAN, SOC.

Historical Perspectives in Development

HIST*1150 [0.50] The Modern World
HIST*2450 [0.50] The Practising Historian

One of:

HIST*1010 [0.50] The Early Modern World
HIST*1050 [0.50] Invitation to History
HIST*1250 [0.50] Science and Technology in a Global Context

One of:

HIST*2070 [0.50] World Religions in Historical Perspective
HIST*2250 [0.50] Environment and History
HIST*2340 [0.50] Migrations in the Atlantic World, 1500-1850
HIST*2500 [0.50] Britain Since 1603
HIST*2890 [0.50] Early Islamic World
HIST*2910 [0.50] Modern Asia
HIST*2920 [0.50] Republican Latin America

Three of the following not taken as part of the core:

ECON*2420 [0.50] Canadian Economic History
ECON*3720 [0.50] History of the World Economy Since 1850
ECON*3730 [0.50] Europe and the World Economy to 1914
HIST*3070 [0.50] Modern India
HIST*3150 [0.50] History and Culture of Mexico
HIST*3270 [0.50] Revolution in the Modern World
HIST*3310 [0.50] Disease and History
HIST*3320 [0.50] Modern China
HIST*3360 [0.50] History and Culture of Brazil
HIST*3380 [0.50] British Imperialism in Asia and Africa
HIST*3410 [0.50] Pre-Colonial Africa
HIST*3460 [0.50] Natural Disasters in Global History
HIST*3470 [0.50] Independent Reading
HIST*3580 [0.50] Women's History in Asia
HIST*3590 [0.50] Ancient & Medieval India
HIST*3830 [0.50] Modern Middle East
HIST*3840 [0.50] Ottoman Empire, 1300-1923
HIST*3910 [0.50] Africa Since 1800

1.00 additional credits at the 4000-level in HIST.

0.50 additional credits with a regional focus at the 2000 level or above in ANTH, GEOG, IDEV, ISS, POLS, SOAN or SOC. See the Course planning guide on http://www.ids.uoguelph.ca/ for a list of appropriate courses.

Latin American Studies

SPAN*2000 [0.50] Intermediate Spanish I
SPAN*2010 [0.50] Intermediate Spanish II
SPAN*3500 [0.50] Advanced Spanish I

One of:

POLS*3180 [0.50] Research Methods I: Political Inquiry and Methods
SOAN*2120 [0.50] Introductory Methods

Three of:

SPAN*2990 [0.50] Hispanic Literary Studies
SPAN*3080 [0.50] Spanish American Culture
HIST*2920 [0.50] Republican Latin America
HIST*3150 [0.50] History and Culture of Mexico
HIST*3360 [0.50] History and Culture of Brazil
HUMN*3300 [0.50] Latin American Studies in the Humanities
ISS*3300 [0.50] Latin American Studies in the Social Sciences
POLS*3080 [0.50] Politics of Latin America
SOAN*3250 [0.50] Social Change in Latin America

0.50 additional credits in SPAN at the 3000 level*

1.00 additional credits at the 4000 level in SPAN or in ANTH, HIST, IDEV, POLS, SOAN, SOC with a focus on Latin America or the Caribbean. See the Course planning guide on http://www.ids.uoguelph.ca/ for a list of appropriate courses.

***Note:** SPAN*2990 or permission of the instructor is required for 3rd year literature courses.

Political Economy and Administrative Change

POLS*3180 [0.50] Research Methods I: Political Inquiry and Methods
Two of:
- POLS*2000 [0.50] Political Theory
- POLS*2100 [0.50] Comparative Politics
- POLS*2200 [0.50] International Relations

Two of the following not taken as part of the core:
- ECON*2100 [0.50] Economic Growth and Environmental Quality
- ECON*2310 [0.50] Intermediate Microeconomics
- ECON*2720 [0.50] Business History
- ECON*3720 [0.50] History of the World Economy Since 1850
- ECON*3730 [0.50] Europe and the World Economy to 1914
- ECON*4720 [0.50] Topics in Economic History
- ECON*4830 [0.50] Economic Development
- ECON*4890 [0.50] History of Economic Thought
- FARE*2700 [0.50] Survey of Natural Resource Economics
- FARE*3170 [0.50] Cost-Benefit Analysis
- FARE*3250 [0.50] Food and International Development
- FARE*4210 [0.50] World Agriculture, Food Security and Economic Development
- FARE*4290 [0.50] Land Economics
- FARE*4310 [0.50] Resource Economics

1.00 additional credits in POLS at the 3000-level, not taken as part of the core.
1.00 additional credits in POLS at the 4000 level
0.50 additional credits with a regional focus at the 2000 or 3000 level in HIST or POLS. See the Course planning guide on http://www.ids.uoguelph.ca/ for a list of appropriate courses.

Rural and Agricultural Development

AGR*2150 [0.50] Plant Agriculture for International Development
SOAN*2120 [0.50] Introductory Methods
One of the following not taken as part of the core:
- ANTH*2160 [0.50] Social Anthropology
- FARE*1300 [0.50] Poverty, Food & Hunger
- FARE*2700 [0.50] Survey of Natural Resource Economics
- SOC*2080 [0.50] Rural Sociology

One of:
- FARE*3170 [0.50] Cost-Benefit Analysis
- SOAN*3070 [0.50] Qualitative and Observational Methods
- SOAN*3120 [0.50] Quantitative Methods

Two of the following not taken as part of the core:
- ANTH*3670 [0.50] Indigenous Peoples: Global Context
- ANTH*3690 [0.50] Engaging Anthropological Theory
- FARE*3250 [0.50] Food and International Development
- GEOG*3320 [0.50] Food Systems: Issues in Security and Sustainability
- SOAN*3240 [0.50] Gender & Global Inequality I
- SOAN*3250 [0.50] Social Change in Latin America
- SOAN*3680 [0.50] Perspectives on Development
- SOC*3380 [0.50] Society and Nature
- Any EDRD courses at the 3000 level or above.

1.00 additional credits in AGR, BIOL, BOT, CROP, ENVS, HORT, NRS or OAGR, at least 0.50 being at the 3000-level or above. See the Course planning guide on http://www.ids.uoguelph.ca/ for a list of appropriate courses.
1.00 additional credits in ANTH, FARE, SOAN or SOC at the 4000 level.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:
ANTH*1150 [0.50] Introduction to Anthropology
ECON*1050 [0.50] Introductory Microeconomics
ECON*1100 [0.50] Introductory Macroeconomics
IDEV*2500 [0.50] International Development Studies
POLS*2080 [0.50] Development and Underdevelopment
2.50 credits from the following Restricted Elective list, as indicated below. A minimum of 0.50 credits must be taken from each group and at least 1.50 credits must be taken at the 3000 level. Students are advised to check prerequisites for their desired upper level courses.
Geography
- GEOG*2030 [0.50] Environment and Development
- GEOG*3020 [0.50] Global Environmental Change
- GEOG*3050 [0.50] Development and the City
- GEOG*3320 [0.50] Food Systems: Issues in Security and Sustainability

Sociology/Anthropology
- ANTH*3670 [0.50] Indigenous Peoples: Global Context
- SOAN*3240 [0.50] Gender & Global Inequality I
- SOAN*3250 [0.50] Social Change in Latin America
- SOAN*3680 [0.50] Perspectives on Development

Economics or Food, Agricultural and Resource Economics
- ECON*2100 [0.50] Economic Growth and Environmental Quality
- ECON*2650 [0.50] Introductory Development Economics
- ECON*3720 [0.50] History of the World Economy Since 1850
- ECON*3730 [0.50] Europe and the World Economy to 1914
- FARE*1300 [0.50] Poverty, Food & Hunger
- FARE*3250 [0.50] Food and International Development

Political Science and History
- HIST*2340 [0.50] Migrations in the Atlantic World, 1500-1850
- HIST*2890 [0.50] Early Islamic World
- HIST*2910 [0.50] Modern Asia
- HIST*2920 [0.50] Republican Latin America
- HIST*3070 [0.50] Modern India
- HIST*3150 [0.50] History and Culture of Mexico
- HIST*3320 [0.50] Modern China
- HIST*3360 [0.50] History and Culture of Brazil
- HIST*3410 [0.50] Pre-Colonial Africa
- HIST*3580 [0.50] Women's History in Asia
- HIST*3590 [0.50] Ancient & Medieval India
- HIST*3830 [0.50] Modern Middle East
- HIST*3910 [0.50] Africa Since 1800
- POLS*3000 [0.50] Politics of Africa
- POLS*3060 [0.50] Politics of the Middle East and North Africa
- POLS*3080 [0.50] Politics of Latin America
- POLS*3160 [0.50] Women and Politics in the Third World
- POLS*3320 [0.50] Politics of Aid & Development
- POLS*3490 [0.50] Conflict and Conflict Resolution
- POLS*3670 [0.50] Comparative Public Policy and Administration
- POLS*3790 [0.50] The Political Economy of International Relations
- POLS*3890 [0.50] Government and Politics of India

Italian (ITAL)

School of Languages and Literatures, College of Arts

All language courses carry 0.50 credits. Students with Year 4 or grade 12 Italian or their equivalent may be admitted into ITAL*1060 or ITAL*1070 only with the approval of the department. Students advancing in a Romance language (French, Spanish, Italian) are advised to take elective courses in a second Romance language and in Latin. All language students are strongly advised to include CLAS*1000 and LING*1000 among their electives in order to derive the maximum benefit from their studies. Except where stated otherwise, literary texts are, at all levels, studied in the original language. Students registering in these courses will be expected to have the appropriate knowledge.

Study Abroad

The School of Languages and Literatures encourages students in modern languages to spend 1 or 2 semesters in another country to study a particular language at the university level. Credit for programs of study successfully completed may be applied towards the University of Guelph degree requirements. Requests should be addressed well in advance to either the School or a particular section of the School. A letter of permission is required (see Section VIII--Undergraduate Degree Regulations and Procedures.)

Italian may be taken as a minor in the honours program. Students in Italian will be counselled by the School of Languages and Literatures.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:
ITAL*1060 [0.50] Introductory Italian I
ITAL*1070 [0.50] Introductory Italian II
ITAL*2050 [0.50] Introduction to Literature
ITAL*2090 [1.00] Intermediate Italian
ITAL*3060 [0.50] Advanced Italian
ITAL*3150 [0.50] Medieval Italian Literature
ITAL*3400 [0.50] Renaissance Lovers and Fools
1.00 Credits from:
ARTH*2540 [0.50] Medieval Art
ARTH*2550 [0.50] The Italian Renaissance
ARTH*2950 [0.50] Baroque Art
ARTH*3150 [0.50] Space: Roman Art and Urbanism
ARTH*3320 [0.50] Lives: Aspects of Western Art
ARTH*3340 [0.50] Studies in Renaissance and Baroque Art
CLAS*1000 [0.50] Introduction to Classical Culture
CLAS*2000 [0.50] Classical Mythology
HIST*2200 [0.50] The Medieval World
HIST*2850 [0.50] Ancient Greece and Rome
HIST*3750 [0.50] The Reformation
ITAL*4900 [0.50] Research Paper in Italian Studies
LAT*1100 [0.50] Preliminary Latin I
LAT*1110 [0.50] Preliminary Latin II
LAT*2000 [0.50] Latin Literature
LING*1000 [0.50] Introduction to Linguistics
PHIL*2140 [0.50] History of Greek and Roman Philosophy
PHIL*3060 [0.50] Medieval Philosophy

Marketing (MKTG)

Department of Marketing and Consumer Studies, College of Business and Economics

The minor in Marketing is designed for students who wish to better understand the subject of marketing and potentially integrate this with their primary field of study. The program develops a core knowledge of contemporary theory and principles of marketing and consumer behaviour of particular relevance to the non-specialist. Note: the minor in Marketing is not open to students enrolled in the Marketing Management major in the Bachelor of Commerce degree.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

ECON*1050	[0.50]	Introductory Microeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*1000	[0.50]	Introductory Marketing
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3000	[0.50]	Advanced Marketing
PSYC*1000	[0.50]	Introduction to Psychology

Restricted Electives

2.00 restricted Electives, including at least 1.00 credits at 3000 level or above:

ECON*2740	[0.50]	Economic Statistics
MCS*3010	[0.50]	Quality Management
MCS*3030	[0.50]	Research Methods
MCS*3500	[0.50]	Marketing Analytics
MCS*3600	[0.50]	Consumer Information Processes
MCS*3620	[0.50]	Marketing Communications
MCS*4040	[0.50]	Management in Product Development
MCS*4300	[0.50]	Marketing and Society
MCS*4400	[0.50]	Pricing Management
MCS*4600	[0.50]	International Marketing
PSYC*1010	[0.50]	Quantification in Psychology
STAT*2060	[0.50]	Statistics for Business Decisions

***NOTE**: only one of ECON*2740, PSYC*1010 or STAT*2060 may be counted as a restricted elective towards the minor in Marketing.

Mathematical Economics (MAEC)

Department of Economics and Finance, College of Business and Economics

Most economic theory rests on explicit, formal, mathematical and/or statistical foundations. This specialization articulates and emphasizes these interactions. It is most suitable for students who either have, or wish to develop, a strong analytical background.

Major (Honours Program)

Semester 1

CIS*1500	[0.50]	Introduction to Programming
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1200	[0.50]	Calculus I

1.00 electives

Semester 2

ECON*1100	[0.50]	Introductory Macroeconomics
MATH*1210	[0.50]	Calculus II

1.50 electives

Semester 3

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
STAT*2040	[0.50]	Statistics I

1.00 electives

Semester 4

ECON*3740 [0.50] Introduction to Econometrics

2.00 electives or restricted electives*

Semester 5

ECON*3710 [0.50] Advanced Microeconomics

2.00 electives or restricted electives*

Semester 6

ECON*3100	[0.50]	Game Theory
ECON*3810	[0.50]	Advanced Macroeconomics

1.50 electives or restricted electives*

Semester 7

ECON*4640	[0.50]	Applied Econometrics I
ECON*4710	[0.50]	Advanced Topics in Microeconomics
ECON*4700	[0.50]	Advanced Mathematical Economics

1.00 electives or restricted electives*

Semester 8

ECON*4810 [0.50] Advanced Topics in Macroeconomics

One of:

ECON*4840	[0.50]	Applied Econometrics II
MATH*3200	[0.50]	Real Analysis
STAT*4340	[0.50]	Statistical Inference
STAT*4350	[0.50]	Applied Multivariate Statistical Methods
STAT*4360	[0.50]	Applied Time Series Analysis

0.50 credits in Economics at the 4000 level

1.00 electives

*at least 1.00 credits of the 4.00 restricted electives credits must be from Mathematics and 1.00 credits must be from Statistics. The remaining 2.00 credits can be from either subject area. Of the 4.00 credits, at least 1.00 credits must be at the 3000 level or above and the remaining 3.00 credits must be at the 2000 level or above.

Note: Courses from MATH or STATS will be allowed with the appropriate prerequisites, or by permission of the instructor.

Mathematical Economics (Co-op) (MAEC:C)

Department of Economics and Finance, College of Business and Economics

Most economic theory rests on explicit, formal, mathematical and/or statistical foundations. This specialization articulates and emphasizes these interactions. It is most suitable for students who either have, or wish to develop, a strong analytical background.

Major (Honours Program)

Semester 1 - Fall

CIS*1500	[0.50]	Introduction to Programming
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1200	[0.50]	Calculus I

1.00 electives

Semester 2 - Winter

ECON*1100	[0.50]	Introductory Macroeconomics
MATH*1210	[0.50]	Calculus II

1.50 electives

Semester 3 - Fall

COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
STAT*2040	[0.50]	Statistics I

1.00 electives

Semester 4 - Winter

ECON*3740 [0.50] Introduction to Econometrics

2.00 electives or restricted electives*

Spring/Summer

COOP*1000 [0.00] Co-op Work Term I

Fall

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

Semester 5 - Winter

ECON*3100	[0.50]	Game Theory
ECON*3810	[0.50]	Advanced Macroeconomics

1.50 electives or restricted electives*

Spring/Summer

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

Semester 6 - Fall

ECON*3710 [0.50] Advanced Microeconomics

2.00 electives or restricted electives*

Winter

COOP*4000 [0.00] Co-op Work Term IV

Spring/Summer

COOP*5000 [0.00] Co-op Work Term V

Semester 7 - Fall

ECON*4640	[0.50]	Applied Econometrics I
ECON*4700	[0.50]	Advanced Mathematical Economics
ECON*4710	[0.50]	Advanced Topics in Microeconomics

1.00 electives or restricted electives*

Semester 8 - Winter

ECON*4810 [0.50] Advanced Topics in Macroeconomics

One of:

ECON*4840	[0.50]	Applied Econometrics II
MATH*3200	[0.50]	Real Analysis
STAT*4080	[0.50]	Data Analysis
STAT*4340	[0.50]	Statistical Inference
STAT*4350	[0.50]	Applied Multivariate Statistical Methods
STAT*4360	[0.50]	Applied Time Series Analysis

0.50 credits at the 4000 level Economics

1.00 electives

*at least 1.00 credits of the 4.00 restricted electives credits must be from Mathematics and 1.00 credits must be from Statistics. The remaining 2.00 credits can be from either

subject area. Of the 4.00 credits, at least 1.00 credits must be at the 3000 level or above and the remaining 3.00 credits must be at the 2000 level or above.

Note: Courses from MATH or STATS will be allowed with the appropriate prerequisites, or by permission of the instructor.

Mathematical Science (MSCI)

Department of Mathematics and Statistics, College of Physical and Engineering Science

Major (Honours Program)

Knowledge of Mathematics and Statistics is crucial for understanding our world. This unique program provides a core of both mathematics and statistics with a choice of a Mathematics stream or a Statistics stream. This major also requires the completion of an area of emphasis as listed. Students are encouraged to speak with a Program Counsellor when choosing courses for the selected stream and area of emphasis.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A total of 20.00 credits is required to complete the Major which includes at least 10.00 credits in Mathematics & Statistics, 0.50 credits in Computing and Information Science, and an additional 2.50 credits in an area of emphasis. Of the total credits required, students are required to complete 2.00 mathematics and/or statistics credits at the 4000 level and an additional 3.00 mathematics and/or statistics credits must be at the 3000 or 4000 level.

Semester 1

MATH*1160	[0.50]	Linear Algebra I
MATH*1200	[0.50]	Calculus I

1.50 credits selected from the College of Arts and the College of Social and Applied Human Sciences*

Semester 2

MATH*1210	[0.50]	Calculus II
STAT*2040	[0.50]	Statistics I

1.50 electives** (PHIL*2110 is recommended)

Semester 3

CIS*1500	[0.50]	Introduction to Programming
MATH*2200	[0.50]	Advanced Calculus I
STAT*3100	[0.50]	Introductory Mathematical Statistics I

1.00 electives or restricted electives

Semester 4

MATH*2130	[0.50]	Numerical Methods
STAT*2050	[0.50]	Statistics II

1.50 electives or restricted electives (CIS*2500 is recommended)

Semester 5

2.50 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

MATH*4440	[0.50]	Case Studies in Mathematics and Statistics

2.00 electives or restricted electives

*These courses should be chosen from the list of Semester 1 requirements as listed in the Program Regulations for the BA.

**Students are reminded that they must meet the BA distribution requirements of 1.50 credits in the humanities and 1.50 credits in the social sciences.

Students are required to complete 5.50 credits from either the Mathematics Stream or the Statistics Stream as follows:

Mathematics Stream

MATH*2210	[0.50]	Advanced Calculus II
MATH*2270	[0.50]	Applied Differential Equations
MATH*3160	[0.50]	Linear Algebra II
MATH*3200	[0.50]	Real Analysis

0.50 additional credits in MATH at 3000 level or above

3.00 additional credits in MATH or STAT at 3000 level or above of which at least 1.50 credits must be MATH at the 4000 level

Statistics Stream

STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3240	[0.50]	Applied Regression Analysis

0.50 additional credits in MATH at 3000 level or above

1.00 additional credits in MATH or STAT at 2000 level or above

3.00 additional credits in MATH or STAT at 3000 level or above of which at least 1.50 credits must be STAT at the 4000 level

Areas of Emphasis

Students are required to complete 2.50 credits from one of the following Areas of Emphasis:

COMPUTER SCIENCE (CS)***

The following credits must be taken:

CIS*2430	[0.50]	Object Oriented Programming
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures

at least 1.00 credits from:

CIS*3110	[0.50]	Operating Systems I
CIS*3190	[0.50]	Software for Legacy Systems
CIS*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts

Note: CIS*2750 is recommended in addition to the Area of Emphasis requirements for students interested in Computer Science

ECONOMICS (ECON)***

The following credits must be taken:

ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics

at least 1.00 credits from:

ECON*3100	[0.50]	Game Theory
ECON*3710	[0.50]	Advanced Microeconomics
ECON*4710	[0.50]	Advanced Topics in Microeconomics

INDIVIDUALIZED (IND)***

It is required that 2.50 credits are taken from humanities and social science electives where 1.00 credits must be at the 3000 level or above.

***Students are reminded that they must meet the BA requirement that at least 7.00 credits must be at the 3000 level of above.

Mathematics (MATH)

Department of Mathematics and Statistics, College of Physical and Engineering Science

Knowledge of mathematics is crucial for understanding our world. Students can choose to study mathematics as a minor in the B.A. Honours Program or as an area of concentration in the General Program. These specializations are designed to provide considerable flexibility for students to pursue their own mathematical interests, whether they be in the concepts of "pure" mathematics or techniques and applications. The Mathematics specializations develop skills that are valued in many sectors such as business, education, government, and industry.

Area of Concentration (General Program)

A minimum of 5.00 Mathematics credits is required, including:

a. 4.00 credits in Mathematics, including at least 1.00 from courses at the 3000 level or above

b. 1.00 additional credits from Mathematics, Statistics and/or Computing Science

Minor (Honours Program)

A total of 5.00 credits is required to complete the Minor including:

(MATH*1080 or MATH*1200)*
(MATH*1210 or MATH*2080)**

MATH*1160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
STAT*2040	[0.50]	Statistics I

1.00 additional Mathematics credits at the 2000 level or above.

1.50 additional Mathematics credits at the 3000 or 4000 level

* IPS*1500 can count toward this 0.50 credit

** IPS*1510 can count toward this 0.50 credit

Media & Cinema Studies (MCST)

College of Arts

This minor considers the various approaches to media, communication, and culture. By examining conventions used across media forms and texts, students are expected to demonstrate an understanding of the relationship between form and content, media and society, technology and culture. Attention will be given to cinema, sound/music, visual culture, and digital/Internet texts and practices. The minor in Media and Cinema Studies (MCST) guides students to an understanding of the pertinent questions at stake in today's technological and information-focused environments.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

ARTH*2220	[0.50]	The Visual Arts Today
THST*1200	[0.50]	The Languages of Media

At least 0.50 credits from Media Studies:

THST*2450	[0.50]	Approaches to Media Studies
THST*2650	[0.50]	History of Communication

At least 0.50 credits from Cinema Studies:

HIST*3260	[0.50]	Cinema and the Moving Image
THST*2500	[0.50]	Contemporary Cinema
THST*3530	[0.50]	Canadian Film

At least 0.50 credits from Computing and Information Science:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
CIS*2050	[0.50]	Computers and Society

2.50 additional credits from:

ARTH*2290	[0.50]	History of Photographic Media
CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
CIS*2050	[0.50]	Computers and Society
CIS*2170	[0.75]	User Interface Design
EURO*1100	[0.50]	European Film
HIST*2020	[0.50]	Film as History
HIST*3260	[0.50]	Cinema and the Moving Image
HIST*4170	[1.00]	Exploration of Digital Humanities
HUMN*3190	[0.50]	Experiential Learning
HUMN*3470	[0.50]	Holocaust & WWII in German Lit. & Film
HUMN*4190	[0.50]	Experiential Learning
MUSC*2150	[0.50]	Music and Popular Culture
MUSC*2380	[0.50]	Classical Music from Concert Hall to Cinema
SART*1150	[0.50]	Contemporary Artistic Practice
SART*2610	[0.50]	Photography I
SART*2700	[0.50]	Introduction to Computer Graphics
SART*2710	[0.50]	Drawing Graphics on the Computer
SART*3750	[0.50]	Photography II
SART*3480	[0.50]	Web Development and Design
THST*2450	[0.50]	Approaches to Media Studies
THST*2500	[0.50]	Contemporary Cinema
THST*2650	[0.50]	History of Communication
THST*3530	[0.50]	Canadian Film

At least 1.00 credits must be at 3000 level or higher

Note: Some courses may also have prerequisites which are identified in course descriptions in the academic calendar.

Museum Studies (MS)

School of Fine Art and Music

The Minor program in Museum Studies offers an introduction to museum culture from both theoretical and practical perspectives. Courses in the program cover the history of museums, examination of assumptions that have guided the collecting and classifying of visual culture, and consideration of how these institutions serve the needs of national and group identity construction.

This program of study is designed as a complement to a significant number of Major specializations, suitable for any student wishing to broaden their knowledge beyond their Major area of study.

Minor (Honours Program)

(May not be taken in combination with Art History Honours Major).

A minimum of 5.00 credits is required, including:

-

ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II
ARTH*2120	[0.50]	Introduction to Museology
ARTH*2480	[0.50]	Introduction to Art Theory and Criticism
ARTH*3330	[0.50]	Display: Visual Culture in Western Europe
ARTH*3620	[0.50]	Museum Studies

- 2.00 additional credits in Art History

Music (MUSC)

School of Fine Art and Music, College of Arts

The School offers courses in music history, theory, ethnomusicology, composition, pedagogy, jazz and improvisation, popular music, digital music, and performance. Many courses are open to all students, while others require knowledge of the rudiments of musical notation or other prerequisites. Students are urged to plan their program in consultation with a Music advisor. Music programs allow considerable flexibility for students to select one or more areas of interest, such as individual study on an instrument or in composition, performing in vocal or instrumental ensembles, specialized historical or theoretical study or in-depth study in other music topics.

Courses in Music are offered in several of the semesters abroad, especially London. Credit for programs of study successfully completed may be applied towards the University of Guelph degree requirements.

Applied Music

MUSC*1500 is available only by audition. MUSC*1500 is restricted to students in Semesters 1-4 who are enrolled in a Music program: general program, area of concentration; honours program, major or minor. Students enrolled in a Music program, honours major, may audition for MUSC*1500 beyond the fourth semester.

Applied Music courses are designed to be taken during successive Fall and Winter terms. If this sequence is interrupted for more than one semester, students may be required to reapply (re-audition) before registering to continue in Applied Music. Students must achieve a minimum grade 70% in Applied Music courses in order to proceed to the next level.

Applied Composition

Private instruction is offered in music composition. In order to register in Applied Composition (MUSC*2410), students must submit a portfolio of compositions (scores and recordings) to the School of Fine Art and Music at the time of course selection. Interviews are held prior to the first day of classes each semester (see School of Fine Art and Music for interview schedule). In order to enrol in Applied Composition, students must be registered in a Music program: Area of Concentration (General Program), Major or Minor (Honours Program). Applied Composition courses are designed to be taken during successive Fall and Winter terms. If this sequence is interrupted for more than one semester, students may be required to reapply before registering to continue in Applied Composition. Students must achieve a minimum grade of 70% in Applied Composition courses in order to proceed to the next level.

Core Requirements

The Music core is designed to provide the concepts and skills students need for successful study in higher level courses. All students in honours program major must complete the following courses:

MUSC*1060	[0.50]	Amadeus to Zeppelin: Music and Culture I
MUSC*1180	[0.50]	Musicianship I
MUSC*2100	[0.50]	Creating Music on the Computer
MUSC*2140	[0.50]	History of Jazz
MUSC*2150	[0.50]	Music and Popular Culture
MUSC*2180	[0.50]	Musicianship II
MUSC*2270	[0.50]	World Music
MUSC*2330	[0.50]	Beethoven to Broadway: Music and Culture II
MUSC*2660	[0.50]	Materials of Music I
MUSC*2670	[0.50]	Materials of Music II
MUSC*3630	[0.50]	Tragedy, Technology, and Torture: Music Post 1900

Note: MUSC*1130 does not count toward either the Major (Honours), Minor (Honours), or Area of Concentration (General Program).

Area of Concentration (General Program)

A minimum of 6.00 Music credits is required, including:

a. MUSC*1060, MUSC*1180, MUSC*2180, MUSC*2330, MUSC*2660, MUSC*2670,(3.00 credits)

b. 1.50 credits from MUSC*2100, MUSC*2140, MUSC*2150, MUSC*2270, MUSC*3630

c. at least 1.00 Music credits at the 3000 level or above (excluding MUSC*3630)

d. two of MUSC*2530, MUSC*2540, MUSC*2550, MUSC*2560.

Major (Honours Program)

A minimum of 9.00 Music credits is required, including:

a. the Music core (5.50 credits)

b. two of MUSC*2530, MUSC*2540, MUSC*2550, MUSC*2560.

c. MUSC*4401/2 or MUSC*4450

d. 2.00 additional credits of upper-level topics courses (MUSC*3730, MUSC*3740, MUSC*3800, MUSC*3820, MUSC*3860, MUSC*3880)

Participation in Applied Music courses is strongly recommended for all honours students. Students contemplating graduate studies in Music should consult music faculty early in their program.

Minor (Honours Program)

A minimum of 5.00 Music credits is required, including MUSC*1060, MUSC*1180 and at least 2.00 Music credits at the 3000 or 4000 level. Students should be aware that courses at the 3000 or 4000 level will require additional prerequisites.

Honours students considering graduate work in ethnomusicology, performance, theory, and other music specializations should consult a faculty advisor early in their program. Students should take courses covering a broad range of historical periods and methodologies, and also consider courses in Humanities (HUMN), dramatic theory, art history, anthropology, and English literature. A reading knowledge of at least one language other than English is also recommended.

Philosophy (PHIL)

Department of Philosophy, College of Arts

The Department of Philosophy offers programs emphasizing the history of philosophy and the study of metaphysics, epistemology, ethics and logic. The requirements for the various Philosophy programs are designed to ensure a basic competence in the discipline while permitting varying degrees of flexibility. It is important that students discuss their programs with a faculty advisor in order to ensure that the best selection of elective Philosophy courses is made. This is especially important for students who are contemplating graduate work in Philosophy.

Students may take PHIL*1000, PHIL*1010 and PHIL*1050 but only one may be counted towards the minimum number of Philosophy courses required for a degree.

Area of Concentration (General Program)

At least 5.00 Philosophy credits are required, including one course from each of groups A, B and C below. At least 1.50 Philosophy credits must be at the 3000 or 4000 level.

Each course listed is 0.50 credits unless noted otherwise.

Group A:

PHIL*2140	[0.50]	History of Greek and Roman Philosophy
PHIL*2160	[0.50]	Modern European Philosophy to Hume
PHIL*2170	[0.50]	Existentialism
PHIL*3060	[0.50]	Medieval Philosophy
PHIL*3080	[0.50]	History of Modern European Philosophy from Kant
PHIL*3130	[0.50]	Contemporary British and American Philosophy
PHIL*3200	[0.50]	Contemporary European Philosophy
PHIL*3280	[0.50]	21st Century Philosophy

Group B:

PHIL*2110	[0.50]	Elementary Symbolic Logic
PHIL*2130	[0.50]	Philosophy of Religion
PHIL*2180	[0.50]	Philosophy of Science
PHIL*2250	[0.50]	Knowledge, Mind and Language
PHIL*3180	[0.50]	Philosophy of Mind
PHIL*3190	[0.50]	Theory of Knowledge I
PHIL*3250	[0.50]	Philosophy of Language
PHIL*3420	[0.50]	Philosophical Problems of Religion
PHIL*3450	[0.50]	Ethics in the Life Sciences
PHIL*3910	[0.50]	Indian Philosophy
PHIL*3920	[0.50]	Chinese Philosophy
PHIL*3930	[0.50]	African Philosophy
PHIL*4360	[0.50]	Theory of Knowledge II
PHIL*4370	[0.50]	Metaphysics
PSYC*3280	[0.50]	Minds, Brains & Machines

Group C:

PHIL*2030	[0.50]	Philosophy of Medicine
PHIL*2060	[0.50]	Philosophy of Feminism I
PHIL*2070	[0.50]	Philosophy of the Environment
PHIL*2120	[0.50]	Ethics
PHIL*2600	[0.50]	Business and Professional Ethics
PHIL*3040	[0.50]	Philosophy of Law
PHIL*3050	[0.50]	Philosophy of Art
PHIL*3230	[0.50]	Issues in Social and Political Philosophy
PHIL*4040	[0.50]	Advanced Philosophy of the Environment
PHIL*4060	[0.50]	Philosophy of Feminism II
PHIL*4310	[0.50]	Applied Ethics
PHIL*4340	[0.50]	Advanced Ethics

Major (Honours Program)

At least 8.50 Philosophy credits are required, including the required courses and two courses from each of groups D, E and F below. At least 3.50 Philosophy credits must be at the 3000 or 4000 level, and at least 1.50 must be at the 4000 level.

Each course listed is 0.50 credits unless noted otherwise.

Required courses:

PHIL*2110	[0.50]	Elementary Symbolic Logic
PHIL*2120	[0.50]	Ethics
PHIL*2140	[0.50]	History of Greek and Roman Philosophy
PHIL*2160	[0.50]	Modern European Philosophy to Hume
PHIL*3080	[0.50]	History of Modern European Philosophy from Kant

Group D:

PHIL*2170	[0.50]	Existentialism
PHIL*2180	[0.50]	Philosophy of Science
PHIL*2250	[0.50]	Knowledge, Mind and Language
PHIL*3180	[0.50]	Philosophy of Mind
PHIL*3190	[0.50]	Theory of Knowledge I
PHIL*3250	[0.50]	Philosophy of Language
PHIL*3450	[0.50]	Ethics in the Life Sciences
PHIL*4360	[0.50]	Theory of Knowledge II
PHIL*4370	[0.50]	Metaphysics
PSYC*3280	[0.50]	Minds, Brains & Machines

Group E:

PHIL*2060	[0.50]	Philosophy of Feminism I
PHIL*3050	[0.50]	Philosophy of Art
PHIL*3230	[0.50]	Issues in Social and Political Philosophy
PHIL*4310	[0.50]	Applied Ethics
PHIL*4340	[0.50]	Advanced Ethics

Group F:

PHIL*2030	[0.50]	Philosophy of Medicine
PHIL*2070	[0.50]	Philosophy of the Environment
PHIL*2130	[0.50]	Philosophy of Religion
PHIL*2600	[0.50]	Business and Professional Ethics
PHIL*3130	[0.50]	Contemporary British and American Philosophy
PHIL*3200	[0.50]	Contemporary European Philosophy
PHIL*3280	[0.50]	21st Century Philosophy
PHIL*3420	[0.50]	Philosophical Problems of Religion
PHIL*3910	[0.50]	Indian Philosophy
PHIL*3920	[0.50]	Chinese Philosophy
PHIL*3930	[0.50]	African Philosophy
PHIL*4040	[0.50]	Advanced Philosophy of the Environment
PHIL*4060	[0.50]	Philosophy of Feminism II

Minor (Honours Program)

At least 5.00 Philosophy credits are required, including one course from each of groups G, H, I and J below. At least 2.00 Philosophy credits must be at the 3000 or 4000 level.

Each course listed is 0.50 credits unless noted otherwise.

Group G:

PHIL*2140	[0.50]	History of Greek and Roman Philosophy
PHIL*2160	[0.50]	Modern European Philosophy to Hume
PHIL*2170	[0.50]	Existentialism
PHIL*3060	[0.50]	Medieval Philosophy
PHIL*3080	[0.50]	History of Modern European Philosophy from Kant

Group H:

PHIL*2110	[0.50]	Elementary Symbolic Logic
PHIL*2180	[0.50]	Philosophy of Science
PHIL*2250	[0.50]	Knowledge, Mind and Language
PHIL*3180	[0.50]	Philosophy of Mind
PHIL*3190	[0.50]	Theory of Knowledge I
PHIL*3250	[0.50]	Philosophy of Language
PHIL*3450	[0.50]	Ethics in the Life Sciences
PHIL*4360	[0.50]	Theory of Knowledge II
PHIL*4370	[0.50]	Metaphysics
PSYC*3280	[0.50]	Minds, Brains & Machines

Group I:

PHIL*2060	[0.50]	Philosophy of Feminism I
PHIL*2120	[0.50]	Ethics
PHIL*3050	[0.50]	Philosophy of Art
PHIL*3230	[0.50]	Issues in Social and Political Philosophy
PHIL*4310	[0.50]	Applied Ethics
PHIL*4340	[0.50]	Advanced Ethics

Group J:

PHIL*2030	[0.50]	Philosophy of Medicine
PHIL*2070	[0.50]	Philosophy of the Environment
PHIL*2130	[0.50]	Philosophy of Religion
PHIL*2600	[0.50]	Business and Professional Ethics
PHIL*3130	[0.50]	Contemporary British and American Philosophy
PHIL*3200	[0.50]	Contemporary European Philosophy
PHIL*3280	[0.50]	21st Century Philosophy
PHIL*3420	[0.50]	Philosophical Problems of Religion
PHIL*3910	[0.50]	Indian Philosophy
PHIL*3920	[0.50]	Chinese Philosophy
PHIL*3930	[0.50]	African Philosophy
PHIL*4040	[0.50]	Advanced Philosophy of the Environment
PHIL*4060	[0.50]	Philosophy of Feminism II

Political Science (POLS)

Department of Political Science, College of Social and Applied Human Sciences

The Department of Political Science offers courses in the following areas: Political Thought; Canadian Politics; Public Policy, Governance, and Law; Comparative Politics; and International Relations and Global Studies. The Department of Political Science also participates in several interdisciplinary programs, including Criminal Justice and Public Policy, International Development Studies, Environmental Governance, and European Studies.

Students taking courses in Political Science may enrol initially in POLS*1150, POLS*1400, POLS*1500, the latter 2 courses providing overview and introductory treatments of particular interest to students who wish to take higher level courses in the department but who do not intend to specialize in the discipline. For students intending to pursue a general or honours specialization in Political Science, however, POLS*1150 is required.

Courses at the 2000 level provide students with essential grounding in specific areas of the discipline and are normally prerequisite for enrolment in 3000 and 4000 level courses. Students in the honours program major are required to take POLS*3180 and POLS*3650. Students in the honours program minor are required to take POLS*3180.

In addition to the requirements set out in the B.A. Program Regulations, the Department of Political Science requires that students pursuing general and honours programs successfully complete a core requirement of 2.50 credits and meet specific distribution requirements as follows:

Core Requirements

POLS*1150 [0.50] Understanding Politics
POLS*2300 [0.50] Canadian Government and Politics
One of:
- PHIL*2280 [0.50] Key Concepts in Political Philosophy
- POLS*2000 [0.50] Political Theory

One of:
- POLS*2080 [0.50] Development and Underdevelopment
- POLS*2100 [0.50] Comparative Politics
- POLS*2200 [0.50] International Relations

One of:
- POLS*2150 [0.50] Gender and Politics
- POLS*2250 [0.50] Public Administration and Governance
- POLS*2350 [0.50] Law from a Political Science Perspective

Area of Concentration (General Program)

A minimum of 5.00 credits is required, including:

POLS*1150 [0.50] Understanding Politics
POLS*2300 [0.50] Canadian Government and Politics
One of:
- PHIL*2280 [0.50] Key Concepts in Political Philosophy
- POLS*2000 [0.50] Political Theory

One of:
- POLS*2080 [0.50] Development and Underdevelopment
- POLS*2100 [0.50] Comparative Politics
- POLS*2200 [0.50] International Relations

One of:
- POLS*2150 [0.50] Gender and Politics
- POLS*2250 [0.50] Public Administration and Governance
- POLS*2350 [0.50] Law from a Political Science Perspective

2.50 additional credits, at least 1.50 of which must be at the 3000 level or above.

Major (Honours Program)

A minimum of 9.00 credits is required, including:

POLS*1150 [0.50] Understanding Politics
POLS*2300 [0.50] Canadian Government and Politics
POLS*3180 [0.50] Research Methods I: Political Inquiry and Methods
POLS*3650 [0.50] Research Methods II: Quantitative Methods
One of:
- PHIL*2280 [0.50] Key Concepts in Political Philosophy
- POLS*2000 [0.50] Political Theory

One of:
- POLS*2080 [0.50] Development and Underdevelopment
- POLS*2100 [0.50] Comparative Politics
- POLS*2200 [0.50] International Relations

One of:
- POLS*2150 [0.50] Gender and Politics
- POLS*2250 [0.50] Public Administration and Governance
- POLS*2350 [0.50] Law from a Political Science Perspective

at least 0.50 credits at the 3000 level in three of the five fields in the department

1.50 credits at the 4000 level, two of which must include either one course from the 1.00 credit-weighted research and writing intensive seminar courses or two courses which comprise the POLS*4970/POLS*4980 Honours Thesis sequence.

4000 level courses that fulfill the Honours writing and research intensive course requirement:

POLS*4050 [1.00] Advanced Topics in Law and Politics
POLS*4070 [1.00] Courts and Parliament
POLS*4100 [1.00] Women, Justice and Public Policy
POLS*4140 [1.00] Conceptions of Canada
POLS*4160 [1.00] Multi-Level Governance in Canada
POLS*4200 [1.00] International Political Economy
POLS*4250 [1.00] Topics in Public Management
POLS*4260 [1.00] Topics in Public Policy
POLS*4300 [1.00] Human Rights, Ethics, and Development
POLS*4340 [1.00] Nationalism, State-building and Identity
POLS*4710 [1.00] Topics in Comparative Politics
POLS*4720 [1.00] Topics in International Relations
POLS*4730 [1.00] International Relations of the Middle East
POLS*4740 [1.00] Advanced Topics in Rights and Liberties
POLS*4900 [1.00] Special Topics Seminar in Political Science
POLS*4970 [0.50] Honours Political Science Research I

an additional 2.50 credits from courses in Political Science.

** Students interested in pursuing graduate or professional studies related to Political Science are encouraged to consider taking the POLS*4970/POLS*4980 Honours Thesis sequence. Interested students must obtain instructor consent in order to register for this option.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

POLS*1150 [0.50] Understanding Politics
POLS*2300 [0.50] Canadian Government and Politics
POLS*3180 [0.50] Research Methods I: Political Inquiry and Methods
One of:
- PHIL*2280 [0.50] Key Concepts in Political Philosophy
- POLS*2000 [0.50] Political Theory

One of:
- POLS*2080 [0.50] Development and Underdevelopment
- POLS*2100 [0.50] Comparative Politics
- POLS*2200 [0.50] International Relations

One of:
- POLS*2150 [0.50] Gender and Politics
- POLS*2250 [0.50] Public Administration and Governance
- POLS*2350 [0.50] Law from a Political Science Perspective

0.50 credits at the 4000 level

1.50 additional credits from courses in Political Science

Choices for fulfillment of prerequisites for 4000 level courses (see course descriptions for corresponding requirements).

Political Thought

POLS*3230 [0.50] Modern Political Thought
POLS*3710 [0.50] Politics and Sexuality

Canadian Politics

HIST*3160 [0.50] Canadian Political History
POLS*3050 [0.50] Canadian Political Parties, Elections and Pressure Groups
POLS*3210 [0.50] The Constitution and Canadian Federalism
POLS*3270 [0.50] Local Government in Ontario
POLS*3470 [0.50] Business-Government Relations in Canada

Public Policy, Governance and Law

POLS*3130 [0.50] Law, Politics and Judicial Process
POLS*3210 [0.50] The Constitution and Canadian Federalism
POLS*3250 [0.50] Public Policy: Challenges and Prospects
POLS*3300 [0.50] Governing Criminal Justice
POLS*3370 [0.50] Environmental Politics and Governance
POLS*3440 [0.50] Corruption, Scandal and Political Ethics
POLS*3470 [0.50] Business-Government Relations in Canada
POLS*3670 [0.50] Comparative Public Policy and Administration

Comparative Politics

POLS*3000 [0.50] Politics of Africa
POLS*3060 [0.50] Politics of the Middle East and North Africa
POLS*3080 [0.50] Politics of Latin America
POLS*3160 [0.50] Women and Politics in the Third World
POLS*3320 [0.50] Politics of Aid & Development
POLS*3410 [0.50] U.S. Politics and Government
POLS*3440 [0.50] Corruption, Scandal and Political Ethics
POLS*3450 [0.50] European Governments and Politics
POLS*3670 [0.50] Comparative Public Policy and Administration
POLS*3890 [0.50] Government and Politics of India
POLS*3920 [0.50] Modern China

International Relations and Global Studies

POLS*3160 [0.50] Women and Politics in the Third World
POLS*3320 [0.50] Politics of Aid & Development
POLS*3490 [0.50] Conflict and Conflict Resolution
POLS*3790 [0.50] The Political Economy of International Relations

The Department of Political Science offers a academic advising service for students in Political Science.

Students are encouraged to consult with the faculty advisor for either of these programs about course selection, substitution of courses offered by other departments, or other matters.

Psychology (PSYC)

Department of Psychology, College of Social and Applied Human Sciences

The discipline of Psychology is normally associated with the social sciences, the biological sciences, and the health professions. Specialization in Psychology at Guelph is available as a B.A. Honours program major, a B.A. Honours program major (co-op), and as an Honours major in the B.SC. program (described in the schedule of studies for B.SC. programs). Through its different undergraduate programs, the Psychology Department provides: a) a broad general education emphasizing psychological theory and methodology, with an empirical basis in course work (e. g., experiments and projects); b) an appropriate background in psychology for those who leave the University with an undergraduate degree to embark on careers in related areas; and c) a sound preparation for graduate study in Psychology. Students intending to apply to Psychology graduate programs, and those who want a structured, intensive research experience, may apply to enrol in the Honours Thesis courses (See Option B – Honours Thesis Stream). In addition, students intending to apply for admission to graduate programs in Psychology should note most graduate programs require the applicant to have at least an A- average in order to be considered for admission.

The department does not offer Psychology as an Area of Concentration in the General BA Program.

Note on Honours Courses

Courses designated with (H) are for students in Psychology Honours programs. These include: B.A. Honours Psychology (PYSC) major or minor, B.A. Information Systems and Human Behaviour (ISHB) major, B.Sc. Psychology: Brain and Cognition (PBC), major or minor, and the Neuroscience (NEUR) minor. A cumulative average of at least 70% in all course attempts in Psychology or registration in the ISHB major, NEUR minor, or PBC major or minor is required to enrol in H designated courses.

Major (Honours Program)

The required number of Psychology credits for the Major is 9.00 credits.

Students may choose to take an additional 2.00 credits in Psychology to a maximum of 11.00 credits in Psychology.

Year 1 (semesters 1 and 2)

Students must complete 1.00 credit at the 1000 level in psychology.

Required courses:

PSYC*1000	[0.50]	Introduction to Psychology
PSYC*1010	[0.50]	Quantification in Psychology

Year 2 (semesters 3 and 4)

Students must complete 3.50 credits at the 2000 level in Psychology.

Required courses:

PSYC*2040	[0.50]	Research Statistics
PSYC*2360	[0.50]	Introductory Research Methods

Students must complete an additional 2.50 credits out of the following Core courses in Psychology:

PSYC*2310	[0.50]	Introduction to Social Psychology
PSYC*2330	[0.50]	Principles of Learning
PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*2410	[0.50]	Behavioural Neuroscience I
PSYC*2450	[0.50]	Introduction to Developmental Psychology
PSYC*2650	[0.50]	Cognitive Psychology
PSYC*2740	[0.50]	Personality

Year 3 and 4 (semesters 5 to 8)

Option A – Honours Regular Stream

Students must complete 3.00 credits at the 3000 level in Psychology.

Required courses:

PSYC*3250	[0.50]	Psychological Measurement

2.50 additional credits in Psychology to a maximum of 3.50

Year 4 (semesters 7 and 8)

Students must complete 1.50 credits at the 4000 level in Psychology to a maximum of 3.00.

Option B – Honours Thesis Stream

Students intending to apply to Psychology graduate programs, and those who want a structured, intensive research experience, may apply to enrol in the Honours Thesis courses.

Year 3 (Semester 5 and 6)

Students must complete 2.50 credits at the 3000 level in Psychology.

Required courses:

PSYC*3250	[0.50]	Psychological Measurement
PSYC*3370	[0.50]	Experimental Design and Analysis
PSYC*3380	[0.50]	Non-experimental Research Methods

Students may choose to take up to an additional 1.00 credit at the 3000 level in Psychology.

Year 4 (semesters 7 and 8)

Students must complete 2.00 credits at the 4000 level in Psychology and may take up to a maximum 1.00 additional 4000 level in Psychology.

Required courses:

PSYC*4870	[0.50]	Honours Thesis I
PSYC*4880	[1.00]	Honours Thesis II

One of:

PSYC*4370	[0.50]	History of Psychology
PSYC*4900	[0.50]	Psychology Seminar

Students should note that the Honours Thesis courses are normally taken in a Fall-Winter sequence and are worth the equivalent of 1.50 credits toward the 20.00 credits Honours B.A. degree requirements.

Minor (Honours Program)

(May not be taken in combination with a Psychology Honours Major)

A total of 5.00 credits is required including:

PSYC*1000	[0.50]	Introduction to Psychology
PSYC*1010	[0.50]	Quantification in Psychology
PSYC*2360	[0.50]	Introductory Research Methods

An additional 2.00 credits selected from the following:

PSYC*2310	[0.50]	Introduction to Social Psychology
PSYC*2330	[0.50]	Principles of Learning
PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*2410	[0.50]	Behavioural Neuroscience I
PSYC*2450	[0.50]	Introduction to Developmental Psychology
PSYC*2650	[0.50]	Cognitive Psychology
PSYC*2740	[0.50]	Personality

The remaining 1.50 credits must comprise 3000-level courses in Psychology.

Note: There is a maximum number of Psychology credits a student may complete. Please refer to the major for further information.

Psychology (Co-op) (PSYC:C)

Department of Psychology, College of Social and Applied Human Sciences

Co-operative Education formally integrates the student's academic study with 3 work terms (COOP*1000, COOP*2000, COOP*3000) in co-operating employer organizations. The Co-op program is offered as a B.A. honours program major degree taken as one of two major options combined with 3 work terms. (Students interested in applying to graduate school in Psychology after graduation should see the Graduate Advisory Note at the end of this section.)

All Co-op students are strongly advised to complete the B.A. requirements by including in their program 3 or more courses from the listing of courses under Business Economics (BECN), to ensure that they have 1 or more courses in computer science, accounting and management, or organizational behaviour. (Business Administration is also available as a minor.)

Depending on career aspirations, students should have a good working knowledge of one or more of the following before their first work semester: quantitative methods, computer science, accounting and management, or organizational behaviour.

The first work term normally follows 3 or 4 semesters of academic study (see Section X-Co-operative Education Programs). Students must be eligible to continue in the Honours Psychology program in order to remain in the Co-op program.

Admission to the Co-op program is limited and will be based on academic background. Admission will normally be considered only at semester 1 entry or during semester 2 when the student selects courses for semester 3.

Courses designated with (H) are designed for students in a psychology honours specialization. (H) courses are Honours level requiring for registration a cumulative average of at least 70% in all course attempts in Psychology.

Major (Honours Program)

Note: When selecting core and elective credits the student should keep in mind the prerequisites for their desired 3000 and 4000 level courses. When selecting courses beyond Psychology the student should keep in mind both their second specialization and courses appropriate for potential work-term placements.

The required number of Psychology credits for the Major is 9.00. Students may choose to take up to an additional 2.00 credits in Psychology for a maximum of 11.00 credits, distributed as follows:

1000 level courses: 1 credit

2000 level courses: 3.5 credits

3000 level courses: 3.5 credits

4000 level courses: 3 credits

Semester 1 - Fall

PSYC*1000	[0.50]	Introduction to Psychology

2.00 electives*

Semester 2 - Winter

COOP*1100	[0.00]	Introduction to Co-operative Education
PSYC*1010	[0.50]	Quantification in Psychology
PSYC*2330	[0.50]	Principles of Learning
PSYC*2450	[0.50]	Introduction to Developmental Psychology

1.00 electives*

Summer Semester

Optional, however if students want to progress more quickly through the program or plan to apply to graduate school after graduation then they should take PSYC*2740 and PSYC*2310. **If students do not take these courses in this semester then they must complete them by the end of Semester 4.**

Semester 3 - Fall

PSYC*2040	[0.50]	Research Statistics
PSYC*2360	[0.50]	Introductory Research Methods

Student must take 2 of the following:

PSYC*2410	[0.50]	Behavioural Neuroscience I
PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*2650	[0.50]	Cognitive Psychology

0.50 electives*

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I **

Semester 4 - Summer

1.00 Psychology credits at the 2000 or 3000 level
1.50 electives

Fall Semester

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

Semester 5 - Winter

PSYC*3250	[0.50]	Psychological Measurement

0.50 Psychology credits at the 3000 or 4000 level***
1.50 electives

Summer Semester

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

Semester 6 - Fall

0.50 Psychology electives at the 3000 level or 4000 level***
0.50 Psychology electives at the 4000 level***
1.50 electives

Semester 7 - Winter

1.00 Psychology electives at the 4000 level***
1.50 electives

Semester 8 - Summer

2.50 electives****

* B.A. distribution requirements should be satisfied within the first 4 semesters.

** Students wanting to move more quickly through the program are recommended to take one DE course during each work term.

*** Students planning on applying to graduate school in Psychology will need to take the following courses in the corresponding semesters:

Semester 5 Winter–PSYC*3380, Semester 6–Fall–PSYC*3370, PSYC*4870, Semester 7–Winter– PSYC*4370, PSYC*4880 or PSYC*4900 in Semester 7 or 8.

***** The actual number of electives required in this semester will depend on how many additional courses the student has taken throughout the program to meet the 20.00 credit requirement.

Graduate Studies Advisory Note: Most graduate programs require the student to have at least an A- average in order to be considered for admission.

Students should note that the Honours Thesis courses are normally taken in a Fall-Winter sequence and are worth the equivalent of 1.50 credits toward the 20.00 credits Honours B.A. degree requirements.

Sociology (SOC)

Department of Sociology and Anthropology, College of Social and Applied Human Sciences

The Department of Sociology and Anthropology offers three types of courses: sociology courses with the prefix SOC*; anthropology courses with the prefix ANTH*; and departmental courses with the prefix SOAN*. The departmental category of courses recognizes the fact that the disciplines of sociology and sociocultural anthropology have developed in tandem and it is possible to identify large areas of overlap and convergence in the work of practitioners both historically and in the present. Departmental courses include most of the core theory and methods courses as well as many elective courses. They contribute equally to the subject matter of sociology as well as the subject matter of sociocultural anthropology for purposes of the undergraduate programs of study in both disciplines. Please see the listings for all courses required for the Sociology program.

Note: the following courses may be used towards a sociology specialization:

FRHD*3060	[0.50]	Principles of Social Gerontology
PHIL*2180	[0.50]	Philosophy of Science

Courses will normally be offered in the semesters designated. For information on other semesters these courses will be offered and the semester those courses without designations will be offered, please check with the department. In addition to regularly scheduled courses, students may elect to do independent study. A student who wishes to do a reading course should first consult the professor with whom he/she wishes to work. Please note, a student is allowed a total of 1.00 credits only for reading courses.

SOAN courses will be used towards the Sociology specializations.

Area of Concentration (General Program)

A minimum of 5.00 credits in Sociology and Anthropology is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
SOAN*2111/2	[1.00]	Classical Theory
SOAN*2120	[0.50]	Introductory Methods
SOC*1100	[0.50]	Sociology

2.50 additional credits in SOC and SOAN courses, including at least 1.00 credits at the 3000 level

Major (Honours Program)

A minimum of 8.00 credits in Sociology and Anthropology is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
SOAN*2111/2	[1.00]	Classical Theory
SOAN*2120	[0.50]	Introductory Methods
SOAN*3070	[0.50]	Qualitative and Observational Methods
SOAN*3120	[0.50]	Quantitative Methods
SOC*1100	[0.50]	Sociology
SOC*3310	[0.50]	Contemporary Theory

4.00 additional credits in SOC and SOAN courses, including at least 1.50 credits at the 4000 level

The following courses may be used toward a sociology specialization:

FRHD*3060	[0.50]	Principles of Social Gerontology
PHIL*2180	[0.50]	Philosophy of Science

Minor (Honours Program)

A minimum of 5.00 credits in Sociology and Anthropology is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
SOAN*2111/2	[1.00]	Classical Theory
SOAN*2120	[0.50]	Introductory Methods
SOC*1100	[0.50]	Sociology

2.50 additional credits in SOC and SOAN courses, including at least 1.00 credits at the 3000 level or above

The following courses may be used toward a sociology specialization:

FRHD*3060	[0.50]	Principles of Social Gerontology
PHIL*2180	[0.50]	Philosophy of Science

Spanish and Hispanic Studies (SPAH)

School of Languages and Literatures, College of Arts

The Spanish and Hispanic Studies program enables students to concentrate on the Spanish language and on Spanish and Latin American literature. Language courses provide study of the grammatical concepts required to establish and enrich reading, writing, oral and aural skills from basic through advanced levels of study. Through literature and film, students are introduced to a variety of cultural, historical, social, and political topics.

The usual first course in Spanish is SPAN*1100. Students with 4U Spanish commonly take SPAN*2000. They may be admitted into SPAN*1110 only with the approval of the Instructor or the Faculty Advisor. Students with native or near native fluency normally begin language courses with SPAN*2000.

All language students are strongly advised to include LING*1000 in their program, and CLAS*1000 among their electives in order to derive the maximum benefit from their studies.

Study Abroad

The Spanish and Hispanic Studies program encourages its students to take advantage of the University of Guelph's exchange programs and the semester abroad opportunities. We offer exchange programs with the University of Málaga and the University of Alcalá de Henares in Spain the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) and the University of Guadalajara (with over 30 campuses) in Mexico and the University of San Andrés in Argentina. Students also enjoy the semester abroad opportunity every second winter in Guatemala. It is recommended that students go on exchange in their third year. In order to be eligible for an exchange, students should have completed at least SPAN*2010, SPAN*2990 , SPAN*2040 and SPAN*3080. Credits successfully completed at the host university are applied towards University of Guelph degree requirements. Please see the International Study section of the undergraduate calendar and consult the Head of Spanish and Hispanic Studies for more information.

Area of Concentration (General Program)

A minimum of 5.00 credits in Spanish and Hispanic Studies is required, including:

SPAN*2040	[0.50]	Culture of Spain
SPAN*2990	[0.50]	Hispanic Literary Studies
SPAN*3080	[0.50]	Spanish American Culture

;

2.50 credits from:

LING*1000	[0.50]	Introduction to Linguistics
SPAN*1100	[0.50]	Introductory Spanish I
SPAN*1110	[0.50]	Introductory Spanish II
SPAN*2000	[0.50]	Intermediate Spanish I
SPAN*2010	[0.50]	Intermediate Spanish II

SPAN*3240	[0.50]	Topics in Hispanic Linguistics
SPAN*3500	[0.50]	Advanced Spanish I
SPAN*4500	[0.50]	Spanish Translation I

0.50 credits in literature from:

SPAN*3210	[0.50]	Topics in Hispanic Studies
SPAN*3220	[0.50]	Literature and Arts I: Spain Pre-1936
SPAN*3230	[0.50]	Literature and Arts II: Latin America Pre-1950
SPAN*3800	[0.50]	Directed Readings in Hispanic Studies
SPAN*3810	[0.50]	Directed Readings in Hispanic Studies
SPAN*4100	[1.00]	Seminar in Hispanic Studies
SPAN*4410	[1.00]	Senior Seminar on Latin American Post-1950
SPAN*4420	[1.00]	Senior Seminar on Spain or Africa Post-1936
SPAN*4840	[1.00]	Research Paper in Hispanic Studies

0.50 additional credits in Spanish and Hispanic Studies

Major (Honours Program)

A minimum of 8.00 credits in Spanish and Hispanic Studies is required, including:

SPAN*2040	[0.50]	Culture of Spain
SPAN*2990	[0.50]	Hispanic Literary Studies
SPAN*3080	[0.50]	Spanish American Culture

6.50 credits from:

LING*1000	[0.50]	Introduction to Linguistics
SPAN*1100	[0.50]	Introductory Spanish I
SPAN*1110	[0.50]	Introductory Spanish II
SPAN*2000	[0.50]	Intermediate Spanish I
SPAN*2010	[0.50]	Intermediate Spanish II
SPAN*3210	[0.50]	Topics in Hispanic Studies
SPAN*3220	[0.50]	Literature and Arts I: Spain Pre-1936
SPAN*3230	[0.50]	Literature and Arts II: Latin America Pre-1950
SPAN*3240	[0.50]	Topics in Hispanic Linguistics
SPAN*3500	[0.50]	Advanced Spanish I
SPAN*3800	[0.50]	Directed Readings in Hispanic Studies
SPAN*3810	[0.50]	Directed Readings in Hispanic Studies
SPAN*4100	[1.00]	Seminar in Hispanic Studies
SPAN*4410	[1.00]	Senior Seminar on Latin American Post-1950
SPAN*4420	[1.00]	Senior Seminar on Spain or Africa Post-1936
SPAN*4500	[0.50]	Spanish Translation I
SPAN*4840	[1.00]	Research Paper in Hispanic Studies

Minor (Honours Program)

A minimum of 5.00 credits in Spanish and Hispanic Studies is required, including:

SPAN*2040	[0.50]	Culture of Spain
SPAN*2990	[0.50]	Hispanic Literary Studies
SPAN*3080	[0.50]	Spanish American Culture

2.50 credits from:

LING*1000	[0.50]	Introduction to Linguistics
SPAN*1100	[0.50]	Introductory Spanish I
SPAN*1110	[0.50]	Introductory Spanish II
SPAN*2000	[0.50]	Intermediate Spanish I
SPAN*2010	[0.50]	Intermediate Spanish II
SPAN*3240	[0.50]	Topics in Hispanic Linguistics
SPAN*3500	[0.50]	Advanced Spanish I
SPAN*4500	[0.50]	Spanish Translation I

1.00 credits in literature from:

SPAN*3210	[0.50]	Topics in Hispanic Studies
SPAN*3220	[0.50]	Literature and Arts I: Spain Pre-1936
SPAN*3230	[0.50]	Literature and Arts II: Latin America Pre-1950
SPAN*3800	[0.50]	Directed Readings in Hispanic Studies
SPAN*3810	[0.50]	Directed Readings in Hispanic Studies
SPAN*4100	[1.00]	Seminar in Hispanic Studies
SPAN*4410	[1.00]	Senior Seminar on Latin American Post-1950
SPAN*4420	[1.00]	Senior Seminar on Spain or Africa Post-1936
SPAN*4840	[1.00]	Research Paper in Hispanic Studies

Students wishing to substitute required courses with courses taken abroad, or other options, should consult the Head of Spanish and Hispanic Studies.

Statistics (STAT)

Department of Mathematics and Statistics, College of Physical and Engineering Science

Knowledge of statistics is crucial for understanding our world. An understanding of statistics is vital in many disciplines including psychology, sociology, political science, marketing and economics. Students can choose to study statistics as a minor in the B.A. Honours Program or as an area of concentration in the General Program.

Area of Concentration (General Program)

A minimum of 5.00 credits in Statistics and Mathematics is required, including:

a. no more than 1.00 credits from courses at the 1000 level

b. 3.00 credits in statistics (STAT), 2.00 of which must be from courses at the 3000 level or above

Recommended Courses

MATH*1200	[0.50]	Calculus I
MATH*1210	[0.50]	Calculus II
STAT*2040	[0.50]	Statistics I
STAT*2050	[0.50]	Statistics II
STAT*3100	[0.50]	Introductory Mathematical Statistics I
STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3240	[0.50]	Applied Regression Analysis

0.50 additional credits in Statistics

0.50 additional credits in Statistics or Mathematics

* IPS*1500 can count toward this 0.50 credit

** IPS*1510 can count toward this 0.50 credit

Honours Programs

Students who minor in Statistics may not receive credit for the following courses unless taken to satisfy the requirements of another program: ECON*2740, PSYC*2010 , PSYC*3320 , SOAN*3120.

Minor (Honours Program)

A total of 5.00 credits is required to complete the minor, including:

(MATH*1080 or MATH*1200)*

(MATH*1210 or MATH*2080)**

MATH*1160	[0.50]	Linear Algebra I
STAT*2040	[0.50]	Statistics I
STAT*2050	[0.50]	Statistics II
STAT*3100	[0.50]	Introductory Mathematical Statistics I
STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3240	[0.50]	Applied Regression Analysis

0.50 additional credits in Statistics

0.50 additional credits in Statistics or Mathematics

* IPS*1500 can count toward this 0.50 credit

** IPS*1510 can count toward this 0.50 credit

Studio Art (SART)

School of Fine Art and Music, College of Arts

The School offers programs that allow for concentrated study in Art History or in Studio Art, or a combination of the two disciplines.

The Studio Art program provides a thorough grounding in contemporary art practice, art history, theory, and criticism. Courses are offered in drawing, painting, photography, printmaking, sculpture, computer graphics, and extended practices. Studio Art majors must also take a selection of courses in art history. Specific requirements are listed below.

Cost of Studio Supplies

The majority of the cost of supplies must be borne by the student. In order to permit the University to subsidize this cost and to allow for savings through discount buying, some materials are obtained through the school by payment of a lab fee. The amount of the fee is established for each semester prior to registration.

Student Counselling

Students who elect to take a substantial number of credits in Studio Art with the objective of graduate work are advised to obtain counseling from their academic advisor regarding their choices. However, in general, it is important to know that graduate studies in Studio Art normally require an in-depth knowledge of traditional and contemporary media, as well as a significant awareness of contemporary art history and theory. Students are encouraged to take electives in other disciplines from across the University to inform their Studio Art practice. Cognate electives in other disciplines in the College of Arts, such as Philosophy, History, and English will almost certainly prove an asset.

Core Requirements

SART*1050	[0.50]	Foundation Studio
SART*1060	[0.50]	Core Studio

One of:

ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II

One of:

ARTH*2220	[0.50]	The Visual Arts Today
ARTH*2480	[0.50]	Introduction to Art Theory and Criticism

Major (Honours Program)

A minimum of 9.00 credits is required, including:

a. the Studio Art core

b. 2.00 additional credits in Studio Art, including at least 0.50 credits from List A and 0.50 from List B

c. 2.00 additional credits in Art History including at least 0.50 credits at the 3000 level or above

d. 3.00 additional credits in Studio Art including 1.50 credits at the 4000-level

List A

SART*2090	[0.50]	Drawing I
SART*2200	[0.50]	Painting I
SART*2460	[0.50]	Introductory Printmaking I
SART*2470	[0.50]	Introductory Printmaking II
SART*2610	[0.50]	Photography I
SART*2700	[0.50]	Introduction to Computer Graphics
SART*2710	[0.50]	Drawing Graphics on the Computer
SART*3090	[0.50]	Drawing II
SART*3200	[0.50]	Painting II
SART*3410	[0.50]	Intaglio
SART*3450	[0.50]	Lithography
SART*3470	[0.50]	Photo-Printmaking
SART*3480	[0.50]	Web Development and Design
SART*3600	[0.50]	Digital & Non-Silver Photography
SART*3750	[0.50]	Photography II
SART*4090	[0.50]	Drawing III
SART*4130	[1.00]	Drawing IV
SART*4200	[0.50]	Painting III
SART*4230	[0.50]	Special Topics in Painting
SART*4240	[1.00]	Painting IV
SART*4410	[0.50]	Experimental Printmaking
SART*4470	[1.00]	Advanced Printmaking
SART*4700	[0.50]	Photography III
SART*4720	[1.00]	Photography IV
SART*4890	[1.00]	Interactive Multimedia

List B

SART*2300	[0.50]	Sculpture I
SART*2800	[0.50]	Extended Practices I
SART*3300	[0.50]	Sculpture II
SART*3770	[0.50]	Extended Practices II
SART*4300	[0.50]	Sculpture III
SART*4330	[1.00]	Senior Sculpture
SART*4660	[0.50]	Topics in Extended Practices
SART*4670	[0.50]	Topics in Extended Practices
SART*4800	[0.50]	Special Topics in Sculpture
SART*4810	[0.50]	Extended Practices III
SART*4870	[0.50]	Special Topics in Sculpture
SART*4880	[1.00]	Extended Practices IV

Notes:

1. In accordance with the B.A. program regulation limiting the number of credits to be taken in any subject area, OCAD graduates granted the maximum advanced standing of credits in Studio Arts will be limited to 2.00 additional credits in Studio Arts at the University of Guelph.
2. A cumulative average of at least 70% in all course attempts in Studio Arts and Art History is required in order to enter or continue in the Honours Studio Arts program.
3. Students in SART can fulfill one of the natural and mathematical sciences B.A. distribution requirements with HK*2100 . This credit cannot be used towards the SART major.

Theatre Studies (THST)

School of English and Theatre Studies, College of Arts

The Theatre Studies program is a component of a liberal education, and is dedicated to integrating academic study and theatre practice. The program offers introductory and advanced courses that combine theory and practice with an emphasis on educating well-rounded theatre creators for both the academic and professional spheres. Students will have the opportunity to work on both scripted and devised productions and do in-depth research and analysis. Rather than a focus on individual disciplines such as acting, directing, design and technical theatre, the program integrates this knowledge into a series of variable topic courses that examine performance from various perspectives. Many of these courses have presentational or performance outcomes.

Notes:

1. A maximum of 2.00 credits in Directed Readings or Special Studies Courses (THST*3000, THST*3600) is allowed in the honours program major. A maximum of 1.00 credits in such courses is allowed in honours program minor or the general program area of concentration. Students will normally be permitted to take only 0.50 credits in Directed Readings or Special Studies courses per semester.

   Certain approved Dramatic Literature courses from the English Program within the School of English and Theatre Studies or other departments may be counted towards a degree in Theatre Studies. A list of approved courses may be obtained from the School's website: http://www.arts.uoguelph.ca/sets/.
2. In connection with THST*1040 and some upper-level courses, students are required as part of the course to attend various specified theatre performances in cities such as Toronto, Stratford, Niagara-on-the-Lake, and London. A special fee is charged for travel to these performances and students will be notified during the first week of classes of the amount of this fee and the dates of the performances.
3. In any given semester, a student may not enroll in more than ONE production-related course at a time. These include: THST*2190, THST*3190, THST*4280.

Area of Concentration (General Program)

A minimum of 5.00 credits in Theatre Studies is required, including :

THST*1040	[0.50]	Introduction to Performance
THST*1190	[0.50]	Theatre Workshop I
THST*1270	[0.50]	Theatre Research I
THST*2050	[0.50]	Devising
THST*2270	[0.50]	Theatre Research II
THST*3170	[0.50]	Special Topics

1.00 additional credit in THST at the 2000 level or above

1.00 additional credit in THST at the 3000 level or above

Major (Honours Program)

A minimum of 8.50 credits in Theatre Studies is required, including:

THST*1040	[0.50]	Introduction to Performance
THST*1190	[0.50]	Theatre Workshop I
THST*1270	[0.50]	Theatre Research I
THST*2050	[0.50]	Devising
THST*2190	[1.00]	Theatre Workshop II
THST*2270	[0.50]	Theatre Research II
THST*3170	[0.50]	Special Topics
THST*4270	[0.50]	Research Seminar I
THST*4280	[1.00]	Ensemble Project

1.00 additional credit in THST at the 2000 level or above

2.00 additional credits in THST at the 3000 level or above

Minor (Honours Program)

A minimum of 5.00 credits in Theatre Studies is required, including :

THST*1040	[0.50]	Introduction to Performance
THST*1190	[0.50]	Theatre Workshop I
THST*1270	[0.50]	Theatre Research I
THST*2050	[0.50]	Devising
THST*2270	[0.50]	Theatre Research II
THST*3170	[0.50]	Special Topics

1.00 additional credit in THST at the 2000 level or above

1.00 additional credit in THST at the 3000 level or above

Bachelor of Arts and Sciences (B.A.S.)

The University of Guelph offers an 8 semester (20.00 credits) honours program leading to a Bachelor of Arts and Sciences (B.A.S.) degree.

The Bachelor of Arts & Sciences program is designed for students who are motivated equally by the study of Arts/Social Sciences and the Sciences, and who find challenge and satisfaction in testing the traditional boundaries of study through undergraduate level interdisciplinary work. The program meets these objectives through a unique structure that accredits students in an Arts/Social Sciences core, a Sciences core, a Subject Area core of interdisciplinary humanities and sciences courses (ASCI*), and a minor in each of the Arts/Social Sciences and the Sciences (see program information for choices of minors). The structure of the program ensures disciplinary rigour and breadth through completion of core requirements for a B.A.S. degree, concentration in two distinct minors, and concentration of learning in an academic cohort of B.A.S. students through the interdisciplinary ASCI courses in the B.A.S. core. This core is open only to students in the B.A.S. program.

Program Information

Academic Counselling

The B.A.S. program counsellor assists students in the selection of minors, interpreting program and academic regulations, and with the selection of appropriate courses for chosen minors and distribution requirements. Students should consult the counsellor when experiencing particular difficulties affecting academic standing and progress through the program. Students are encouraged to check the B.A.S. program website regularly for course information and cross-listing of acceptable credits where appropriate.

Counselling on Minors

Academic departments offer the minors in the B.A.S. program and assign faculty advisors to assist students with academic planning (e.g., a faculty advisor in the History department handles queries about a minor in History). Students should consult the appropriate faculty advisor, along with the B.A.S. Program Counsellor, when requiring advice on the completion of specialization requirements. The list of faculty advisors is available on the Undergraduate Academic Information Centre website: http://www.uoguelph.ca/uaic/facultyadvisors or contact the B.A.S. Program Counsellor for further information.

Continuation of Study

To be eligible to continue in the program, students must meet the requirements for Continuation of Study as noted in Section VIII--Undergraduate Degree Regulations & Procedures of this calendar (Schedules 1 and 2).

Conditions for Graduation

To qualify for the degree Bachelor of Arts and Sciences, the student must successfully complete a minimum of 20.00 credits as identified below. In addition, students must meet the continuation of study requirements at the time of graduation and have a 60.00% cumulative average.

Distribution Requirements

This program will require the completion of 20.00 credits as indicated below, with a maximum of 7.00 credits at the 1000 level. First year core courses may be counted towards the minors.

1. Science Core - 2.00 credits.
2. Arts/Social Science core - 2.00 credits.
3. Subject Area Core - (ASCI) - 3.00 credits.
4. Arts/Social Science Minor -5.00 credits minimum.
5. Science Minor - 5.00 credits minimum.
6. Free Electives - 3.00 credits.

1. Science Core - 2.00 credits

Science Core - 2.00 credits as identified by minor below:

Core Requirements for BAS Science Minors

If you choose this BAS Science Minor, then	The BAS Science Core Requirements would be:
Agriculture	BIOL*1070, BIOL*1090, [(CHEM*1040, CHEM*1050) or (MATH*1080, STAT*2040)]
Biochemistry	BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1040
Biology	BIOL*1070, BIOL*1090, [(CHEM*1040, CHEM*1050) or (MATH*1080, STAT*2040)]
Biotechnology	BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050
Chemistry	CHEM*1040, CHEM*1050, MATH*1200, MATH*1210
Computing & Information Science	CIS*1500, CIS*2500, (2 of BIOL*1070, BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050, MATH*1080, PHYS*1070, PHYS*1080)
Ecology	BIOL*1070, BIOL*1090, STAT*2040, (MATH*1080 or MATH*1200)
GIS & Environmental Analysis	GEOG*1300, (1 of MATH*1080, MATH*1200, CIS*1500), (STAT*2040 or GEOG*2460), (1 of BIOL*1070, BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050)
Mathematics	MATH*1200, MATH*1210, STAT*2040, (1 of BIOL*1070, BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050, PHYS*1070, PHYS*1080)
Mathematical Sciences	MATH*1200, MATH*1210, STAT*2040, (1 of CIS*1000, CIS*1200, CIS*1500)
Microbiology	BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050
Molecular Biology and Genetics	BIOL*1080, BIOL*1090, (CHEM*1040, CHEM*1050)
Neuroscience	BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050
Nutritional and Nutraceutical Sciences	BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050
Plant Science	BIOL*1070, BIOL*1090, CHEM*1040, CHEM*1050
Physics	IPS*1500 and IPS*1510 recommended or [PHYS*1070, PHYS*1080, (MATH*1200 or MATH*1080), (MATH*1210 or MATH*2080)]
Psychology: Brain and Cognition	MATH*1080, (PHYS*1010 or STAT*2040), (2 of BIOL*1070, BIOL*1080, BIOL*1090, CHEM*1040, CHEM*1050, PHYS*1070, PHYS*1080)
Statistics	MATH*1200, MATH*1210, STAT*2040, STAT*2050
Zoology	BIOL*1070, BIOL*1090, [(CHEM*1040, CHEM*1050) or [STAT*2040, (MATH*1080 or MATH*1200)]]

2. Arts and Social Science Core - 2.00 credits including:

a. 1.00 credits over at least 2 different subject areas in the College of Arts: ARTH - Art History; CHIN - Mandarin; CLAS - Classical Studies; ENGL - English; EURO - European Studies; FREN - French Studies; GERM - German Studies; GREK - Greek; HIST - HISP - Hispanic Studies; History; HUMN - Humanities; ITAL - Italian Studies; LAT - Latin Studies; LING - Linguistics; MUSC - Music; PHIL - Philosophy; PORT - Portuguese; THST - Theatre Studies.

b. 1.00 credits over at least 2 different subject areas (listed below) in the College of Social and Applied Human Sciences or College of Business and Economics: ANTH - Anthropology; ECON - Economics; GEOG - Geography; IDEV - International Development Studies; ISS - Interdisciplinary Social Science; POLS - Political Science; PSYC - Psychology; SOAN - Sociology and Anthropology; SOC - Sociology; UNIV - Interdisciplinary University.

3. Subject Area Core (ASCI) - 3.00 credits

- 1.50 credits from:

ASCI*1110	[0.50]	Society and Inquiry I
ASCI*1120	[0.50]	Society and Inquiry II
ASCI*2050	[0.50]	Uses of Knowledge

- 0.50 credits from:

ASCI*3000	[0.50]	Arts and Sciences Community Project
ASCI*3100	[0.50]	Case Studies in Arts and Sciences Research
ASCI*3700	[0.50]	Independent Studies in Arts/Sciences

- 1.00 credits from:

ASCI*4010	[1.00]	Arts and Sciences Honours Research Seminar
ASCI*4020	[0.50]	Topics in Arts and Sciences Research
ASCI*4030	[0.50]	Topics in Arts and Sciences Research
ASCI*4700	[0.50]	Independent Studies in Arts/Sciences
ASCI*4710	[0.50]	Independent Studies in Arts/Sciences

Note: Of the 20.00 credits required for this program, 3.00 credits must be completed at the 3000 or 4000 level, and 2.00 credits at the 4000 level. This requirement is partially fulfilled by senior level courses in the Subject Core (ASCI) requirements.

4. Arts/Social Sciences Minors - 5.00 credits (Minimum)

Minors available in the Arts/ Social Sciences core (see B.A. program descriptions):

Anthropology
Art History
Business
Business Economics
Classical Studies
Criminal Justice & Public Policy
Economics
English
European Culture and Civilization
Family & Child Studies
French Studies
Geography
German
History
International Development
Italian
Marketing
Media and Cinema Studies
Museum Studies
Music
Philosophy
Political Science
Psychology
Sociology
Spanish and Hispanic Studies
Theater Studies

5. Science Minor - 5.00 credits (Minimum)

Minors available in the Science core (see B.Sc. program descriptions):

Agriculture (see B.Sc.(Agr.) program description)
Biochemistry
Biology
Biotechnology
Chemistry
Computing & Information Science
Ecology
GIS* & Environmental Analysis
Mathematics
Mathematical Science
Microbiology
Molecular Biology and Genetics
Neuroscience
Nutritional and Nutraceutical Sciences
Physics
Plant Science
Psychology: Brain and Cognition
Statistics
Zoology
* Geographic Information Systems

6. Free Electives - 3.00 credits

The program includes 3.00 free electives. Electives may be completed in any subject area. The number of free electives is reduced if a minor requires more than 5.00 credits.

This program includes 3.00 credits at the 3000 or 4000 level, including 2.00 credits at the 4000 level. This requirement is partially fulfilled by senior level courses in the Subject Area Core (ASCI) requirements.

A maximum of 7.00 credits at the 1000 level may be counted toward the 20.00 credits requirement.

Students cannot, of course, select Psychology or Mathematics for both their B.Sc. and B.A. minors.

Double Counting Rule

A maximum of 3.00 credits may be double-counted:

a. 1.00 credits may be double-counted between minors.

b. 2.00 credits may be double-counted between a core and one minor.

Students may not triple-count a course between a core and two minors.

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. At the present time, two majors, Environmental Management and Equine Management, are available in the program.

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.

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 first two years. 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 the degree program 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
ENVM*1020	[0.50]	Introduction to Environmental Microbiology
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy

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*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
HROB*2090	[0.50]	Individuals and Groups in Organizations

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*2320	[0.50]	Current Issues in Microbial and Molecular Science
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]	Current Issues in 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
EDRD*4500	[1.00]	Planning Industrial Ecology: Design for Sustainability
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*4130	[0.50]	Chemical Ecology: Principles & Practice
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*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. The flexibility provided in semesters 6 and 7 permits students to participate in international exchanges and semesters abroad. 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: 13.50 from required courses, 5.50 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

One of:

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

0.50 electives or restricted electives

Semester 3 - Fall

ENVS*2060	[0.50]	Soil Science
EQN*2040	[0.50]	Equine Anatomy and Physiology
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

ACCT*2230	[0.50]	Management Accounting
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

0.50 electives or restricted electives

Semester 5 - Fall

AGR*2030	[0.50]	Pasture Management
ANSC*3080	[0.50]	Agricultural Animal Physiology
STAT*2060	[0.50]	Statistics for Business Decisions

1.00 electives or restricted electives

Semester 6 - Winter

EQN*3050	[0.50]	Equine Exercise Physiology
EQN*3060	[0.50]	Equine Reproduction
EQN*3500	[1.00]	Equine Integrated Project

0.50 electives or restricted electives

Semester 7 - Fall

2.50 electives or restricted electives

Semester 8 - Winter

EQN*3070	[0.50]	Equine Health Management
EQN*4020	[0.50]	Feeding the Performance Horse
EQN*4400	[0.50]	Equine Industry Trends and Issues II

1.00 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 5.50 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
POPM*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:

CROP*3340	[0.50]	Managed Grasslands
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*2240	[0.50]	Applied Financial 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
AGR*3510	[0.50]	Experiential Education II
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

Bachelor of Commerce (B.Comm.)

The University of Guelph offers an eight semester (20.00 credits) honours program leading to a Bachelor of Commerce degree (B.Comm.). The normal course load is 2.50 credits per semester for a full-time student. The program is of an interdisciplinary nature and designed to give students a sound professional management education with a focus on specific industry sectors or management functions which prepare the graduates for positions of responsibility in particular areas of management and business.

Elective options enable students to select courses which support or complement their primary field of study.

In their first semester, students may be admitted to one of nine specialized majors or enter as "undeclared". Students in the undeclared first year, must declare a specialized major by mid-February in semester two in order to gain access to required courses in semester three.

Bachelor of Commerce Majors

Undeclared (only available in semesters one and two)

Accounting *

Food and Agricultural Business*

Hotel and Food Administration*

Leadership and Organizational Management

Management Economics and Finance*

Marketing Management*

Public Management*

Real Estate and Housing*

Tourism Management

Co-operative Education is available in the majors denoted by an asterisk (*).

In addition to specializing in a major area of study, the B.Comm. core ensures that each major also provides a comprehensive commerce education to all students in the program.

The B.Comm. Core includes:

Year 1		
ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
MATH*1030	[0.50]	Business Mathematics
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business
Year 2		
ACCT*2230	[0.50]	Management Accounting
ECON*2560	[0.50]	Theory of Finance
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*2020	[0.50]	Information Management
Year 3		
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management
Year 4		
MGMT*4000	[0.50]	Strategic Management

Liberal Education Requirement

Other requirements are accommodated by specialized courses within the major or through specific courses chosen by the major from those available on campus.

The following core areas are covered through a choice of courses as determined by your major:

- Law

  HROB*3050, MCS*3040, REAL*4840
- Operations

  FARE*3310, HTM*3120
- Statistics

  ECON*2740, PSYC*1010, STAT*2060

Program Information

Academic Counselling

Program Counselling

Students are urged to seek the assistance of the counsellors in the B.Comm. Counselling Office regarding their program and academic regulations, course selection issues, services and resources, and when they are experiencing difficulties that affect their academic progress.

Departmental Advising

On entering the program, all students are assigned to a departmental Faculty Advisor by major. Students should seek the advice of the Faculty Advisor when they have questions or concerns about courses and academic requirements for their program/major. The Faculty Advisor is also knowledgeable about career opportunities which relate to a student's specific major. The list of Faculty Advisors is available on the Undergraduate Academic Information Centre website: http://www.uoguelph.ca/uaic/students_advisors.shtml or contact the B.Comm. Counselling Office for further information.

Special Expenses

Expenses may include cost of field trips and supplies and, for some majors, laboratory coats and other protective clothing.

Study at Other Universities

Students contemplating study at another university for credit towards a Bachelor of Commerce degree at the University of Guelph should refer to the general regulations governing Letters of Permission in Section VII Degree and Regulations and Procedures in this calendar.

Students must obtain approval for the Letter of Permission prior to undertaking studies at another institution. Approval of the request depends on good standing in the program with a minimum cumulative average of 60%.

The total limit of credits taken on a Letter of Permission is 2.50 based on the University of Guelph's credit system.

Study Abroad

Global understanding and perspectives are regarded as being of central importance among the university's learning objectives, as they are, also, in understanding the international business environment. On both of these accounts, students enrolled in the B.Comm. program are urged to participate in one of the several exchange and study abroad programs specifically designed for the Commerce program. Planning for such participation is best undertaken quite early in the course of studies. For more specific information on possible opportunities refer to Section V -- International Study of the calendar or contact the B.Comm. program counsellor.

Continuation of Studies

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 and Procedures.

Conditions of Graduation

To qualify for a Bachelor of Commerce degree, the student must satisfy the following conditions:

- The student must successfully complete 1.50 credits from the Liberal Education Requirement list.
- The student must successfully complete a minimum of 20.00 approved credits, in accordance with the Schedule of Studies for the specified major, including the Liberal Education Requirement.
- Students will not be eligible to graduate while on probationary or required-to-withdraw status.

Liberal Education Requirement

The Liberal Education Requirement is designed to provide the student with exposure to and some understanding of a range of disciplines in the Arts, Humanities, Social Sciences, and Mathematical and Natural Sciences.

The Liberal Education Requirement consists of 3 courses (1.50 credits) from at least two different subject prefixes. The course prefixes listed below **cannot** be used to satisfy the Liberal Education Requirement:

ACCT Accounting

BUS Business

ECON Economics

FARE Food, Agricultural and Resource Economics

HROB Human Resources and Organizational Behaviour

HTM Hospitality and Tourism Management

MGMT Management

MCS Marketing and Consumer Studies

REAL Real Estate and Housing

Free Electives

Free Electives allow students to select courses that support or complement their primary field of study. Students may select undergraduate courses from any department, including Commerce/Business related courses, provided any individual course restrictions and prerequisites are satisfied. These courses can be at any year level.

The total number of Free Electives allowed varies by major (refer to the Schedule of Studies for details). Free Electives cannot be used to fulfill Required Core courses, Restricted Electives or Liberal Education Electives, but they could contribute to the total number of credits required for graduation.

Honours Minor

A minor is a group of courses which provide exposure to and mastery of the fundamental principles of a subject. A minor consists of a minimum of 5.00 credits (normally 10 courses). It may also require certain other courses from other areas to be taken along with the specified courses of the minor. A minor is taken in conjunction with a major. Students cannot earn a minor in the same subject area as their major. Additionally, students in the BComm program are not permitted to earn a minor in Business or Business Economics. For a list of Minors, please see Specializations and Their Degrees.

Double Counting of Credits

A maximum of 2.50 credits required in a major program may be applied to meet the requirements of a minor. Courses used to meet the Liberal Education requirement may not double-count toward the requirements of their major but may double-count towards the completion of a minor.

Schedule of Studies

Courses specified in the schedule of studies are required courses and must be completed successfully. A full course load normally involves 2.50 credits per semester. Part-time study is also possible although students should discuss this option with their Program Counsellor or Faculty Advisor.

Undeclared (UND)

College of Business and Economics

Applicants to the B.Comm program who want a flexible introduction to business studies should consider entering as an unspecialized student. Students must declare one of the 9 majors in order to gain access to required courses. This must be done no later than mid-February in semester two.

Liberal Education Requirement

As part of the graduation requirement all students within the B.Comm Program are required to complete 1.50 credits from at least two different subject prefixes as listed under the B.Comm. Program Information section of the undergraduate calendar.

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
MATH*1030	[0.50]	Business Mathematics
MGMT*1000	[1.00]	Introduction to Business

One of:

HTM*1000	[0.50]	Introduction to Hospitality and Tourism Management *
MATH*1200	[0.50]	Calculus I *
POLS*1400	[0.50]	Issues in Canadian Politics *
PSYC*1000	[0.50]	Introduction to Psychology
REAL*1820	[0.50]	Real Estate and Housing *

0.50 elective

* These courses are offered in the Fall semester only

Semester 2

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*1000	[0.50]	Introductory Marketing

0.50 electives

*Students interested in choosing the FAB Major should take FARE*1400 Economics of the Agri-Food System instead of HROB*2090 and the 0.50 electives.

Students leaning towards a certain major may use their electives to take courses in that area. Undeclared students are encouraged to meet with a B.Comm. program counsellor for advice on elective selection. Further information on selecting electives for the Undeclared first year can be found on the B.Comm. Program Counselling Office website: https://www.uoguelph.ca/business/bcomm

Accounting (ACCT)

Department of Management, College of Business and Economics

By combining the conceptual and quantitative elements of accounting while promoting the integration of theory and practice, the accounting major provides graduates with the academic requirements for the postgraduate pursuit of a Professional Accounting designation. Students will develop the technical, analytical, evaluative and communication skills needed for a successful career in accounting and related management areas.

The program provides a strong foundation of accounting and general business knowledge while allowing significant opportunity to develop breadth and depth of knowledge in related areas of study.

Students pursuing a professional accounting designation should visit the Department of Management website for links to the requirements.

Elective options enable students to select courses which support or complement their primary field of study.

Degree Requirements (20.00 Total Credits)

13.00 - Required Core Courses

1.00 - Restricted Electives (see semester 7 & 8)

1.50 - Liberal Education Electives

4.50 - Free Electives

The recommended program sequence is outlined below.

Major

Semester 1

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1030	[0.50]	Business Mathematics
MGMT*1000	[1.00]	Introduction to Business

Semester 2

ACCT*1240	[0.50]	Applied Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*1000	[0.50]	Introductory Marketing

0.50 electives

Semester 3

ACCT*2230	[0.50]	Management Accounting
MCS*2020	[0.50]	Information Management
STAT*2060	[0.50]	Statistics for Business Decisions

1.00 electives

Semester 4

ACCT*3330	[0.50]	Intermediate Financial Accounting I
ECON*2560	[0.50]	Theory of Finance
MCS*3040	[0.50]	Business and Consumer Law
MGMT*3320	[0.50]	Financial Management

0.50 electives

Semester 5

ACCT*3280	[0.50]	Auditing I
ACCT*3340	[0.50]	Intermediate Financial Accounting II
ACCT*3350	[0.50]	Taxation
HROB*3000	[0.50]	Human Resources Management

0.50 electives

Semester 6

ACCT*3230	[0.50]	Intermediate Management Accounting
FARE*3310	[0.50]	Operations Management
MGMT*3020	[0.50]	Corporate Social Responsibility

1.00 electives

Semester 7 - Fall

ACCT*4220	[0.50]	Advanced Financial Accounting

Semester 8 - Winter

ACCT*4230	[0.50]	Advanced Management Accounting

Semester 7 or 8 - Fall or Winter

MGMT*4000	[0.50]	Strategic Management

Two of:

ACCT*4270	[0.50]	Auditing II
ACCT*4340	[0.50]	Accounting Theory
ACCT*4350	[0.50]	Income Taxation II
ACCT*4440	[0.50]	Integrated Cases in Accounting

2.50 electives

Note: ACCT*4270 and ACCT*4350 are offered in the Fall only. ACCT*4340 and ACCT*4440 are offered in the Winter only. Students may take MGMT*4000 in either Fall or Winter.

Accounting (Co-op) (ACCT:C)

Department of Management, College of Business and Economics

The Co-op program in Accounting is designed to facilitate the transition of students from academic studies to a professional career by enhancing the integration of theory and practice.

The Co-op in Accounting is a five year program including 4 work terms. Students must follow the academic work schedule as outlined on the Co-operative Education and Career Services website: https://www.recruitguelph.ca/cecs/.

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 website: https://www.recruitguelph.ca/cecs/.

Students pursuing a professional accounting designation should visit the Department of Management website for links to the requirements.

Group/Team work is a significant part of core credit work.

Degree Requirements (20.00 Total Credits)

13.00 - Required Core Courses

1.00 - Restricted Electives (see semester 7 & 8)

1.50 - Liberal Education Electives

4.50 - Free Electives

The recommended program sequence is outlined below.

Major

Semester 1 -- Fall

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1030	[0.50]	Business Mathematics
MGMT*1000	[1.00]	Introduction to Business

Semester 2 -- Winter

ACCT*1240	[0.50]	Applied Financial Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1100	[0.50]	Introductory Macroeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations

1.00 electives

Semester 3 -- Fall

ACCT*2230	[0.50]	Management Accounting
ACCT*3330	[0.50]	Intermediate Financial Accounting I
MCS*1000	[0.50]	Introductory Marketing
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 -- Summer

ACCT*3280	[0.50]	Auditing I
ACCT*3340	[0.50]	Intermediate Financial Accounting II
ACCT*3350	[0.50]	Taxation
MCS*2020	[0.50]	Information Management

0.50 electives

Semester 5 -- Fall

ECON*2560	[0.50]	Theory of Finance
FARE*3310	[0.50]	Operations Management
HROB*3000	[0.50]	Human Resources Management

1.00 electives

Winter Semester

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

Semester 6 -- Summer

ACCT*3230	[0.50]	Intermediate Management Accounting
MCS*3040	[0.50]	Business and Consumer Law
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management

0.50 electives

Fall Semester

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

(Eight month work term in conjunction with COOP*4000)

Winter Semester

COOP*4000	[0.00]	Co-op Work Term IV

(Eight month work term in conjunction with COOP*3000)

Semester 7 - Fall

ACCT*4220	[0.50]	Advanced Financial Accounting

Semester 8 - Winter

ACCT*4230	[0.50]	Advanced Management Accounting

Semester 7 or 8 - Fall or Winter

MGMT*4000	[0.50]	Strategic Management

Two of:

ACCT*4270	[0.50]	Auditing II
ACCT*4340	[0.50]	Accounting Theory
ACCT*4350	[0.50]	Income Taxation II
ACCT*4440	[0.50]	Integrated Cases in Accounting

2.50 electives

Note: ACCT*4270 and ACCT*4350 are offered in the Fall only. ACCT*4340 and ACCT*4440 are offered in the Winter only. Students may take MGMT*4000 in either Fall or Winter.

Food and Agricultural Business (FAB)

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

In this major, students will acquire the management education needed to succeed in the dynamic and innovative food and agribusiness industries. Building on an understanding of economic theory and applied methods in both the Canadian and the global context, the program prepares graduates with technical, entrepreneurial and leadership skills for a variety of professional opportunities in industry, government agencies and non-governmental organizations. The major provides a complete foundation for further studies leading to a graduate degree or professional accounting designation.

The major is administered by the Department of Food, Agricultural and Resource Economics in the Ontario Agricultural College and students are urged to consult the faculty advisor.

Degree Requirements (20.00 Total Credits)

15.50 - Required Core Courses

1.00 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

2.00 - Free Electives

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
MATH*1030	[0.50]	Business Mathematics
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business

Semester 2

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
FARE*1400	[1.00]	Economics of the Agri-Food System

0.50 electives or restricted electives

Semester 3

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2740	[0.50]	Economic Statistics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*2020	[0.50]	Information Management

0.50 electives or restricted electives

Semester 4

ACCT*2230	[0.50]	Management Accounting
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2770	[0.50]	Introductory Mathematical Economics
FARE*2410	[0.50]	Agrifood Markets and Policy

0.50 electives or restricted electives

Semester 5

ECON*2560	[0.50]	Theory of Finance
ECON*3740	[0.50]	Introduction to Econometrics
FARE*3310	[0.50]	Operations Management
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management

Semester 6

FARE*4240	[0.50]	Futures and Options Markets

2.00 electives or restricted electives

Semester 7

FARE*3030	[0.50]	The Firm and Markets
FARE*4370	[0.50]	Food & Agri Marketing Management
MGMT*4000	[0.50]	Strategic Management

One of:

HROB*3050	[0.50]	Employment Law
MCS*3040	[0.50]	Business and Consumer Law
REAL*4840	[0.50]	Housing and Real Estate Law

0.50 electives or restricted electives

Semester 8

AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving
FARE*4000	[0.50]	Agricultural and Food Policy
FARE*4220	[0.50]	Advanced Agribusiness Management

0.50 electives or restricted electives

Restricted Electives

A minimum of 1.00 credits from the following list:

FARE*1300	[0.50]	Poverty, Food & Hunger
FARE*2700	[0.50]	Survey of Natural Resource Economics
FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*3250	[0.50]	Food and International Development
FARE*4210	[0.50]	World Agriculture, Food Security and Economic Development
FARE*4290	[0.50]	Land Economics
FARE*4310	[0.50]	Resource Economics
FARE*4360	[0.50]	Marketing Research

FARE*4500	[0.50]	Decision Science
FARE*4550	[0.50]	Independent Studies I
FARE*4560	[0.50]	Independent Studies II

Food and Agricultural Business (Co-op) (FAB:C)

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

A principal aim of the Co-op program in Food and Agricultural Business 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 and Agricultural Business is a five year program, including 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, 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/cecs/.

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.

The major is administered by the Department of Food, Agricultural and Resource Economics in the Ontario Agricultural College and students are urged to consult the faculty advisor.

Degree Requirements (20.00 Total Credits)

15.50 - Required Core Courses

1.00 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

2.00 - Free Electives

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
MATH*1030	[0.50]	Business Mathematics
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business

Semester 2

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
FARE*1400	[1.00]	Economics of the Agri-Food System

0.50 electives or restricted electives

Semester 3 - Fall

COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2740	[0.50]	Economic Statistics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*2020	[0.50]	Information Management

0.50 electives or restricted electives

Semester 4 - Winter

ACCT*2230	[0.50]	Management Accounting
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2770	[0.50]	Introductory Mathematical Economics
FARE*2410	[0.50]	Agrifood Markets and Policy

0.50 electives or restricted electives

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Fall Semester

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

(Eight month work term Summer/Fall)

Semester 5 - Winter

ECON*2560	[0.50]	Theory of Finance
ECON*3740	[0.50]	Introduction to Econometrics
FARE*3310	[0.50]	Operations Management
FARE*4240	[0.50]	Futures and Options Markets
MGMT*3320	[0.50]	Financial Management

Summer Semester

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

Semester 6 - Fall

MGMT*3020	[0.50]	Corporate Social Responsibility

2.00 electives or restricted electives

Winter Semester

COOP*4000	[0.00]	Co-op Work Term IV

(Eight month work term in conjunction with COOP*5000)

Summer Semester

COOP*5000	[0.00]	Co-op Work Term V

(Eight month work term in conjunction with COOP*4000)

Semester 7 - Fall

FARE*3030	[0.50]	The Firm and Markets
FARE*4370	[0.50]	Food & Agri Marketing Management
MGMT*4000	[0.50]	Strategic Management

One of:

HROB*3050	[0.50]	Employment Law
MCS*3040	[0.50]	Business and Consumer Law
REAL*4840	[0.50]	Housing and Real Estate Law

0.50 electives or restricted electives

Semester 8 - Winter

AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving
FARE*4000	[0.50]	Agricultural and Food Policy
FARE*4220	[0.50]	Advanced Agribusiness Management

0.50 electives or restricted electives

Restricted Electives

A minimum of 1.00 credits from the following list:

FARE*1300	[0.50]	Poverty, Food & Hunger
FARE*2700	[0.50]	Survey of Natural Resource Economics
FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*3250	[0.50]	Food and International Development
FARE*4210	[0.50]	World Agriculture, Food Security and Economic Development
FARE*4290	[0.50]	Land Economics
FARE*4310	[0.50]	Resource Economics
FARE*4360	[0.50]	Marketing Research
FARE*4500	[0.50]	Decision Science
FARE*4550	[0.50]	Independent Studies I
FARE*4560	[0.50]	Independent Studies II

Hotel and Food Administration (HAFA)

School of Hospitality, Food and Tourism Management, College of Business and Economics

The Hotel and Food Administration major prepares graduates to assume positions of responsibility in any aspect of the hospitality field, including hotels, resorts, restaurants, convention centres, food services and related industries. Graduates will gain skills not just in hotel operations, food production and food service systems but also in human resources management, marketing, accounting and communications. The focus on experiential learning means that theory is balanced with practice. Students are encouraged to participate in guided learning opportunities outside the conventional classroom, such as independent study courses, managing a student-run restaurant, participating in a semester exchange and engaging in networking events. Students may consult the Faculty Advisor or the B.Comm. Program Counsellor for additional information.

1200 hours of verified Verified work experience in the hospitality industry is required for students to be eligible for graduation. 700 hours of hospitality and tourism work experience must be completed before a student enters Semester 7.

Group work is a significant part of core credit work.

Elective options enable students to select courses which support or complement their primary field of study. Examples: 1) Students can use a combination of restricted, Liberal Education and free electives to earn the Certificate in Leadership. http://www.leadershipcertificate.com/ for information about this certificate and its course requirements. 2) Students interested in languages and/or going on exchange can use a combination of their restricted, Liberal Education or free electives to study one or more of the various languages taught at the University or to take courses while on exchange.

Degree Requirements (20.00 Total Credits)

15.00 - Required Core Courses (including List A)

2.50 - Restricted Electives (List B)

1.50 - Liberal Education Electives

1.00 - Free Electives

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
HTM*1000	[0.50]	Introduction to Hospitality and Tourism Management
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business

Semester 2

ECON*1100	[0.50]	Introductory Macroeconomics

HTM*2100 [0.50] Lodging Operations
MATH*1030 [0.50] Business Mathematics
1.00 from List A or List B or electives

Semester 3

One of:
ECON*2740 [0.50] Economic Statistics
STAT*2060 [0.50] Statistics for Business Decisions
2.00 from List A or List B or electives

Semester 4

2.50 from List A or List B or electives

Semester 5

2.50 from List A or List B or electives

Semester 6

2.50 from List A or List B or electives

Semester 7

HTM*3060 [0.50] Lodging Management
2.00 from List A or List B or electives

Semester 8

2.50 from List A or List B or electives

List A - Further Required Courses

The following 10.00 credits are also required. Further details on the scheduling of courses will be provided in writing prior to each course selection period by the School's faculty advisor.

Semester 2 or 3

HTM*2700 [0.50] Understanding Foods

Semester 3 or 4

ACCT*1220 [0.50] Introductory Financial Accounting
HROB*2090 [0.50] Individuals and Groups in Organizations
HTM*2010 [0.50] Hospitality and Tourism Business Communications
HTM*2030 [0.50] Control Systems in the Hospitality Industry
MCS*2020 [0.50] Information Management
MCS*3040 [0.50] Business and Consumer Law

Semester 4 or 5

ACCT*2230 [0.50] Management Accounting

Semester 5 or 6

ECON*2560 [0.50] Theory of Finance
HROB*3000 [0.50] Human Resources Management
HTM*3080 [0.50] Marketing Strategy for Hospitality Managers
HTM*3090 [1.00] Restaurant Operations Management
MGMT*3020 [0.50] Corporate Social Responsibility
MGMT*3320 [0.50] Financial Management

Semester 6 or 7

HTM*3120 [0.50] Service Operations Analysis

Semester 7 or 8

HTM*3150 [0.50] Experiential Learning in the Hospitality and Tourism Industry
HTM*4190 [0.50] Hospitality and Tourism Industry Consultation
HTM*4250 [0.50] Hospitality Revenue Management
MGMT*4000 [0.50] Strategic Management

List B - Restricted Electives

Students must take a minimum of 2.50 restricted electives throughout the program. Students may choose to explore a variety of subjects or may choose to study one area in some depth. Restricted electives are listed below and have been grouped in major topical areas which are related to, or are an extension of, the professional interests of the major. Students may, however, choose restricted electives from any of those listed without regard to the categories, which are intended to be suggestive.

Students may select credits in any second language as restricted electives. Students without a second language are encouraged to take language courses.

Specialized courses in Hospitality and Tourism Management:

HTM*2070 [0.50] Event Management
HTM*2740 [0.50] Cultural Aspects of Food
HTM*3030 [0.50] Beverage Management
HTM*3180 [0.50] Casino Operations Management
HTM*3780 [0.50] Managing Food in Canada
HTM*4050 [0.50] Wine and Oenology
HTM*4090 [0.50] Hospitality Development, Design and Sustainability
HTM*4110 [0.50] Advanced Restaurant Operations
HTM*4130 [0.50] Current Management Topics
HTM*4140 [0.50] Current Management Topics
HTM*4150 [0.50] Current Management Topics
HTM*4500 [0.50] Special Study in Hospitality and Tourism

Tourism related courses:

EDRD*3500 [0.50] Recreation and Tourism Planning
GEOG*1220 [0.50] Human Impact on the Environment
GEOG*3490 [0.50] Tourism and Environment
HTM*2170 [0.50] Responsible Tourism Policy and Planning
HTM*3160 [0.50] Destination Management and Marketing
HTM*4170 [0.50] International Tourism

Event management related courses:

EDRD*3160 [0.50] International Communication
HTM*2070 [0.50] Event Management
HTM*2740 [0.50] Cultural Aspects of Food
HTM*3030 [0.50] Beverage Management
HTM*4050 [0.50] Wine and Oenology
HTM*4090 [0.50] Hospitality Development, Design and Sustainability
HTM*4110 [0.50] Advanced Restaurant Operations

Hospitality real estate related courses:

REAL*1820 [0.50] Real Estate and Housing
REAL*2820 [0.50] Real Estate Finance
REAL*3810 [0.50] Real Estate Market Analysis
REAL*3890 [0.50] Property Management
REAL*4820 [0.50] Real Estate Appraisal
REAL*4840 [0.50] Housing and Real Estate Law

Accounting and administration related courses:

ACCT*1240 [0.50] Applied Financial Accounting
ACCT*3230 [0.50] Intermediate Management Accounting
ACCT*3280 [0.50] Auditing I
ACCT*3330 [0.50] Intermediate Financial Accounting I
ACCT*3340 [0.50] Intermediate Financial Accounting II
ACCT*3350 [0.50] Taxation
ACCT*4220 [0.50] Advanced Financial Accounting
ACCT*4230 [0.50] Advanced Management Accounting
MGMT*4260 [0.50] International Business
MCS*2100 [0.50] Personal Financial Management

Marketing and consumer behaviour related courses:

FARE*4360 [0.50] Marketing Research
MCS*2600 [0.50] Fundamentals of Consumer Behaviour
MCS*3000 [0.50] Advanced Marketing
MCS*3010 [0.50] Quality Management
MCS*3620 [0.50] Marketing Communications
MCS*4400 [0.50] Pricing Management
PSYC*1000 [0.50] Introduction to Psychology

Preparation for The Certified Human Resource Professional (CHRP) designation:

ECON*2200 [0.50] Industrial Relations
HROB*3010 [0.50] Managing and Rewarding Performance
HROB*3030 [0.50] Workplace Health and Safety
HROB*3070 [0.50] Attracting and Acquiring Talent
HROB*3090 [0.50] Developing Talent
HROB*4060 [0.50] Workforce Optimization

Human behaviour related to work and work groups:

ANTH*1150 [0.50] Introduction to Anthropology
EDRD*3140 [0.50] Organizational Communication
HROB*2010 [0.50] Foundations of Leadership
HROB*3050 [0.50] Employment Law
HROB*4010 [0.50] Leadership Certificate Capstone
ECON*2200 [0.50] Industrial Relations
PSYC*1000 [0.50] Introduction to Psychology
PSYC*2310 [0.50] Introduction to Social Psychology
SOAN*2040 [0.50] Globalization of Work and Organizations
SOC*1100 [0.50] Sociology

Social and economic environment of business:

ECON*2310 [0.50] Intermediate Microeconomics
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*3520 [0.50] Labour Economics
ECON*3660 [0.50] Economics of Equity Markets
ECON*3760 [0.50] Fundamentals of Derivatives
ECON*3860 [0.50] International Finance
ECON*3960 [0.50] Money, Credit and the Financial System
PHIL*1010 [0.50] Introductory Philosophy: Social and Political Issues
PHIL*2600 [0.50] Business and Professional Ethics
POLS*1400 [0.50] Issues in Canadian Politics

Institutional food service management related courses:

CHEM*1040 [0.50] General Chemistry I
CHEM*1050 [0.50] General Chemistry II
FOOD*2150 [0.50] Introduction to Nutritional and Food Science
FOOD*3700 [0.50] Sensory Evaluation of Foods
HTM*2740 [0.50] Cultural Aspects of Food
NUTR*1010 [0.50] Introduction to Nutrition
NUTR*2050 [0.50] Nutrition Through the Life Cycle

Other restricted electives:

CIS*1000	[0.50]	Introduction to Computer Applications
ENGL*1200	[0.50]	Reading the Contemporary World
ENGL*1410	[0.50]	Major Writers
MCS*3010	[0.50]	Quality Management
MGMT*4050	[0.50]	Business Consulting
MGMT*4060	[0.50]	Business Consulting
MGMT*4350	[0.50]	Business Case Competition Preparation
PHIL*2100	[0.50]	Critical Thinking

Liberal Education Requirement and Free Electives

Students must complete 1.50 credits towards the Liberal Education Requirement and they have 1.00 credits in free electives.

Hotel and Food Administration (Co-op) (HAFA:C)

School of Hospitality, Food and Tourism Management, College of Business and Economics

The principal aim of the Hotel and Food Administration Co-op program is to facilitate the transition of students from academic studies to a professional work life by enhancing the integration of theory and practice. Students may consult the departmental Co-op Advisor or the B.Comm. Program Counsellor for additional information. The focus on experiential learning means that theory is balanced with practice. Students are encouraged to participate in guided learning opportunities outside the conventional classroom, such as independent study courses, managing a student-run restaurant, participating in a semester exchange and engaging in networking events.

The co-op work term portion of the program consists of one twelve-month period. The work term begins at the end of the second year and extends from May to April. The co-op program is completed over a 5 year period.

Group work is a significant part of the core courses.

Elective options enable students to select courses which support or complement their primary field of study. Examples: 1) Students can use a combination of restricted, Liberal Education and free electives to earn the Certificate in Leadership. http://www.leadershipcertificate.com/ for information about this certificate and its course requirements. 2) Students interested in languages and/or going on exchange can use a combination of their restricted, Liberal Education or free electives to study one or more of the various languages taught at the University or to take courses while on exchange.

Degree Requirements (20.00 Total Credits)

15.00 - Required Core Courses

2.50 - Restricted Electives

1.50 - Liberal Education Electives

1.00 - Free Electives

Major

Semester 1 - Fall

ECON*1050	[0.50]	Introductory Microeconomics
HTM*1000	[0.50]	Introduction to Hospitality and Tourism Management
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business

Semester 2 - Winter

ECON*1100	[0.50]	Introductory Macroeconomics
HTM*2100	[0.50]	Lodging Operations
MATH*1030	[0.50]	Business Mathematics

1.00 from List A or List B or electives

Semester 3 - Fall

COOP*1100	[0.00]	Introduction to Co-operative Education

One of:

ECON*2740	[0.50]	Economic Statistics
STAT*2060	[0.50]	Statistics for Business Decisions

2.00 from List A or List B or electives

Semester 4 - Winter

2.50 from List A or List B or electives

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Fall Semester

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

Winter Semester

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

Semester 5 - Fall

2.50 from List A or List B or electives

Semester 6 - Winter

2.50 from List A or List B or electives

Semester 7 - Fall

HTM*3060	[0.50]	Lodging Management

2.00 from List A or List B or electives

Semester 8 - Winter

2.50 from List A or List B or electives

Note: For courses included in List A or List B refer to the regular Hotel and Food Administration major.

Leadership and Organizational Management (LOM)

Department of Management, College of Business and Economics

The major in Leadership and Organizational Management provides a balanced foundation of management knowledge and strategic leadership competencies that will enable graduates to one day work as professional managers and organizational leaders. Courses extend beyond the traditional lecture based format to include community based group projects, guest lecturers, in-class simulations and case-based learning to help link academic expertise and theory with industry practice. Experiential learning is an integral part of the major, and occurs through the integration of industry examples in the classroom, and a required course in evidence-based management, in which students conduct research in organizations under the direction of a faculty member. Our faculty are highly skilled and committed educators who encourage students to become actively involved in their own education, both within and outside the classroom. In addition, the Leadership and Organizational Management Student Association (LOMSA) is active in providing access to professional associations, networking opportunities with industry professionals, leadership conferences, guest speakers and social events to help students build relationships with other students, faculty, and the business community.

Graduates of the Leadership and Organizational Management major will leave the University of Guelph equipped with a range of knowledge and competencies that prepare them to meet the leadership and management needs of the future in such roles as management consultant, human resource practitioner, talent management specialist or as future general managers. Successful completion of the courses within the Leadership and Organizational Management may qualify graduates for potential certification by the Human Resources Professionals Association (HRPA) as a Certified Human Resources Professional (CHRP).

Degree Requirements (20.00 Total Credits)

14.50 - Required Core Courses

1.50 - Liberal Education Electives

4.00 - Free Electives

The recommended program sequence is outlined below.

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business

0.50 electives

Semester 2

ECON*1100	[0.50]	Introductory Macroeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MATH*1030	[0.50]	Business Mathematics

1.00 electives

Semester 3

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*2200	[0.50]	Industrial Relations
HROB*2010	[0.50]	Foundations of Leadership

One of:

ECON*2740	[0.50]	Economic Statistics
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

Semester 4

ACCT*2230	[0.50]	Management Accounting
HROB*3000	[0.50]	Human Resources Management
MCS*2020	[0.50]	Information Management

1.00 electives

Semester 5

ECON*2560	[0.50]	Theory of Finance
HROB*3010	[0.50]	Managing and Rewarding Performance
HROB*3050	[0.50]	Employment Law
HROB*3070	[0.50]	Attracting and Acquiring Talent

0.50 electives

Semester 6

HROB*3030	[0.50]	Workplace Health and Safety
HROB*3090	[0.50]	Developing Talent
HROB*3100	[0.50]	Developing Management and Leadership Competencies
FARE*3310	[0.50]	Operations Management
MGMT*3320	[0.50]	Financial Management

Semester 7

HROB*4100	[1.00]	Evidence-Based People Management

MGMT*4000 [0.50] Strategic Management
1.00 electives

Semester 8

HROB*4000 [0.50] Leadership and Organizational Management Capstone
HROB*4060 [0.50] Workforce Optimization
MGMT*3020 [0.50] Corporate Social Responsibility
1.00 electives

Management Economics and Finance (MEF)

Department of Economics and Finance, **College of Business and Economics**

The Management Economics and Finance major is designed to offer students an appreciation of business and economic problems particularly in the area of finance.

The major provides a suitable education for a career in the business world or in the public service. It also constitutes a useful preparation for more advanced studies, including graduate studies in Economics, Finance, Business Administration, Accounting, Industrial Relations, Law, and Public Policy. The major is administered by the Department of Economics and Finance and students are urged to consult the faculty advisor.

Degree Requirements (20.00 Total Credits)

11.00 - Required Core Courses

5.50 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

2.00 - Free Electives

Major

Semester 1

ECON*1050 [0.50] Introductory Microeconomics
MGMT*1000 [1.00] Introduction to Business
One of:
- MATH*1030 [0.50] Business Mathematics
- MATH*1200 [0.50] Calculus I

0.50 electives
***Note:** MATH*1200 is recommended for the Finance Area of Emphasis.

Semester 2

ACCT*1220 [0.50] Introductory Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics
HROB*2090 [0.50] Individuals and Groups in Organizations
MCS*1000 [0.50] Introductory Marketing
0.50 electives

Semester 3

ACCT*2230 [0.50] Management Accounting
ECON*2310 [0.50] Intermediate Microeconomics
ECON*2740 [0.50] Economic Statistics
ECON*2770 [0.50] Introductory Mathematical Economics
MCS*2020 [0.50] Information Management
Note: Students who wish to take the Statistics courses listed under the Finance Area of Emphasis may select STAT*2040 in place of ECON*2740.

Semester 4

ECON*2410 [0.50] Intermediate Macroeconomics
ECON*2560 [0.50] Theory of Finance
MCS*3040 [0.50] Business and Consumer Law **
MGMT*3320 [0.50] Financial Management
0.50 electives or restricted electives in an area of emphasis
***Note**: Students may select HROB*3050 or REAL*4840 in place of MCS*3040. Both are Fall semester courses and can be completed in any Fall semester, provided the prerequisites are completed.

Semester 5

ECON*3740 [0.50] Introduction to Econometrics
MGMT*3020 [0.50] Corporate Social Responsibility
1.50 electives or restricted electives
Note: ECON*3710 is required for the Finance Area of Emphasis.

Semester 6

FARE*3310 [0.50] Operations Management
2.00 electives or restricted electives
Note: One of ECON*3100 or ECON*3810 is required for the Finance Area of Emphasis

Semester 7

2.50 electives or restricted electives

Semester 8

MGMT*4000 [0.50] Strategic Management
One of:
- ECON*4400 [0.50] Economics of Organizations and Corporate Governance
- ECON*4780 [0.50] Topics in Industrial Organization
- ECON*4800 [0.50] Competitiveness and Strategic Advantage

1.50 electives or restricted electives

Areas of Emphasis

Students choose either Finance or Management as an area of emphasis in the MEF major. This choice should be made by semester 4. See the Economics and Finance departmental advisor to declare an area of emphasis.

FINANCE Area of Emphasis

ECON*3710 [0.50] Advanced Microeconomics
ECON*4560 [0.50] Advanced Topics in Finance
1.50 credits from the following Finance courses:
- ECON*3360 [0.50] The Strategy of Mergers and Acquisitions
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives **
- ECON*3860 [0.50] International Finance
- ECON*3960 [0.50] Money, Credit and the Financial System

** Note that FARE*4240 may be substituted for this course.

One of:
- ECON*3100 [0.50] Game Theory
- ECON*3810 [0.50] Advanced Macroeconomics
- ECON*4700 [0.50] Advanced Mathematical Economics

1.00 Economics credits at the 3000 or 4000 level
In addition to the required credits listed above, students must take a minimum of 1.5 credits in restricted electives. Restricted electives are listed below and have been grouped in major topical areas which are related to, or are an extension of, the professional interests of the major. Students may, however, choose restricted electives from any of those listed without regard to the categories, which are intended to be suggestive.

Courses toward a professional designation as a Chartered Financial Analyst (CFA)

ACCT*3330 [0.50] Intermediate Financial Accounting I
ACCT*3340 [0.50] Intermediate Financial Accounting II
ECON*3660 [0.50] Economics of Equity Markets
ECON*3760 [0.50] Fundamentals of Derivatives
ECON*4660 [0.50] Financial Markets Risk Management
ECON*4760 [0.50] Topics in Monetary Economics
MGMT*4350 [0.50] Business Case Competition Preparation

Courses in Quantitative Finance

ECON*4640 [0.50] Applied Econometrics I
ECON*4840 [0.50] Applied Econometrics II
MATH*1160 [0.50] Linear Algebra I
STAT*3100 [0.50] Introductory Mathematical Statistics I
STAT*3110 [0.50] Introductory Mathematical Statistics II

Courses in preparation for post-graduate work in Economics (MA)

ECON*4640 [0.50] Applied Econometrics I
ECON*4710 [0.50] Advanced Topics in Microeconomics
ECON*4810 [0.50] Advanced Topics in Macroeconomics

MANAGEMENT Area of Emphasis

1.50 credits from the following Finance courses:
- ECON*3360 [0.50] The Strategy of Mergers and Acquisitions
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives **
- ECON*3860 [0.50] International Finance
- ECON*3960 [0.50] Money, Credit and the Financial System

** Note that FARE*4240 may be substituted for this course.

2.50 additional credits in economics of which at least 0.50 must be at the 4000 level and at most 0.50*** may be at the 2000 level.

*** May be replaced with a 4000 level 0.50 credits in Accounting.

In addition to the economics credits listed above, students must take a minimum of 1.50 credits in restricted electives listed below. These courses have been grouped in major topical areas which are related to various professional interests. Students may, however, choose restricted electives from any of those listed without regard to the categories.

Courses toward a professional accounting designation Chartered Professional Accountants (CPA)

See http://www.business.uoguelph.ca/accounting.shtml for additional information.

ACCT*2240 [0.50] Applied Financial Accounting
ACCT*3230 [0.50] Intermediate Management Accounting
ACCT*3280 [0.50] Auditing I
ACCT*3330 [0.50] Intermediate Financial Accounting I
ACCT*3340 [0.50] Intermediate Financial Accounting II
ACCT*3350 [0.50] Taxation
ACCT*4220 [0.50] Advanced Financial Accounting
ACCT*4230 [0.50] Advanced Management Accounting
ACCT*4270 [0.50] Auditing II
ACCT*4290 [0.50] Auditing III
ACCT*4340 [0.50] Accounting Theory
ACCT*4350 [0.50] Income Taxation II
ACCT*4440 [0.50] Integrated Cases in Accounting

Courses to prepare for the Certified Human Resource Professional (CHRP) designation:

(see http://www.uoguelph.ca/business/academic-advisor-careers-chrp.shtml for more information)

ECON*2200	[0.50]	Industrial Relations
HROB*3010	[0.50]	Managing and Rewarding Performance
HROB*3030	[0.50]	Workplace Health and Safety
HROB*3070	[0.50]	Attracting and Acquiring Talent
HROB*3090	[0.50]	Developing Talent
HROB*4060	[0.50]	Workforce Optimization

Courses to prepare for a post-graduate program in Industrial Relations:

ECON*2200	[0.50]	Industrial Relations
ECON*3400	[0.50]	The Economics of Personnel Management
ECON*3520	[0.50]	Labour Economics
ECON*3620	[0.50]	International Trade
ECON*4790	[0.50]	Topics in Labour Market Theory
HROB*3010	[0.50]	Managing and Rewarding Performance
HROB*3030	[0.50]	Workplace Health and Safety
HROB*3070	[0.50]	Attracting and Acquiring Talent
HROB*3090	[0.50]	Developing Talent
HROB*4060	[0.50]	Workforce Optimization

Courses toward the Leadership Certificate:

(see http://www.leadershipcertificate.com/ for more information)

HROB*2010	[0.50]	Foundations of Leadership
HROB*4010	[0.50]	Leadership Certificate Capstone
HROB*4030	[0.50]	Advanced Topics In Leadership and Organizational Management
HROB*4100	[1.00]	Evidence-Based People Management
POLS*2250	[0.50]	Public Administration and Governance
POLS*3440	[0.50]	Corruption, Scandal and Political Ethics

Courses in Public Administration:

ECON*3610	[0.50]	Public Economics
POLS*2250	[0.50]	Public Administration and Governance
POLS*2300	[0.50]	Canadian Government and Politics
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3250	[0.50]	Public Policy: Challenges and Prospects
POLS*3270	[0.50]	Local Government in Ontario
POLS*3470	[0.50]	Business-Government Relations in Canada

Courses in Real Estate and Housing:

ECON*3500	[0.50]	Urban Economics **
REAL*1820	[0.50]	Real Estate and Housing
REAL*2820	[0.50]	Real Estate Finance
REAL*3890	[0.50]	Property Management
REAL*4820	[0.50]	Real Estate Appraisal **

** These courses count towards the Post Graduate Valuation Certificate offered by UBC, part of the requirements to obtain an Accredited Appraiser Canadian Institute designation

Courses in Corporate Social Responsibility:

BUS*4550	[0.50]	Applied Business Project I
BUS*4560	[0.50]	Applied Business Project II
ECON*2650	[0.50]	Introductory Development Economics
ECON*3300	[0.50]	Economics of Health and the Workplace
ECON*4930	[0.50]	Environmental Economics
HROB*3030	[0.50]	Workplace Health and Safety
REAL*2850	[0.50]	Service Learning in Housing
MGMT*4050	[0.50]	Business Consulting
MGMT*4060	[0.50]	Business Consulting

Courses in Marketing:

MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3000	[0.50]	Advanced Marketing
MCS*3010	[0.50]	Quality Management
MCS*3620	[0.50]	Marketing Communications
MCS*4400	[0.50]	Pricing Management

Courses in Food and Agribusiness:

FARE*2410	[0.50]	Agrifood Markets and Policy
FARE*3030	[0.50]	The Firm and Markets
FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*4000	[0.50]	Agricultural and Food Policy
FARE*4220	[0.50]	Advanced Agribusiness Management

Management Economics and Finance (Co-op) (MEF:C)

Department of Economics and Finance, **College of Business and Economics**

A principal aim of the Co-op program in Management Economics and Finance 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 Management Economics and Finance is a five year program including, 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter, and Summer work term.

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/cecs/. Please refer to the Co-operative Education program policy with respect to adjusting the schedule listed below.

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 coordinator and Co-op Faculty Advisor, listed on the Co-operative Education and Career Services web site.

Degree Requirements (20.00 Total Credits)

11.00 - Required Core Courses

5.50 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

2.00 - Free Electives

Major

Semester 1 - Fall

ECON*1050	[0.50]	Introductory Microeconomics
MGMT*1000	[1.00]	Introduction to Business

One of:

MATH*1030	[0.50]	Business Mathematics
MATH*1200	[0.50]	Calculus I

0.50 electives

***Note:** MATH*1200 is recommended for the Finance Area of Emphasis.

Semester 2 - Winter

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*1000	[0.50]	Introductory Marketing

0.50 electives

Semester 3 - Fall

ACCT*2230	[0.50]	Management Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2740	[0.50]	Economic Statistics
ECON*2770	[0.50]	Introductory Mathematical Economics
MCS*2020	[0.50]	Information Management

Note: Students who wish to take the Statistics courses listed under the Finance Area of Emphasis may select STAT*2040 in place of ECON*2740.

Semester 4 - Winter

ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2560	[0.50]	Theory of Finance
MCS*3040	[0.50]	Business and Consumer Law *
MGMT*3320	[0.50]	Financial Management

0.50 electives or restricted electives in an area of emphasis

*** Note**: Students may select HROB*3050 or REAL*4840 in place of MCS*3040. Both are Fall semester courses and can be completed in any Fall semester, provided the prerequisites are completed.

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Fall Semester

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

Semester 5 - Winter

ECON*3740	[0.50]	Introduction to Econometrics
FARE*3310	[0.50]	Operations Management

1.50 electives or restricted electives

Note: One of ECON*3100 or ECON*3810 is required for the Finance Area of Emphasis

Summer Semester

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

Semester 6 - Fall

MGMT*3020	[0.50]	Corporate Social Responsibility

2.00 electives or restricted electives

Note: If in the Finance Area of Emphasis take ECON*3710.

Winter Semester

COOP*4000	[0.00]	Co-op Work Term IV

(Eight month work term in conjunction with COOP*5000)

Summer Semester

COOP*5000 [0.00] Co-op Work Term V
(Eight month work term in conjunction with COOP*4000)

Semester 7 - Fall

2.50 electives or restricted electives

Semester 8 - Winter

MGMT*4000 [0.50] Strategic Management
One of:
- ECON*4400 [0.50] Economics of Organizations and Corporate Governance
- ECON*4780 [0.50] Topics in Industrial Organization
- ECON*4800 [0.50] Competitiveness and Strategic Advantage

1.50 electives or restricted electives

Areas of Emphasis

Students choose either Finance or Management as an area of emphasis in the MEF major. This choice should be made by semester 4. See the Economics and Finance departmental advisor to declare an area of emphasis.

FINANCE Area of Emphasis

- ECON*3710 [0.50] Advanced Microeconomics
- ECON*4560 [0.50] Advanced Topics in Finance
- 1.50 credits from the following Finance courses:
  - ECON*3360 [0.50] The Strategy of Mergers and Acquisitions
  - ECON*3660 [0.50] Economics of Equity Markets
  - ECON*3760 [0.50] Fundamentals of Derivatives **
  - ECON*3860 [0.50] International Finance
  - ECON*3960 [0.50] Money, Credit and the Financial System
  - ** Note that FARE*4240 may be substituted for this course.
- One of:
  - ECON*3100 [0.50] Game Theory
  - ECON*3810 [0.50] Advanced Macroeconomics
  - ECON*4700 [0.50] Advanced Mathematical Economics

1.00 Economics credits at the 3000 or 4000 level

In addition to the required credits listed above, students must take a minimum of 1.50 credits in restricted electives. Restricted electives are listed below and have been grouped in major topical areas which are related to, or are an extension of, the professional interests of the major. Students may, however, choose restricted electives from any of those listed without regard to the categories, which are intended to be suggestive.

Courses toward a professional designation as a Chartered Financial Analyst (CFA):

- ACCT*3330 [0.50] Intermediate Financial Accounting I
- ACCT*3340 [0.50] Intermediate Financial Accounting II
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives
- ECON*4660 [0.50] Financial Markets Risk Management
- ECON*4760 [0.50] Topics in Monetary Economics
- MGMT*4350 [0.50] Business Case Competition Preparation

Courses in Quantitative Finance:

- ECON*4640 [0.50] Applied Econometrics I
- ECON*4840 [0.50] Applied Econometrics II
- MATH*1160 [0.50] Linear Algebra I
- STAT*3100 [0.50] Introductory Mathematical Statistics I
- STAT*3110 [0.50] Introductory Mathematical Statistics II

Courses in preparation for post-graduate work in Economics (MA):

- ECON*4640 [0.50] Applied Econometrics I
- ECON*4710 [0.50] Advanced Topics in Microeconomics
- ECON*4810 [0.50] Advanced Topics in Macroeconomics

MANAGEMENT Area of Emphasis

1.50 credits from the following Finance courses:
- ECON*3360 [0.50] The Strategy of Mergers and Acquisitions
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives **
- ECON*3860 [0.50] International Finance
- ECON*3960 [0.50] Money, Credit and the Financial System
- ** Note that FARE*4240 may be substituted for this course.

2.50 additional credits in economics of which at least 0.50 must be at the 4000 level and at most 0.50** may be at the 2000 level.

** May be replaced with a 4000 level 0.50 credits in Accounting.

In addition to the economics credits listed above, students must take a minimum of 1.50 credits in restricted electives listed below. These courses have been grouped in major topical areas which are related to various professional interests. Students may, however, choose restricted electives from any of those listed without regard to the categories.

Courses toward a professional accounting designation Chartered Professional Accountants (CPA)

See http://www.business.uoguelph.ca/accounting.shtml for additional information.

- ACCT*2240 [0.50] Applied Financial Accounting
- ACCT*3230 [0.50] Intermediate Management Accounting
- ACCT*3280 [0.50] Auditing I
- ACCT*3330 [0.50] Intermediate Financial Accounting I
- ACCT*3340 [0.50] Intermediate Financial Accounting II
- ACCT*3350 [0.50] Taxation
- ACCT*4220 [0.50] Advanced Financial Accounting
- ACCT*4230 [0.50] Advanced Management Accounting
- ACCT*4270 [0.50] Auditing II
- ACCT*4290 [0.50] Auditing III
- ACCT*4340 [0.50] Accounting Theory
- ACCT*4350 [0.50] Income Taxation II
- ACCT*4230 [0.50] Advanced Management Accounting
- ACCT*4440 [0.50] Integrated Cases in Accounting

Courses to prepare for the Certified Human Resource Professional (CHRP) designation:

(see http://www.uoguelph.ca/business/academic-advisor-careers-chrp.shtml for more information)

- ECON*2200 [0.50] Industrial Relations
- HROB*3010 [0.50] Managing and Rewarding Performance
- HROB*3030 [0.50] Workplace Health and Safety
- HROB*3070 [0.50] Attracting and Acquiring Talent
- HROB*3090 [0.50] Developing Talent
- HROB*4060 [0.50] Workforce Optimization

Courses to prepare for a post-graduate program in Industrial Relations:

- ECON*2200 [0.50] Industrial Relations
- ECON*3400 [0.50] The Economics of Personnel Management
- ECON*3520 [0.50] Labour Economics
- ECON*3620 [0.50] International Trade
- ECON*4790 [0.50] Topics in Labour Market Theory
- HROB*3010 [0.50] Managing and Rewarding Performance
- HROB*3030 [0.50] Workplace Health and Safety
- HROB*3070 [0.50] Attracting and Acquiring Talent
- HROB*3090 [0.50] Developing Talent
- HROB*4060 [0.50] Workforce Optimization

Courses toward the Leadership Certificate:

(see http://www.leadershipcertificate.com/ for more information)

- HROB*2010 [0.50] Foundations of Leadership
- HROB*4010 [0.50] Leadership Certificate Capstone
- HROB*4030 [0.50] Advanced Topics In Leadership and Organizational Management
- HROB*4100 [1.00] Evidence-Based People Management
- POLS*2250 [0.50] Public Administration and Governance
- POLS*3440 [0.50] Corruption, Scandal and Political Ethics

Courses in Public Administration:

- ECON*3610 [0.50] Public Economics
- POLS*2250 [0.50] Public Administration and Governance
- POLS*2300 [0.50] Canadian Government and Politics
- POLS*3210 [0.50] The Constitution and Canadian Federalism
- POLS*3250 [0.50] Public Policy: Challenges and Prospects
- POLS*3270 [0.50] Local Government in Ontario
- POLS*3470 [0.50] Business-Government Relations in Canada

Courses in Real Estate and Housing:

- ECON*3500 [0.50] Urban Economics **
- REAL*1820 [0.50] Real Estate and Housing
- REAL*2820 [0.50] Real Estate Finance
- REAL*3890 [0.50] Property Management
- REAL*4820 [0.50] Real Estate Appraisal **

** These courses count towards the Post Graduate Valuation Certificate offered by UBC, part of the requirements to obtain an Accredited Appraiser Canadian Institute designation

Courses in Corporate Social Responsibility:

- BUS*4550 [0.50] Applied Business Project I
- BUS*4560 [0.50] Applied Business Project II
- ECON*2650 [0.50] Introductory Development Economics
- ECON*3300 [0.50] Economics of Health and the Workplace
- ECON*4930 [0.50] Environmental Economics
- HROB*3030 [0.50] Workplace Health and Safety
- REAL*2850 [0.50] Service Learning in Housing
- MGMT*4050 [0.50] Business Consulting
- MGMT*4060 [0.50] Business Consulting

Courses in Marketing:

- MCS*2600 [0.50] Fundamentals of Consumer Behaviour
- MCS*3000 [0.50] Advanced Marketing
- MCS*3010 [0.50] Quality Management
- MCS*3620 [0.50] Marketing Communications
- MCS*4400 [0.50] Pricing Management

Courses in Food and Agribusiness:

- FARE*2410 [0.50] Agrifood Markets and Policy

FARE*3030	[0.50]	The Firm and Markets
FARE*3170	[0.50]	Cost-Benefit Analysis
FARE*4000	[0.50]	Agricultural and Food Policy
FARE*4220	[0.50]	Advanced Agribusiness Management

Marketing Management (MKMN)

Department of Marketing and Consumer Studies, College of Business and Economics

The Marketing Management major is interdisciplinary, follows a liberal education philosophy, and is built on the Department's expertise in the field of marketing and consumer research.

The Department of Marketing and Consumer Studies prepares students for a career in marketing but also for educating them so that they can be active and engaged citizens. This is achieved from a balanced curriculum of marketing and liberal education courses that provide students with an understanding of the world they will work and live in. Students will gain knowledge in creating, communicating, and delivering product offerings to create value to stakeholders in a global and connected economy. Students completing this major will be prepared to pursue a variety of marketing career paths and diverse leadership roles.

Elective options enable students to select courses which support or complement their primary field of study. Examples: (1) students can use a combination of restricted, Liberal Education, and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information about this certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. Note: students also can take courses of interest as electives without concern for categories.

Degree Requirements (20.00 Total Credits)

13.00 - Required Core Courses

2.50 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

3.00 - Free Electives

Major

Semester 1- Fall

ECON*1050	[0.50]	Introductory Microeconomics
MGMT*1000	[1.00]	Introduction to Business

Semester 2 - Winter

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
MCS*1000	[0.50]	Introductory Marketing

Semesters 1 or 2 - Fall or Winter

MATH*1030	[0.50]	Business Mathematics
PSYC*1000	[0.50]	Introduction to Psychology

0.50 Marketing Environment electives (see List E1)
0.50 electives

Semester 3 - Fall

ACCT*2230	[0.50]	Management Accounting
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*2000	[0.50]	Business Communication in a Changing World

Semester 4 - Winter

One of:

ECON*2740	[0.50]	Economic Statistics
PSYC*1010	[0.50]	Quantification in Psychology
STAT*2060	[0.50]	Statistics for Business Decisions

Semesters 3 or 4 - Fall or Winter

MCS*2020	[0.50]	Information Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3040	[0.50]	Business and Consumer Law

0.50 History/Global Perspective electives (see List E2)
1.00 electives

Semesters 5 or 6 - Fall or Winter

ECON*2560	[0.50]	Theory of Finance
FARE*3310	[0.50]	Operations Management
MCS*3030	[0.50]	Research Methods
MCS*3500	[0.50]	Marketing Analytics
MCS*3620	[0.50]	Marketing Communications
MGMT*3320	[0.50]	Financial Management

0.50 Leadership/Professionalism electives (see List E3)
1.50 electives

Semesters 7 or 8 - Fall or Winter

MCS*3600	[0.50]	Consumer Information Processes
MCS*4370	[0.50]	Marketing Strategy
MCS*4600	[0.50]	International Marketing
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*4000	[0.50]	Strategic Management

0.50 Advanced Marketing electives (see List E4)
0.50 Experiential Learning Capstone electives (see List E5)
1.50 electives

Restricted Electives for the Marketing Management Major

Substitutions for restricted electives will be allowed if a Marketing and Consumer Studies Faculty Advisor agrees that a proposed alternative is relevant to marketing in today's world and has an appropriate level of rigour.

Marketing Environment Elective - List E1

To supplement the knowledge students gain in MCS*1000 about the socio-cultural, economic, political/legal, and technological "environmental" factors that must be taken into consideration in marketing decision-making, marketing management majors must take one [0.50 credits] of:

ANTH*1150	[0.50]	Introduction to Anthropology
EDRD*1400	[0.50]	Introduction to Design
FRHD*1010	[0.50]	Human Development
GEOG*1200	[0.50]	Society and Space
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*2510	[0.50]	Canada: A Regional Synthesis
NUTR*1010	[0.50]	Introduction to Nutrition
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250	[0.50]	Public Administration and Governance
POLS*2300	[0.50]	Canadian Government and Politics
SOC*1100	[0.50]	Sociology

History/Global Elective - List E2

To help marketing majors develop a sense of the fundamental relativity of knowledge and understanding over time and/or to help them gain the global perspective needed in senior marketing courses, marketing management majors must take one [0.50 credits] of:

ARTH*2490	[0.50]	History of Canadian Art
BIOL*1500	[0.50]	Humans in the Natural World
GEOG*2030	[0.50]	Environment and Development
HIST*1150	[0.50]	The Modern World
HIST*1250	[0.50]	Science and Technology in a Global Context
HIST*2070	[0.50]	World Religions in Historical Perspective
HIST*2250	[0.50]	Environment and History
HIST*2300	[0.50]	The United States Since 1776
HIST*2510	[0.50]	Modern Europe Since 1789
HIST*2800	[0.50]	The History of the Modern Family
HIST*2910	[0.50]	Modern Asia
HIST*2930	[0.50]	Women and Cultural Change
HIST*3070	[0.50]	Modern India
HIST*3150	[0.50]	History and Culture of Mexico
ISS*2000	[0.50]	Asia
POLS*1500	[0.50]	World Politics
POLS*2080	[0.50]	Development and Underdevelopment
POLS*2200	[0.50]	International Relations

Leadership/Professionalism Elective - List E3

To help prepare senior marketing management majors for leadership positions in organizations, they must take one [0.50 credits] of:

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
EDRD*3160	[0.50]	International Communication
EDRD*4120	[0.50]	Leadership Development in Small Organizations
HROB*2010	[0.50]	Foundations of Leadership
MGMT*4260	[0.50]	International Business
PHIL*2100	[0.50]	Critical Thinking
PHIL*2120	[0.50]	Ethics
PHIL*2600	[0.50]	Business and Professional Ethics

Advanced Marketing Elective - List E4

To address the University Learning Objective of "Depth and Breadth of Learning" and to enhance the knowledge of product development, placement strategies, and the integration of societal influences on thinking, senior marketing management majors must take one [0.5 credits] of:

MCS*3010	[0.50]	Quality Management
MCS*4020	[0.50]	Research in Consumer Studies
MCS*4040	[0.50]	Management in Product Development
MCS*4300	[0.50]	Marketing and Society
MCS*4400	[0.50]	Pricing Management
MCS*4910	[0.50]	Topics in Consumer Studies
MGMT*4350	[0.50]	Business Case Competition Preparation

Experiential Learning Capstone Electives - List E5

To enhance their understanding of marketing in terms of application, senior marketing management majors must take one [0.50 credits] of:

HROB*4010	[0.50]	Leadership Certificate Capstone

MCS*4100	[0.50]	Entrepreneurship
MCS*4920	[0.50]	Topics in Consumer Studies
MCS*4950	[0.50]	Consumer Studies Practicum
MGMT*4020	[0.50]	Interdisciplinary Food Product Development I
MGMT*4030	[0.50]	Interdisciplinary Food Product Development II
MGMT*4050	[0.50]	Business Consulting
MGMT*4060	[0.50]	Business Consulting

Marketing Management (Co-op) (MKMN:C)

Department of Marketing and Consumer Studies, College of Business and Economics

The Co-op program in Marketing Management is designed 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 Marketing Management is a five year program including 5 work terms. Although the recommended schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, 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/cecs/.

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 the B.Comm. Program Counsellors or the MKMN Co-op Faculty Advisor.

Elective options enable students to select courses which support or complement their primary field of study. Examples: (1) students can use a combination of restricted, Liberal Education, and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information about this certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. Note: students also can take courses of interest as electives without concern for categories.

Degree Requirements (20.00 Total Credits)

13.00 - Required Core Courses

2.50 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

3.00 - Free Electives

Major

Semester 1- Fall

ECON*1050	[0.50]	Introductory Microeconomics
MGMT*1000	[1.00]	Introduction to Business

Semester 2 - Winter

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
MCS*1000	[0.50]	Introductory Marketing

Semesters 1 or 2 - Fall or Winter

MATH*1030	[0.50]	Business Mathematics
PSYC*1000	[0.50]	Introduction to Psychology

0.50 Marketing Environment electives (see List E1)
0.50 electives

Semester 3 - Fall

ACCT*2230	[0.50]	Management Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*2000	[0.50]	Business Communication in a Changing World

One of:

ECON*2740	[0.50]	Economic Statistics
PSYC*1010	[0.50]	Quantification in Psychology
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

Semesters 3 or 4 - Fall or Winter

MCS*2020	[0.50]	Information Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3030	[0.50]	Research Methods
MCS*3040	[0.50]	Business and Consumer Law

0.50 History/Global Perspective electives (see List E2)

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Fall Semester

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

Semester 5 - Winter

The following 5.00 credits must be completed over semesters 5 and 6. Select 2.50 credits in Winter Semester 5 and the remaining 2.50 in Fall Semester 6:

ECON*2560	[0.50]	Theory of Finance
FARE*3310	[0.50]	Operations Management
MCS*3500	[0.50]	Marketing Analytics
MCS*3620	[0.50]	Marketing Communications
MGMT*3320	[0.50]	Financial Management

0.50 Leadership/Professionalism electives (see List E3)
2.00 electives

Summer Semester

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

Semester 6 - Fall

Select 2.50 credits from the list below that were not taken in Winter Semester 5:

ECON*2560	[0.50]	Theory of Finance
FARE*3310	[0.50]	Operations Management
MCS*3500	[0.50]	Marketing Analytics
MCS*3620	[0.50]	Marketing Communications
MGMT*3320	[0.50]	Financial Management

0.50 Leadership/Professionalism electives (see List E3)
2.00 electives

Winter Semester

COOP*4000	[0.00]	Co-op Work Term IV

(Eight month work term in conjunction with COOP*5000)

Summer Semester

COOP*5000	[0.00]	Co-op Work Term V

(Eight month work term in conjunction with COOP*4000)

Semesters 7 or 8 - Fall or Winter

MCS*3600	[0.50]	Consumer Information Processes
MCS*4370	[0.50]	Marketing Strategy
MCS*4600	[0.50]	International Marketing
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*4000	[0.50]	Strategic Management

0.50 Advanced Marketing electives (see List E4)
0.50 Experiential Learning Capstone electives (see List E5)
1.50 electives

Restricted Electives for the Marketing Management Major

Substitutions for restricted electives will be allowed if a Marketing and Consumer Studies Faculty Advisor agrees that a proposed alternative is relevant to marketing in today's world and has an appropriate level of rigour.

Marketing Environment Elective - List E1

To supplement the knowledge students gain in MCS*1000 about the socio-cultural, economic, political/legal, and technological "environmental" factors that must be taken into consideration in marketing decision-making, marketing management majors must take one [0.50 credits] of:

ANTH*1150	[0.50]	Introduction to Anthropology
EDRD*1400	[0.50]	Introduction to Design
FRHD*1010	[0.50]	Human Development
GEOG*1200	[0.50]	Society and Space
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*2510	[0.50]	Canada: A Regional Synthesis
NUTR*1010	[0.50]	Introduction to Nutrition
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250	[0.50]	Public Administration and Governance
POLS*2300	[0.50]	Canadian Government and Politics
SOC*1100	[0.50]	Sociology

History/Global Elective - List E2

To help marketing majors develop a sense of the fundamental relativity of knowledge and understanding over time and/or to help them gain the global perspective needed in senior marketing courses, marketing management majors must take one [0.50 credits] of:

ARTH*2490	[0.50]	History of Canadian Art
BIOL*1500	[0.50]	Humans in the Natural World
GEOG*2030	[0.50]	Environment and Development
HIST*1150	[0.50]	The Modern World
HIST*1250	[0.50]	Science and Technology in a Global Context
HIST*2070	[0.50]	World Religions in Historical Perspective
HIST*2250	[0.50]	Environment and History
HIST*2300	[0.50]	The United States Since 1776
HIST*2510	[0.50]	Modern Europe Since 1789
HIST*2800	[0.50]	The History of the Modern Family
HIST*2910	[0.50]	Modern Asia
HIST*2930	[0.50]	Women and Cultural Change
HIST*3070	[0.50]	Modern India

HIST*3150	[0.50]	History and Culture of Mexico
ISS*2000	[0.50]	Asia
POLS*1500	[0.50]	World Politics
POLS*2080	[0.50]	Development and Underdevelopment
POLS*2200	[0.50]	International Relations

Leadership/Professionalism Elective - List E3

To help prepare senior marketing management majors for leadership positions in organizations, they must take one [0.50 credits] of:

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
EDRD*3160	[0.50]	International Communication
EDRD*4120	[0.50]	Leadership Development in Small Organizations
HROB*2010	[0.50]	Foundations of Leadership
MGMT*4260	[0.50]	International Business
PHIL*2100	[0.50]	Critical Thinking
PHIL*2120	[0.50]	Ethics
PHIL*2600	[0.50]	Business and Professional Ethics

Advanced Marketing Elective - List E4

To address the University Learning Objective of "Depth and Breadth of Learning" and to enhance the knowledge of product development, placement strategies, and the integration of societal influences on thinking, senior marketing management majors must take one [0.5 credits] of:

MCS*3010	[0.50]	Quality Management
MCS*4020	[0.50]	Research in Consumer Studies
MCS*4040	[0.50]	Management in Product Development
MCS*4300	[0.50]	Marketing and Society
MCS*4400	[0.50]	Pricing Management
MCS*4910	[0.50]	Topics in Consumer Studies
MGMT*4350	[0.50]	Business Case Competition Preparation

Experiential Learning Capstone Electives - List E5

To enhance their understanding of marketing in terms of application, senior marketing management majors must take one [0.50 credits] of:

HROB*4010	[0.50]	Leadership Certificate Capstone
MCS*4100	[0.50]	Entrepreneurship
MCS*4920	[0.50]	Topics in Consumer Studies
MCS*4950	[0.50]	Consumer Studies Practicum
MGMT*4020	[0.50]	Interdisciplinary Food Product Development I
MGMT*4030	[0.50]	Interdisciplinary Food Product Development II
MGMT*4050	[0.50]	Business Consulting
MGMT*4060	[0.50]	Business Consulting

Public Management (PMGT)

Department of Economics and Finance, College of Business and Economics

The Public Management program is designed to lead to an understanding of public sector administration and management from the "inside" - as an integrated enterprise - as well as from the outside - as a series of policy decisions and outcomes. Characterized by a multi-disciplinary approach employing political, economic and business-oriented analysis, students will confront questions of why politicians and public servants behave the way they do, and how their policy choices and processes can be optimized. Management of public entities features a unique set of challenges that arise from and interact with basic political issues like democracy, accountability, equity, fairness, and justice. At the same time it necessarily faces concerns common to all organizations, such as efficiency, human and capital resource management, morale, planning, and adaptation to change.

The program will appeal to students interested in the public service, public sector businesses or business-government relations.

Students enrolled in the PMGT major can choose to complete three of the five required courses for the Certificate in Leadership as part of their requirements for the program if they choose the appropriate restricted electives. If you would like to graduate both with a BComm degree and the Certificate in Leadership you should use two of your free electives to enroll in HROB*2010 in either semester 3 or 6 and HROB*4010 in semester 8. In addition to the five degree-credit courses selected from the above list, 120 hours of leadership practice are required to obtain the undergraduate Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements.

Degree Requirements (20.00 Total Credits)

12.00 - Required Core Courses

5.00 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

1.50 - Free Electives

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business
POLS*1400	[0.50]	Issues in Canadian Politics

Semester 2

ECON*1100	[0.50]	Introductory Macroeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MATH*1030	[0.50]	Business Mathematics
POLS*2300	[0.50]	Canadian Government and Politics

0.50 electives

Semester 3

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2740	[0.50]	Economic Statistics
POLS*3250	[0.50]	Public Policy: Challenges and Prospects

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
ECON*2200	[0.50]	Industrial Relations
ECON*2650	[0.50]	Introductory Development Economics

Semester 4

ACCT*2230	[0.50]	Management Accounting
ECON*2410	[0.50]	Intermediate Macroeconomics
POLS*2250	[0.50]	Public Administration and Governance

One of:

PHIL*2120	[0.50]	Ethics
PHIL*2600	[0.50]	Business and Professional Ethics
PHIL*3040	[0.50]	Philosophy of Law *

0.50 electives

* This course may be offered in the fall and can be taken later in the program.

Semester 5

ECON*2560	[0.50]	Theory of Finance
FARE*3310	[0.50]	Operations Management
MGMT*3320	[0.50]	Financial Management

One of:

MCS*3040	[0.50]	Business and Consumer Law
HROB*3050	[0.50]	Employment Law
REAL*4840	[0.50]	Housing and Real Estate Law

0.50 electives

Semester 6

MCS*2020	[0.50]	Information Management
MGMT*3020	[0.50]	Corporate Social Responsibility

One of:

ECON*3300	[0.50]	Economics of Health and the Workplace
ECON*3400	[0.50]	The Economics of Personnel Management
ECON*3520	[0.50]	Labour Economics
ECON*3580	[0.50]	Economics of Regulation
ECON*3620	[0.50]	International Trade

One of:

POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3130	[0.50]	Law, Politics and Judicial Process
POLS*3270	[0.50]	Local Government in Ontario
POLS*3670	[0.50]	Comparative Public Policy and Administration

0.50 electives

Semester 7

ECON*3610	[0.50]	Public Economics
POLS*3470	[0.50]	Business-Government Relations in Canada

One of:

ECON*3300	[0.50]	Economics of Health and the Workplace
ECON*3400	[0.50]	The Economics of Personnel Management
ECON*3520	[0.50]	Labour Economics
ECON*3580	[0.50]	Economics of Regulation
ECON*3620	[0.50]	International Trade

One of**:

POLS*4160	[1.00]	Multi-Level Governance in Canada
POLS*4250	[1.00]	Topics in Public Management
POLS*4270	[0.50]	Advanced Lecture in Public Management
POLS*4970	[0.50]	Honours Political Science Research I
		0.50 credits at the 3000 or 4000 level in Economics or Political Science

0.50 electives***

Semester 8

MGMT*4000	[0.50]	Strategic Management

One of:

ECON*4400	[0.50]	Economics of Organizations and Corporate Governance
ECON*4800	[0.50]	Competitiveness and Strategic Advantage

One of**:

POLS*4160	[1.00]	Multi-Level Governance in Canada
POLS*4250	[1.00]	Topics in Public Management
POLS*4980	[0.50]	Honours Political Science Research II

0.50 credits at the 4000 level in Economics
One of:

POLS*3130	[0.50]	Law, Politics and Judicial Process
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3270	[0.50]	Local Government in Ontario
POLS*3670	[0.50]	Comparative Public Policy and Administration

0.50 electives***

** If a 1.00 credit POLS is taken in either semester 7 or 8 this will meet the restricted elective requirement for both semesters.

*** The number of electives will change if a 1.00 credit POLS course is taken in semester 7 or 8

Public Management (Co-op) (PMGT:C)

Department of Economics and Finance, College of Business and Economics

A principal aim of the Co-op program in Public 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 Public Management is a five year program, including 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter and Summer work term. 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/cecs/.

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.

Students enrolled in the PMGT major may choose to complete three of the five required courses for the Certificate in Leadership as part of their requirements for the program if they select the appropriate restricted electives. If you would like to graduate both with a BComm degree and the Certificate in Leadership you should use two of your free electives to enroll in HROB*2010 in either semester 3 or 6 and HROB*4010 in semester 8. In addition to the five degree-credit courses selected from the above list, 120 hours of leadership practice are required to obtain the undergraduate Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements.

Degree Requirements (20.00 Total Credits)

12.00 - Required Core Courses

5.00 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

1.50 - Free Electives

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
MCS*1000	[0.50]	Introductory Marketing
MGMT*1000	[1.00]	Introduction to Business
POLS*1400	[0.50]	Issues in Canadian Politics

Semester 2

ECON*1100	[0.50]	Introductory Macroeconomics
HROB*2090	[0.50]	Individuals and Groups in Organizations
MATH*1030	[0.50]	Business Mathematics
POLS*2300	[0.50]	Canadian Government and Politics

0.50 elective

Semester 3

ACCT*1220	[0.50]	Introductory Financial Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2740	[0.50]	Economic Statistics
POLS*3250	[0.50]	Public Policy: Challenges and Prospects

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
ECON*2200	[0.50]	Industrial Relations
ECON*2650	[0.50]	Introductory Development Economics

Semester 4 - Winter

ACCT*2230	[0.50]	Management Accounting
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2560	[0.50]	Theory of Finance
POLS*2250	[0.50]	Public Administration and Governance

0.50 electives

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Fall Semester

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

Semester 5 - Winter

FARE*3310	[0.50]	Operations Management
MCS*2020	[0.50]	Information Management
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management

One of:

PHIL*2120	[0.50]	Ethics
PHIL*2600	[0.50]	Business and Professional Ethics
PHIL*3040	[0.50]	Philosophy of Law

* This course may be offered in the fall and can be taken later in the program.

Summer Semester

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

Semester 6 - Fall

ECON*3610	[0.50]	Public Economics
POLS*3470	[0.50]	Business-Government Relations in Canada

One of:

ECON*3300	[0.50]	Economics of Health and the Workplace
ECON*3400	[0.50]	The Economics of Personnel Management
ECON*3520	[0.50]	Labour Economics
ECON*3580	[0.50]	Economics of Regulation
ECON*3620	[0.50]	International Trade

One of:

MCS*3040	[0.50]	Business and Consumer Law
HROB*3050	[0.50]	Employment Law
REAL*4840	[0.50]	Housing and Real Estate Law

0.50 electives

Winter Semester

COOP*4000	[0.00]	Co-op Work Term IV

(Eight month work term in conjunction with COOP*5000)

Summer Semester

COOP*5000	[0.00]	Co-op Work Term V

(Eight month work term in conjunction with COOP*4000)

Semester 7 - Fall

MGMT*4000	[0.50]	Strategic Management

One of:

ECON*3300	[0.50]	Economics of Health and the Workplace
ECON*3400	[0.50]	The Economics of Personnel Management
ECON*3520	[0.50]	Labour Economics
ECON*3580	[0.50]	Economics of Regulation
ECON*3620	[0.50]	International Trade

One of**:

POLS*4160	[1.00]	Multi-Level Governance in Canada
POLS*4250	[1.00]	Topics in Public Management
POLS*4270	[0.50]	Advanced Lecture in Public Management
POLS*4970	[0.50]	Honours Political Science Research I

0.50 credits at the 3000 or 4000 level in Economics or 4000 level in Political Science
1.00 electives***

Semester 8 - Winter

Two of:

POLS*3130	[0.50]	Law, Politics and Judicial Process
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3270	[0.50]	Local Government in Ontario
POLS*3670	[0.50]	Comparative Public Policy and Administration

One of**:

POLS*4160	[1.00]	Multi-Level Governance in Canada
POLS*4250	[1.00]	Topics in Public Management
POLS*4980	[0.50]	Honours Political Science Research II

0.50 credits at the 4000 level in Economics
One of:

ECON*4400	[0.50]	Economics of Organizations and Corporate Governance
ECON*4800	[0.50]	Competitiveness and Strategic Advantage

0.50 electives***

** If a 1.00 credit POLS is taken in either semester 7 or 8 this will meet the restricted elective requirement for both semesters.

*** The number of electives will change if a 1.00 credit POLS course is taken in semester 7 or 8

Real Estate and Housing (REH)

Department of Marketing and Consumer Studies, College of Business and Economics

The Real Estate and Housing major in the B.Comm. program is one of only a few undergraduate programs in Canada that specialize in the real estate sector. It takes a multi-disciplinary approach to the study of residential and commercial/investment real estate. Topics such as the development, financing, valuation, market analysis and management of real estate are taught in the context of economic, legal, political and social factors affecting this large and growing field of business in Canada and the world.

The purpose of this major is to develop the conceptual, analytical and management skills required for careers in real estate and housing. Students graduate with a degree that can lead to a variety of professional positions in the private or public sectors of the Canadian real estate industry or they can continue on to graduate work in business, planning or the social sciences.

Elective options enable students to select courses which support or complement their primary field of study. Examples: (1) students can use Liberal Education and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. (3) Students interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking some of the additional 4 required courses through University of British Columbia distance education by letter of permission to count as electives in their degree, once they have completed REAL*4820.

Students may consult the REH Faculty Advisor or B.Comm. Program Counsellor for additional information.

Degree Requirements (20.00 Total Credits)

16.00 - Required Core Courses

1.50 - Liberal Education Electives

2.50 - Free Electives

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
REAL*1820	[0.50]	Real Estate and Housing
MGMT*1000	[1.00]	Introduction to Business
0.50 electives		

Semester 2

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
MCS*1000	[0.50]	Introductory Marketing
MATH*1030	[0.50]	Business Mathematics
0.50 electives		

Semester 3

ACCT*2230	[0.50]	Management Accounting
ECON*2310	[0.50]	Intermediate Microeconomics
REAL*2850	[0.50]	Service Learning in Housing
One of:		
ECON*2740	[0.50]	Economic Statistics
STAT*2060	[0.50]	Statistics for Business Decisions
0.50 electives		

Semester 4

ECON*2560	[0.50]	Theory of Finance
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*2020	[0.50]	Information Management
REAL*2820	[0.50]	Real Estate Finance
0.50 electives		

Semester 5

ECON*2410	[0.50]	Intermediate Macroeconomics
FARE*3310	[0.50]	Operations Management
REAL*4820	[0.50]	Real Estate Appraisal
REAL*4840	[0.50]	Housing and Real Estate Law
0.50 electives		

Semester 6

ECON*3960	[0.50]	Money, Credit and the Financial System
LARC*2820	[0.50]	Urban and Regional Planning
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management
REAL*3890	[0.50]	Property Management

Semester 7

ECON*3500	[0.50]	Urban Economics
MGMT*4000	[0.50]	Strategic Management
REAL*3810	[0.50]	Real Estate Market Analysis
REAL*4870	[0.50]	Sustainable Real Estate
0.50 electives		

Semester 8

POLS*3270	[0.50]	Local Government in Ontario
REAL*4830	[1.00]	Real Estate Development Project
1.00 electives		

Real Estate and Housing (Co-op) (REH:C)

Department of Marketing and Consumer Studies, College of Business and Economics

The Real Estate and Housing major in the B.Comm. program is one of only a few undergraduate programs in Canada that specialize in the real estate sector. It takes a multi-disciplinary approach to the study of residential and commercial/investment real estate.

The purpose of this major is to develop the conceptual, analytical and management skills required for careers in real estate and housing. Students graduate with a degree that can lead to a variety of professional positions in the private or public sectors of the Canadian real estate industry or they can continue on to graduate work in business, planning or the social sciences.

A principal aim of the Co-op program in Real Estate and Housing 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 Real Estate and Housing is a five year program, including 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter and Summer work term. 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/cecs/. Please refer to the Co-operative Education programs policy with respect to adjusting the schedule listed below.

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 programs policy with respect to work term performance grading and work term report grading.

Elective options enable students to select courses which support or complement their primary field of study. Examples: (1) students can use Liberal Education and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. (3) Students interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking some of the additional 4 required courses through University of British Columbia distance education by letter of permission to count as electives in their degree, once they have completed REAL*4820.

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

Degree Requirements (20.00 Total Credits)

16.00 - Required Core Courses

1.50 - Liberal Education Electives

2.50 - Free Electives

Major

Semester 1 - Fall

ECON*1050	[0.50]	Introductory Microeconomics
REAL*1820	[0.50]	Real Estate and Housing
MGMT*1000	[1.00]	Introduction to Business
0.50 electives		

Semester 2 - Winter

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
MCS*1000	[0.50]	Introductory Marketing
MATH*1030	[0.50]	Business Mathematics
0.50 electives		

Semester 3 - Fall

ACCT*2230	[0.50]	Management Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
REAL*2850	[0.50]	Service Learning in Housing
One of:		
ECON*2740	[0.50]	Economic Statistics
STAT*2060	[0.50]	Statistics for Business Decisions
0.50 electives		

Semester 4 - Winter

ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2560	[0.50]	Theory of Finance
HROB*2090	[0.50]	Individuals and Groups in Organizations
REAL*2820	[0.50]	Real Estate Finance
0.50 electives		

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Fall Semester

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

Semester 5 - Winter

ECON*3960	[0.50]	Money, Credit and the Financial System
FARE*3310	[0.50]	Operations Management
REAL*3890	[0.50]	Property Management
MCS*2020	[0.50]	Information Management

0.50 electives

Summer Semester

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

Semester 6 - Fall

MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management
REAL*4820	[0.50]	Real Estate Appraisal
REAL*4840	[0.50]	Housing and Real Estate Law

0.50 electives

Winter Semester

COOP*4000	[0.00]	Co-op Work Term IV

(Eight month work term in conjunction with COOP*5000)

Summer Semester

COOP*5000	[0.00]	Co-op Work Term V

(Eight month work term in conjunction with COOP*4000)

Semester 7 - Fall

ECON*3500	[0.50]	Urban Economics
MGMT*4000	[0.50]	Strategic Management
REAL*3810	[0.50]	Real Estate Market Analysis
REAL*4870	[0.50]	Sustainable Real Estate

0.50 electives

Semester 8 - Winter

LARC*2820	[0.50]	Urban and Regional Planning
POLS*3270	[0.50]	Local Government in Ontario
REAL*4830	[1.00]	Real Estate Development Project

0.50 electives

Tourism Management (TMGT)

School of Hospitality, Food and Tourism Management, College of Business and Economics

As the world's largest industry, tourism encompasses a wide range of public and private enterprises that require knowledgeable and talented management professionals. The program in Tourism Management focuses on tourism marketing, tourism planning and development, sustainability and international tourism. This major includes a solid foundation of business skills: (human resources management, accounting and finance). The focus on experiential learning means that theory is balanced with practice. Students are encouraged to participate in guided learning opportunities outside the conventional classroom, such as independent study courses, participating in a semester exchange and engaging in networking events. Students may consult the Faculty Advisor or the B.Comm. Program Counsellor for additional information.

1200 hours of verified work experience in the hospitality and tourism industry is required for students to be eligible to graduate. 700 hours of hospitality and tourism work experience must be completed before a student enters Semester 7.

Group work is a significant part of core credit work.

Elective options enable students to select courses which support or complement their primary field of study. Examples: 1) Students can use a combination of restricted, Liberal Education and free electives to earn the Certificate in Leadership. http://www.leadershipcertificate.com/ for information about this certificate and its course requirements. 2) Students interested in languages and/or going on exchange can use a combination of their restricted, Liberal Education or free electives to study one or more of the various languages taught at the University or to take courses while on exchange.

Degree Requirements (20.00 Total Credits)

16.00 - Required Core Courses

1.50 - Restricted Electives (from list A)

1.50 - Liberal Education Electives

1.00 - Free Electives

Major

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics
HTM*1000	[0.50]	Introduction to Hospitality and Tourism Management
MATH*1030	[0.50]	Business Mathematics
MGMT*1000	[1.00]	Introduction to Business

Semester 2

ECON*1100	[0.50]	Introductory Macroeconomics
GEOG*1220	[0.50]	Human Impact on the Environment
HTM*2010	[0.50]	Hospitality and Tourism Business Communications
HTM*2100	[0.50]	Lodging Operations
MCS*1000	[0.50]	Introductory Marketing

Semester 3

ACCT*1220	[0.50]	Introductory Financial Accounting
HROB*2090	[0.50]	Individuals and Groups in Organizations
HTM*2170	[0.50]	Responsible Tourism Policy and Planning

One of:

ECON*2740	[0.50]	Economic Statistics
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 from List A or electives

Semester 4

ACCT*2230	[0.50]	Management Accounting
ECON*2560	[0.50]	Theory of Finance
MCS*2020	[0.50]	Information Management

1.00 from List A or electives

Semester 5

HROB*3000	[0.50]	Human Resources Management
HTM*3080	[0.50]	Marketing Strategy for Hospitality Managers
HTM*3160	[0.50]	Destination Management and Marketing
MGMT*3020	[0.50]	Corporate Social Responsibility
MGMT*3320	[0.50]	Financial Management

Semester 6

FARE*4360	[0.50]	Marketing Research
HTM*2070	[0.50]	Event Management
HTM*3120	[0.50]	Service Operations Analysis
MCS*3040	[0.50]	Business and Consumer Law

0.50 from List A or electives

Semester 7

HTM*3150	[0.50]	Experiential Learning in the Hospitality and Tourism Industry
HTM*4190	[0.50]	Hospitality and Tourism Industry Consultation
MGMT*4000	[0.50]	Strategic Management

1.00 from List A or electives

Semester 8

EDRD*4010	[0.50]	Tourism Planning in the Less Developed World
HTM*4170	[0.50]	International Tourism
HTM*4250	[0.50]	Hospitality Revenue Management

1.00 from List A or electives

List A - Restricted Electives

Students must also take a minimum of 1.50 restricted elective credits from the following list, throughout the program. Students may choose to explore a variety of categories or they may choose to study one area related to their major in some depth. Restricted electives are listed below and have been grouped into major subject areas which are related to the professional interests of the Tourism Management major. Students may, however, choose restricted electives from any of those listed without regard to the categories.

Students may also select language courses as restricted electives. Students without a second language are encouraged to take language courses.

Eco-tourism related courses:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
EDRD*3400	[0.50]	Sustainable Communities
FARE*2700	[0.50]	Survey of Natural Resource Economics
FARE*4290	[0.50]	Land Economics
GEOG*2210	[0.50]	Environment and Resources
GEOG*3490	[0.50]	Tourism and Environment
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*3370	[0.50]	Environmental Politics and Governance

International tourism related courses:

ECON*2650	[0.50]	Introductory Development Economics
ECON*3620	[0.50]	International Trade
ECON*4830	[0.50]	Economic Development
EDRD*3160	[0.50]	International Communication
GEOG*3490	[0.50]	Tourism and Environment
HTM*2740	[0.50]	Cultural Aspects of Food

Tourism real estate related courses:

GEOG*3490	[0.50]	Tourism and Environment
LARC*2820	[0.50]	Urban and Regional Planning
REAL*1820	[0.50]	Real Estate and Housing
REAL*2820	[0.50]	Real Estate Finance
REAL*3810	[0.50]	Real Estate Market Analysis
REAL*3890	[0.50]	Property Management

REAL*4820	[0.50]	Real Estate Appraisal
REAL*4840	[0.50]	Housing and Real Estate Law

Social and economic environment of business:

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*3520	[0.50]	Labour Economics
ECON*3660	[0.50]	Economics of Equity Markets
ECON*3760	[0.50]	Fundamentals of Derivatives
ECON*3860	[0.50]	International Finance
ECON*3960	[0.50]	Money, Credit and the Financial System
PHIL*1010	[0.50]	Introductory Philosophy: Social and Political Issues
PHIL*2600	[0.50]	Business and Professional Ethics
POLS*1400	[0.50]	Issues in Canadian Politics

Human behaviour related to work and work groups:

ANTH*1150	[0.50]	Introduction to Anthropology
ANTH*2160	[0.50]	Social Anthropology
EDRD*3140	[0.50]	Organizational Communication
HROB*2010	[0.50]	Foundations of Leadership
HROB*3030	[0.50]	Workplace Health and Safety
HROB*3050	[0.50]	Employment Law
HROB*4010	[0.50]	Leadership Certificate Capstone
ECON*2200	[0.50]	Industrial Relations
PSYC*1000	[0.50]	Introduction to Psychology
PSYC*2310	[0.50]	Introduction to Social Psychology
SOAN*2040	[0.50]	Globalization of Work and Organizations
SOC*1100	[0.50]	Sociology

Marketing and consumer behaviour related courses:

MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3000	[0.50]	Advanced Marketing
MCS*3010	[0.50]	Quality Management
MCS*3620	[0.50]	Marketing Communications
MCS*4400	[0.50]	Pricing Management
PSYC*1000	[0.50]	Introduction to Psychology

Specialized courses related to Hospitality and Tourism Management:

HTM*2700	[0.50]	Understanding Foods
HTM*2740	[0.50]	Cultural Aspects of Food
HTM*3030	[0.50]	Beverage Management
HTM*3060	[0.50]	Lodging Management
HTM*3090	[1.00]	Restaurant Operations Management
HTM*3180	[0.50]	Casino Operations Management
HTM*3780	[0.50]	Managing Food in Canada
HTM*4050	[0.50]	Wine and Oenology
HTM*4090	[0.50]	Hospitality Development, Design and Sustainability
HTM*4110	[0.50]	Advanced Restaurant Operations
HTM*4130	[0.50]	Current Management Topics
HTM*4140	[0.50]	Current Management Topics
HTM*4150	[0.50]	Current Management Topics
HTM*4500	[0.50]	Special Study in Hospitality and Tourism

Accounting and administration related courses:

ACCT*1240	[0.50]	Applied Financial Accounting
ACCT*3230	[0.50]	Intermediate Management Accounting
ACCT*3280	[0.50]	Auditing I
ACCT*3330	[0.50]	Intermediate Financial Accounting I
ACCT*3340	[0.50]	Intermediate Financial Accounting II
ACCT*3350	[0.50]	Taxation
ACCT*4220	[0.50]	Advanced Financial Accounting
ACCT*4230	[0.50]	Advanced Management Accounting
MCS*2100	[0.50]	Personal Financial Management
MGMT*4260	[0.50]	International Business

Preparation for The Certified Human Resource Professional (CHRP) designation:

ECON*2200	[0.50]	Industrial Relations
HROB*3010	[0.50]	Managing and Rewarding Performance
HROB*3030	[0.50]	Workplace Health and Safety
HROB*3070	[0.50]	Attracting and Acquiring Talent
HROB*3090	[0.50]	Developing Talent
HROB*4060	[0.50]	Workforce Optimization

Other restricted electives:

CHEM*1100	[0.50]	Chemistry Today
CIS*1000	[0.50]	Introduction to Computer Applications
ENGL*1200	[0.50]	Reading the Contemporary World
ENGL*1410	[0.50]	Major Writers
MGMT*4050	[0.50]	Business Consulting
MGMT*4060	[0.50]	Business Consulting
MGMT*4350	[0.50]	Business Case Competition Preparation
PHIL*2100	[0.50]	Critical Thinking

and Liberal Education Requirement and Free Electives

Students must complete 1.50 credits towards the Liberal Education Requirement and they have 1.00 credits in free electives.

Bachelor of Computing (B.Comp.)

Students graduating from this program obtain a solid foundation in the theory and application of all aspects of computing and information science. Core subjects, combined with in-depth study in an area of application, give students the freedom to combine their interests in computing with other areas of study and application.

There are two majors available in the Bachelor of Computing honours program. The major in Computer Science provides a traditional computing foundation in software, hardware, and theory. The major in Software Engineering contains an emphasis on software development and design and has a greater focus on team work, communication skills, and professional standards.

Course projects are based on real-world software development scenarios and allows students to get the professional experience valued by today's high-tech employers. The focused study in a second discipline (area of application) gives students the background to effectively apply their knowledge.

Both majors require the equivalent of 8 semesters of successful full-time study. The general program requires the equivalent of 6 semesters of successful full-time study are available. Students in the honours program must choose a major in either Computer Science or Software Engineering. The majors are also available with a Co-op option.

Since not all courses are offered in every semester and prerequisite dependencies must be observed, students are encouraged to consult the program B.Comp. counsellor to plan an initial program of study or when considering modifications to the suggested schedule of studies list.

Program Information

To graduate with an honours Degree with a major in Computer Science or Software Engineering a student must:

a. Successfully complete 20.00 credits. These must include the 11.25 CIS credits, a minimum of 4.00 credits in an Area of Application and an additional 4.75 credits as free electives. Not more than 6.00 credits from courses at the introductory (1000) level may be counted towards the 20.00 credit requirement.

   The program requires 6.00 Computing and Information Science credits at the 3000 level or above, which must include 2.00 credits at the 4000 level. The area of application requires an additional 1.00 credits at the 3000 level or above. The Area of Application is a graduation requirement and must be approved by Semester 4 by the faculty advisor.

b. Obtain a cumulative average at least 70% in CIS courses and a 60% cumulative average in all courses.

c. An Area of Application normally consists of 4.00 credits (normally 8 courses) of a minor. Minors are described under the B.A. and B.Sc. programs. Access to some courses may be limited. Minors are listed in Section X of the Calendar. A student may complete a minor should they decide to do so.

   Students must consult the faculty advisor for approval of their Area of Application by semester 4. Not all disciplines or courses may be available as areas of application.

   Students failing to meet the graduation requirements of the honours program may apply to graduate with a general degree if the requirements for the general degree are met.

Continuation of Study

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

General Program

School of Computer Science, College of Physical and Engineering Science

To graduate from a general program a student must:

a. Earn 15.00 credits. These must include courses that fulfill the distribution requirements of the general Degree (see below). At least 4.00 credits must be at the 3000 level or above. Not more than 6.00 credits at the introductory (1000) level may be counted towards the 15.00 credit requirement.

b. No more than 11.00 credits in any one subject or discipline, as indicated by the course prefix code, can be counted towards a general degree.

c. Successfully complete the following credits:

CIS*1500	[0.50]	Introduction to Programming
CIS*1910	[0.50]	Discrete Structures in Computing I
CIS*2430	[0.50]	Object Oriented Programming
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration
CIS*2910	[0.50]	Discrete Structures in Computing II
CIS*3530	[0.50]	Data Base Systems and Concepts

   0.50 additional CIS or STAT credits at the 2000 level or higher
   1.00 additional CIS credits at 3000 level or higher

d. Earn 2.00 science credits (list of courses available in the Program Counsellor's office) and 2.00 credits in the College of Arts or College of Social and Applied Human Sciences in addition to the courses listed in c.

Computer Science (CS)

School of Computer Science, College of Physical and Engineering Science

Major (Honours Program)

Since many courses are offered in only one semester and course pre-requisites place an ordering on courses, the following program of studies is designed so that students can schedule their courses over 8 semesters of study. Students deviating from this schedule must consult with their academic advisor.

Semester 1

CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I

1.50 credits in the Area of Application or electives

Semester 2

CIS*1910	[0.50]	Discrete Structures in Computing I
CIS*2500	[0.50]	Intermediate Programming

1.50 credits in the Area of Application or electives

Semester 3

CIS*2030	[0.50]	Structure and Application of Microcomputers
CIS*2430	[0.50]	Object Oriented Programming
CIS*2520	[0.50]	Data Structures
CIS*2910	[0.50]	Discrete Structures in Computing II

0.50 credits in the Area of Application or electives

Semester 4

CIS*2750	[0.75]	Software Systems Development and Integration
CIS*3110	[0.50]	Operating Systems I
CIS*3490	[0.50]	The Analysis and Design of Computer Algorithms

0.75 credits in the Area of Application or elective

Semester 5

CIS*3150	[0.50]	Theory of Computation
CIS*3750	[0.75]	System Analysis and Design in Applications

One of:

CIS*2460	[0.50]	Modelling of Computer Systems
STAT*2040	[0.50]	Statistics I

0.75 credits in the Area of Application or electives

Semester 6

CIS*3760	[0.75]	Software Engineering

0.50 C.I.S electives at the 3000 level or above
1.25 credits in the Area of Application or electives

Semester 7

1.00 credits in the Area of Application or electives
0.50 credits in CIS at 3000 level or above
1.00 credits in CIS at the 4000 level

Semester 8

CIS*4650	[0.50]	Compilers

1.00 credits in the Area of Application or electives
0.50 credits in CIS at the 3000 level or above
0.50 credits in CIS at the 4000 level

Computer Science (Co-op) (CS:C)

Computing and Information Science, College of Physical and Engineering Science

The honours major in Computer Science is available with a Co-operative Education option. Students may apply for this option at the time of University admission or completion of semester 2. Please check with CIS Co-op faculty advisor for semester planning.

Since many courses are offered in only one semester and course pre-requisites place an ordering on courses, the following program of studies is designed so that students can schedule their courses over 8 semesters of study. Students deviating from this schedule must consult with their Co-op faculty advisor.

Computer Science Co-op Work Term Schedule

Year	Fall	Winter	Summer
1	Academic	Academic	Off
2	Academic	Academic	Work Term 1
3	Work Term 2	Academic	Work Term 3
4	Academic	Work Term 4	Work Term 5
5	Academic	Academic	N/A

Note: that a total of four work terms are necessary to complete the Co-op requirement.

Students are eligible to participate in a maximum two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website.

The course COOP*1100 must be successfully completed before the student may apply for a placement for the first work term (normally 2 semesters before the first work term). COOP*1000, COOP*2000, COOP*3000, COOP*4000 and COOP*5000 represent the first, second, third, fourth, and fifth work terms respectively.

Students are advised to plan their schedule of studies well in advance so that they can take all required prerequisites for later (especially 4000 level) courses. Students should note that some 4000 level courses are only given in alternate years. Failure to plan may result in the inability to take a particular senior CIS course. Not all sequences may be viable. Please check with the CIS Co-op faculty advisor for semester planning.

Conditions for graduation are the same as the corresponding regular B.Comp. program. In addition, all work reports and performance evaluations must have a grade of satisfactory or better.

Major Co-op (Honours Program)

The recommended schedule of studies for Co-op is as follows:

Semester 1 - Fall

CIS*1500 [0.50] Introduction to Programming
MATH*1200 [0.50] Calculus I
1.50 credits in the Area of Application or electives

Semester 2 - Winter

CIS*1910 [0.50] Discrete Structures in Computing I
CIS*2500 [0.50] Intermediate Programming
1.50 credits in the Area of Application or electives

Summer Semester - Off

Semester 3 - Fall

CIS*2030 [0.50] Structure and Application of Microcomputers
CIS*2430 [0.50] Object Oriented Programming
CIS*2520 [0.50] Data Structures
CIS*2910 [0.50] Discrete Structures in Computing II
COOP*1100 [0.00] Introduction to Co-operative Education
0.50 credits in the Area of Application or electives

Semester 4 - Winter

CIS*2750 [0.75] Software Systems Development and Integration
CIS*3110 [0.50] Operating Systems I
CIS*3490 [0.50] The Analysis and Design of Computer Algorithms
0.75 credits in the Area of Application or elective

Summer Semester

COOP*1000 Work Term 1

Fall Semester

COOP*2000 Work Term 2

Semester 5 - Winter

CIS*3760 [0.75] Software Engineering
0.50 C.I.S electives at the 3000 level or above
1.25 credits in the Area of Application or electives

Summer Semester

COOP*3000 Work Term 3

Semester 6 - Fall

CIS*3150 [0.50] Theory of Computation
CIS*3750 [0.75] System Analysis and Design in Applications
One of:
- CIS*2460 [0.50] Modelling of Computer Systems
- STAT*2040 [0.50] Statistics I

0.75 credits in the Area of Application or electives

Winter Semester

COOP*4000 Work Term 4
8-month work term in conjunction with COOP*5000

Summer Semester

COOP*5000 Work Term 5
8-month work term in conjunction with COOP*4000

Semester 7 - Fall

1.00 credits in the Area of Application or electives
0.50 credits in CIS at 3000 level or above
1.00 credits in CIS at the 4000 level

Semester 8 - Winter

CIS*4650 [0.50] Compilers
1.00 credits in the Area of Application or electives
0.50 credits in CIS at 3000 level or above
0.50 credits in CIS at the 4000 level

Software Engineering (SENG)

School of Computer Science, College of Physical and Engineering Science

Major (Honours Program)

Since many courses are offered in only one semester and course pre-requisites place an ordering on courses, the following program of studies is designed so that students can schedule their courses over 8 semesters of study. Students deviating from this schedule must consult with their academic advisor.

Semester 1

CIS*1250 [0.50] Software Design I
CIS*1500 [0.50] Introduction to Programming
1.50 credits in the Area of Application or electives

Semester 2

CIS*1910 [0.50] Discrete Structures in Computing I
CIS*2250 [0.50] Software Design II
CIS*2500 [0.50] Intermediate Programming
1.00 credits in the Area of Application or electives

Semester 3

CIS*2030 [0.50] Structure and Application of Microcomputers
CIS*2430 [0.50] Object Oriented Programming
CIS*2520 [0.50] Data Structures
CIS*3250 [0.50] Software Design III
0.50 credits in the Area of Application or electives

Semester 4

CIS*2750 [0.75] Software Systems Development and Integration
CIS*3110 [0.50] Operating Systems I
0.75 credits in the Area of Application or elective
0.50 C.I.S electives at the 3000 level or above

Semester 5

CIS*3260 [0.50] Software Design IV
CIS*3750 [0.75] System Analysis and Design in Applications
One of:
- CIS*2460 [0.50] Modelling of Computer Systems
- STAT*2040 [0.50] Statistics I

0.75 credits in the Area of Application or electives

Semester 6

CIS*3760 [0.75] Software Engineering
0.50 C.I.S electives at the 3000 level or above
1.25 credits in the Area of Application or electives

Semester 7

CIS*4150 [0.50] Software Reliability and Testing
CIS*4250 [0.50] Software Design V
CIS*4300 [0.50] Human Computer Interaction
1.00 credits in the Area of Application or electives

Semester 8

1.50 credits in the Area of Application or electives
0.50 credits in CIS at the 3000 level or above
0.50 credits in CIS at the 4000 level

Software Engineering (Co-op) (SENG:C)

Computing and Information Science, College of Physical and Engineering Science

The honours major in Software Engineering is available with a Co-operative Education option. Students may apply for this option at the time of University admission or completion of semester 2. Please check with CIS Co-op faculty advisor for semester planning.

Since many courses are offered in only one semester and course pre-requisites place an ordering on courses, the following program of studies is designed so that students can schedule their courses over 8 semesters of study. Students deviating from this schedule must consult with their Co-op faculty advisor.

Software Engineering Co-op Work Term Schedule

Year	Fall	Winter	Summer
1	Academic	Academic	Off
2	Academic	Academic	Work Term 1
3	Work Term 2	Academic	Work Term 3
4	Academic	Work Term 4	Work Term 5
5	Academic	Academic	N/A

Note: that a total of four work terms are necessary to complete the Co-op requirement.

Students are eligible to participate in a maximum two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website

The course COOP*1100 must be successfully completed before the student may apply for a placement for the first work term (normally 2 semesters before the first work term). COOP*1000, COOP*2000, COOP*3000, COOP*4000 and COOP*5000 represent the first, second, third, fourth, and fifth work terms respectively.

Students are advised to plan their schedule of studies well in advance so that they can take all required prerequisites for later (especially 4000 level) courses. Students should note that some 4000 level courses are only given in alternate years. Failure to plan may result in the inability to take a particular senior CIS course. Not all sequences may be viable. Please check with the CIS Co-op faculty advisor for semester planning.

Conditions for graduation are the same as the corresponding regular B.Comp. program. In addition, all work reports and performance evaluations must have a grade of satisfactory or better.

Major (Honours Program) Co-op

The recommended schedule of studies for Co-op is as follows:

Semester 1 - Fall

CIS*1250	[0.50]	Software Design I
CIS*1500	[0.50]	Introduction to Programming

1.50 credits in the Area of Application or electives

Semester 2 - Winter

CIS*1910	[0.50]	Discrete Structures in Computing I
CIS*2250	[0.50]	Software Design II
CIS*2500	[0.50]	Intermediate Programming

1.00 credits in the Area of Application or electives

Summer Semester - Off

Semester 3 - Fall

CIS*2030	[0.50]	Structure and Application of Microcomputers
CIS*2430	[0.50]	Object Oriented Programming
CIS*2520	[0.50]	Data Structures
CIS*3250	[0.50]	Software Design III
COOP*1100	[0.00]	Introduction to Co-operative Education

0.50 credits in the Area of Application or electives

Semester 4 - Winter

CIS*2750	[0.75]	Software Systems Development and Integration
CIS*3110	[0.50]	Operating Systems I

0.75 credits in the Area of Application or elective
0.50 C.I.S electives at the 3000 level or above

Summer Semester

COOP*1000 Work Term 1

Fall Semester

COOP*2000 Work Term 2

Semester 5 - Winter

CIS*3760	[0.75]	Software Engineering

0.50 C.I.S electives at the 3000 level or above
1.25 credits in the Area of Application or electives

Summer Semester

COOP*3000 Work Term 3

Semester 6 - Fall

CIS*3260	[0.50]	Software Design IV
CIS*3750	[0.75]	System Analysis and Design in Applications

One of:

CIS*2460	[0.50]	Modelling of Computer Systems
STAT*2040	[0.50]	Statistics I

0.75 credits in the Area of Application or electives

Winter Semester

COOP*4000 Work Term 4
8-month work term in conjunction with COOP*5000

Summer Semester

COOP*5000 Work Term 5
8-month work term in conjunction with COOP*4000

Semester 7 - Fall

CIS*4150	[0.50]	Software Reliability and Testing
CIS*4250	[0.50]	Software Design V
CIS*4300	[0.50]	Human Computer Interaction

1.00 credits in the Area of Application or electives

Semester 8 - Winter

1.50 credits in the Area of Application or electives
0.50 credits in CIS at 3000 level or above
0.50 credits in CIS at the 4000 level

Bachelor of Engineering [B.Eng.]

Program Information

Objectives of the Program

Students in this program obtain a liberal engineering education, which includes a comprehensive core of science, mathematics and engineering science that provides a strong foundation for engineering design and analysis. This enables students to undertake the solution of engineering problems in the areas of biological, biomedical, computer, engineering systems and computing, environmental, mechanical and water resources. Core subjects, combined with elective opportunities, provide an understanding of the connection between engineering and science, coupled with the interdisciplinary skills needed to address the problems and challenges faced by engineers in society today.

The curriculum includes a strong emphasis on engineering design. Students engage in engineering design throughout the program, and gain experience in computer aided design and modeling, conceptual design and physical construction. Emphasis is on teamwork and communications skills, as well as working on interdisciplinary projects.

Career opportunities are open in many segments of the economy. Examples are: consulting services to municipalities, utilities and industry; resource agencies in advisory, regulatory, planning and utilization; service industries of construction, power and water supply and public health; manufacturing, design of computer and control systems, hardware and software development; mechatronics and emerging energy systems; medical devices, pharmaceutical and food industries and industrial ergonomics; academic research and graduate studies within and without the field of engineering.

Many engineers assume management responsibilities after gaining experience in design, development and operations. The balance provided by liberal arts and engineering education allows graduates to enjoy a great deal of career mobility.

Accreditation

The baccalaureate degree programs in all engineering programs are accredited by the Canadian Engineering Accreditation Board of Engineers Canada. Graduates from accredited engineering programs have the educational requirements to apply for membership in the Professional Engineers Ontario (PEO) and other provinces after a number of years of acceptable engineering experience and successful completion of a PEO examination in engineering law and ethics.

Requirements of the Program

Students combine their required courses in mathematics, physical sciences and engineering with additional credits providing the opportunity for specialization in: one of the programs; complementary studies courses; and elective subjects. A minimum of 23.50 credits must be obtained for the following programs: Biological Engineering, Engineering Systems and Computing, Environmental Engineering, Mechanical Engineering, and Water Resources Engineering. A minimum of 23.25 credits must be obtained for Biomedical Engineering. A minimum of 24.00 credits must be obtained for Computer Engineering. At least 3.00 credits must be complementary studies, which consist of courses in the social sciences, arts, management, engineering economics and communication. They complement the technical content of the curriculum. All credits are selected according to the schedule of studies for the student's chosen program. Restrictions apply to the number of non-core credits which may be at the 1000 level. Further information on approved courses may be obtained from the B.Eng. Program Guide available from the director or program counsellor of the School of Engineering

Programs

Entry into a specific B.Eng. program is done two ways. Students can select their desired program of study (major) at the time of application. If accepted, students will be given an offer to their program of choice. Students also have the option of selecting the Undeclared First Year (Undeclared Stream) entry point due to the similarities of first year. Students in the Undeclared Stream then normally select their specific program of study during course selection for Semester II. Students in the Undeclared stream are strongly encouraged to meet with their Program Counsellor during Semester I. The School's Associate Director - Undergraduate Affairs or designate approve program selection during the semester add periods. There are no enrollment caps on any program, so students are free to select their programs of choice. Students wanting to make a switch in majors after the above dates are free to do so with prior approval, but will be off sequence and may be required to take additional courses.

The available programs are:

Undeclared First Year: Students selecting this entry point are required to select one of the B.Eng. Majors at the time of course selection in Semester II.

Biological Engineering - the application of engineering to the control and management of biological processes, environments, and human factors in engineering design.

Biomedical Engineering - the application of engineering to health and medicine.

Computer Engineering - the application of engineering to the design, fabrication, and testing of computing machines and computer systems.

Engineering Systems and Computing - the application of engineering to the design, operation and management of data sensing, transmission and processing systems, and of control systems.

Environmental Engineering - the application of engineering to protect and restore the environment, through the prevention and treatment of gaseous, liquid and solid wastes.

Mechanical Engineering - The application of engineering to the design, manufacturing and control of mechanical and electro-mechanical equipment, systems and devices.

Water Resources Engineering - the application of engineering to the control and management of water and soil resources to meet human needs while sustaining the natural environment.

The schedule of studies for each program is provided below but guidance in the selection of appropriate courses is available from the program counsellor of the School of Engineering.

Additional Course Requirements

Students lacking specific subject requirements are advised to consult the Recommendations and Notes in Section IV--Admission Information-B.Eng..

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 Regulation & Procedures. Students will be ineligible to continue in the B.Eng. program and will not be readmitted to the degree program if the same course is failed three times.

Normally, students in the B.Eng. program will be permitted only one supplemental privilege during their studies. It will usually be granted for 3000 or 4000 level courses only.

Conditions for Graduation

To qualify for the degree the student must complete the courses required for a B.Eng. program, obtaining a minimum of 23.50 credits for one of: Biological Engineering, Environmental Engineering, Mechanical Engineering, Engineering Systems and Computing Engineering; or 23.25 credits for Biomedical Engineering; or 24.00 credits for Computer Engineering, and must achieve an overall minimum cumulative average of at least 60% and a minimum cumulative average of at least 60% in all ENGG courses.

Co-operative Education

Students studying for the B.Eng. degree may participate in a Co-operative Education program following the completion of the first 4 semesters of study. The Co-operative Education program consists of a minimum of 4 semesters of experience in industry with employers who participate in the program. Reports and assignments are graded by a faculty supervisor with assistance from the employer. Evaluations of Co-op semesters are recorded on the student's academic record. The Co-operative Education program provides an excellent opportunity for students to obtain work experience in industry directly related to their field of study. Interested students should consult their program counsellor.

Students wishing to participate in the Co-operative Education program should indicate their intention to do so by applying for admission to the Co-op program on entrance. Following the completion of semester 2, in-course applicants will be considered for admission to the Co-op program if space permits.

Successful applicants will:

1. have a minimum cumulative average of 70% in semesters 1 and 2
2. have successfully completed all of the credits required in the schedule of studies for semesters 1 and 2
3. be employable in Canada or be in possession of an appropriate work-permit for Co-op students)
4. have obtained the approval of their Co-op advisor in the school to participate in the program. The Co-op advisor's approval will signify that the schedule of work semesters in the Co-op program as planned by the student is compatible with the schedule of studies in the program in which the student is enrolled.
5. completion of COOP*1100 is a requirement for entry into the first work term.

Please refer to Co-operative Education Program for Admission requirements into the Co-op Program.

B. Eng. Co-op Work Term Schedule

Semester	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5
Fall	1	3	5	6	work
Winter	2	4	work	7	8
Summer		work	work	work	

All candidates must complete a minimum of 4 of the preceding 5 work terms with at least one work-term in each of a Fall, Winter and Summer semester. Students are eligible to participate in a maximum of two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website.

Undeclared First Year Entry - B.Eng. Program Regular and Co-op

School of Engineering, College of Physical and Engineering Science

Semester 1

CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
ENGG*1100	[0.75]	Engineering and Design I

MATH*1200 [0.50] Calculus I
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 Regular or Co-op (Biological Engineering, Biomedical Engineering, Environmental Engineering, Water Resources Engineering)

CHEM*1050 [0.50] General Chemistry II
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 2 Regular or Co-op (Computer Engineering, Engineering Systems and Computing)

CIS*2500 [0.50] Intermediate Programming
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 2 Regular or Co-op (Mechanical Engineering)

ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Biomedical Engineering Program Regular and Co-op (BME/BME:C)

School of Engineering, College of Physical and Engineering Science

Biomedical Engineering is a field of engineering that deals with health and medicine. (e.g.: electronic and mechanical devices used on biological materials, animals and humans, medical implants and instruments, ergonomics, bioinstrumentation, imaging and pharmacology). Graduates in Biomedical engineering are able to apply mathematical, scientific and engineering principles to a wide variety of fields and find employment across the private and public sectors of the health care industry. The program provides students with a common base of knowledge essential to engineering, and then allows them to select from a menu of electives to attain a degree of specialization in one of three areas, or to choose electives which broaden their general knowledge base. Elective concentrations are available in the areas of biomechanics; biosignal processing; and pharmaceuticals. The program is built around the concept of interdisciplinary application of engineering principles to health related problems.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
ENGG*1100 [0.75] Engineering and Design I
MATH*1200 [0.50] Calculus I
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

CHEM*1050 [0.50] General Chemistry II
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 3 - Regular or Co-op

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
COOP*1100 [0.00] Introduction to Co-operative Education
ENGG*2160 [0.50] Engineering Mechanics II
ENGG*2400 [0.50] Engineering Systems Analysis
MATH*2270 [0.50] Applied Differential Equations
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

Note: ENGG*2120 or ENGG*2230 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

BIOL*1080 [0.50] Biological Concepts of Health
BIOM*2000 [0.50] Concepts in Human Physiology
ENGG*2450 [0.50] Electric Circuits
MATH*2130 [0.50] Numerical Methods
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Note: Students pursuing the pharmaceutical series of electives may select ENGG*2660 in Semester 4. If ENGG*2660 is selected, students must select BIOM*2000 in semester 6 in place of a 0.50 restricted elective.

Semester 5 - Regular or Co-op

BIOM*3010 [0.50] Biomedical Comparative Anatomy
ENGG*3170 [0.50] Biomaterials
ENGG*3240 [0.50] Engineering Economics
ENGG*3260 [0.50] Thermodynamics
ENGG*3390 [0.50] Signal Processing
ENGG*3450 [0.50] Electrical Devices

Semester 6 Regular / Semester 7 Co-op

ENGG*3100 [0.75] Engineering and Design III
ENGG*3410 [0.50] Systems and Control Theory
ENGG*3430 [0.50] Heat and Mass Transfer
PATH*3610 [0.50] Principles of Disease
1.00 restricted electives

Semester 7 Regular / Semester 6 Co-op

ENGG*4000 [0.00] Proposal for Engineering Design IV
ENGG*4390 [0.75] Bio-instrumentation Design
2.00 restricted electives

Note: BME:C students must register for ENGG*4000 in the final co-op work term semester immediately preceding registration in ENGG*4180.

Semester 8 (Winter) - Regular or Co-op

ENGG*4180 [1.00] Biomedical Engineering Design IV
1.75 restricted electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 0.75 credits in Biomedical Engineering design electives
- 2.00 credits in Biomedical Engineering electives

Biological Engineering Program Regular and Co-op (BIOE/BIOE:C)

School of Engineering, College of Physical and Engineering Science

Students interested in problems requiring the application of knowledge from both the biological sciences and engineering will find a challenge as a Biological Engineer. This field of engineering relates to the control of technological processes with the aim of enhancing human, animal and plant life. The program encompasses the technologies of biotechnology, waste management, food engineering, and ergonomics. For example, a Biological Engineer concentrating on biotechnology might design and manage bioreactors to improve their productivity. A career in Biomedical Engineering, which requires graduate work beyond the Bachelor's degree, involves designing instruments and diagnostic techniques to be used in the practice of medicine, developing prosthetic devices, and applying engineering techniques to the study of physiological systems.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
ENGG*1100 [0.75] Engineering and Design I
MATH*1200 [0.50] Calculus I
One of:

ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

CHEM*1050 [0.50] General Chemistry II
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 3 - Regular or Co-op

COOP*1100 [0.00] Introduction to Co-operative Education
BIOL*1080 [0.50] Biological Concepts of Health
ENGG*2400 [0.50] Engineering Systems Analysis
MATH*2270 [0.50] Applied Differential Equations
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

Note: ENGG*2120 or ENGG*2230 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

BIOC*2580 [0.50] Introduction to Biochemistry
ENGG*2450 [0.50] Electric Circuits
ENGG*2660 [0.50] Biological Engineering Systems I
MATH*2130 [0.50] Numerical Methods
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Semester 5 - Regular or Co-op

ENGG*3160 [0.50] Biological Engineering Systems II
ENGG*3170 [0.50] Biomaterials
ENGG*3240 [0.50] Engineering Economics
ENGG*3260 [0.50] Thermodynamics
ENGG*3450 [0.50] Electrical Devices
ENGG*3830 [0.50] Bio-Process Engineering

Semester 6 Regular / Semester 7 Co-op

ENGG*3100 [0.75] Engineering and Design III
ENGG*3410 [0.50] Systems and Control Theory
ENGG*3430 [0.50] Heat and Mass Transfer
1.00 restricted electives

Semester 7 Regular / Semester 6 Co-op

ENGG*4000 [0.00] Proposal for Engineering Design IV
ENGG*4390 [0.75] Bio-instrumentation Design
2.75 restricted electives

Note: BIOE:C students must register for ENGG*4000 in the final co-op work term semester immediately preceding registration in ENGG*4110.

Semester 8 (Winter) - Regular or Co-op

ENGG*4110 [1.00] Biological Engineering Design IV
ENGG*4280 [0.75] Digital Process Control Design
1.00 restricted electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 0.75 credits in required Design electives
- 1.00 credits in Biological Engineering electives
- 1.00 credits in Free electives

Computer Engineering Program Regular and Co-op (CENG/CENG:C)

School of Engineering, College of Physical and Engineering Science

Computer Engineering is a field of engineering that focuses on the design and organization of computer systems. Graduates in Computer Engineering are able to apply mathematical, scientific and engineering principles to design and integrate computer systems suitable for applications in a wide range of fields. The program provides students with a common base of knowledge essential to computer engineering and then allows them to select from a menu of electives to attain a degree of specialization in one of four areas or to choose electives to broaden their knowledge base. Elective concentrations are available in areas of Electronic Design automation, Software Design, Artificial Intelligence and Robotics, and Microsystems.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
ENGG*1100 [0.75] Engineering and Design I
MATH*1200 [0.50] Calculus I
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

CIS*2500 [0.50] Intermediate Programming
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 3 - Regular or Co-op

CIS*2430 [0.50] Object Oriented Programming
CIS*2520 [0.50] Data Structures
CIS*2910 [0.50] Discrete Structures in Computing II
COOP*1100 [0.00] Introduction to Co-operative Education
ENGG*2400 [0.50] Engineering Systems Analysis
ENGG*2410 [0.50] Digital Systems Design Using Descriptive Languages
MATH*2270 [0.50] Applied Differential Equations

Semester 4 - Regular or Co-op

ENGG*2100 [0.75] Engineering and Design II
ENGG*2450 [0.50] Electric Circuits
ENGG*3380 [0.50] Computer Organization and Design
MATH*2130 [0.50] Numerical Methods
STAT*2120 [0.50] Probability and Statistics for Engineers
0.50 restricted electives (CIS*2750 recommended for students interested in the software engineering stream)

Semester 5 - Regular or Co-op

ENGG*2120 [0.50] Material Science
ENGG*3240 [0.50] Engineering Economics
ENGG*3390 [0.50] Signal Processing
ENGG*3450 [0.50] Electrical Devices
ENGG*3640 [0.50] Microcomputer Interfacing
0.50 restricted electives

Semester 6 - Regular / Semester 7 - Co-op

CIS*3110 [0.50] Operating Systems I
CIS*3490 [0.50] The Analysis and Design of Computer Algorithms
ENGG*3100 [0.75] Engineering and Design III
ENGG*3210 [0.50] Communication Systems
ENGG*3410 [0.50] Systems and Control Theory
0.50 restricted electives

Semester 7 - Regular / Semester 6 - Co-op

ENGG*4000 [0.00] Proposal for Engineering Design IV
ENGG*4080 [0.50] Micro and Nano-Scale Electronics
ENGG*4420 [0.75] Real-time Systems Design
ENGG*4450 [0.50] Large-Scale Software Architecture Engineering
1.00 restricted electives

Note: CENG:C students must register for ENGG*4000 in the final co-op work term semester immediately preceding registration in ENGG*4170.

Semester 8 - Regular or Co-op

ENGG*4170 [1.00] Computer Engineering Design IV
ENGG*4540 [0.50] Advanced Computer Architecture

ENGG*4550 [0.50] VLSI Digital Design
1.00 electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements

- 2.00 credits in Complimentary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list)
- 1.50 credits in Computer engineering electives.

Engineering Systems and Computing Program Regular and Co-op (ESC/ESC:C)

School of Engineering, College of Physical and Engineering Science

In the last quarter century, the computer has grown so rapidly in importance that engineering, science, business and industry could not function without it. With this growth, a need has evolved for specialists who can incorporate computers and information into complex industrial processes. The Engineering Systems and Computing program has been conceived to satisfy this need. Graduates from this program will have, in addition to the basic engineering skills, the ability to identify application areas where computer technology represents the optimum solution, specify appropriate software for process control, data reduction and/or expert system implementation and integrate the computer into the overall system application.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
ENGG*1100 [0.75] Engineering and Design I
MATH*1200 [0.50] Calculus I
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

CIS*2500 [0.50] Intermediate Programming
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 3 - Regular or Co-op

CIS*2430 [0.50] Object Oriented Programming
CIS*2520 [0.50] Data Structures
COOP*1100 [0.00] Introduction to Co-operative Education
ENGG*2400 [0.50] Engineering Systems Analysis
ENGG*2410 [0.50] Digital Systems Design Using Descriptive Languages
MATH*2270 [0.50] Applied Differential Equations
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Note: ENGG*2120 or ENGG*2230 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

ENGG*2100 [0.75] Engineering and Design II
ENGG*2450 [0.50] Electric Circuits
MATH*2130 [0.50] Numerical Methods
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics
0.50 restricted electives

Semester 5 - Regular or Co-op

ENGG*3260 [0.50] Thermodynamics
ENGG*3390 [0.50] Signal Processing
ENGG*3450 [0.50] Electrical Devices
ENGG*3640 [0.50] Microcomputer Interfacing
1.00 restricted electives

Semester 6 - Regular / Semester 7 - Co-op

ENGG*3100 [0.75] Engineering and Design III
ENGG*3130 [0.50] Modelling Complex Systems
ENGG*3410 [0.50] Systems and Control Theory
ENGG*3430 [0.50] Heat and Mass Transfer
0.50 or 0.75 restricted electives

Semester 7 - Regular / Semester 6 - Co-op

ENGG*3240 [0.50] Engineering Economics
ENGG*4000 [0.00] Proposal for Engineering Design IV
ENGG*4420 [0.75] Real-time Systems Design
ENGG*4450 [0.50] Large-Scale Software Architecture Engineering
1.00 or 1.25 restricted electives

Note: ESC:C students must register for ENGG*4000 in the final co-op work term semester immediately preceding registration in ENGG*4120.

Semester 8 - Regular or Co-op

ENGG*4120 [1.00] Engineering Systems and Computing Design IV
ENGG*4280 [0.75] Digital Process Control Design
1.00 electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 1.50 credits in ES&C Engineering electives
- 0.75 credits in ES&C Engineering Design electives

Environmental Engineering Program Regular and Co-op (ENVE/ENVE:C)

School of Engineering, College of Physical and Engineering Science

The degradation of the environment is a concern shared by citizens, government agencies, non governmental agencies and businesses. The Environmental Engineering program offered by the School of Engineering provides graduates with design and engineering skills to minimize and prevent the impact of human activities on water, soil and air systems. Both simple and innovative solutions are part of the tool box. Graduates will also creatively integrate humanistic and social perspectives in their solutions.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
ENGG*1100 [0.75] Engineering and Design I
MATH*1200 [0.50] Calculus I
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

CHEM*1050 [0.50] General Chemistry II
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 3 - Regular or Co-op

COOP*1100 [0.00] Introduction to Co-operative Education
ENGG*2400 [0.50] Engineering Systems Analysis
MATH*2270 [0.50] Applied Differential Equations
0.50 restricted electives
One of:
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
MICR*2420 [0.50] Introduction to Microbiology
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

Note: ENGG*2120 or ENGG*2230 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

ENGG*2450 [0.50] Electric Circuits
ENGG*2560 [0.50] Environmental Engineering Systems
MATH*2130 [0.50] Numerical Methods
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:

ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics
0.50 restricted electives

Semester 5 - Regular or Co-op

ENGG*3180 [0.50] Air Quality
ENGG*3240 [0.50] Engineering Economics
ENGG*3260 [0.50] Thermodynamics
ENGG*3590 [0.50] Water Quality
ENGG*3650 [0.50] Hydrology
ENGG*3670 [0.50] Soil Mechanics

Semester 6 Regular / Semester 7 Co-op

ENGG*3100 [0.75] Engineering and Design III
ENGG*3220 [0.50] Groundwater Engineering
ENGG*3410 [0.50] Systems and Control Theory
ENGG*3430 [0.50] Heat and Mass Transfer
ENGG*3470 [0.50] Mass Transfer Operations
0.50 restricted electives

Semester 7 Regular / Semester 6 Co-op

ENGG*4000 [0.00] Proposal for Engineering Design IV
ENGG*4340 [0.50] Solid and Hazardous Waste Management
ENGG*4370 [0.75] Urban Water Systems Design
1.50 restricted electives

Note: ENVE:C students must register for ENGG*4000 in the final co-op work term semester immediately preceding registration in ENGG*4130.

Semester 8 - Regular or Co-op

ENGG*4130 [1.00] Environmental Engineering Design IV
2.00 restricted electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 3.00 credits in Environmental Engineering electives

Minor (Honours Program)

Students must be registered in the B.Eng degree program to apply for a minor in Environmental Engineering.

The minor can be satisfied by taking the following additional courses:

BIOC*2580 [0.50] Introduction to Biochemistry
CHEM*3360 [0.50] Environmental Chemistry and Toxicology
ENGG*2560 [0.50] Environmental Engineering Systems
ENGG*3180 [0.50] Air Quality
ENGG*3590 [0.50] Water Quality
GEOG*1300 [0.50] Introduction to the Biophysical Environment
MICR*2420 [0.50] Introduction to Microbiology
Three of:
ENGG*3470 [0.50] Mass Transfer Operations
ENGG*4340 [0.50] Solid and Hazardous Waste Management
ENGG*4760 [0.50] Biological Wastewater Treatment Design
ENGG*4770 [0.50] Physical & Chemical Water and Wastewater Treatment Design
ENGG*4810 [0.50] Control of Atmospheric Particulates
ENGG*4820 [0.50] Atmospheric Emission Control: Combustion Systems

Students must incorporate an environmental application as part of their capstone design course worth 1.00 credits in the final semester of their B.Eng major program.

Food Engineering (FENG)

School of Engineering, College of Physical and Engineering Science

Minor (Honours Program)

Students must be registered in the B.Eng. degree program to apply for a Minor in Food Engineering.

The minor can be satisfied by taking the following additional courses:

ACCT*1220 [0.50] Introductory Financial Accounting
BIOC*2580 [0.50] Introduction to Biochemistry
ENGG*2660 [0.50] Biological Engineering Systems I
ENGG*3830 [0.50] Bio-Process Engineering
FOOD*2150 [0.50] Introduction to Nutritional and Food Science
MICR*1020 [0.50] Fundamentals of Applied Microbiology
One of:
ENGG*4300 [0.75] Food Processing Engineering Design
ENGG*4380 [0.75] Bioreactor Design
Two of:
FOOD*4070 [0.50] Food Packaging
FOOD*4110 [0.50] Meat and Poultry Processing
MCS*3010 [0.50] Quality Management
One of:
FOOD*3160 [0.75] Food Processing I
FOOD*4520 [0.50] Utilization of Cereal Grains for Human Food
One of:
FOOD*2400 [0.50] Introduction to Food Chemistry
FOOD*3010 [0.50] Food Chemistry
FOOD*3230 [0.75] Food Microbiology
FOOD*3260 [0.50] Industrial Microbiology

**Students must incorporate a food engineering application as part of their capstone design course worth 1.0 credits in the final semester of their B.Eng. major program.*

NOTE: Courses taken for the minors are credited to appropriate elective areas.

Mechanical Engineering Program Regular and Co-op (MECH/MECH:C)

School of Engineering, College of Physical and Engineering Science

Mechanical Engineering at Guelph is built around concepts of sustainability and sustainable design to equip graduates to tackle issues associated with emerging technologies. Graduates in mechanical engineering are able to apply mathematical, scientific and engineering principles to a wide variety of fields and find employment across the private and public sectors. The program provides students with a common base of knowledge essential to mechanical engineering, and then allows them to select from a menu of electives to attain a degree of specialization in one of five areas, or to choose electives which broaden their general knowledge base. Elective concentrations are available in the areas of wind and solar energy, food and beverage engineering, mechatronics, manufacturing system design and biomechanics.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
ENGG*1100 [0.75] Engineering and Design I
MATH*1200 [0.50] Calculus I
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Note: One of ENGG*1210 and HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
PHYS*1130 [0.50] Physics with Applications
One of:
ENGG*1210 [0.50] Engineering Mechanics I
HIST*1250 [0.50] Science and Technology in a Global Context

Semester 3 - Regular or Co-op

COOP*1100 [0.00] Introduction to Co-operative Education
ENGG*1070 [0.25] Occupational Health and Safety
ENGG*2160 [0.50] Engineering Mechanics II
ENGG*2400 [0.50] Engineering Systems Analysis
MATH*2270 [0.50] Applied Differential Equations
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

Note: ENGG*2120 or ENGG*2230 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

ENGG*2180 [0.50] Introduction to Manufacturing Processes
ENGG*2340 [0.50] Kinematics and Dynamics
ENGG*2450 [0.50] Electric Circuits
MATH*2130 [0.50] Numerical Methods
One of:
ENGG*2100 [0.75] Engineering and Design II
STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
ENGG*2120 [0.50] Material Science
ENGG*2230 [0.50] Fluid Mechanics

Semester 5 - Regular or Co-op

ENGG*3140 [0.50] Mechanical Vibration
ENGG*3240 [0.50] Engineering Economics
ENGG*3260 [0.50] Thermodynamics

ENGG*3280 [0.75] Machine Design
ENGG*3510 [0.50] Electromechanical Devices
0.50 restricted electives

Semester 6 - Regular / Semester 7 - Co-op

ENGG*3100 [0.75] Engineering and Design III
ENGG*3370 [0.50] Applied Fluids and Thermodynamics
ENGG*3410 [0.50] Systems and Control Theory
ENGG*3430 [0.50] Heat and Mass Transfer
1.00 restricted electives

Semester 7 - Regular / Semester 6 - Co-op

ENGG*4000 [0.00] Proposal for Engineering Design IV
2.50 restricted electives

Note: MECH:C students must register for ENGG*4000 in the final co-op work term semester immediately preceding registration in ENGG*4160.

Semester 8 - Regular or Co-op

ENGG*4160 [1.00] Mechanical Engineering Design IV
2.25 restricted electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 0.75 credits in Mechanical Engineering Design electives.
- A minimum of 3.50 credits in Mechanical Engineering electives. Specific credit requirements vary by the mechanical engineering design elective chosen. Please consult the Program Guide for further information on the prerequisite requirements specific to each mechanical engineering design elective.

Water Resources Engineering Program Regular and Co-op (WRE/WRE:C)

School of Engineering, College of Physical and Engineering Science

Water resources engineering focuses on the use and management of land and water resources in rural and urban watersheds. The hydrologic and hydraulic behaviour of watershed flow systems is combined with engineering science and ecological principles in the design of water management systems and strategies. Water management includes flood prevention, warning and control; drainage; design of natural channels; irrigation; and erosion prevention and control. The supply of water for municipal, industrial and agricultural purposes is considered in the context of resource conservation. Identification of potential point and diffused sources of pollutants is used to develop efficient, environmentally sustainable and economical methods to preserve high-quality water to sustain human life and water-dependent ecosystems.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
ENGG*1100 [0.75] Engineering and Design I
MATH*1200 [0.50] Calculus I
One of:
  ENGG*1210 [0.50] Engineering Mechanics I
  HIST*1250 [0.50] Science and Technology in a Global Context

Note: One of ENGG*1210 and HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

CHEM*1050 [0.50] General Chemistry II
ENGG*1500 [0.50] Engineering Analysis
MATH*1210 [0.50] Calculus II
PHYS*1130 [0.50] Physics with Applications
One of:
  ENGG*1210 [0.50] Engineering Mechanics I
  HIST*1250 [0.50] Science and Technology in a Global Context

Semester 3 - Regular or Co-op

COOP*1100 [0.00] Introduction to Co-operative Education
ENGG*2400 [0.50] Engineering Systems Analysis
GEOG*2000 [0.50] Geomorphology
MATH*2270 [0.50] Applied Differential Equations
One of:
  BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
  MICR*2420 [0.50] Introduction to Microbiology
One of:
  ENGG*2100 [0.75] Engineering and Design II
  STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
  ENGG*2120 [0.50] Material Science
  ENGG*2230 [0.50] Fluid Mechanics

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

Note: ENGG*2120 or ENGG*2230 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

ENGG*2450 [0.50] Electric Circuits
ENGG*2550 [0.50] Water Management
ENGG*2560 [0.50] Environmental Engineering Systems
MATH*2130 [0.50] Numerical Methods
One of:
  ENGG*2100 [0.75] Engineering and Design II
  STAT*2120 [0.50] Probability and Statistics for Engineers
One of:
  ENGG*2120 [0.50] Material Science
  ENGG*2230 [0.50] Fluid Mechanics

Semester 5 - Regular or Co-op

ENGG*3240 [0.50] Engineering Economics
ENGG*3260 [0.50] Thermodynamics
ENGG*3590 [0.50] Water Quality
ENGG*3650 [0.50] Hydrology
ENGG*3670 [0.50] Soil Mechanics
0.50 restricted electives

Semester 6 - Regular / Semester 7 - Co-op

ENGG*3100 [0.75] Engineering and Design III
ENGG*3220 [0.50] Groundwater Engineering
ENGG*3430 [0.50] Heat and Mass Transfer
1.50 restricted electives

Semester 7 - Regular / Semester 6 - Co-op

ENGG*3340 [0.50] Geographic Information Systems in Environmental Engineering
ENGG*4000 [0.00] Proposal for Engineering Design IV
ENGG*4360 [0.75] Soil-Water Conservation Systems Design
ENGG*4370 [0.75] Urban Water Systems Design
1.00 restricted electives

Note: WRE:C students must register for ENGG*4000 in the final co-op work term semester immediately preceding registration in ENGG*4150.

Semester 8 (Winter) Regular or Co-op

ENGG*4150 [1.00] Water Resources Engineering Design IV
ENGG*4250 [0.75] Watershed Systems Design
1.00 restricted electives

Note: ENGG*4250 can be taken in Semester 6

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 1.00 credits in Water Resources Engineering electives
- 0.50 credits in Environmental Resources electives
- 0.50 credits in Water Resources electives

Bachelor of Landscape Architecture (B.L.A.)

Landscape Architecture is the art and science of designing and conserving land and water for human use and enjoyment. As a profession, Landscape Architecture is concerned with two scales of planning and design.

The first scale is with the development of specific sites for residential, recreational, institutional, commercial and industrial projects. The second scale pertains to the regional landscape where the issues include management plans for forest, park and recreation areas, agricultural lands protection, gravel pit mining and restoration, hazard land studies, and visual resource analysis.

Program Information

Objectives of the Program

Landscape Architecture is a diverse and rewarding design profession. Landscape architects play an important role in shaping our environment, working in collaboration with other design professionals, specialists and the public.

Students in the B.L.A. program attain professional knowledge and skill that prepares them to deal with problems that concern the interface between people and the environment. Program emphasis is on core professional knowledge domains that include landscape analysis, design, implementation, communication, history and professional practice. Additional required and elective courses in the arts and sciences provide a well-rounded education.

Graduates of the program have exciting careers in the public and private sector. As landscape architects, they design memorable places that are attractive, functional and sustainable and that affect the way our cities, suburbs, rural and wilderness areas are planned, designed and managed.

Accreditation

The Bachelor of Landscape Architecture program is accredited by the Landscape Architecture Accreditation Council (LAAC) of the Canadian Society of Landscape Architects (CSLA). This accreditation is also recognized by the American Society of Landscape Architects (ASLA). Graduates of accredited landscape architecture programs have the educational qualifications to apply for membership in provincial and state professional associates in Canada and the United States after completion of the required number of years of professional practice and successful completion of required examinations.

Admission to the Landscape Architecture Program

Students wishing to enter the program of study leading to the Bachelor of Landscape Architecture degree should consult Section IV--Admission Information.

Degree

The degree granted for the successful completion of the program is the Bachelor of Landscape Architecture (B.L.A.).

Selection of Electives

All electives may be chosen independently although counselling with the BLA Program Counsellor is highly, recommended. In selecting electives two approaches may be followed: 1) electives may be chosen from a variety of disciplines to achieve breadth of knowledge or, 2) all or most electives may be chosen in a subject area in order to pursue a particular field of interest in depth. Some of these fields might include agricultural and biological sciences, environmental studies, studio arts, geography, philosophy or sociology.

Students wishing to elect a permissible substitute shall do so in consultation with the BLA Program Coordinator and BLA Program Counsellor. A substitute course will normally be in the same academic area as that listed in the Landscape Architecture Program.

Academic Advising

Students can consult the BLA Coordinator who is a faculty member that can address program issues and individual curriculum queries.

Computers

Expertise in many aspects of computer application is now a fundamental skill for the profession. Recognizing this, the school provides computer facilities in the building. If it is feasible we recommend that students acquire their own computer within the first two years of the program.

Field Trips

Participation in organized visits to site study areas and project sites is obligatory for all students taking certain courses in landscape architecture. To the extent that it 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 director prior to registration for permission to substitute papers on appropriate topics.

Pre-Professional Experience

It is considered highly advisable that the prospective graduate prepare for later professional practice through summer employment in the landscape industry. Two summers spent in landscape related work followed by 1 summer in a professional office is considered to be a desirable sequence of employment.

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 for Graduation

In order to qualify for graduation from the 8 semester Honours B.L.A. program, the student must successfully complete all of the courses approved for the program (20.00 credits) and maintain a minimum 60.0% cumulative average.

Schedule of Studies

Major (Honours Program)

Semester 1

BIOL*1500	[0.50]	Humans in the Natural World
LARC*1100	[0.75]	Design and Communications Studio
LARC*1950	[0.50]	History of Cultural Form I

One of:

ANTH*1150	[0.50]	Introduction to Anthropology
PHIL*1010	[0.50]	Introductory Philosophy: Social and Political Issues
PSYC*1000	[0.50]	Introduction to Psychology
SOC*1100	[0.50]	Sociology

0.50 electives

Semester 2

LARC*2020	[0.75]	Design Studio
LARC*2230	[0.50]	Planting Design
LARC*2420	[0.50]	Materials and Techniques
PHIL*2070	[0.50]	Philosophy of the Environment

0.50 electives

Semester 3

LARC*2100	[0.50]	Landscape Analysis
LARC*2240	[0.50]	Plants in the Landscape
LARC*2410	[0.50]	Site Engineering
LARC*3040	[0.75]	Site Planning and Design Studio

0.50 electives

Semester 4

LARC*2820	[0.50]	Urban and Regional Planning
LARC*3050	[0.75]	Landscape Architecture I
LARC*3430	[0.50]	Landscape Construction I

0.50 Social Science elective

***Note:** A "Social Science" elective can be any course in the following areas: Anthropology, Economics, Geography, Women's Studies, International Development, Political Science, Psychology or Sociology.

Semester 5

LARC*3060	[0.75]	Landscape Architecture II
LARC*3440	[0.75]	Landscape Construction II
LARC*4610	[0.50]	Professional Practice

0.50 electives

Semester 6

Choose one of the following three options:

Option 1

2.00 electives

Option 2

LARC*4620	[1.00]	Internship in Landscape Architecture

1.00 electives

Option 3

Exchange Program (2.00 credits)

Semester 7

LARC*3070	[1.00]	Landscape Architecture III
LARC*3320	[0.50]	Principles of Landscape Ecology
LARC*4510	[0.50]	Honours Thesis

0.50 electives

Semester 8

LARC*4090	[0.50]	Seminar
LARC*4710	[1.00]	Integrative Design Studio

0.50 electives

0.50 electives

Bachelor of Science (B.Sc.)

The University of Guelph offers general and honours programs leading to the B.Sc. degree. The general program consists of a minimum of 15.00 credits (usually 30 semester courses) involving normally 6 semesters of study. The requirements for the honours program is a minimum of 20.00 credits (usually 40 semester courses) which may be obtained over 8 semesters of study. Some majors may require more than 20.00 credits.

The Three Semester System

Most of the B.Sc. programs operate on the three semester system. In this system each of the Fall, Winter and Summer semesters is of 12 weeks duration. Two semesters are equivalent to 1 academic year at a university on the traditional system. In the three semester system, students may vary their rate of progress towards graduation. However, since many science courses must be taken in a certain sequence and not all courses are offered each semester, most science students are required to proceed from semester to semester in restricted patterns. Furthermore, the advanced courses of the honours programs are offered only in the regular fall and winter semesters.

Additional information may be obtained from Admissions Services, Office of Registrarial Services. The three-semester system and the pass-by-course method of advancement allow considerable flexibility of program arrangement. In addition, a variety of program contents is available which the student may modify to meet individual requirements.

Transfer from One B.Sc. Program to Another

On entrance to the B.Sc. program, the student may elect to follow an intended area of specialization or to postpone this decision until a later semester. The choice of a particular program of study may be most effectively made at the end of Semester 3 or 4. Judicious selection of courses in each and every semester will allow the easiest transfer between programs without incurring the need for additional semesters of study. The program counsellor of the particular college from which it is anticipated that the majority of science courses will be taken should be consulted for advice.

Program Information

General Program Requirements

The general B.Sc. degree requires the successful completion of 15.00 credits. Normally 2.50 credits (usually 5 courses) are taken in each semester so that the degree may be completed in 6 semesters. The general science program is designed to give a broad general training in biological science, chemistry, physics and mathematical science. This is achieved by requiring each student to take a minimum of 1.00 credits in each of the above areas and an additional 0.50 credits in three of the four above areas. The courses to be taken in semesters 4 to 6 may be selected to allow a broad study of the sciences from the list of approved electives for B.Sc. students.

Honours Program Requirements

In order to graduate from the honours program, students must fulfill all program requirements for the program and have achieved a 60%, or higher, cumulative average over all course attempts. Normally 2.50 credits (usually 5 courses) are taken in each semester so that the degree may be completed in generally 8 semesters. The following types of honours programs are offered:

Honours Major Programs

Major in a subject

Major in a subject with a minor or a second major

Honours Major

Majors permit a student to study science in greater depth than is permitted by the general program. The student is required to take a minimum of 1.00 credits (usually 2 courses) in each of biological science, chemistry, physics and mathematical science. In each of semesters 3 to 8, students select science credits so that the total program provides a broad science training with concentration in an area of physical science or biological science.

A major normally consists of certain prescribed courses (minimum of 8.00 credits) and a number of elective courses to complete the requirements for the degree. The composition of science courses selected must contain a sufficient number (minimum of 6.00 credits) of 3000 and 4000 level courses including a grouping (minimum of 2.00 credits) particularly at the 4000 level. A major program may be studied in conjunction with a minor in an area of science, humanities or social science.

Honours Minor

A minor is a group of courses which provides for exposure to and mastery of the fundamental principles of a subject. A minor consists of a minimum of 5.00 credits (normally 10 courses). It may also require certain other courses from other areas to be taken along with the specified courses of the minor. A minor is taken in conjunction with a major.

Students should seek advice from the program counsellor of either the College of Biological Science or the College of Physical and Engineering Science dependent upon their primary area(s) of interest. Refer to B.Sc. Program Requirements: Regulation 6 Double-Counting of Credits..

B.Sc. Program Requirements

Regulations 1, 2, 3 and 4 apply to all B.Sc. students.

1. Entry Credits

In general, the 4U /grade 12 credit or its equivalent is required in a subject area to allow entrance to the initial university course. Students who lack this requirement can remedy the deficiency by successful completion of:

BIOL*1020 for students lacking biology
CHEM*1060 for students lacking chemistry
If more than one of the above courses is taken, students are required to complete additional credits beyond the minimum total required for the degree.

2. 1st Year Science Core

In each of the first 2 semesters B.Sc. students must take one (1) of the specified courses in each of biology, chemistry, physics and mathematical science, and 1 other course which is normally an Arts or Social Science elective.

3. 1000 Level Credits

If more than 7.00 credits at the 1000 level are completed, students are required to complete additional credits beyond the minimum total required for the degree.

4. 3000 and 4000 Level Credits

There is a requirement for a minimum of 6.00 science credits at the 3000- and 4000-levels with a minimum of 2.00 credits at the 4000 level.

5. Science Credits

A minimum of 16.00 science credits (usually 32 courses) is required for the honours major program. The inclusion of a minor in a non-science area involves the reduction to 14.00 science credits (usually 28 courses) with the approval of the program counsellors. Acceptable science courses in the following programs means "acceptable to the B.Sc. Program Committee". Lists of acceptable courses are available in the offices of the faculty advisors and the program counsellors and on the world wide web at the following address: http://www.bsc.uoguelph.ca/Approved_electives.shtml.

6. Double-Counting of Credits

A maximum of 2.50 credits required in a major program may be applied to meet the requirements of a minor or an additional major.

For a completed minor in a non B.Sc. area, students can apply up to 1.00 credits, from their minor, at the 3000/4000 level towards the 6.00 credits at the 3000/4000 level required for the degree.

7. Continuation of Study

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

Doctor of Veterinary Medicine.

Students in the B.Sc. program who intend to apply for admission to the Doctor of Veterinary Medicine program should register for the Major Biological Science or Major Physical Science program, or the major of their choice. Prospective candidates for the D.V.M. program should consult the admission requirements for the program. Students may obtain assistance in selecting a program that will meet the requirements for the Doctor of Veterinary Program and for continuation in biological or physical science programs by consulting the appropriate Program Counsellor.

General Program (BSCG)

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 for Graduation

In order to qualify for graduation from the general program the student is required to attain a passing grade in a minimum of 15.00 required credits as outlined in the Total Course Requirements for all students in the General Science Program and have achieved a minimum cumulative average of 50%.

Total Course Requirements for all Students in the General Science Program

Total of 15.00 credits as follows:

1. 4.00 credits from the first year science core - 1.00 credits beyond the 4U/ grade 12 level in each of biological science, chemistry, mathematical science, physics. Note: A maximum of 7.00 credits at the 1000 level may be used towards the degree requirements.
2. An additional 0.50 credits from at least 3 of the following subject areas: biological science, biochemistry/chemistry, mathematical science, physics.
3. 6.50 additional credits selected from the list of approved sciences electives for the B.Sc. degree program of which 2.50 credits must be at the 3000 or 4000 level. Note: One of: BIOL*1020, CHEM*1060 may be counted towards the degree requirements, counting as 0.50 credits in science.

4. 2.00 credits - arts and/or social science electives approved for the B.Sc. degree program.
5. 1.00 credits in electives.

Recommended Schedule for Students in Biological Science Areas

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology *
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070	[0.50]	Discovering Biodiversity *
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

One of:

CIS*1000	[0.50]	Introduction to Computer Applications
CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
STAT*2040	[0.50]	Statistics I
MATH*2080	[0.50]	Elements of Calculus II

0.50 Arts or Social Science electives

* BIOL*1080 is a prerequisite for some courses in the biological sciences. Students are strongly recommended to also complete this course by the end of the third semester.

Semester 3 to 6

A minimum of 2.50 credits in each semester, including at least 2.00 acceptable science credits per semester. For details consult 'Total Course Requirements'.

Recommended Schedule for Students in Physical Science Areas

Semester 1

CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050	[0.50]	General Chemistry II
IPS*1510	[1.00]	Integrated Mathematics and Physics II

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

Semester 3 to 6

A minimum of 2.50 credits in each semester, including 2.00 acceptable science courses per semester. For details consult 'Total Course Requirements'.

Honours Programs (BSCH)

Honours Program Majors

The following honours majors are available:

Biological Sciences:

20.00 credits -Animal Biology (ABIO)
20.00 credits -Biochemistry (BIOC)
20.00 credits -Biodiversity (BIOD)
20.00 credits -Biological Science (BIOS)
20.00 credits -Bio-Medical Science (BIOM)
20.00 credits -Biomedical Toxicology (BTOX)
20.00 credits -Environmental Biology (ENVB)
20.00 credits - Human Kinetics (HK)
20.00 credits - Marine and Freshwater Biology (MFB)
20.00 credits - Microbiology (MICR)
20.00 credits - Molecular Biology and Genetics (MBG)
20.00 credits - Nutritional and Nutraceutical Sciences (NANS)
20.00 credits - Plant Science (PLSC)
20.00 credits - Wildlife Biology and Conservation (WBC)
20.00 credits - Zoology (ZOO)

Physical Sciences:

20.00 credits - Biological and Pharmaceutical Chemistry (BPCH)
20.00 credits - Biological and Medical Physics (BMPH)
20.00 credits - Chemical Physics (CHPY)
20.00 credits - Chemistry (CHEM)
20.00 credits - Environmental Biology (ENVB)
20.00 credits - Environmental Geoscience and Geomatics (EGG)
20.00 credits - Nanoscience (NANO)
20.00 credits -Physical Science (PSCI)
20.00 credits -Physics (PHYS)
20.00 credits -Theoretical Physics (THPY)

Environmental Sciences:

20.00 credits - Environmental Biology (ENVB)*

*also see B.SC.(ENV.)

Mathematical Science

20.00 credits - Mathematical Science (MSCI)

Additional Disciplines:

20.00 credits - Food Science (FOOD)
20.00 credits - Psychology: Brain & Cognition (PBC)

Co-operative Educational Programs:

20.00 credits - Biochemistry (Co-op) (BIOC:C)
20.00 credits - Biological and Medical Physics (Co-op) (BMPH:C)
20.00 credits - Biological and Pharmaceutical Chemistry (Co-op) (BPCH:C)
20.00 credits -Biomedical Toxicology (Co-op) (BTOX:C)
20.00 credits - Chemical Physics (Co-op) (CHPY:C)
20.00 credits - Chemistry (Co-op) (CHEM:C)
20.00 credits - Food Science (Co-op) (FOOD:C)
20.00 credits - Nanoscience (NANO:C)
20.00 credits - Microbiology (Co-op) (MICR:C)
20.00 credits - Physics (Co-op) (PHYS:C)

Honours Program Minors

Minors are available in the following science areas with the particular credit requirements being given (additional minors are available from the College of Arts and the College of Social and Applied Human Sciences). A minor may include additional prerequisites - consult with the appropriate faculty advisor.

Biological Sciences:

5.00 credits - Biology (BIOL)
5.00 credits - Biochemistry (BIOC)
5.00 credits - Biotechnology (BIOT)
5.00 credits - Microbiology (MICR)
5.00 credits - Molecular Biology and Genetics (MBG)
5.00 credits - Neuroscience (NEUR)
5.00 credits - Nutritional and Nutraceutical Sciences (NANS)
5.00 credits - Plant Science (PLSC)
5.00 credits - Zoology (ZOO)

Physical Sciences:

5.00 credits - Chemistry (CHEM)
5.00 credits - Physics (PHYS)

Environmental Sciences:

5.00 credits - Ecology (ECOL)
5.00 credits - Geographic Information Systems (GIS) and Environmental Analysis

Mathematical Sciences:

5.00 credits - Computing and Information Science (CIS)
5.00 credits - Mathematical Science (MSCI)
5.00 credits - Mathematics (MATH)
5.00 credits - Statistics (STAT)

Additional Disciplines:

5.00 credits - Business Economics (BECN)
5.00 credits - Psychology: Brain & Cognition (PBC)

Continuation of Study

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

Conditions for Graduation

Schedules 1 and 2

In order to qualify for graduation from the honours program, the student must fulfill all program requirements and have achieved 60%, or higher, cumulative average in all course attempts.

Note: A student registered in an honours program who has successfully completed all required courses and the specified total number of credits for the program but does not have a cumulative average of 60%, or higher, may apply to graduate from the general program.

Co-operative Education Program

Admission to the Co-operative Education program may be granted on entry to the University or by application normally before the conclusion of Semester 2. Application forms can be obtained from the appropriate faculty co-op advisor. In-course students will need to complete successfully an interview in the appropriate department.

Conditions for Graduation from the B.Sc. Co-operative Education Program

Conditions for graduation are the same as the corresponding regular B.Sc. program. In addition, all work reports and work performance evaluations must have a grade of satisfactory or better.

Animal Biology (ABIO)

Department of Animal Biosciences, Ontario Agricultural College

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor.

Semester 1

BIOL*1050	[0.50]	Biology of Plants & Animals in Managed Ecosystems
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

ANSC*1210	[1.00]	Principles of Animal Care and Welfare
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

Semester 3

AGR*2350	[0.50]	Animal Production Systems, Health and Industry
BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics

0.50 electives or restricted electives

Students are encouraged to consider CIS*1000 as an elective if they wish to enhance their computer literacy.

Semester 4

ANSC*2340	[0.50]	Structure of Farm Animals
MCB*2050	[0.50]	Molecular Biology of the Cell
NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

Semester 5

ANSC*3080	[0.50]	Agricultural Animal Physiology
ANSC*3120	[0.50]	Introduction to Animal Nutrition

1.50 electives or restricted electives

Semester 6

ANSC*3040	[0.50]	Animal Reproduction
ANSC*3270	[0.50]	Animal Disorders
MBG*3060	[0.50]	Quantitative Genetics

1.00 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

Restricted Electives

1. Students must complete 2.00 credits from Arts or Social Science courses. ANSC*1210 is an Arts and Social Science 1.00 credit. 1.00 additional credits from Arts or Social Science are required.
2. 0.50 credits is required from each of the following areas: Animal Nutrition, Animal Breeding & Genetics, and Animal Physiology & Behaviour. Students are encouraged to consult with the Faculty Advisor for help in tailoring their selection to meet personal and career interests.

Animal Breeding & Genetics [0.50] Required

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

Animal Nutrition [0.50] Required

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*4560	[0.50]	Pet Nutrition
EQN*4020	[0.50]	Feeding the Performance Horse

Animal Physiology & Behaviour [0.50] Required

ANSC*4090	[0.50]	Applied Animal Behaviour
ANSC*4100	[0.50]	Applied Environmental Physiology and Animal Housing
ANSC*4350	[0.50]	Experiments in Animal Biology
ANSC*4470	[0.50]	Animal Metabolism
ANSC*4490	[0.50]	Applied Endocrinology

3. An additional 3.00 credits must be obtained by selecting courses from the above lists and from the following:

ANSC*3050	[0.50]	Aquaculture: Advanced Issues
ANSC*4610	[0.50]	Critical Analysis in Animal Science
ANSC*4650	[0.50]	Comparative Immunology
ANSC*4700	[0.50]	Research in Animal Biology I
ANSC*4710	[0.50]	Research in Animal Biology II
BIOC*3560	[0.50]	Structure and Function in Biochemistry
EQN*3050	[0.50]	Equine Exercise Physiology
MICR*3230	[0.50]	Immunology
PATH*3610	[0.50]	Principles of Disease
POPM*3240	[0.50]	Epidemiology
POPM*4230	[0.50]	Animal Health

Credit Summary (20.00 Total Credits)

3.50 - First year science credits

6.50 - Required science courses semesters 3 - 8

4.50 - Restricted electives (#2 and #3)

1.50 - Approved Science electives

1.00 - Required Arts and/or Social Science course (ANSC 1210)

1.00 – Approved Arts and/or Social Science electives

2.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biochemistry (BIOC)

Department of Molecular and Cellular Biology, College of Biological Science

A B.Sc. in Biochemistry offers a multidisciplinary curriculum that gives students broad exposure to the life sciences with specific attention paid to the physical and chemical nature of biomolecular systems. The lab-intensive experience in this program prepares students to pursue post-graduate research opportunities in many different life science related fields. Graduates are also positioned to be successful in obtaining entrance to a number of professional programs, as well as employment in industry and government.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. The major will require the completion of at least 20.00 credits as indicated below:

Major (Honours Program)

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
MATH*2080	[0.50]	Elements of Calculus II
PHYS*1070	[0.50]	Physics for Life Sciences II

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

Semester 4

BIOC*3560	[0.50]	Structure and Function in Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
CHEM*2700	[0.50]	Organic Chemistry I
MCB*2050	[0.50]	Molecular Biology of the Cell
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology

Semester 5

BIOC*3570	[0.75]	Analytical Biochemistry
CHEM*2880	[0.50]	Physical Chemistry
CHEM*3750	[0.50]	Organic Chemistry II

electives or restricted electives to a maximum of 2.75 total credits

Semester 6

MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I

electives or restricted electives to a maximum of 2.75 total credits

Semester 7

2.50 electives or restricted electives

Semester 8

BIOC*4540	[0.75]	Enzymology

electives or restricted electives to a maximum of 2.75 total credits

Restricted Electives

1. Students must take as part of their program: 4.00 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050.

BIOC*4520	[0.50]	Metabolic Processes
BIOC*4580	[0.50]	Membrane Biochemistry
BIOL*3300	[0.50]	Applied Bioinformatics
BIOM*3200	[1.00]	Biomedical Physiology
MBG*3080	[0.50]	Bacterial Genetics *
MBG*4080	[0.50]	Molecular Genetics *
MCB*3010	[0.50]	Dynamics of Cell Function and Signaling
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MCB*4500	[1.00]	Research Project in Molecular & Cellular Biology I
MCB*4510	[1.00]	Research Project in Molecular & Cellular Biology 2
MCB*4600	[0.50]	Topics in Molecular and Cellular Biology
MICR*3230	[0.50]	Immunology
MICR*3330	[0.50]	World of Viruses
MICR*4330	[0.50]	Molecular Virology
MICR*4530	[0.50]	Immunology II
PBIO*3110	[0.50]	Crop Physiology
PBIO*4750	[0.50]	Genetic Engineering of Plants
STAT*2050	[0.50]	Statistics II
TOX*4590	[0.50]	Biochemical Toxicology

*Only one of MBG*3080 and MBG*4080 can be used to meet the restricted elective requirements.

2. Students must take as part of their program: 0.50 credits from the following list:

PHYS*2030	[0.50]	Biophysics of Excitable Cells
PHYS*2240	[0.50]	Thermal Physics
PHYS*2330	[0.50]	Electricity and Magnetism I
PHYS*2600	[0.50]	General Astronomy
PHYS*3080	[0.50]	Energy

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

7.75 - Required science courses semesters 3 - 8

4.50 - Restricted elective (# 1 and # 2 in restricted elective list)

1.00 - Approved Arts and/or Social Science electives

2.25 - Free electives – any approved electives for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Biochemistry consists of at least 5.00 course credits. The following courses are required:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOC*3570	[0.75]	Analytical Biochemistry
BIOC*4540	[0.75]	Enzymology
CHEM*2480	[0.50]	Analytical Chemistry I
CHEM*2700	[0.50]	Organic Chemistry I

One of:

MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MICR*2420	[0.50]	Introduction to Microbiology

In addition, at least 1.50 credits must be chosen from the following courses, with at least 1.00 credits from the first three courses listed:

BIOC*4520	[0.50]	Metabolic Processes
BIOC*4580	[0.50]	Membrane Biochemistry
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*3230	[0.50]	Immunology
MICR*3330	[0.50]	World of Viruses
TOX*4590	[0.50]	Biochemical Toxicology

Biochemistry (Co-op) (BIOC:C)

Department of Molecular and Cellular Biology, College of Biological Science

A B.Sc. in Biochemistry offers a multidisciplinary curriculum that gives students broad exposure to the life sciences with specific attention paid to the physical and chemical nature of biomolecular systems. The lab-intensive experience in this program prepares students to pursue post-graduate research opportunities in many different life science related fields. Graduates are also positioned to be successful in obtaining entrance to a number of professional programs, as well as employment in industry and government.

Two Streams are available. Stream A is different from Stream B in that Stream A has a double work term following academic semester 5. The course content of semesters 1-4 is the same as that listed above for the regular Honours Program Major. Students in the Co-op program must also take COOP*1100 in the second academic semester. The total program requirements, including the selection of electives are also the same.

Students will be expected to undertake their work terms after semester 3 and completion of course CHEM*2480. Since certain courses must be taken in a different semester from usual, consult your Faculty Co-op Advisor for assistance with course selection.

To graduate from the Co-op program a minimum of 4 successfully completed work terms is normally required.

This major requires the completion of 20.00 credits as indicated below.

Stream A

Semester 1 - Fall

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*2080	[0.50]	Elements of Calculus II
PHYS*1070	[0.50]	Physics for Life Sciences II

Summer Semester

No academic semester or work term

Semester 3 - Fall

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
CHEM*2880	[0.50]	Physical Chemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics

0.50 Arts or Social Science electives

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - Summer

BIOC*3570	[0.75]	Analytical Biochemistry
CHEM*2700	[0.50]	Organic Chemistry I
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2040	[0.50]	Statistics I

electives or restricted electives to a maximum of 2.75 total credits

Semester 5 - Fall

BIOC*3560	[0.50]	Structure and Function in Biochemistry
CHEM*3750	[0.50]	Organic Chemistry II
MCB*2050	[0.50]	Molecular Biology of the Cell
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology

0.50 electives or restricted electives

Winter Semester

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

Summer Semester

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

Semester 6 - Fall

MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I

electives or restricted electives to a maximum of 2.75 total credits

Semester 7 - Winter

BIOC*4540	[0.75]	Enzymology

electives or restricted electives to a maximum of 2.75 total credits

Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV

Semester 8 - Fall

2.50 electives or restricted electives

Restricted Electives

1. Students must take as part of their program: 4.00 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050.

BIOC*4520	[0.50]	Metabolic Processes
BIOC*4580	[0.50]	Membrane Biochemistry
BIOL*3300	[0.50]	Applied Bioinformatics
BIOM*3200	[1.00]	Biomedical Physiology
MBG*3080	[0.50]	Bacterial Genetics *
MBG*4080	[0.50]	Molecular Genetics *
MCB*3010	[0.50]	Dynamics of Cell Function and Signaling
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MCB*4500	[1.00]	Research Project in Molecular & Cellular Biology I
MCB*4510	[1.00]	Research Project in Molecular & Cellular Biology 2
MCB*4600	[0.50]	Topics in Molecular and Cellular Biology
MICR*3230	[0.50]	Immunology
MICR*3330	[0.50]	World of Viruses
MICR*4330	[0.50]	Molecular Virology
MICR*4530	[0.50]	Immunology II
PBIO*3110	[0.50]	Crop Physiology
PBIO*4750	[0.50]	Genetic Engineering of Plants
STAT*2050	[0.50]	Statistics II
TOX*4590	[0.50]	Biochemical Toxicology

*Only one of MBG*3080 and MBG*4080 can be used to meet the restricted elective requirements.

2. Students must take as part of their program: 0.50 credits from the following list:

PHYS*2030	[0.50]	Biophysics of Excitable Cells
PHYS*2240	[0.50]	Thermal Physics
PHYS*2330	[0.50]	Electricity and Magnetism I
PHYS*2600	[0.50]	General Astronomy
PHYS*3080	[0.50]	Energy

Stream B

Semester 1 - Fall

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*2080	[0.50]	Elements of Calculus II
PHYS*1070	[0.50]	Physics for Life Sciences II

Summer Semester

No academic semester or work term

Semester 3 - Fall

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
CHEM*2880	[0.50]	Physical Chemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics

0.50 Arts or Social Science electives

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - Summer

BIOC*3570	[0.75]	Analytical Biochemistry
CHEM*2700	[0.50]	Organic Chemistry I
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2040	[0.50]	Statistics I

electives or restricted electives to a maximum of 2.75 total credits

Fall Semester

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

Semester 5 - Winter

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MCB*2050	[0.50]	Molecular Biology of the Cell
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology

1.00 electives or restricted electives

Summer Semester

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

Semester 6 - Fall

CHEM*3750	[0.50]	Organic Chemistry II

2.00 electives or restricted electives

Semester 7 - Winter

BIOC*4540	[0.75]	Enzymology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I

1.00 electives or restricted electives

Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV

Semester 8 - Fall

2.50 electives or restricted electives

Restricted Electives

1. Students must take as part of their program: 4.00 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050.

BIOC*4520	[0.50]	Metabolic Processes
BIOC*4580	[0.50]	Membrane Biochemistry
BIOL*3300	[0.50]	Applied Bioinformatics
BIOM*3200	[1.00]	Biomedical Physiology
MBG*3080	[0.50]	Bacterial Genetics *
MBG*4080	[0.50]	Molecular Genetics *
MCB*3010	[0.50]	Dynamics of Cell Function and Signaling
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MCB*4500	[1.00]	Research Project in Molecular & Cellular Biology I
MCB*4510	[1.00]	Research Project in Molecular & Cellular Biology 2
MCB*4600	[0.50]	Topics in Molecular and Cellular Biology
MICR*3230	[0.50]	Immunology
MICR*3330	[0.50]	World of Viruses
MICR*4330	[0.50]	Molecular Virology
MICR*4530	[0.50]	Immunology II
PBIO*3110	[0.50]	Crop Physiology
PBIO*4750	[0.50]	Genetic Engineering of Plants
STAT*2050	[0.50]	Statistics II
TOX*4590	[0.50]	Biochemical Toxicology

*Only one of MBG*3080 and MBG*4080 can be used to meet the restricted elective requirements.

2. Students must take as part of their program: 0.50 credits from the following list:

PHYS*2030	[0.50]	Biophysics of Excitable Cells
PHYS*2240	[0.50]	Thermal Physics
PHYS*2330	[0.50]	Electricity and Magnetism I
PHYS*2600	[0.50]	General Astronomy
PHYS*3080	[0.50]	Energy

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

7.75 - Required science courses semesters 3 - 8

4.50 - Restricted elective (# 1 and #2 in restricted elective list)

1.00 - Approved Arts and/or Social Science electives

2.25 - Free electives – any approved electives for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biodiversity (BIOD)

Department of Integrative Biology, College of Biological Science

The Major in Biodiversity offers a broad education in the diversity and evolution of life while providing a more specialized understanding of biology at the level of the organism. It is the most flexible of the majors offered by the Department of Integrative Biology and as such, it allows students the opportunity to design a customized program around their interests. The major qualifies students for postgraduate work in biodiversity, botany, zoology, and other life sciences and provides a sound science background for students wishing to pursue professional life science degrees or careers in teaching, government service or the private sector.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum total of 20.00 credits are required to complete the major. At least 6.00 science credits must be at the 3000 or 4000 level, 2.00 of which must be at the 4000 level.

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 electives or restricted electives*

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
ZOO*2090	[0.50]	Vertebrate Structure and Function

1.00 electives or restricted electives*

Semester 4

BIOL*2060	[0.50]	Ecology
BIOL*2400	[0.50]	Evolution
STAT*2230	[0.50]	Biostatistics for Integrative Biology
ZOO*2700	[0.50]	Invertebrate Morphology & Evolution

0.50 electives or restricted electives*

Semester 5

MICR*2420	[0.50]	Introduction to Microbiology

2.00 electives or restricted electives*

Semester 6

BOT*3710	[0.50]	Plant Diversity and Evolution
ENVS*3090	[0.50]	Insect Diversity and Biology
IBIO*3100	[0.50]	Interpreting Biodiversity I

1.00 electives or restricted electives*

Semester 7

IBIO*4100	[1.00]	Interpreting Biodiversity II

1.50 electives or restricted electives*

Semester 8

2.50 electives or restricted electives*

*** Restricted Electives**

*The major in Biodiversity is a flexible program that allows students, in consultation with faculty advisors, to pursue their own interests and design a customized program of study. For example, students may wish to select their electives to focus on a particular taxonomic group such as microbes, plants, invertebrates, or vertebrates, and/or one of the three areas of research strength in the Department of Integrative Biology: physiology, ecology, or evolution.

1. At least 1.00 Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts
2. A minimum of 0.50 credits from:

BOT*2100	[0.50]	Life Strategies of Plants
BOT*3050	[0.50]	Plant Functional Ecology
ZOO*3600	[0.50]	Comparative Animal Physiology I

3. A minimum of 0.50 credits from:

BOT*3310	[0.50]	Plant Growth and Development
BOT*3410	[0.50]	Plant Anatomy
ZOO*3050	[0.50]	Developmental Biology

4. A minimum of 0.50 credits from the following list. Biodiversity students are strongly encouraged to take at least one field course. Students should keep in mind that some of these courses have prerequisites that are not required courses for the BIOD major and should plan their programs accordingly.

BIOL*4410	[0.75]	Field Ecology
BIOL*4610	[0.75]	Arctic Ecology
BIOL*4700	[0.50]	Field Biology
BIOL*4710	[0.25]	Field Biology
BIOL*4800	[0.50]	Field Biology
BIOL*4810	[0.25]	Field Biology
IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
IBIO*4521/2	[2.00]	Thesis in Integrative Biology
ZOO*4170	[0.50]	Experimental Comparative Animal Physiology
ZOO*4300	[0.75]	Marine Biology and Oceanography

Other field or research courses with approval of faculty advisor.

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

6.50 - Required science courses semesters 3 - 8

1.50 - Restricted elective (# 2, 3 and 4 in restricted elective list)

4.00 - Approved Science electives

1.00 - Arts and/or Social Science electives (# 1 in restricted elective list)

3.00 - Free electives - any approved elective for B.Sc. students.

*Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological and Medical Physics (BMPH)

Department of Physics, College of Physical and Engineering Science

Major (Honours Program)

The program emphasizes the application of physics to biology and medicine. It provides an excellent background for careers in the expanding interdisciplinary research laboratories of government and industry, as well as a starting point for a career in medical physics. Completion of the program at an appropriate level will qualify a student to pursue post-graduate studies in biophysics, medical physics and related areas of physics.

Since some of the required courses are not offered every semester, students entering the Major in Biological and Medical Physics should plan their program in consultation with the Department of Physics Faculty Advisor.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. This major requires the completion of 20.00 credits as follows:

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1160	[0.50]	Linear Algebra I

1.00 credits from: IPS*1500, or (MATH*1080, PHYS*1080) or (MATH*1200, PHYS*1080)

* IPS*1500 is recommended

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
CIS*1500	[0.50]	Introduction to Programming

1.00 credits from: IPS*1510, or (MATH*2080, PHYS*1070) or (MATH*1210, PHYS*1010)

* IPS*1510 is recommended

Semester 3

MATH*2200	[0.50]	Advanced Calculus I
MATH*2270	[0.50]	Applied Differential Equations
PHYS*2240	[0.50]	Thermal Physics
PHYS*2330	[0.50]	Electricity and Magnetism I

0.50 Arts or Social Science electives

Semester 4

BIOC*2580	[0.50]	Introduction to Biochemistry
PHYS*2030	[0.50]	Biophysics of Excitable Cells
PHYS*2180	[0.50]	Experimental Techniques in Physics
PHYS*2310	[0.50]	Mechanics
PHYS*2340	[0.50]	Electricity and Magnetism II

Semester 5

NANO*3600	[0.50]	Computational Methods in Materials Science
PHYS*3130	[0.50]	Mathematical Physics
PHYS*3230	[0.50]	Quantum Mechanics I

1.00 electives **

Semester 6

PHYS*3510	[0.50]	Intermediate Laboratory
PHYS*4040	[0.50]	Quantum Mechanics II
PHYS*4300	[0.50]	Inquiry in Physics
PHYS*4540	[0.50]	Molecular Biophysics

0.50 electives **

Semester 7

PHYS*3170	[0.50]	Radioactivity and Radiation Interactions
PHYS*4500	[0.50]	Advanced Physics Laboratory

One of:

PHYS*4001	[0.50]	Research in Physics

0.50 electives

1.00 electives **

Semester 8

PHYS*4070 [0.50] Clinical Applications of Physics in Medicine
One of:
PHYS*4002 [0.50] Research in Physics
0.50 electives **
1.50 electives **
Note: PHYS*4001/2 will be projects in biological or medical physics, some of which may be in areas outside the Department of Physics.
** A minimum of 1.00 credits in Arts/Social Science is required. In addition, students are required to complete 1.50 credits from either List A or List B as follows:

List A: Biological Physics stream

BIOC*3560 [0.50] Structure and Function in Biochemistry
BIOC*4580 [0.50] Membrane Biochemistry
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
MCB*2050 [0.50] Molecular Biology of the Cell
MCB*4050 [0.50] Protein and Nucleic Acid Structure
PHYS*3000 [0.50] Optics: Fundamentals and Applications

List B: Medical Physics stream

BIOM*2000 [0.50] Concepts in Human Physiology
ENGG*4040 [0.50] Medical Imaging Modalities
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
PATH*3610 [0.50] Principles of Disease
PHYS*3000 [0.50] Optics: Fundamentals and Applications
PHYS*4130 [0.50] Subatomic Physics

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

9.50 - Required science courses semesters 3 – 8

1.50 - Restricted electives (from List A OR List B)

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological and Medical Physics (Co-op) (BMPH:C)

Department of Physics, College of Physical and Engineering Science

Major (Honours Program)

The program emphasizes the application of physics to biology and medicine. It provides an excellent background for careers in the expanding interdisciplinary research laboratories of government and industry, as well as a starting point for a career in medical physics. Completion of the program at an appropriate level will qualify a student to pursue post-graduate studies in biophysics, medical physics and related areas of physics.

Since some of the required courses are not offered every semester, students entering the Major in Biological and Medical Physics (Co-op) should plan their program in consultation with the Department of Physics Faculty Advisor.

To graduate from the Co-op program a minimum of 4 successfully completed work terms is normally required. Students are eligible to participate in a maximum two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website: https://www.recruitguelph.ca/cecs/.

This major requires the completion of 20.00 credits as follows:

Semester 1 - Fall

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
MATH*1160 [0.50] Linear Algebra I
1.00 credits from: IPS*1500, or (MATH*1080, PHYS*1080) or (MATH*1200, PHYS*1080)
* IPS*1500 is recommended
Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

BIOL*1080 [0.50] Biological Concepts of Health
CHEM*1050 [0.50] General Chemistry II
CIS*1500 [0.50] Introduction to Programming
1.00 credits from: IPS*1510, or (MATH*2080, PHYS*1070) or (MATH*1210, PHYS*1010)
* IPS*1510 is recommended

Semester 3 - Fall

COOP*1100 [0.00] Introduction to Co-operative Education
MATH*2200 [0.50] Advanced Calculus I
MATH*2270 [0.50] Applied Differential Equations
PHYS*2240 [0.50] Thermal Physics
PHYS*2330 [0.50] Electricity and Magnetism I
0.50 Arts or Social Science electives

Semester 4 - Winter

BIOC*2580 [0.50] Introduction to Biochemistry
PHYS*2030 [0.50] Biophysics of Excitable Cells
PHYS*2180 [0.50] Experimental Techniques in Physics
PHYS*2310 [0.50] Mechanics
PHYS*2340 [0.50] Electricity and Magnetism II

Summer Semester

COOP*1000 [0.00] Co-op Work Term I ++

Semester 5 - Fall

NANO*3600 [0.50] Computational Methods in Materials Science
PHYS*3130 [0.50] Mathematical Physics
1.50 electives ***

Winter Semester

COOP*2000 [0.00] Co-op Work Term II ++
(8-month work term in conjunction with COOP*3000)

Summer Semester

COOP*3000 [0.00] Co-op Work Term III ++
(8-month work term in conjunction with COOP*2000)

Semester 6 - Fall

PHYS*3170 [0.50] Radioactivity and Radiation Interactions
PHYS*3230 [0.50] Quantum Mechanics I
1.50 electives ***

Semester 7 - Winter

PHYS*3510 [0.50] Intermediate Laboratory
PHYS*4040 [0.50] Quantum Mechanics II
PHYS*4300 [0.50] Inquiry in Physics
PHYS*4540 [0.50] Molecular Biophysics
0.50 electives ***

Summer Semester

COOP*4000 [0.00] Co-op Work Term IV ++

Fall Semester

COOP*5000 [0.00] Co-op Work Term V ++

Semester 8 - Winter

PHYS*4070 [0.50] Clinical Applications of Physics in Medicine
PHYS*4500 [0.50] Advanced Physics Laboratory
1.50 electives ***
++Four work terms are required for the completion of the co-op degree. It is also necessary that there be at least one work term in each of Fall, Winter and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. Whether the student completes four or five work terms, a report is required for each work term completed. Contact the co-op faculty advisor for further details.

Students are required to complete 1.50 credits from either List A or List B as follows:

List A: Biological Physics stream

BIOC*3560 [0.50] Structure and Function in Biochemistry
BIOC*4580 [0.50] Membrane Biochemistry
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
MCB*2050 [0.50] Molecular Biology of the Cell
MCB*4050 [0.50] Protein and Nucleic Acid Structure
PHYS*3000 [0.50] Optics: Fundamentals and Applications

List B: Medical Physics stream

BIOM*2000 [0.50] Concepts in Human Physiology
ENGG*4040 [0.50] Medical Imaging Modalities
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
PATH*3610 [0.50] Principles of Disease
PHYS*3000 [0.50] Optics: Fundamentals and Applications
PHYS*4130 [0.50] Subatomic Physics

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

9.50 - Required science courses semesters 3 – 8

1.50 - Restricted electives (from List A OR List B)

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological and Pharmaceutical Chemistry (BPCH)

Department of Chemistry, College of Physical and Engineering Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Chemistry Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I

0.50 Arts or Social Science electives

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050	[0.50]	General Chemistry II
IPS*1510	[1.00]	Integrated Mathematics and Physics II

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health

0.50 Arts or Social Science electives

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2060	[0.50]	Structure and Bonding
CHEM*2400	[0.75]	Analytical Chemistry I
CHEM*2880	[0.50]	Physical Chemistry

electives or restricted electives to a maximum of 2.75 total credits in this semester*

Semester 4

CHEM*2070	[0.50]	Structure and Spectroscopy
CHEM*2700	[0.50]	Organic Chemistry I
CHEM*3430	[0.50]	Analytical Chemistry II: Instrumental Analysis
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2040	[0.50]	Statistics I

Semester 5

BIOC*3570	[0.75]	Analytical Biochemistry
CHEM*3750	[0.50]	Organic Chemistry II

One of:

CHEM*3640	[0.50]	Chemistry of the Elements I **

0.50 electives or restricted electives *

Electives or restricted electives to a maximum of 2.75 total credits in this semester*

** CHEM*3640 is a prerequisite for CHEM*3650

Semester 6

Select either Option A or Option B

Option A (at Guelph)

BIOC*3560	[0.50]	Structure and Function in Biochemistry
CHEM*3650	[0.50]	Chemistry of the Elements II
CHEM*3760	[0.50]	Organic Chemistry III

1.00 electives or restricted electives *

Option B (at Seneca)

2.50 credits from:

XSEN*3030	[0.50]	Pharmacology and Applied Toxicology
XSEN*3040	[0.50]	Occupational Health and Chemistry
XSEN*3060	[0.50]	Pharmaceutical Analysis - Advanced
XSEN*3070	[0.50]	Pharmaceutical Product Formulations
XSEN*3090	[0.50]	Biopharmaceuticals
XSEN*3200	[0.50]	Pharmaceutical Organic Chemistry
XSEN*3210	[0.50]	Introduction to Pharmaceutical Manufacturing

Note: All XSEN courses are taught at the Seneca@York campus of Seneca College in Toronto. (For more information, go to: http://www.chemistry.uoguelph.ca/bpch/

Semester 7

One of:

CHEM*4730	[0.50]	Synthetic Organic Chemistry
CHEM*4740	[0.50]	Topics in Bio-Organic Chemistry

2.00 electives or restricted electives *

Semester 8

2.50 electives or restricted electives *

*** Restricted Electives**

**Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

1. 1.00 credits from the following:

MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MCB*2050	[0.50]	Molecular Biology of the Cell
TOX*2000	[0.50]	Principles of Toxicology

2. A minimum of 1.50 credits at the 4000 level and 2.50 credits at the 3000/4000 level from the following list:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOC*4520	[0.50]	Metabolic Processes
BIOC*4540	[0.75]	Enzymology **
BIOC*4580	[0.50]	Membrane Biochemistry
BIOM*3090	[0.50]	Principles of Pharmacology **
BIOM*3200	[1.00]	Biomedical Physiology
BIOM*4090	[0.50]	Pharmacology **
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
CHEM*3640	[0.50]	Chemistry of the Elements I
CHEM*3650	[0.50]	Chemistry of the Elements II **
CHEM*3760	[0.50]	Organic Chemistry III
CHEM*4010	[0.50]	Chemistry and Industry
CHEM*4400	[0.50]	Advanced Topics in Analytical Chemistry
CHEM*4630	[0.50]	Bioinorganic Chemistry **
CHEM*4720	[0.50]	Organic Reactivity **
CHEM*4730	[0.50]	Synthetic Organic Chemistry **
CHEM*4740	[0.50]	Topics in Bio-Organic Chemistry
CHEM*4900	[1.00]	Chemistry Research Project I **
CHEM*4910	[1.00]	Chemistry Research Project II **
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I **
MCB*4050	[0.50]	Protein and Nucleic Acid Structure **
MICR*3230	[0.50]	Immunology
NUTR*3210	[0.50]	Fundamentals of Nutrition
PATH*3610	[0.50]	Principles of Disease
TOX*4590	[0.50]	Biochemical Toxicology **
XSEN*3030	[0.50]	Pharmacology and Applied Toxicology
XSEN*3040	[0.50]	Occupational Health and Chemistry
XSEN*3060	[0.50]	Pharmaceutical Analysis - Advanced
XSEN*3070	[0.50]	Pharmaceutical Product Formulations
XSEN*3090	[0.50]	Biopharmaceuticals
XSEN*3200	[0.50]	Pharmaceutical Organic Chemistry
XSEN*3210	[0.50]	Introduction to Pharmaceutical Manufacturing

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

6.50 - Required science courses semesters 3 – 8

5.00 - Restricted electives (#1 and 2 in restricted electives list)

0.50 - Approved Science electives

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological and Pharmaceutical Chemistry (Co-op) (BPCH:C)

Department of Chemistry, College of Physical and Engineering Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Chemistry Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

Semester 1 - Fall

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I

0.50 Arts or Social Science electives

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
IPS*1510	[1.00]	Integrated Mathematics and Physics II

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health

0.50 Arts or Social Science electives

Semester 3 - Fall

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2060	[0.50]	Structure and Bonding

CHEM*2400 [0.75] Analytical Chemistry I
CHEM*2880 [0.50] Physical Chemistry
electives or restricted electives to a maximum of 2.75 total credits in this semester*

Winter Semester

COOP*1000 [0.00] Co-op Work Term I

Semester 4 - Summer

CHEM*2070 [0.50] Structure and Spectroscopy
CHEM*2700 [0.50] Organic Chemistry I
CHEM*3430 [0.50] Analytical Chemistry II: Instrumental Analysis
STAT*2040 [0.50] Statistics I
0.50 electives or restricted electives *

Semester 5 - Fall

BIOC*3570 [0.75] Analytical Biochemistry
CHEM*3750 [0.50] Organic Chemistry II
One of:
CHEM*3640 [0.50] Chemistry of the Elements I **
0.50 electives or restricted electives *
electives or restricted electives to a maximum of 2.75 total credits in this semester*
** CHEM*3640 is a prerequisite for CHEM*3650

Semester 6 - Winter

Select either Option A or Option B

Option A (at Guelph)

BIOC*3560 [0.50] Structure and Function in Biochemistry
CHEM*3650 [0.50] Chemistry of the Elements II
CHEM*3760 [0.50] Organic Chemistry III
1.00 electives or restricted electives *

Option B (at Seneca)

2.50 credits from:

XSEN*3030 [0.50] Pharmacology and Applied Toxicology
XSEN*3040 [0.50] Occupational Health and Chemistry
XSEN*3060 [0.50] Pharmaceutical Analysis - Advanced
XSEN*3070 [0.50] Pharmaceutical Product Formulations
XSEN*3090 [0.50] Biopharmaceuticals
XSEN*3200 [0.50] Pharmaceutical Organic Chemistry
XSEN*3210 [0.50] Introduction to Pharmaceutical Manufacturing
Note: All XSEN courses are taught at the Seneca@York campus of Seneca College in Toronto. (For more information, go to: http://www.chemistry.uoguelph.ca/bpch/

Summer Semester

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

Fall Semester

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

Semester 7 - Winter

2.50 electives or restricted electives *

Summer Semester

COOP*4000 [0.00] Co-op Work Term IV

Semester 8 - Fall

One of:
CHEM*4730 [0.50] Synthetic Organic Chemistry
CHEM*4740 [0.50] Topics in Bio-Organic Chemistry
2.00 electives or restricted electives *

*** Restricted Electives**

**Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

1. MICR*2420 [0.50] Introduction to Microbiology
2. 1.00 credits from the following:
   - MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
   - MCB*2050 [0.50] Molecular Biology of the Cell
   - TOX*2000 [0.50] Principles of Toxicology
3. A minimum of 1.50 credits at the 4000 level and 2.50 credits at the 3000/4000 level from the following list:
   - BIOC*3560 [0.50] Structure and Function in Biochemistry
   - BIOC*4520 [0.50] Metabolic Processes
   - BIOC*4540 [0.75] Enzymology **
   - BIOC*4580 [0.50] Membrane Biochemistry
   - BIOM*3090 [0.50] Principles of Pharmacology **
   - BIOM*3200 [1.00] Biomedical Physiology
   - BIOM*4090 [0.50] Pharmacology **
   - CHEM*3360 [0.50] Environmental Chemistry and Toxicology
   - CHEM*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation
   - CHEM*3640 [0.50] Chemistry of the Elements I
   - CHEM*3650 [0.50] Chemistry of the Elements II **
   - CHEM*3760 [0.50] Organic Chemistry III
   - CHEM*4010 [0.50] Chemistry and Industry
   - CHEM*4400 [0.50] Advanced Topics in Analytical Chemistry
   - CHEM*4630 [0.50] Bioinorganic Chemistry **
   - CHEM*4720 [0.50] Organic Reactivity **
   - CHEM*4730 [0.50] Synthetic Organic Chemistry **
   - CHEM*4740 [0.50] Topics in Bio-Organic Chemistry
   - CHEM*4900 [1.00] Chemistry Research Project I **
   - CHEM*4910 [1.00] Chemistry Research Project II **
   - MBG*3350 [0.75] Laboratory Methods in Molecular Biology I **
   - MBG*4080 [0.50] Molecular Genetics **
   - MCB*4050 [0.50] Protein and Nucleic Acid Structure **
   - MICR*3230 [0.50] Immunology
   - NUTR*3210 [0.50] Fundamentals of Nutrition
   - PATH*3610 [0.50] Principles of Disease
   - TOX*4590 [0.50] Biochemical Toxicology **
   - XSEN*3030 [0.50] Pharmacology and Applied Toxicology
   - XSEN*3040 [0.50] Occupational Health and Chemistry
   - XSEN*3060 [0.50] Pharmaceutical Analysis - Advanced
   - XSEN*3070 [0.50] Pharmaceutical Product Formulations
   - XSEN*3090 [0.50] Biopharmaceuticals
   - XSEN*3200 [0.50] Pharmaceutical Organic Chemistry
   - XSEN*3210 [0.50] Introduction to Pharmaceutical Manufacturing

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

6.00 - Required science courses semesters 3 – 8

5.50 - Restricted electives (#1 and #2 in restricted electives list)

0.50 - Approved Science electives

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological Science (BIOS)

College of Biological Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

Schedule of Studies

Semester 1

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
MATH*1080 [0.50] Elements of Calculus I
PHYS*1080 [0.50] Physics for Life Sciences
0.50 Arts or Social Science electives
Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
CHEM*1050 [0.50] General Chemistry II
PHYS*1070 [0.50] Physics for Life Sciences II
0.50 Arts or Social Science electives

Semester 3

BIOL*2400 [0.50] Evolution
One of:
BIOC*2580 [0.50] Introduction to Biochemistry
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
1.00 electives or restricted electives *
0.50 Arts or Social Science elective

Semester 4

STAT*2040 [0.50] Statistics I
One of:
BIOC*2580 [0.50] Introduction to Biochemistry
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
1.00 electives or restricted electives *
0.50 Arts or Social Science elective

Semester 5 to 8

2.50 in each semester*

*** Restricted Electives**

** **Note:** some courses may require additional prerequisites.

1. A minimum of 2.00 credits of Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts
2. A minimum of 0.50 credits in Ecology:

BIOL*2060	[0.50]	Ecology
BOT*3050	[0.50]	Plant Functional Ecology

3. A minimum of 0.50 credits in Mathematical or Computational Science:

CIS*1000	[0.50]	Introduction to Computer Applications
CIS*1200	[0.50]	Introduction to Computing
MATH*2080	[0.50]	Elements of Calculus II
STAT*2050	[0.50]	Statistics II

4. A minimum of 0.50 credits in Physiology:

BIOM*3200	[1.00]	Biomedical Physiology
BOT*2100	[0.50]	Life Strategies of Plants
HK*2810	[0.50]	Human Physiology I - Concepts and Principles
ZOO*3600	[0.50]	Comparative Animal Physiology I **

5. 5.50 additional Biological Science credits of which 4.00 must be at the 3000 or 4000 level. The list of approved science electives is posted at http://www.bsc.uoguelph.ca/ .

Credit Summary (20.00 Total Credits)

4.00 - First year science core

3.50 - Required science courses semesters 3 - 8 (# 2, 3 and 4 in restricted elective list)

5.50 - Approved Biological Science electives of which 4.00 must be 3000/4000 level (# 5 in restricted elective list)

3.00 - Approved Science electives of which 2.00 must be 3000/4000 level* May include 1 of BIOL*1020, CHEM*1060

2.00 - Approved Arts and/or Social Science electives

2.00 - Electives

*Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biology (BIOL)

College of Biological Science

Minor (Honours Program)

A minor in Biology consists of a minimum of 5.00 credits including the following courses:

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics

One of:

BIOL*2060	[0.50]	Ecology
BOT*3050	[0.50]	Plant Functional Ecology

Of the additional 3.00 credits approved science electives, students must complete a minimum of 1.50 credits at the 3000 or 4000 level, from courses offered by the following departments: Human Health and Nutritional Sciences , Integrative Biology and Molecular and Cellular Biology. BIOL*1080 is a prerequisite for some CBS courses. This minor is restricted to students registered in B.Sc. majors in the Physical Sciences, B.A.S., and the B.A. degree programs.

Bio-Medical Science (BIOM)

Department of Biomedical Sciences and Department of Human Health and Nutritional Sciences

This joint program of the Department of Human Health and Nutritional Sciences and the Department of Biomedical Sciences provides students with a broad and integrated foundational overview of human and animal health through the study of function (biochemistry and physiology), structure (anatomy and histology), and paraclinical sciences (epidemiology and pharmacology). The program prepares students well for more advanced studies or applied training in many health-related fields including clinical practice, business, government, research and education. Through the use of electives, students may structure a program emphasizing aspects of health and disease. For more information on recommended electives contact the Faculty Advisor of the major.

In addition this program is designed to partially meet the current requirements for entry into medical schools in Ontario (a student interested in meeting these requirements should check the present admission requirements for the medical schools); as well as entry into the DVM program of the Ontario Veterinary College.

Live animals and/or animal tissues are used for teaching purposes in some courses in the Bio-Medical Science Major. This must be accepted by students admitted to the program. All animals are protected under the Animals for Research Act of Ontario (1980), the Guidelines for the Care and Use of Experimental Animals (Canadian Council on Animal Care), and the Animal Care Policies of the University of Guelph.

Students who are admitted into the Bio-Medical Science major from high school must meet additional requirements to continue in the major. Continuation from first to second year is based on the cumulative average in the first two semesters (total of 5.00 credits), including the eight core courses as prescribed by the Schedule of Studies (see below). Students with a minimum average of 75% average will be guaranteed continuation in this major. For students with a 70-74.9% average, continuation will be competitive based on available spaces. Students with an average below 70% will be changed to the Biological Science major. Students may subsequently change to another B.Sc. major of their choice.

B.Sc. students who wish to declare the specialization at the end of or beyond first year must apply directly to the Department of Biomedical Sciences by the last day of classes in the winter semester and meet the same requirements specified above.

Admission to the major will be based on the cumulative average in the two semesters (total of 5.00 credits) preceding application to the major (normally fall and winter). Acceptance will be competitive based on available spaces. Students with an average below 70% will not be considered for admission to the major. All decisions will be made at the end of June.

All decisions will be made at the end of June.

Major (Honours Program)

A minimum of 20.00 credits is required.

Note: Students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level.

Semester 1

BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 electives or restricted electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 electives or restricted electives

Semester 3 (see admission statement above)

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
STAT*2040	[0.50]	Statistics I

1.00 electives or restricted electives

Semester 4

MCB*2050	[0.50]	Molecular Biology of the Cell
NUTR*3210	[0.50]	Fundamentals of Nutrition

One of:

BIOM*3200	[1.00]	Biomedical Physiology
HK*2810	[0.50]	Human Physiology I - Concepts and Principles

Electives or restricted electives to a maximum of 2.50 total credits in this semester.

Note: If HK*2810 is selected, then HK*3810 must be taken in Semester 5.

Semester 5

BIOC*3560	[0.50]	Structure and Function in Biochemistry

Electives or restricted electives to a maximum of 2.75 total credits in this semester. BIOM*3210 is recommended.

Note: As part of the electives or restricted electives students must select HK*3810 in semester 5 if HK*2810 was selected in semester 4.

Semester 6

BIOM*3090	[0.50]	Principles of Pharmacology
PATH*3610	[0.50]	Principles of Disease
POPM*3240	[0.50]	Epidemiology

Electives or restricted electives to a maximum of 2.75 total credits in this semester.

Semester 7

2.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives*

Restricted Electives

1. Anatomy Elective - [1 of (BIOM*3010, BIOM*3040), HK*3401/2, HK*3501/2]
2. Immunology Elective - ANSC*4650 or MICR*3230
3. Advance Study Electives - 2.00 credits from BIOM*4030, BIOM*4050, BIOM*4070, BIOM*4090, BIOM*4110, BIOM*4150, BIOM*4180, BIOM*4300, BIOM*4500, BIOM*4510, BIOM*4521/2, HK*4070, HK*4230, HK*4340, HK*4360, HK*4371/2, HK*4441/2, HK*4460, NUTR*4320, NUTR*4360, NUTR*4510, TOX*4000

4. At least 2.00 credits of Arts and/or Social Science Electives are required. The approved list of Arts and Social Science Electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml.

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

5.75 - Required science courses semesters 3 – 8 (with HK 2810,3810) or 5.50 (with BIOM 3200)

4.00 - Restricted elective (with HK 3401/2 or HK 3501/2) 3.75 (with BIOM 3010, BIOM 3040) (Restricted elective #1, #2 and #3)

2.25 – 2.75 Approved Science electives depending on which anatomy and physiology courses are completed above.

2.00 - Arts and/or Social Science electives (# 4 in restricted elective list)

2.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biomedical Toxicology (BTOX)

Interdisciplinary Program, Departments of Biomedical Sciences, Chemistry, School of Environmental Sciences, Molecular and Cellular Biology

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum of 20.00 credits are required for graduation.

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
TOX*2000	[0.50]	Principles of Toxicology

0.50 Arts or Social Science electives

Semester 4

CHEM*2700	[0.50]	Organic Chemistry I
MCB*2050	[0.50]	Molecular Biology of the Cell
NUTR*3210	[0.50]	Fundamentals of Nutrition
TOX*3360	[0.50]	Environmental Chemistry and Toxicology

0.50 electives or restricted electives*

Semester 5

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOM*3200	[1.00]	Biomedical Physiology
TOX*3300	[0.50]	Analytical Toxicology

0.50 electives or restricted electives*

Semester 6

BIOM*3090	[0.50]	Principles of Pharmacology
PATH*3610	[0.50]	Principles of Disease

One of:

BIOM*3040	[0.75]	Medical Embryology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I *

Electives or restricted electives to a maximum of 2.75 total credits in this semester

Semester 7

NUTR*4510	[0.50]	Toxicology, Nutrition and Food
TOX*4000	[0.50]	Medical Toxicology
TOX*4590	[0.50]	Biochemical Toxicology

1.00 electives or restricted electives*

Semester 8

BIOM*4090	[0.50]	Pharmacology
TOX*4100	[0.50]	Toxicological Pathology
TOX*4200	[0.50]	Topics in Toxicology

1.00 electives or restricted electives*

*** Restricted Electives**

At least 1.50 credits must be completed from the following list of allowable courses.

**Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

ANSC*4650	[0.50]	Comparative Immunology
BIOM*3040	[0.75]	Medical Embryology
BIOM*4050	[0.50]	Biomedical Aspects of Aging
BIOM*4070	[0.50]	Biomedical Histology
BIOM*4150	[0.50]	Cancer Biology
CHEM*3750	[0.50]	Organic Chemistry II
CHEM*3760	[0.50]	Organic Chemistry III
CHEM*4740	[0.50]	Topics in Bio-Organic Chemistry
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MBG*4080	[0.50]	Molecular Genetics
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MCB*4010	[0.50]	Advanced Cell Biology
MICR*3230	[0.50]	Immunology
NUTR*4090	[0.50]	Functional Foods and Nutraceuticals
NUTR*4320	[0.50]	Nutrition and Metabolic Control of Disease
PATH*3040	[0.50]	Principles of Parasitology
POPM*3240	[0.50]	Epidemiology
POPM*4040	[0.50]	Epidemiology of Food-borne Diseases
STAT*2050	[0.50]	Statistics II
STAT*3510	[0.50]	Environmental Risk Assessment
TOX*4900	[1.00]	Toxicology Research Project I
TOX*4910	[1.00]	Toxicology Research Project II

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

10.75 - Required science courses semesters 3 – 8

1.50 - Restricted electives

1.50 - Arts and/or Social Science electives

2.25 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biomedical Toxicology (Co-op) (BTOX:C)

Interdisciplinary Program, Departments of Biomedical Sciences, Chemistry, School of Environmental Sciences, Molecular and Cellular Biology

To graduate from the Co-op program a minimum of 3 successfully completed work terms (COOP*1000, COOP*2000, COOP*3000) is normally required.

Major (Honours Program)

A minimum of 20.00 credits are required for graduation.

Semester 1 - Fall

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
PHYS*1070	[0.50]	Physics for Life Sciences II
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

Semester 3 - Fall

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
TOX*2000	[0.50]	Principles of Toxicology

0.50 Arts or Social Science electives

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Summer Semester

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

Semester 4 - Fall

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MCB*2050	[0.50]	Molecular Biology of the Cell
NUTR*3210	[0.50]	Fundamentals of Nutrition
TOX*3300	[0.50]	Analytical Toxicology

0.50 electives or restricted electives

Semester 5 - Winter

CHEM*2700	[0.50]	Organic Chemistry I
BIOM*3200	[1.00]	Biomedical Physiology
TOX*3360	[0.50]	Environmental Chemistry and Toxicology

0.50 electives or restricted electives*

Summer Semester

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

Fall Semester

COOP*4000	[0.00]	Co-op Work Term IV

Semester 6 - Winter

BIOM*3090	[0.50]	Principles of Pharmacology
PATH*3610	[0.50]	Principles of Disease

One of:

BIOM*3040	[0.75]	Medical Embryology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I *

Electives or restricted electives to a maximum of 2.75 total credits in this semester

Semester 7 - Fall

NUTR*4510	[0.50]	Toxicology, Nutrition and Food
TOX*4000	[0.50]	Medical Toxicology
TOX*4590	[0.50]	Biochemical Toxicology

1.00 electives or restricted electives*

Semester 8- Winter

BIOM*4090	[0.50]	Pharmacology
TOX*4100	[0.50]	Toxicological Pathology
TOX*4200	[0.50]	Topics in Toxicology

1.00 electives or restricted electives*

*** Restricted Electives**

At least 1.50 credits must be completed from the following list of allowable courses.

**Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

ANSC*4650	[0.50]	Comparative Immunology
BIOM*3040	[0.75]	Medical Embryology
BIOM*4050	[0.50]	Biomedical Aspects of Aging
BIOM*4070	[0.50]	Biomedical Histology
BIOM*4150	[0.50]	Cancer Biology
CHEM*3750	[0.50]	Organic Chemistry II
CHEM*3760	[0.50]	Organic Chemistry III
CHEM*4740	[0.50]	Topics in Bio-Organic Chemistry
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MBG*4080	[0.50]	Molecular Genetics
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MCB*4010	[0.50]	Advanced Cell Biology
MICR*3230	[0.50]	Immunology
NUTR*4090	[0.50]	Functional Foods and Nutraceuticals
NUTR*4320	[0.50]	Nutrition and Metabolic Control of Disease
PATH*3040	[0.50]	Principles of Parasitology
POPM*3240	[0.50]	Epidemiology
POPM*4040	[0.50]	Epidemiology of Food-borne Diseases
STAT*2050	[0.50]	Statistics II
STAT*3510	[0.50]	Environmental Risk Assessment
TOX*4900	[1.00]	Toxicology Research Project I
TOX*4910	[1.00]	Toxicology Research Project II

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

10.75 - Required science courses semesters 3 – 8

1.50 - Restricted electives

1.50 - Arts and/or Social Science electives

2.25 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biotechnology (BIOT)

Department of Molecular and Cellular Biology, College of Biological Science

Minor (Honours Program)

A minimum of 5.00 credits is required including:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MICR*2420	[0.50]	Introduction to Microbiology
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology

0.50 credits from:

ENGG*2660	[0.50]	Biological Engineering Systems I
ENGG*3830	[0.50]	Bio-Process Engineering
FOOD*2410	[0.50]	Introduction to Food Processing
FOOD*2420	[0.50]	Introduction to Food Microbiology
FOOD*2620	[0.50]	Food Engineering Principles

1.00 credits from:

ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
MCS*1000	[0.50]	Introductory Marketing

A minimum of 1.50 credits from:

ANSC*4050	[0.50]	Biotechnology in Animal Science
BIOC*4540	[0.75]	Enzymology
BIOL*3300	[0.50]	Applied Bioinformatics
FOOD*3260	[0.50]	Industrial Microbiology
MBG*3660	[0.50]	Genomics
MBG*4240	[0.50]	Advanced Molecular Biology Techniques
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*3230	[0.50]	Immunology
MICR*4280	[0.50]	Microbial Ecology
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4750	[0.50]	Genetic Engineering of Plants

Business Economics (BECN)

Department of Economics and Finance, College of Business and Economics

Interdisciplinary study in Business Economics is offered as a minor in the honours program. Students in this program will be counselled by the Department of Economics and Finance. It is possible for students to pursue a more intensive program in the area of business and economics; see the heading Economics (ECON) or Mathematical Economics (MAEC) in the B.A. degree and the heading Management Economics (MEF) in the B.Comm. degree.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

ACCT*1220	[0.50]	Introductory Financial Accounting
ACCT*2230	[0.50]	Management Accounting
ECON*1050	[0.50]	Introductory Microeconomics *
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2560	[0.50]	Theory of Finance

One of:

IPS*1500	[1.00]	Integrated Mathematics and Physics I
MATH*1030	[0.50]	Business Mathematics
MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

One of:

ECON*2740	[0.50]	Economic Statistics
PSYC*1010	[0.50]	Quantification in Psychology
SOAN*2120	[0.50]	Introductory Methods
STAT*2040	[0.50]	Statistics I
STAT*2060	[0.50]	Statistics for Business Decisions
STAT*2080	[0.50]	Introductory Applied Statistics I
STAT*2120	[0.50]	Probability and Statistics for Engineers

One of:

ECON*3660	[0.50]	Economics of Equity Markets
ECON*4400	[0.50]	Economics of Organizations and Corporate Governance
ENGG*3240	[0.50]	Engineering Economics
FARE*3310	[0.50]	Operations Management
HROB*2090	[0.50]	Individuals and Groups in Organizations
MCS*1000	[0.50]	Introductory Marketing
MCS*3040	[0.50]	Business and Consumer Law
MGMT*3320	[0.50]	Financial Management

* FARE*1040 and FARE*1400 may replace this course if it is required for the major.

Chemical Physics (CHPY)

Administered by the Office of the Dean, College of Physical and Engineering Science on behalf of the Department of Chemistry and the Department of Physics

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum of 20.00 credits is required. At least 1.00 credits must be from Arts and/or Social Science courses.

Semester 1

CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I
MATH*1160	[0.50]	Linear Algebra I

One of:
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050 [0.50] General Chemistry II
CIS*1500 [0.50] Introduction to Programming
IPS*1510 [1.00] Integrated Mathematics and Physics II
One of:
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Semester 3

CHEM*2060 [0.50] Structure and Bonding
MATH*2200 [0.50] Advanced Calculus I
MATH*2270 [0.50] Applied Differential Equations
PHYS*2330 [0.50] Electricity and Magnetism I
0.50 Arts or Social Science electives

Semester 4

CHEM*2070 [0.50] Structure and Spectroscopy
CHEM*2480 [0.50] Analytical Chemistry I
PHYS*2180 [0.50] Experimental Techniques in Physics
PHYS*2310 [0.50] Mechanics
PHYS*2340 [0.50] Electricity and Magnetism II

Semester 5

CHEM*3860 [0.50] Quantum Chemistry
NANO*3600 [0.50] Computational Methods in Materials Science
PHYS*3130 [0.50] Mathematical Physics
PHYS*3230 [0.50] Quantum Mechanics I
One of:
- CHEM*2820 [0.50] Thermodynamics and Kinetics
- PHYS*2240 [0.50] Thermal Physics

Semester 6

CHEM*3430 [0.50] Analytical Chemistry II: Instrumental Analysis
PHYS*3000 [0.50] Optics: Fundamentals and Applications
PHYS*4040 [0.50] Quantum Mechanics II
One of:
- PHYS*4300 [0.50] Inquiry in Physics
- 0.50 electives

One of:
- CHEM*3870 [0.50] Molecular Spectroscopy
- CHEM*4880 [0.50] Topics in Advanced Physical Chemistry

Semester 7

CHEM*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation
PHYS*4120 [0.50] Atomic and Molecular Physics
PHYS*4240 [0.50] Statistical Physics II
One of:
- PHYS*4001 [0.50] Research in Physics +
- 0.50 electives +

0.50 electives

Semester 8

One of:
- CHEM*3870 [0.50] Molecular Spectroscopy
- CHEM*4880 [0.50] Topics in Advanced Physical Chemistry

One of:
- CHEM*4900 [1.00] Chemistry Research Project I +
- PHYS*4002 and 0.50 electives

One of:
- PHYS*4300 [0.50] Inquiry in Physics
- 0.50 electives +

0.50 electives

+ Students must complete either (PHYS*4001, PHYS*4002 in semester 7 and 8) or (CHEM*4900 in semester 8).

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

11.50 - Required science courses semesters 3 – 8

1.00 - Arts and/or Social Science electives

2.50 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Chemical Physics (Co-op) (CHPY:C)

Administered by the Office of the Dean, College of Physical and Engineering Science on behalf of the Department of Chemistry and the Department of Physics

Major (Honours Program)

A minimum of 20.00 credits is required. At least 1.00 credits must be from Arts and/or Social Science courses. Students are eligible to participate in a maximum two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website: https://www.recruitguelph.ca/cecs/.

Semester 1 - Fall

CHEM*1040 [0.50] General Chemistry I
IPS*1500 [1.00] Integrated Mathematics and Physics I
MATH*1160 [0.50] Linear Algebra I
One of:
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

CHEM*1050 [0.50] General Chemistry II
CIS*1500 [0.50] Introduction to Programming
IPS*1510 [1.00] Integrated Mathematics and Physics II
One of:
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Semester 3 - Fall

CHEM*2060 [0.50] Structure and Bonding
COOP*1100 [0.00] Introduction to Co-operative Education
MATH*2200 [0.50] Advanced Calculus I
MATH*2270 [0.50] Applied Differential Equations
PHYS*2330 [0.50] Electricity and Magnetism I
0.50 Arts or Social Science electives

Semester 4 - Winter

CHEM*2070 [0.50] Structure and Spectroscopy
CHEM*2480 [0.50] Analytical Chemistry I
PHYS*2180 [0.50] Experimental Techniques in Physics
PHYS*2310 [0.50] Mechanics
PHYS*2340 [0.50] Electricity and Magnetism II

Summer Semester

COOP*1000 [0.00] Co-op Work Term I ++

Fall Semester

COOP*2000 [0.00] Co-op Work Term II ++

Semester 5 - Winter

CHEM*3430 [0.50] Analytical Chemistry II: Instrumental Analysis
PHYS*4300 [0.50] Inquiry in Physics
One of:
- CHEM*3870 [0.50] Molecular Spectroscopy +
- 0.50 electives *

One of:
- CIS*2500 [0.50] Intermediate Programming
- 0.50 electives *

Summer Semester

COOP*3000 [0.00] Co-op Work Term III ++

Semester 6 - Fall

CHEM*3860 [0.50] Quantum Chemistry
NANO*3600 [0.50] Computational Methods in Materials Science
PHYS*3130 [0.50] Mathematical Physics
PHYS*3230 [0.50] Quantum Mechanics I
One of:
- CHEM*2820 [0.50] Thermodynamics and Kinetics
- PHYS*2240 [0.50] Thermal Physics

Winter Semester

COOP*4000 [0.00] Co-op Work Term IV ++
(8-month work term in conjunction with COOP*5000)

Summer Semester

COOP*5000 [0.00] Co-op Work Term V ++
(8-month work term in conjunction with COOP*4000)

Semester 7 - Fall**

CHEM*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation
PHYS*4240 [0.50] Statistical Physics II
One of:
- CHEM*3640 [0.50] Chemistry of the Elements I
- CHEM*3750 [0.50] Organic Chemistry II
- 0.50 electives *

1.00 electives *

Semester 8 - Winter**

PHYS*3000 [0.50] Optics: Fundamentals and Applications
PHYS*4040 [0.50] Quantum Mechanics II
One of:
- CHEM*3870 [0.50] Molecular Spectroscopy +
- CHEM*4880 [0.50] Topics in Advanced Physical Chemistry +
- 0.50 electives *

1.00 electives *

* A minimum of 1.00 credits of Arts/Social Sciences electives is required for completion of this program.

** A minimum of 2.00 credits in science courses at the 4000 level is required for graduation.

+ One of CHEM*3870 or CHEM*4880 is required for graduation.

++ Four work terms are required for the completion of the co-op degree. It is also necessary that there be at least one work term in each of Fall, Winter and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. Whether the student completes four or five work terms, a report is required for each work term completed. Contact the co-op faculty advisor for further details.

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

10.50 - Required science courses semesters 3 – 8

0.50 – Approved science electives

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Chemistry (CHEM)

Department of Chemistry, College of Physical and Engineering Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. The major will require the completion of 20.00 credits as indicated below:

Semester 1

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
IPS*1500 [1.00] Integrated Mathematics and Physics I
0.50 Arts or Social Science electives
Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050 [0.50] General Chemistry II
IPS*1510 [1.00] Integrated Mathematics and Physics II
MATH*1160 [0.50] Linear Algebra I
One of
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health

Semester 3

BIOC*2580 [0.50] Introduction to Biochemistry
CHEM*2060 [0.50] Structure and Bonding
CHEM*2400 [0.75] Analytical Chemistry I
MATH*2270 [0.50] Applied Differential Equations
Electives to a maximum of 2.75 total credits in this semester *

Semester 4

CHEM*2070 [0.50] Structure and Spectroscopy
CHEM*2700 [0.50] Organic Chemistry I
CHEM*3430 [0.50] Analytical Chemistry II: Instrumental Analysis
1.00 electives* or restricted electives**

Semester 5

CHEM*2820 [0.50] Thermodynamics and Kinetics
CHEM*3640 [0.50] Chemistry of the Elements I
CHEM*3750 [0.50] Organic Chemistry II
CHEM*3860 [0.50] Quantum Chemistry
0.50 electives*

Semester 6

CHEM*3650 [0.50] Chemistry of the Elements II
CHEM*3760 [0.50] Organic Chemistry III
1.50 electives* or restricted electives**

Semester 7 and 8

CHEM*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation
3.00 Chemistry or Biochemistry**
1.50 electives*
*selection of electives is subject to the following:

1. At least 1.00 credits must be in the Arts & Social Sciences.
2. Approval of the Faculty Advisor must be obtained for the selection of courses not listed as restrictive electives.
3. Options for an "Area of Focus" or a minor are available. Subject areas include Biochemistry, Computing and Information Science, Earth Sciences, Environmental Sciences, Mathematical Sciences, and Physics. Please consult with your Faculty Advisor for more detail.

**3.00 credits from the 3000/4000 level as follows:

1. 1.50 comprising of (CHEM*3870 or CHEM*4880), (CHEM*4620 or CHEM*4630), (CHEM*4720 or CHEM*4730)
2. 1.50 chosen from CHEM*3870, CHEM*4010, CHEM*4400, BIOC*4520, BIOC*4540,BIOC*4580, CHEM*4620, CHEM*4630, CHEM*4720, CHEM*4730, CHEM*4740, CHEM*4880, CHEM*4900, CHEM*4910, MCB*4050, MCB*4080 , TOX*4590

Note:

1. Some of these courses may have to be taken in Semester 6.
2. Some of these courses are offered only in alternate years, and some have additional prerequisites for which the student must plan ahead, with the assistance of the faculty advisor.

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

7.75 - Required science courses semesters 3 – 8

3.00 - Restricted electives (#1 and 2 in restricted electives list)

1.25 – Approved science electives

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Chemistry consists of at least 5.00 credits including the following courses:

CHEM*1040 [0.50] General Chemistry I
CHEM*1050 [0.50] General Chemistry II
Of the additional 4.00 credits, students will select Chemistry courses (CHEM) at the 2000 level or above including a minimum of 1.00 credits at the 3000 or 4000 level. BIOC*2580 can be counted towards this specialization

Chemistry (Co-op) (CHEM:C)

Department of Chemistry, College of Physical and Engineering Science

Major (Honours Program)

The major will require the completion of 20.00 credits as indicated below.

The course content of semesters 1 to 3 is the same as listed in the regular Honours Program Major.

To graduate from the Co-op program a minimum of 4 successfully completed work terms is normally required.

Semester 1 - Fall

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
IPS*1500 [1.00] Integrated Mathematics and Physics I
0.50 Arts or Social Science electives
Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

CHEM*1050 [0.50] General Chemistry II

COOP*1100	[0.00]	Introduction to Co-operative Education
IPS*1510	[1.00]	Integrated Mathematics and Physics II
MATH*1160	[0.50]	Linear Algebra I

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health

Semester 3 - Fall

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2060	[0.50]	Structure and Bonding
CHEM*2400	[0.75]	Analytical Chemistry I
MATH*2270	[0.50]	Applied Differential Equations

Electives to a maximum of 2.75 total credits in this semester *

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - Summer

CHEM*2070	[0.50]	Structure and Spectroscopy
CHEM*2700	[0.50]	Organic Chemistry I
CHEM*3430	[0.50]	Analytical Chemistry II: Instrumental Analysis

1.00 electives *

Semester 5 - Fall

CHEM*2820	[0.50]	Thermodynamics and Kinetics
CHEM*3640	[0.50]	Chemistry of the Elements I
CHEM*3750	[0.50]	Organic Chemistry II
CHEM*3860	[0.50]	Quantum Chemistry

0.50 electives *

Semester 6 - Winter

CHEM*3650	[0.50]	Chemistry of the Elements II
CHEM*3760	[0.50]	Organic Chemistry III

1.50 electives* or restricted electives**

Summer Semester

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

Fall Semester

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

Semester 7 - Winter

2.50 electives* or restricted electives**

Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV

Semester 8 - Fall

CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation

2.00 electives* or restricted electives**

* selection of electives is subject to the following:

1. At least 1.00 credits must be in the Arts & Social Sciences.
2. Approval of the Faculty Advisor must be obtained for the selection of courses not listed as restrictive electives.
3. Options for an "Area of Focus" or a minor are available. Subject areas include Biochemistry, Computing and Information Science, Earth Sciences, Environmental Sciences, Mathematical Sciences, and Physics. Please consult with your Faculty Advisor for more detail.

** 3.00 credits from the 3000/4000 level as follows:

1. 1.50 comprising of (CHEM*3870 or CHEM*4880), (CHEM*4620 or CHEM*4630), (CHEM*4720 or CHEM*4730)
2. 1.50 chosen from CHEM*3870, CHEM*4010, CHEM*4400, BIOC*4520, BIOC*4540, BIOC*4580, CHEM*4620, CHEM*4630, CHEM*4720, CHEM*4730, CHEM*4740, CHEM*4880, CHEM*4900, CHEM*4910, MCB*4050, MCB*4080 , TOX*4590

Note:

Some of these courses are offered only in alternate years, and some have additional prerequisites for which the student must plan ahead, with the assistance of the faculty advisor.

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

7.75 - Required science courses semesters 3 – 8

3.00 - Restricted electives (#1 and 2 in restricted electives list)

1.25 – Approved science electives

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Computing and Information Science (CIS)

School of Computer Science, College of Physical and Engineering Science

A knowledge of Computing is a complement to most areas of study. The Minor in Computing and Information Science is directed towards students who wish to supplement their studies in another area with some experience in Computing. Students interested in pursuing a Major in Computing can do so through the Bachelor of Computing Degree Program.

Minor (Honours Program)

CIS*1500	[0.50]	Introduction to Programming
CIS*1910	[0.50]	Discrete Structures in Computing I
CIS*2170	[0.75]	User Interface Design
CIS*2430	[0.50]	Object Oriented Programming
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration

0.50 additional credits from CIS courses at the 2000 level or above
0.50 additional credits from CIS courses at the 3000 level or above

Ecology (ECOL)

Department of Integrative Biology, College of Biological Science

This minor provides a foundation in the principles and methods of ecology. It introduces the knowledge and skills necessary for work in conservation, environmental science and education, resource management, ecological consulting, or nature interpretation.

Minor (Honours Program)

A minimum of 5.00 credits is required to complete the minor, which must include:

BIOL*2060	[0.50]	Ecology
BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BIOL*4110	[1.00]	Ecological Methods
BIOL*4120	[0.50]	Evolutionary Ecology

Of the remaining 2.00 required credits, students will select from the following:

At least one of:

BIOL*2400	[0.50]	Evolution
BIOL*3020	[0.50]	Population Genetics

At least one of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*2090	[0.50]	Vertebrate Structure and Function

One of:

GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Environmental Biology (ENVB)

School of Environmental Sciences, Ontario Agricultural College

The honours B.Sc. program in Environmental Biology combines a broad education in the life sciences with a more specialized understanding of the biological consequences of interactions between humans and the environment. This major prepares students for post-graduate work in environmental biology and related life sciences and provides a strong foundation for students wishing to pursue careers in teaching, government service or the private sector.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. This major requires the completion of 20.00 credits. A minimum of 16.00 of these 20.00 must be science credits. Of these 16.00 science credits, a minimum of 6.00 must be at the 3000 - and 4000-levels with a minimum of 2.00 credits at the 4000-level.

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science elective

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
MATH*2080	[0.50]	Elements of Calculus II
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science elective

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
STAT*2040	[0.50]	Statistics I (if not taken in semester 2)
TOX*2000	[0.50]	Principles of Toxicology

0.50 electives or restricted electives chosen from lists A, B, C and/or D (or 1.00 if STAT*2040 was taken in semester 2)

Semester 4

BIOL*2060	[0.50]	Ecology
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics

1.50 electives or restricted electives chosen from lists A, B, C and/or D

Semester 5

2.50 electives or restricted electives chosen from lists A, B, C and/or D (at least 1.00 restricted electives must be selected, including at least one ENVS course)

Students are encouraged to take (ENVS*3410 and ENVS*3420) or ENVS*3430 in Semesters 5 and 6.

Semester 6

BIOL*2400	[0.50]	Evolution

2.00 electives or restricted electives chosen from lists A, B, C and/or D

Semester 7

2.50 electives or restricted electives chosen from lists A, B, C and/or D

Students contemplating graduate studies are encouraged to take ENVS*4410 in semester 7 and ENVS*4420 in semester 8, or ENVS*4430 in either semester 7 or 8.

Semester 8

2.50 electives or restricted electives chosen from lists A, B, C and/or D

Restricted Electives

1. A minimum of 1.00 credits of Approved Arts and Social Science electives
2. Select 4.50 credits from the following lists of restricted electives during Semesters 3-8. 1.00 credits must be completed in each of lists A, B and C. Of the total 4.50 credits at least 1.00 of these credits must be from ENVS courses.

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

List A - Environment & Agriculture

Minimum of 1.00 credits from the following list:

AGR*2050	[0.50]	Agroecology
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
ENVS*3040	[0.50]	Natural Chemicals in the Environment
ENVS*3210	[0.50]	Plant Pathology
ENVS*3310	[0.50]	Soil Biodiversity and Ecosystem Function **
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests **
ENVS*4130	[0.50]	Chemical Ecology: Principles & Practice **
MICR*3220	[0.50]	Plant Microbiology
PBIO*4750	[0.50]	Genetic Engineering of Plants **

List B - Impacts of Pollution on Living Organisms

Minimum of 1.00 credits from the following list:

BIOL*3450	[0.50]	Introduction to Aquatic Environments
BIOL*4350	[0.50]	Limnology of Natural and Polluted Waters **
BIOL*4610	[0.75]	Arctic Ecology
ENVS*3010	[0.50]	Climate Change Biology
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3290	[0.50]	Waterborne Disease Ecology
ENVS*4180	[0.50]	Insecticide Biological Activity and Resistance
ENVS*4190	[0.50]	Biological Activity of Herbicides
GEOG*3020	[0.50]	Global Environmental Change
MBG*4270	[0.50]	DNA Replication, Recombination and Repair **
PBIO*4530	[0.50]	Plants and Environmental Pollution **
STAT*3510	[0.50]	Environmental Risk Assessment
TOX*3360	[0.50]	Environmental Chemistry and Toxicology

List C - Conservation of Biodiversity & Natural Resources

Minimum of 1.00 credits from the following list:

BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BIOL*3130	[0.50]	Conservation Biology
BIOL*4150	[0.50]	Wildlife Conservation and Management
BIOL*4500	[0.50]	Natural Resource Policy Analysis
ENVS*2120	[0.50]	Introduction to Environmental Stewardship
ENVS*3080	[0.50]	Soil and Water Conservation **
ENVS*3090	[0.50]	Insect Diversity and Biology
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3230	[0.50]	Agroforestry Systems **
ENVS*3250	[0.50]	Forest Health and Disease
ENVS*3270	[0.50]	Forest Biodiversity **
ENVS*3370	[0.50]	Terrestrial Ecosystem Ecology
ENVS*4230	[0.50]	Biology of Aquatic Insects **
ENVS*4260	[0.50]	Field Entomology **
ENVS*4350	[0.50]	Forest Ecology **
ENVS*4390	[1.00]	Soil Variability and Land Evaluation

List D - Supporting Courses

ENVS*3410	[0.50]	Independent Research I
ENVS*3420	[0.50]	Independent Research II
ENVS*3430	[1.00]	Independent Research
ENVS*3510	[0.50]	Independent Study I
ENVS*3520	[0.50]	Independent Study II
ENVS*3530	[1.00]	Independent Study
ENVS*4410	[1.00]	Advanced Independent Research I
ENVS*4420	[1.00]	Advanced Independent Research II
ENVS*4430	[2.00]	Advanced Independent Research
ENVS*4510	[0.50]	Advanced Independent Study I
ENVS*4520	[0.50]	Advanced Independent Study II
ENVS*4530	[1.00]	Advanced Independent Study

The following restricted elective courses are required as prerequisites for some courses in lists A, B and C:

BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BOT*2100	[0.50]	Life Strategies of Plants
ENVS*2060	[0.50]	Soil Science
MCB*2050	[0.50]	Molecular Biology of the Cell

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

3.50 - Required science courses semesters 3 – 8 (3.00 if STAT 2040 is taken in Semester 2)

4.50 - Restricted electives (some restricted electives do not count as science electives towards degree therefore additional science electives may be required)

4.00 - Approved Science electives (4.50 if STAT 2040 is taken in semester 2, in place of CIS)

1.00 - Arts and/or Social Science electives (# 1 in restricted elective list)

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Environmental Geoscience and Geomatics (EGG)

Department of Geography, College of Social and Applied Human Sciences

This program provides opportunities for study of the processes and properties of the biophysical environment and a core foundation in the analytical techniques (i.e. Geographical Information Science and Remote Sensing) used for their interpretation, analysis and presentation.

Graduates of the program that select courses required for a 'Professional Geoscientist' will meet the academic requirements for eligibility for membership as an Environmental Geoscientist in the Association of Professional Geoscientists of Ontario (APGO), allowing for use of the designation P. Geo. Ontario's legislation under the Professional Geoscientists Act, 2000 (the Act), requires registration with the APGO of anyone wishing to practice geoscience in Ontario. Details on the course requirements for APGO membership can be found on the Department of Geography website:

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult with a B.Sc. Faculty Advisor in the Department of Geography. All students are encouraged to consult with the advisor on a regular basis.

The major will require the completion of 20.00 credits as indicated below:

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
GEOG*1350	[0.50]	Earth: Hazards and Global Change
PHYS*1080	[0.50]	Physics for Life Sciences

One of:

MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II

GEOG*1300 [0.50] Introduction to the Biophysical Environment
PHYS*1130 [0.50] Physics with Applications
0.50 Arts or Social Science electives* (GEOG*1220 is recommended)

Semester 3

ENVS*2240 [0.50] Fundamentals of Environmental Geology
GEOG*2000 [0.50] Geomorphology
GEOG*2420 [0.50] The Earth From Space
GEOG*2480 [0.50] Mapping and GIS
0.50 Arts or Social Science electives*

Semester 4

GEOG*2110 [0.50] Climate and the Biophysical Environment
GEOG*2210 [0.50] Environment and Resources
STAT*2040 [0.50] Statistics I
One of:
- CIS*1200 [0.50] Introduction to Computing
- CIS*1500 [0.50] Introduction to Programming
- MATH*1210 [0.50] Calculus II
- MATH*2080 [0.50] Elements of Calculus II

0.50 approved Science electives*

Semester 5

GEOG*3000 [0.50] Fluvial Processes
GEOG*3110 [0.50] Biotic and Natural Resources
One of:
- GEOG*3020 [0.50] Global Environmental Change
- GEOG*3090 [0.50] Gender and Environment
- GEOG*3210 [0.50] Management of the Biophysical Environment

1.00 electives, at least 0.50 from approved Science electives*

Semester 6

GEOG*3420 [0.50] Remote Sensing of the Environment
GEOG*3480 [0.50] GIS and Spatial Analysis
GEOG*3610 [0.50] Environmental Hydrology
1.00 electives, at least 0.50 from approved Science electives*

Semester 7

GEOG*4110 [1.00] Environmental Systems Analysis
1.50 electives, at least 0.50 from approved Science electives* (GEOG*4690 is recommended)

Semester 8

GEOG*4150 [0.50] Catchment Processes
GEOG*4480 [1.00] Applied Geomatics
1.00 Approved Science electives*

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

8.50 - Required science courses semesters 3 – 8

1.00 - Required social science courses semesters 3 – 8

3.00 - Approved Science electives

1.00 - Arts and/or Social Science electives

2.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Food Science (FOOD)

Department of Food Science, Ontario Agricultural College

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor.

Semester 1 - Fall

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
MATH*1080 [0.50] Elements of Calculus I
PHYS*1080 [0.50] Physics for Life Sciences
0.50 Arts or Social Science electives
Note: CIS*1200, rather than an Arts or Social Science credit is recommended for those needing to improve their computer skills.
Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

BIOL*1080 [0.50] Biological Concepts of Health
CHEM*1050 [0.50] General Chemistry II
MATH*2080 [0.50] Elements of Calculus II
PHYS*1070 [0.50] Physics for Life Sciences II
0.50 Arts or Social Science electives

Semester 3 - Fall

BIOC*2580 [0.50] Introduction to Biochemistry
CHEM*2880 [0.50] Physical Chemistry
FOOD*2150 [0.50] Introduction to Nutritional and Food Science
MICR*2420 [0.50] Introduction to Microbiology
0.50 electives

Semester 4 - Winter

FOOD*2100 [0.50] Communication in Food Science
FOOD*2620 [0.50] Food Engineering Principles
NUTR*3210 [0.50] Fundamentals of Nutrition
STAT*2040 [0.50] Statistics I
0.50 electives

Semester 5 - Fall

FOOD*3030 [0.50] Food Chemistry I
FOOD*3160 [0.75] Food Processing I
FOOD*3230 [0.75] Food Microbiology
0.50 electives

Semester 6 - Winter

FOOD*3040 [0.50] Food Chemistry II
FOOD*3170 [0.50] Food Processing II
FOOD*3260 [0.50] Industrial Microbiology
FOOD*3700 [0.50] Sensory Evaluation of Foods
0.50 electives

Semester 7 - Fall

FOOD*4190 [0.50] Advanced Food Analysis
FOOD*4260 [0.50] Food Product Development I
1.50 electives

Semester 8 - Winter

FOOD*4270 [0.50] Food Product Development II
2.00 electives

Notes:

1. ENGL*1200 is recommended for those students needing to improve their English grammar.
2. FOOD*2150 could be replaced by FOOD*2010 with permission of department advisor.
3. Of the 6.50 electives credits:

   At least 2.00 must be Arts or Social Sciences.

   At least 2.00 must be from list of Restricted Electives.

   At least 1.00 must be from additional science electives (1.50 if MCS*3010 is chosen as a Restricted Elective)

Restricted Electives:

FOOD*4070 [0.50] Food Packaging
FOOD*4090 [0.50] Functional Foods and Nutraceuticals
FOOD*4110 [0.50] Meat and Poultry Processing
FOOD*4220 [0.50] Topics in Food Science
FOOD*4230 [0.50] Research in Food Science
FOOD*4310 [0.50] Food Safety Management Systems
FOOD*4400 [0.50] Dairy Processing
FOOD*4520 [0.50] Utilization of Cereal Grains for Human Food
MCS*3010 [0.50] Quality Management
POPM*4040 [0.50] Epidemiology of Food-borne Diseases

Credit Summary (20.00 Total Credits)

4.00 - 1st year science required

9.50 - Required in semesters 3-8

2.00 - Restricted electives

2.00 - Arts or Social Science electives

1.00 or 1.50 - Additional Science electives (See Note 3 above)

1.00 or 1.50 - Free electives (See Note 3 above)

Students not in the Food Science Major who are seeking further study in Food Science are encouraged to consider the Certificate in Food Science. See Special Study Opportunities, Chapter XI of the Calendar.

Food Science (Co-op) (FOOD:C)

Department of Food Science, Ontario Agricultural College

Major (Honours Program)

Semester 1 - Fall

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
MATH*1080 [0.50] Elements of Calculus I
PHYS*1080 [0.50] Physics for Life Sciences
0.50 Arts or Social Science electives

Note: CIS*1200, rather than an Arts or Social Science credit is recommended for those needing to improve their computer skills.
Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
MATH*2080	[0.50]	Elements of Calculus II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 Arts or Social Science electives

Summer Semester

Off

Semester 3 - Fall

BIOC*2580	[0.50]	Introduction to Biochemistry
CHEM*2880	[0.50]	Physical Chemistry
COOP*1100	[0.00]	Introduction to Co-operative Education
FOOD*2150	[0.50]	Introduction to Nutritional and Food Science
MICR*2420	[0.50]	Introduction to Microbiology

0.50 electives

Semester 4 - Winter

FOOD*2100	[0.50]	Communication in Food Science
FOOD*2620	[0.50]	Food Engineering Principles
NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*2040	[0.50]	Statistics I

0.50 electives

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 5 - Fall

FOOD*3030	[0.50]	Food Chemistry I
FOOD*3160	[0.75]	Food Processing I
FOOD*3230	[0.75]	Food Microbiology

0.50 electives

Semester 6 - Winter

FOOD*3040	[0.50]	Food Chemistry II
FOOD*3170	[0.50]	Food Processing II
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3700	[0.50]	Sensory Evaluation of Foods

0.50 electives

Summer Semester

Optional

Fall Semester

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

Winter Semester

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

Semester 7 - Fall

FOOD*4190	[0.50]	Advanced Food Analysis
FOOD*4260	[0.50]	Food Product Development I

1.50 electives

Semester 8 - Winter

FOOD*4270	[0.50]	Food Product Development II

2.00 electives

Notes:

See Notes and Credit Summary in Food Science Major.

Geographic Information Systems (GIS) and Environmental Analysis

Department of Geography, College of Social and Applied Human Sciences

Minor (Honours Program)

A minimum of 5.00 credits is required, including the following 3.50 credits:

GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*2420	[0.50]	The Earth From Space
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3420	[0.50]	Remote Sensing of the Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis
GEOG*4480	[1.00]	Applied Geomatics

And at least 1.50 credits from:

GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment
GEOG*4110	[1.00]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Governance

Human Kinetics (HK)

Department of Human Health and Nutritional Sciences, College of Biological Science

Human Kinetics is concerned with understanding capacities for, and limits of, human movement at different ages and with the role of physical activity in human health. Through the use of electives, students may structure a program emphasizing biomechanics and ergonomics, human population biology or nutrition, exercise and metabolism.

If lacking the fundamentals of word processing, spread sheet use and data management, the student should select CIS*1200 as early in the program as possible.

Major (Honours Program)

B.Sc. students who were not admitted directly into the Human Kinetics major from high school and subsequently wish to transfer to the specialization must apply directly to the Department of Human Health and Nutritional Science by the last day of classes in the winter semester.

To be eligible after first year, applicants must have successfully completed 4.0 science credits in a B.Sc. specialization with an average of 70% or better in BIOL*1070, BIOL*1080 and BIOL*1090. For students with a 65-69.9% average in these three courses, admission to the major will be competitive based on available spaces.

Students wishing to transfer after second year or third year must have an average of 70% or better in their last two semesters (total of best 4.00 science credits). For students with a 65-69.9%, admission to the major will be competitive based on available spaces.

All decisions regarding transfers will be made by the end of June.

To complete the major, a minimum of 20.00 credits, of which 16.00 must be from the list of acceptable science courses, are required.

Semester 1

BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives
Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 arts or social science electives

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
HK*2270	[0.50]	Principles of Human Biomechanics
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

Semester 4

HK*2810	[0.50]	Human Physiology I - Concepts and Principles
MCB*2050	[0.50]	Molecular Biology of the Cell
NUTR*3210	[0.50]	Fundamentals of Nutrition

0.50 electives
0.50 Arts or Social Science electives

Semester 5

HK*3600	[0.75]	Applied Human Kinetics I
HK*3810	[0.75]	Human Physiology II - Integrated Systems
NUTR*3360	[0.50]	Lifestyle Genomics

One of

HK*3401	[0.75]	Human Anatomy: Dissection
HK*3501	[0.75]	Human Anatomy: Prosection

Semester 6

BIOC*3560	[0.50]	Structure and Function in Biochemistry
HK*3100	[0.50]	Neuromuscular Physiology
HK*4600	[0.75]	Applied Human Kinetics II

One of

HK*3402	[0.75]	Human Anatomy: Dissection (if registered in HK*3401 in semester 5)
HK*3502	[0.75]	Human Anatomy (if registered in HK*3501 in semester 5)

Semester 7

HK*4550	[0.50]	Human Cardio-respiratory Physiology
NUTR*4210	[0.50]	Nutrition, Exercise and Energy Metabolism

1.50 electives or restricted electives

Semester 8

2.25 electives or restricted electives

Restricted Electives

1. 2.00 credits of Approved Arts and Social Science electives.
2. A minimum of 1.00 credits of restricted electives are required which must be selected from HK*4XXX, NUTR*4XXX (must be an approved B.Sc. Science Elective).

Credit Summary (20.00 Total Credits)

4.00 - First year science core

9.75 - Required science courses semesters 3 - 8

1.00 - Restricted elective (# 2 in restricted elective list)

1.25 - Approved Science electives

2.00 - Approved Arts and/or Social Science electives (#1 in restricted electives list)

2.00 - Free electives - any approved electives for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Marine and Freshwater Biology (MFB)

Department of Integrative Biology, College of Biological Science

The Marine and Freshwater Biology major capitalizes on Guelph's recognized excellence in aquatic research. In this major, you will build upon core courses in ecology, evolution, genetics, physiology and zoology as you study freshwater and marine environments and work with aquatic organisms experimentally in the field and in the lab. You will have the opportunity to perform independent research projects under a variety of field and laboratory conditions to enhance your learning experience. This program prepares students for post-graduate work in the aquatic sciences, and provides a sound scientific background for students wishing to pursue careers in biology, management and conservation, aquaculture, biotechnology, education, and research either in government or the private sectors.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum total of 20.00 credits is required to complete the major.

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 Arts or Social Science electives

Semester 3

BIOL*2060	[0.50]	Ecology
BIOL*2400	[0.50]	Evolution
ZOO*2090	[0.50]	Vertebrate Structure and Function

1.00 electives or restricted electives*

Semester 4

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
STAT*2230	[0.50]	Biostatistics for Integrative Biology
ZOO*2700	[0.50]	Invertebrate Morphology & Evolution

0.50 electives or restricted electives*

Semester 5

BIOL*3450	[0.50]	Introduction to Aquatic Environments
ZOO*3600	[0.50]	Comparative Animal Physiology I
ZOO*3610	[0.25]	Lab Studies in Animal Physiology I
ZOO*3700	[0.50]	Integrative Biology of Invertebrates

Electives or restricted electives to a maximum of 2.75 total credits in this semester.

Semester 6

BIOL*3060	[0.50]	Populations, Communities & Ecosystems
ZOO*3050	[0.50]	Developmental Biology
ZOO*3620	[0.50]	Comparative Animal Physiology II
ZOO*3630	[0.25]	Lab Studies in Animal Physiology II

Electives or restricted electives to a maximum of 2.25 total credits in this semester.

Semester 7

BIOL*4350	[0.50]	Limnology of Natural and Polluted Waters
IBIO*4600	[1.00]	Integrative Marine and Freshwater Research

1.00 electives or restricted electives

Semester 8

BIOL*4010	[0.50]	Adaptational Physiology
ZOO*4330	[0.50]	Biology of Fishes
ZOO*4570	[0.50]	Marine Ecological Processes

1.00 electives or restricted electives

* CIS*1200 is recommended for those needing to improve their computer skills

Restricted Electives

At least 1.00 credits of Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts

Credit Summary (20.00 Total Credits)

4.00 - First year science core

10.00 - Required science courses semesters 3 - 8

2.00 - Approved science electives

1.00 - Arts and/or Social Science electives (#1 in restricted electives)

3.00 - Free electives - any approved elective for B.Sc. Students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Mathematical Science (MSCI)

Department of Mathematics & Statistics, College of Physical and Engineering Science

Major (Honours Program)

Knowledge of Mathematics and Statistics is crucial for understanding our world. This unique program provides a core of both mathematics and statistics with a choice of a Mathematics stream or a Statistics stream. This major also requires the completion of an area of emphasis as listed. Students are encouraged to speak with a Program Counsellor when choosing courses for the selected stream and area of emphasis.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A total of 20.00 credits is required to complete the Major which includes at least 10.00 credits in Mathematics & Statistics, 0.50 credits in Computing and Information Science, and an additional 2.50 credits in an area of emphasis.

Semester 1

CHEM*1040	[0.50]	General Chemistry I
MATH*1160	[0.50]	Linear Algebra I

One of ***

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

1.00 credits from: IPS*1500, or (MATH*1080, PHYS*1080) or (MATH*1200, PHYS*1080)*

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050	[0.50]	General Chemistry II
STAT*2040	[0.50]	Statistics I

One of ***

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

1.00 credits from: IPS*1510, or (MATH*2080, PHYS*1010) or (MATH*1210, PHYS*1010)**

Semester 3

CIS*1500	[0.50]	Introduction to Programming
MATH*2200	[0.50]	Advanced Calculus I
STAT*3100	[0.50]	Introductory Mathematical Statistics I

1.00 electives or restricted electives

Semester 4

MATH*2130	[0.50]	Numerical Methods
STAT*2050	[0.50]	Statistics II

1.50 electives or restricted electives (CIS*2500 recommended)

Semester 5

2.50 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

MATH*4440	[0.50]	Case Studies in Mathematics and Statistics

2.00 electives or restricted electives

***** Students entering the major in first year are strongly advised to take IPS*1500 or (MATH*1200, PHYS*1080). Students declaring the Energy and Mass Transfer, the Electricity and Systems, or the Signal Processing Area of Emphasis should take (MATH*1200, PHYS*1080).

****** Students entering the major in first year are strongly advised to take IPS*1510 or (MATH*1210, PHYS*1010). Students declaring the Energy and Mass Transfer, the Electricity and Systems, or the Signal Processing Area of Emphasis should take (MATH*1210, PHYS*1010).

******* BIOL*1070 and BIOL*1090 are recommended if taking either the BINF or the BBM Area of Emphasis

RESTRICTED ELECTIVES

1. 1.00 credits of Approved Arts and/or Social Science electives
2. 5.50 credits from either the Mathematics Stream or the Statistics Stream as follows:
3. 2.50 credits from an Area of Emphasis

Mathematics Stream:

MATH*2210	[0.50]	Advanced Calculus II
MATH*2270	[0.50]	Applied Differential Equations
MATH*3160	[0.50]	Linear Algebra II
MATH*3200	[0.50]	Real Analysis

0.50 additional credits in MATH at 3000 level or above

3.00 additional credits in MATH or STAT at 3000 level or above of which at least 1.50 credits must be MATH at the 4000 level

Statistics Stream:

STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3240	[0.50]	Applied Regression Analysis

0.50 additional credits in MATH at 3000 level or above

1.00 additional credits in MATH or STAT at 2000 level or above

3.00 additional credits in MATH or STAT at 3000 level or above of which at least 1.50 credits must be STAT at the 4000 level

AREAS OF EMPHASIS

BIOINFORMATICS (BINF)

The following credits must be taken:

BIOL*2400	[0.50]	Evolution
BIOL*3020	[0.50]	Population Genetics
BIOL*3040	[0.50]	Methods in Evolutionary Biology
BIOL*3300	[0.50]	Applied Bioinformatics
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics

BIOMATHEMATICAL OR BIOSTATISTICAL MODELLING (BBM)

The following credits must be taken:

BIOL*2060	[0.50]	Ecology
BIOL*2400	[0.50]	Evolution
BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BIOL*3130	[0.50]	Conservation Biology
BIOL*4150	[0.50]	Wildlife Conservation and Management

COMPUTER SCIENCE (CS)

The following credits must be taken:

CIS*2430	[0.50]	Object Oriented Programming
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures

at least 1.00 credits from:

CIS*3110	[0.50]	Operating Systems I
CIS*3190	[0.50]	Software for Legacy Systems
CIS*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts

Note: CIS*2750 is recommended in addition to the Area of Emphasis requirements for students interested in Computer Science

ECONOMICS (ECON)

The following credits must be taken:

ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics

at least 1.00 credits from:

ECON*3100	[0.50]	Game Theory
ECON*3710	[0.50]	Advanced Microeconomics
ECON*4710	[0.50]	Advanced Topics in Microeconomics

Note: ECON*1050 and ECON*1100 are approved Arts or Social Science electives for B.Sc. students

ENERGY AND MASS TRANSFER (EMT)

The following credits must be taken:

ENGG*1210	[0.50]	Engineering Mechanics I
ENGG*2230	[0.50]	Fluid Mechanics
ENGG*2400	[0.50]	Engineering Systems Analysis
ENGG*3260	[0.50]	Thermodynamics
ENGG*3430	[0.50]	Heat and Mass Transfer

Note: No more than 3.00 credits in ENGG courses may be taken.

ELECTRICITY AND SYSTEMS (EAS)

The following credits must be taken:

ENGG*1210	[0.50]	Engineering Mechanics I
ENGG*2400	[0.50]	Engineering Systems Analysis
ENGG*2450	[0.50]	Electric Circuits

at least 1.00 credits from:

ENGG*3410	[0.50]	Systems and Control Theory
ENGG*3450	[0.50]	Electrical Devices
ENGG*4460	[0.50]	Robotic Systems

Note: No more than 3.00 credits in ENGG courses may be taken.

SIGNAL PROCESSING (SP)

The following credits must be taken:

ENGG*1210	[0.50]	Engineering Mechanics I
ENGG*2400	[0.50]	Engineering Systems Analysis
ENGG*2450	[0.50]	Electric Circuits
ENGG*3390	[0.50]	Signal Processing
ENGG*4660	[0.50]	Medical Image Processing

Note: No more than 3.00 credits in ENGG courses may be taken.

INDIVIDUALIZED (IN)

It is required that 2.5 credits are taken from approved Science electives for B.Sc. students where 1.00 credits must be at the 3000 level or above.

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

3.00 - Required science courses semesters 3 – 8)

8.00 - Restricted electives (Stream and Area of Emphasis)

1.00 - Arts and/or Social Science electives (# 1 in restricted elective list)

3.00 - Free electives - any approved elective for B.Sc. students. (Could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

This requires 1.00 calculus credits and 4.00 other credits chosen from mathematics, statistics, and computing and information science. For these 4.00 credits students will choose at least 0.50 from each discipline. At least 1.00 credits must be at the 3000 level or above. This minor cannot be combined with a major in Mathematical Science or Computing and Information Science.

Mathematics (MATH)

Department of Mathematics and Statistics, College of Physical and Engineering Science

Knowledge of mathematics is crucial for understanding our world. The Minor in Mathematics is designed to provide considerable flexibility for students to pursue their own mathematical interests, whether they be in the concepts of "pure" mathematics or techniques and applications. Students minoring in Mathematics will develop skills that are valued in many sectors such as business, education, government, and industry.

Minor (Honours Program)

A total of 5.00 credits is required to complete the Minor, including:

(MATH*1080 or MATH*1200)*

(MATH*1210 or MATH*2080)**

MATH*1160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
STAT*2040	[0.50]	Statistics I

1.00 additional Mathematics credits at the 2000 level or above.

1.50 additional Mathematics credits at the 3000 or 4000 level.

* IPS*1500 can count toward this 0.50 credit

** IPS*1510 can count toward this 0.50 credit

Microbiology (MICR)

Department of Molecular and Cellular Biology, College of Biological Science

Microbiology programs are designed to give students a good understanding of microorganisms, including diversity, ecology, physiology, molecular genetics, current approaches in bacterial genomics/proteomics, and microbial associations with animal hosts and the environments. Such knowledge will provide the basis for further work with microbes in medicine, agricultural industries (including biotechnology, pharmaceuticals, food and beverage) and the environment (surveillance and bioremediation).

Students can take the B.Sc. program with a Major or a Minor in Microbiology, or combine the minor with another major. Students should plan their programs in consultation with the microbiology faculty advisor. As course offerings may change during the program, students are strongly encouraged to review their plans at least once a year with their advisors, and to check the departmental website for program news.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum of 6.00 science credits must be at the 3000/4000 level of which at least 2.00 credits must be at the 4000 level (including the 1.00 from the restricted elective credits).

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 Arts or Social Science electives

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

Semester 4

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MCB*2050	[0.50]	Molecular Biology of the Cell
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology

0.50 electives

0.50 Arts or Social Science electives

Semester 5

MBG*3080	[0.50]	Bacterial Genetics
MICR*3420	[0.50]	Microbial Diversity

1.50 electives or restricted electives

Semester 6

MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*3260	[0.50]	Microbial Adaptation
MICR*3430	[0.50]	Microbiology Methods II

A minimum of 0.75 electives or restricted electives

Semester 7

2.50 electives or restricted electives which can include MCB*4500

Semester 8

2.50 electives or restricted electives which can include MCB*4510

Restricted Electives

1. A minimum of 2.00 credits of Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts
2. 3.50 restricted elective credits of which 1.00 credits must be at the 4000 level.

BIOC*4540	[0.75]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
ENVS*3290	[0.50]	Waterborne Disease Ecology
FOOD*3230	[0.75]	Food Microbiology
FOOD*3240	[0.50]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3270	[0.50]	Industrial Microbiology
FOOD*4400	[0.50]	Dairy Processing
MCB*3010	[0.50]	Dynamics of Cell Function and Signaling
MCB*4500	[1.00]	Research Project in Molecular & Cellular Biology I
MCB*4510	[1.00]	Research Project in Molecular & Cellular Biology 2
MCB*4600	[0.50]	Topics in Molecular and Cellular Biology
MICR*3090	[0.50]	Mycology
MICR*3220	[0.50]	Plant Microbiology
MICR*3230	[0.50]	Immunology
MICR*3330	[0.50]	World of Viruses
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4280	[0.50]	Microbial Ecology
MICR*4330	[0.50]	Molecular Virology
MICR*4430	[0.50]	Medical Virology
MICR*4520	[0.50]	Microbial Cell Biology
MICR*4530	[0.50]	Immunology II
PATH*3040	[0.50]	Principles of Parasitology

Credit Summary (20.00 Total Credits)

4.00 - First year science core

6.25 - Required science courses semesters 3 - 8

3.50 - Restricted electives (#2 in restricted electives list)

2.25 - Approved Science electives

2.00 - Approved Arts and/or Social Science electives (#1 in restricted electives list)

2.00 - Free electives - any approved electives for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

The minor in Microbiology consists of the following 5.00 credits including:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MICR*2420	[0.50]	Introduction to Microbiology
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology

A minimum of 2.50 credits from:

FOOD*3230	[0.75]	Food Microbiology
FOOD*3240	[0.50]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3270	[0.50]	Industrial Microbiology
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3080	[0.50]	Bacterial Genetics
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*3090	[0.50]	Mycology
MICR*3220	[0.50]	Plant Microbiology
MICR*3230	[0.50]	Immunology
MICR*3260	[0.50]	Microbial Adaptation
MICR*3330	[0.50]	World of Viruses
MICR*3420	[0.50]	Microbial Diversity
MICR*3430	[0.50]	Microbiology Methods II
MICR*4520	[0.50]	Microbial Cell Biology

1.00 credits from:

MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4280	[0.50]	Microbial Ecology
MICR*4330	[0.50]	Molecular Virology
MICR*4430	[0.50]	Medical Virology
MICR*4530	[0.50]	Immunology II

Microbiology (Co-op) (MICR:C)

Department of Molecular and Cellular Biology, College of Biological Science

Students in the Major in Microbiology program may take the Co-op option. Students do not begin their first work term until they have completed semester 3 and courses BIOL*1070, BIOL*1080, BIOL*1090 and MICR*2430. Students in the co-op program must also complete COOP*1100 in the second academic semester. At least 3 work terms (COOP*1000, COOP*2000, COOP*3000) are required in the co-op program, and the course requirements are the same as shown for the major program. Some courses must be taken during a different semester than usual, and Co-op students generally require an additional semester to meet all the program requirements. Students should plan their programs in consultation with the faculty advisor. A total of 20.00 credits are required to complete the major. A minimum of 6.00 science credits must be at the 3000/4000 level of which at least 2.00 credits must be at the 4000 level (including the 1.00 from the restricted elective credits).

Major (Honours Program)

Semester 1 - Fall

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 Arts or Social Science electives

Summer Semester

No academic semester or work term

Semester 3 - Fall

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

MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

Semester 4 - Winter

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MCB*2050	[0.50]	Molecular Biology of the Cell
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology

0.50 electives

0.50 Arts or Social Science electives

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 5 - Fall

MBG*3080	[0.50]	Bacterial Genetics
MICR*3420	[0.50]	Microbial Diversity

1.50 electives or restricted electives

Semester 6 - Winter

MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*3260	[0.50]	Microbial Adaptation
MICR*3430	[0.50]	Microbiology Methods II

A minimum of 0.75 electives or restricted electives

Summer - Semester

Optional

Fall Semester

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

Winter Semester

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

Semester 7 - Fall

2.50 electives or restricted electives which can include MCB*4500

Semester 8 - Winter

2.50 electives or restricted electives which can include MCB*4510

Restricted Electives

1. A minimum of 2.00 credits of Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts
2. 3.50 restricted elective credits of which 1.00 credits must be at the 4000 level.

BIOC*4540	[0.75]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
ENVS*3290	[0.50]	Waterborne Disease Ecology
FOOD*3230	[0.75]	Food Microbiology
FOOD*3240	[0.50]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3270	[0.50]	Industrial Microbiology
FOOD*4400	[0.50]	Dairy Processing
MCB*3010	[0.50]	Dynamics of Cell Function and Signaling
MCB*4500	[1.00]	Research Project in Molecular & Cellular Biology I
MCB*4510	[1.00]	Research Project in Molecular & Cellular Biology 2
MCB*4600	[0.50]	Topics in Molecular and Cellular Biology
MICR*3090	[0.50]	Mycology
MICR*3220	[0.50]	Plant Microbiology
MICR*3230	[0.50]	Immunology
MICR*3330	[0.50]	World of Viruses
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4280	[0.50]	Microbial Ecology
MICR*4330	[0.50]	Molecular Virology
MICR*4430	[0.50]	Medical Virology
MICR*4520	[0.50]	Microbial Cell Biology
MICR*4530	[0.50]	Immunology II
PATH*3040	[0.50]	Principles of Parasitology

Credit Summary (20.00 Total Credits)

4.00 - First year science core

6.25 - Required science courses semesters 3 - 8

3.50 - Restricted electives (# 2 in restricted electives list)

2.25 - Approved Science electives

2.00 - Approved Arts and/or Social Science electives (#1 in restricted electives)

2.00 - Free electives - any approved electives for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Molecular Biology and Genetics (MBG)

Department of Molecular and Cellular Biology, College of Biological Science

The B.Sc. program with a Major in Molecular Biology and Genetics is a broadly based program in genetics including related areas of cell and molecular biology. In consultation with the Faculty Advisor, students can choose a general program or can focus their courses in areas such as molecular biology, cell biology, developmental biology, genetics, or agricultural genetics. The program qualifies students for postgraduate training in cell or molecular biology and genetics including clinical genetics and genetic counselling, and provides an excellent background for careers in biotechnology, toxicology, agriculture and medical research. Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor.

Major (Honours Program)

A total of 20.00 credits is required to complete the major.

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 Arts or Social Science electives

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MICR*2420	[0.50]	Introduction to Microbiology
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

Semester 4

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MCB*2050	[0.50]	Molecular Biology of the Cell
MICR*2430	[0.50]	Methods in Microbial Culture and Physiology
STAT*2050	[0.50]	Statistics II

0.50 Arts or Social Science electives

Semester 5

MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I

Electives or restricted electives to a maximum of 2.75 total credits in this semester.

Semester 6

2.50 electives or restricted electives

Semester 7*

MCB*4500	[1.00]	Research Project in Molecular & Cellular Biology I

1.50 electives or restricted electives

Semester 8*

MCB*4510	[1.00]	Research Project in Molecular & Cellular Biology 2

1.50 electives or restricted electives

*instead of the 2 semester sequence of MCB*4500 / MCB*4510 students may choose to take MCB*4600 and 1.50 subject area electives at the 4000 level.

Restricted Electives

1. At least 2.00 Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts
2. Physiology Elective - 0.50 credits

BIOM*3200	[1.00]	Biomedical Physiology
BOT*3310	[0.50]	Plant Growth and Development
HK*2810	[0.50]	Human Physiology I - Concepts and Principles
ZOO*3600	[0.50]	Comparative Animal Physiology I

3. Subject Area Electives - 3.00 credits (4.50 if MCB*4600 is taken instead of MCB*4500 and MCB*4510)

BIOL*3020	[0.50]	Population Genetics
BIOL*3300	[0.50]	Applied Bioinformatics
MBG*3050	[0.50]	Human Genetics
MBG*3060	[0.50]	Quantitative Genetics
MBG*3080	[0.50]	Bacterial Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*3360	[0.75]	Laboratory Methods in Molecular Biology II
MBG*3660	[0.50]	Genomics

MBG*4030	[0.50]	Animal Breeding Methods and Applications
MBG*4040	[0.50]	Genetics and Molecular Biology of Development
MBG*4080	[0.50]	Molecular Genetics
MBG*4110	[0.50]	Advanced Concepts in Genetics
MBG*4160	[0.50]	Plant Breeding
MBG*4240	[0.50]	Advanced Molecular Biology Techniques
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MBG*4300	[0.50]	Plant Molecular Genetics
MCB*3010	[0.50]	Dynamics of Cell Function and Signaling
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*3330	[0.50]	World of Viruses
MICR*4330	[0.50]	Molecular Virology

Credit Summary (20.00 Total Credits)

4.00 - First year science core

7.25 - Required science courses semesters 3 - 8

3.50 - Restricted electives (#2 and 3 in restricted electives list)

1.25 - Approved science electives

2.00 - Arts and/or Social Science electives (#1 in the restricted electives list)

2.00 - Free electives - any approved elective for B.Sc. Students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Molecular Biology and Genetics requires 5.00 credits in Molecular Biology and Genetics chosen in consultation with the faculty advisor, and will include:

MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MCB*2050	[0.50]	Molecular Biology of the Cell

A minimum of 4.00 credits from:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOL*3020	[0.50]	Population Genetics
BIOL*3300	[0.50]	Applied Bioinformatics
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics
MBG*3050	[0.50]	Human Genetics
MBG*3060	[0.50]	Quantitative Genetics
MBG*3080	[0.50]	Bacterial Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MBG*3660	[0.50]	Genomics
MBG*4030	[0.50]	Animal Breeding Methods and Applications
MBG*4040	[0.50]	Genetics and Molecular Biology of Development
MBG*4080	[0.50]	Molecular Genetics
MBG*4110	[0.50]	Advanced Concepts in Genetics
MBG*4160	[0.50]	Plant Breeding
MBG*4240	[0.50]	Advanced Molecular Biology Techniques
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MBG*4300	[0.50]	Plant Molecular Genetics
MCB*3010	[0.50]	Dynamics of Cell Function and Signaling
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*3330	[0.50]	World of Viruses
MICR*4330	[0.50]	Molecular Virology

Nanoscience (NANO)

Administered jointly by the Department of Chemistry and the Department of Physics, College of Physical and Engineering Science.

Major (Honours Program)

The major will require the completion of 20.00 credits as indicated below.

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I
NANO*1000	[0.50]	Introduction to Nanoscience

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050	[0.50]	General Chemistry II
IPS*1510	[1.00]	Integrated Mathematics and Physics II
MATH*1160	[0.50]	Linear Algebra I

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health

Semester 3

CHEM*2060	[0.50]	Structure and Bonding
MATH*2270	[0.50]	Applied Differential Equations
NANO*2000	[0.50]	Synthesis and Characterization of Nanomaterials I
PHYS*2330	[0.50]	Electricity and Magnetism I

One of

CHEM*2820	[0.50]	Thermodynamics and Kinetics
PHYS*2240	[0.50]	Thermal Physics

Semester 4

CHEM*2070	[0.50]	Structure and Spectroscopy
NANO*2100	[0.50]	Synthesis and Characterization of Nanomaterials II
PHYS*2310	[0.50]	Mechanics

1.00 electives*

Semester 5

One of:

CHEM*3860	[0.50]	Quantum Chemistry
PHYS*3230	[0.50]	Quantum Mechanics I

NANO*3500	[0.50]	Thin Film Science
NANO*3600	[0.50]	Computational Methods in Materials Science

1.00 electives

Semester 6

NANO*3200	[0.50]	Nanolithographic Techniques
NANO*3300	[0.50]	Spectroscopy of Nanomaterials

1.50 electives

Semester 7

NANO*4100	[0.50]	Biological Nanomaterials
NANO*4700	[0.50]	Concepts in Quantum Computing

1.50 electives

Semester 8

NANO*4200	[0.50]	Topics in Nanomaterials

2.00 electives

* To take PHYS*3230 in semester 5, PHYS*2340 must be selected as an elective in semester 4.

Note: In semesters 7 and 8, the student must select to do either NANO*4900 or NANO*4910.

Areas of Focus

In completing the science requirements for the degree, some suggested complementary areas of focus are:

Chemistry: Inorganic

Semester 4: CHEM*2480
Semester 5: CHEM*3640
Semester 6: CHEM*3650
Semester 7: CHEM*4620
Semester 8: CHEM*2700

Chemistry: Organic

Semester 4: CHEM*2700
Semester 5: CHEM*3750
Semester 6: CHEM*3760
Semester 7: CHEM*4730
Semester 8: CHEM*2480, CHEM*4720

Chemistry: Physical/Analytical

Semester 4: CHEM*2480

Semester 5: CHEM*3860

Semester 6: CHEM*3430 or CHEM*3870

Semester 7: CHEM*3440

Semester 8: CHEM*3430 or CHEM*3870

Engineering

Semester 2: CIS*1500
Semester 4: ENGG*2450
Semester 5: ENGG*2410, ENGG*3450
Semester 6: ENGG*4550
Semester 7: ENGG*4080

Mathematics and Statistics

Semester 4: STAT*2040
Semester 5: STAT*3100
Semester 6: MATH*2130
Semester 8: MATH*3160, MATH*4240

Physics

Semester 4: PHYS*2340
Semester 5: MATH*2200, PHYS*3130
Semester 6: PHYS*3000

Semester 7: PHYS*4180, PHYS*4240
Semester 8: PHYS*4040, PHYS*4150
***Note**: Courses marked with an asterisk may require additional prerequisites. Students should consult the relevant course descriptions for further information.

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

8.00 - Required science courses semesters 3 – 8

0.50 or 1.00- Restricted electives (either NANO 4900 (1.00) or NANO 4910 (0.50))

2.50 to 3.00 - Approved Science electives (depending on restricted elective chosen above)

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Nanoscience (NANO:C)

Administered jointly by the Department of Chemistry and the Department of Physics, College of Physical and Engineering Science

Major (Honours Program)

The major will require the completion of 20.00 credits as indicated below. To graduate from the co-op program, a minimum of 4 successfully completed work terms is normally required. Students are eligible to participate in a maximum two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website: https://www.recruitguelph.ca/cecs/.

Semester 1 - Fall

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I
NANO*1000	[0.50]	Introduction to Nanoscience

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

CHEM*1050	[0.50]	General Chemistry II
IPS*1510	[1.00]	Integrated Mathematics and Physics II
MATH*1160	[0.50]	Linear Algebra I

One of:

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health

Semester 3 - Fall

CHEM*2060	[0.50]	Structure and Bonding
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*2270	[0.50]	Applied Differential Equations
NANO*2000	[0.50]	Synthesis and Characterization of Nanomaterials I
PHYS*2330	[0.50]	Electricity and Magnetism I

One of:

CHEM*2820	[0.50]	Thermodynamics and Kinetics
PHYS*2240	[0.50]	Thermal Physics

Semester 4 - Winter

CHEM*2070	[0.50]	Structure and Spectroscopy
NANO*2100	[0.50]	Synthesis and Characterization of Nanomaterials II
PHYS*2310	[0.50]	Mechanics

1.00 electives*

Summer Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 5 - Fall

NANO*3600	[0.50]	Computational Methods in Materials Science
NANO*3500	[0.50]	Thin Film Science

One of:

CHEM*3860	[0.50]	Quantum Chemistry
PHYS*3230	[0.50]	Quantum Mechanics I

1.00 electives

Winter Semester

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

(8-month work term in conjunction with COOP*3000)

Summer Semester

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

(8-month work term in conjunction with COOP*2000)

Semester 6 - Fall

NANO*4100	[0.50]	Biological Nanomaterials
NANO*4700	[0.50]	Concepts in Quantum Computing

1.50 electives

Semester 7 - Winter

NANO*3200	[0.50]	Nanolithographic Techniques
NANO*3300	[0.50]	Spectroscopy of Nanomaterials

1.50 electives

Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV

Fall Semester

COOP*5000	[0.00]	Co-op Work Term V

Semester 8 -- Winter

NANO*4200	[0.50]	Topics in Nanomaterials

2.00 electives

* To take PHYS*3230 in semester 5, then PHYS*2340 must be selected as an elective in semester 4.

Note: Four work terms are required for the completion of the co-op degree. It is also necessary that there be at least one work term in each of Winter, Fall, and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. It is only required to complete 4 of the 5 listed work terms. A report is required for each work term completed, even when all 5 are done. Contact the co-op faculty advisor for further details.

Note: In semesters 7 and 8, the student must select to do either NANO*4900 or NANO*4910.

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

8.00 - Required science courses semesters 3 – 8

0.50 or 1.00 - Restricted electives (either NANO 4900 (1.00) or NANO 4910 (0.50))

2.50 to 3.00 - Approved Science electives (depending on restricted elective chosen above)

1.00 - Arts and/or Social Science electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Neuroscience (NEUR)

Office of the Associate Dean Academic, College of Biological Science

Minor (Honours Program)

A minor in Neuroscience shall include a minimum of 5.00 credits including:

NEUR*4000	[0.50]	Current Issues in Neuroscience
PSYC*2410	[0.50]	Behavioural Neuroscience I

0.50 credits from:

PSYC*1010	[0.50]	Quantification in Psychology
STAT*2040	[0.50]	Statistics I

A minimum of 0.50 credits from:

BIOM*2000	[0.50]	Concepts in Human Physiology
BIOM*3200	[1.00]	Biomedical Physiology
HK*2810	[0.50]	Human Physiology I - Concepts and Principles
ZOO*3600	[0.50]	Comparative Animal Physiology I

A minimum of 1.00 credits from:*

BIOM*4521/2	[2.00]	Research in Biomedical Sciences
HK*4360	[1.00]	Research in Human Health and Nutritional Sciences
HK*4371/2	[1.00]	Research in Human Health and Nutritional Sciences II
IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
MCB*4500	[1.00]	Research Project in Molecular & Cellular Biology I
NEUR*4401/2	[1.00]	Research in Neurosciences
NEUR*4450	[1.00]	Research in Neurosciences
PSYC*4510	[0.50]	Current Issues in Psychology
PSYC*4870	[0.50]	Honours Thesis I
PSYC*4880	[1.00]	Honours Thesis II

0.50 credits of the required research project may be selected from:

BIOM*4500	[0.50]	Literature-based Research in Biomedical Sciences
HK*4230	[0.50]	Advanced Study in Human Health and Nutritional Sciences
MCB*4600	[0.50]	Topics in Molecular and Cellular Biology
PSYC*4500	[0.50]	Current Theoretical Issues in Psychology

A minimum of 2.00 credits from:

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
BIOM*3000	[0.50]	Functional Mammalian Neuroanatomy
BIOM*3090	[0.50]	Principles of Pharmacology
BIOM*4030	[0.50]	Endocrine Physiology
HK*3100	[0.50]	Neuromuscular Physiology

MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3050	[0.50]	Human Genetics
MCB*2050	[0.50]	Molecular Biology of the Cell
PHYS*2030	[0.50]	Biophysics of Excitable Cells
PHYS*2330	[0.50]	Electricity and Magnetism I
PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*3030	[0.50]	Neurochemical Basis of Behaviour
PSYC*3410	[0.50]	Behavioural Neuroscience II
PSYC*4050	[0.50]	Seminar in Animal Learning
PSYC*4470	[0.50]	Advanced Topics in Behavioural and Cognitive Neuroscience
PSYC*4600	[0.50]	Cognitive Neuroscience
PSYC*4750	[0.50]	Seminar in Motivation and Emotion

Of the 2.00 additional credits, students may select a minimum of 0.50 credits from:

BIOM*3040	[0.75]	Medical Embryology
MBG*4040	[0.50]	Genetics and Molecular Biology of Development
ZOO*3050	[0.50]	Developmental Biology

*The independent research project in the neurosciences must be approved by the faculty advisor.

Please note that some of the restricted electives require prerequisites that are not included in the minor.

Nutritional and Nutraceutical Sciences (NANS)

Department of Human Health and Nutritional Sciences, College of Biological Science

The Nutritional and Nutraceutical Sciences major is concerned with understanding the contribution of food, beverage and nutritional supplement consumption to growth, development of optimal biological function, maintenance of health, and treatment of disease.

If lacking the fundamentals of word processing, spread sheet use and data management, the student should select CIS*1200 as early in the program as possible.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A total of 20.00 credits is required, including 2.00 credits from Arts and Social Sciences courses.

Semester 1

BIOL*1080	[0.50]	Biological Concepts of Health
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 arts or social science electives

Semester 3

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

0.50 arts or social science electives

Semester 4

BIOC*3560	[0.50]	Structure and Function in Biochemistry
HK*2810	[0.50]	Human Physiology I - Concepts and Principles
MCB*2050	[0.50]	Molecular Biology of the Cell
NUTR*3210	[0.50]	Fundamentals of Nutrition

0.50 arts or social science electives

Semester 5

HK*3810	[0.75]	Human Physiology II - Integrated Systems
NUTR*3330	[0.50]	Micronutrients, Phytochemicals and Health
NUTR*3360	[0.50]	Lifestyle Genomics
NUTR*3390	[0.75]	Applied Nutritional and Nutraceutical Sciences I

Semester 6

BIOM*3090	[0.50]	Principles of Pharmacology
NUTR*4090	[0.50]	Functional Foods and Nutraceuticals
NUTR*4320	[0.50]	Nutrition and Metabolic Control of Disease
NUTR*4330	[0.75]	Applied Nutritional and Nutraceutical Sciences II

Electives or restricted electives to a maximum of 2.75 total credits in this semester.

Semester 7

NUTR*4210	[0.50]	Nutrition, Exercise and Energy Metabolism
NUTR*4510	[0.50]	Toxicology, Nutrition and Food

1.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

Restricted Electives

1. 2.00 credits of Approved Arts and Social Science electives
2. 1.00 credits from the following:

HK*4230	[0.50]	Advanced Study in Human Health and Nutritional Sciences
HK*4340	[0.50]	Genomics: Exercise and Disease
HK*4360	[1.00]	Research in Human Health and Nutritional Sciences
HK*4371/2	[1.00]	Research in Human Health and Nutritional Sciences II
HK*4510	[1.00]	Teaching, Learning & Knowledge Transfer
HK*4511/2	[1.00]	Teaching, Learning & Knowledge Transfer II
HK*4460	[0.50]	Regulation of Human Metabolism
NUTR*4360	[0.50]	Current Issues in Nutrigenomics
PATH*3610	[0.50]	Principles of Disease

Credit Summary (20.00 Total Credits)

4.00 - First year science core

9.25 - Required science courses semesters 3 - 8

1.00 - Restricted electives (#2 in restricted electives list)

1.75 - Approved science electives

2.00 - Approved Arts and/or Social Science electives (#1 in restricted electives list)

2.00 - Free electives - any approved electives for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Nutritional and Nutraceutical Sciences (NANS) requires 5.00 credits as follows:

BIOC*2580	[0.50]	Introduction to Biochemistry
NUTR*3210	[0.50]	Fundamentals of Nutrition
NUTR*3330	[0.50]	Micronutrients, Phytochemicals and Health
NUTR*4090	[0.50]	Functional Foods and Nutraceuticals
STAT*2040	[0.50]	Statistics I

At least 0.50 credits from:

ANSC*3080	[0.50]	Agricultural Animal Physiology (restricted to ABIO majors)
BIOM*3200	[1.00]	Biomedical Physiology
HK*2810	[0.50]	Human Physiology I - Concepts and Principles
ZOO*3600	[0.50]	Comparative Animal Physiology I

and 2.00 credits from:

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*4560	[0.50]	Pet Nutrition
EQN*4020	[0.50]	Feeding the Performance Horse
FOOD*2010	[0.50]	Principles of Food Science
HK*3810	[0.75]	Human Physiology II - Integrated Systems
HK*4230	[0.50]	Advanced Study in Human Health and Nutritional Sciences
HK*4340	[0.50]	Genomics: Exercise and Disease
HK*4360	[1.00]	Research in Human Health and Nutritional Sciences
HK*4371/2	[1.00]	Research in Human Health and Nutritional Sciences II
HK*4510	[1.00]	Teaching, Learning & Knowledge Transfer
HK*4511/2	[1.00]	Teaching, Learning & Knowledge Transfer II
NUTR*2150	[0.50]	Introduction to Nutritional and Food Sciences
NUTR*3360	[0.50]	Lifestyle Genomics
NUTR*3390	[0.75]	Applied Nutritional and Nutraceutical Sciences I
NUTR*4210	[0.50]	Nutrition, Exercise and Energy Metabolism
NUTR*4320	[0.50]	Nutrition and Metabolic Control of Disease
NUTR*4330	[0.75]	Applied Nutritional and Nutraceutical Sciences II
NUTR*4360	[0.50]	Current Issues in Nutrigenomics
NUTR*4510	[0.50]	Toxicology, Nutrition and Food

Physical Science (PSCI)

College of Physical and Engineering Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

1. **Basic Science Core - 4.00 credits**

   1.00 - Biology (BIOL*1070, BIOL*1080, BIOL*1090)

1.00 - Chemistry (CHEM*1040, CHEM*1050)*

1.00 - Physics [PHYS*1080, (1 of PHYS*1010, PHYS*1070, PHYS*1130)]*

1.00 - Mathematical Science [(MATH*1080, MATH*2080) or (MATH*1200, MATH*1210)]

* IPS*1500 can be taken instead of PHYS*1080 and MATH*1200, and IPS*1510 can be taken instead of PHYS*1010 and MATH*1210.

2. **Subject Area Core - 8.00 credits**

   0.50 STAT*2040

   0.50 (CIS*1200 or CIS*1500)

   7.00 physical science credits, including at least 4.00 credits at the 3000 or 4000 level of which 2.00 credits must be at the 4000 level.

3. **Science Electives - 4.00 credits**

   4.00 science credits from the List of Approved Science Electives for B.Sc. Students*

4. **Arts and Social Science Electives - 2.00**

   2.00 acceptable Arts or Social Science credits selected from the List of Approved B.Sc. Electives*

5. **Free Electives - 2.00 credits**

Note: the program must include a total of 6.00 science credits at the 3000 or 4000 level. Of these, at least 2.00 credits must be physical science at the 4000 level.

Semester 1

CHEM*1040	[0.50]	General Chemistry I
PHYS*1080	[0.50]	Physics for Life Sciences

One of:

MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

* IPS*1500 can be taken instead of PHYS*1000 and MATH*1200.

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050	[0.50]	General Chemistry II

One of:

PHYS*1010	[0.50]	Introductory Electricity and Magnetism
PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1130	[0.50]	Physics with Applications

One of:

MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II

IPS*1510 can be taken instead of PHYS*1010 and MATH*1210.

One of

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

Semester 3

1.50 science electives from the approved list of acceptable B.Sc. science electives*

0.50 electives

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

OR

STAT*2040	[0.50]	Statistics I

Semester 4

1.50 science electives from the approved list of B.Sc. science electives*

0.50 electives

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

(if a statistics course is chosen in Semester 3)

OR

STAT*2040	[0.50]	Statistics I

(if a computing course is chosen in Semester 3)

Semester 5 to 8

Total of 2.50 credits per semester including at least 2.00 science electives.

Sufficient courses at the 3000 or 4000 level must be selected in Semesters 5 through 8 to total 6.00 credits in science at the 3000 or 4000 level with at least 2.00 physical science at the 4000 level.

*approved course lists are available in the B.Sc. Academic Counselling Office or at: http://www.bsc.uoguelph.ca/Approved_electives.shtml

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

8.00 - Subject area core semesters 3 – 8 (including STAT 2040 and CIS 1200 or CIS 1500)

4.00 - Approved Science electives

2.00 - Arts and/or Social Science electives (# 1 in restricted elective list)

2.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Honours Physical Science (With a Minor)

The requirements and schedules are the same as for Honours Physical Science. Available Minor subjects are listed at the beginning of the B.SC. Program section under the heading Honours Program Minors.

Physics (PHYS)

Department of Physics, College of Physical and Engineering Science

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. Since some of the required courses are not offered every semester, students entering the Major in Honours Physics should plan their program in consultation with the Department of Physics Faculty Advisor.

Major (Honours Program)

This major requires the completion of 20.00 credits. At least 1.00 credits must be from Arts and/or Social Science courses.

Semester 1*

CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I
MATH*1160	[0.50]	Linear Algebra I

One of:

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2*

CHEM*1050	[0.50]	General Chemistry II
CIS*1500	[0.50]	Introduction to Programming
IPS*1510	[1.00]	Integrated Mathematics and Physics II

One of:

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology

* students who have taken physics courses other than IPS*1500 or PHYS*1000 in Semester 1 and IPS*1510 or PHYS*1010 in Semester 2, may proceed to semester 3 with the permission of the Department of Physics

Semester 3

MATH*2200	[0.50]	Advanced Calculus I
MATH*2270	[0.50]	Applied Differential Equations
PHYS*2240	[0.50]	Thermal Physics
PHYS*2330	[0.50]	Electricity and Magnetism I

0.50 Arts or Social Science electives

Semester 4

PHYS*2180	[0.50]	Experimental Techniques in Physics
PHYS*2310	[0.50]	Mechanics
PHYS*2340	[0.50]	Electricity and Magnetism II

1.00 electives

Semester 5

NANO*3600	[0.50]	Computational Methods in Materials Science
PHYS*3130	[0.50]	Mathematical Physics
PHYS*3230	[0.50]	Quantum Mechanics I
PHYS*3400	[0.50]	Advanced Mechanics

0.50 electives

Semester 6

PHYS*3000	[0.50]	Optics: Fundamentals and Applications
PHYS*3510	[0.50]	Intermediate Laboratory
PHYS*4040	[0.50]	Quantum Mechanics II
PHYS*4300	[0.50]	Inquiry in Physics

One of:

MATH*3260 [0.50] Complex Analysis
0.50 electives

Semester 7+

PHYS*4500 [0.50] Advanced Physics Laboratory
PHYS*4180 [0.50] Advanced Electromagnetic Theory
One of:
PHYS*4240 [0.50] Statistical Physics II
0.50 electives
One of:
PHYS*4001 [0.50] Research in Physics
0.50 electives
0.50 electives **

Semester 8+

One of:
PHYS*4002 [0.50] Research in Physics
0.50 electives**
2.00 electives **

+ students going on to graduate school in physics should take PHYS*4001/2, PHYS*4120, PHYS*4130, PHYS*4150, PHYS*4240

** At least 1.50 credits must be from lists A and B below. At least 1.00 credits must be from list A. Substitutions of courses in list B by other 3000 or 4000 level courses must be approved by the Physics Faculty Advisor.

List A

PHYS*4120 [0.50] Atomic and Molecular Physics
PHYS*4130 [0.50] Subatomic Physics
PHYS*4150 [0.50] Solid State Physics

List B

EDRD*3120 [0.50] Educational Communication
ENVS*3060 [0.50] Groundwater
GEOG*3420 [0.50] Remote Sensing of the Environment
MATH*3200 [0.50] Real Analysis
PHYS*3170 [0.50] Radioactivity and Radiation Interactions
PHYS*4070 [0.50] Clinical Applications of Physics in Medicine
PHYS*4540 [0.50] Molecular Biophysics
PHYS*4910 [0.50] Advanced Topics in Physics I
PHYS*4920 [0.50] Advanced Topics in Physics II
PHYS*4930 [0.50] Advanced Topics in Physics III
POLS*3370 [0.50] Environmental Politics and Governance
STAT*3240 [0.50] Applied Regression Analysis
STAT*3510 [0.50] Environmental Risk Assessment

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

8.50 - Required science courses semesters 3 – 8

1.50 - Restricted electives (1.00 credits from List A and 0.50 credits from List B, some restricted electives from List B do not count as science electives towards degree therefore may need additional science electives)

1.00 or 1.50 - Approved Science electives (depending on restricted electives chosen)

1.00 - Arts and/or Social Science electives

2.50 - 3.00 - Free electives - any approved elective for B.Sc. students. , could be less if restricted electives do not count as science

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Physics requires 5.00 credits in interdisciplinary physical science or physics courses including:

PHYS*2180 [0.50] Experimental Techniques in Physics
PHYS*2310 [0.50] Mechanics
PHYS*2330 [0.50] Electricity and Magnetism I
PHYS*2340 [0.50] Electricity and Magnetism II

A maximum of1.00 credits from the following courses may be used towards the minor:

PHYS*1010 [0.50] Introductory Electricity and Magnetism
PHYS*1070 [0.50] Physics for Life Sciences II
PHYS*1080 [0.50] Physics for Life Sciences
PHYS*1130 [0.50] Physics with Applications
IPS*1510 [1.00] Integrated Mathematics and Physics II

A minimum of 1.00 credits are required at the 3000 or 4000 level.

NOTE: PHYS*1300, PHYS*1600 and PHYS*1810 may not be taken for credit toward this minor.

Physics (Co-op) (PHYS:C)

Department of Physics, College of Physical and Engineering Science

Since some of the required courses are not offered every semester, students entering the Major in Physics (Co-op) should plan their program in consultation with the Department of Physics Faculty Advisor. To graduate from the Co-op program a minimum of 4 successfully completed work terms (COOP*1000, COOP*2000, COOP*3000, COOP*4000) is normally required. Students are eligible to participate in a maximum two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website: https://www.recruitguelph.ca/cecs/.

Major (Honours Program)

This major requires the completion of 20.00 credits.

Semester 1 - Fall

CHEM*1040 [0.50] General Chemistry I
IPS*1500 [1.00] Integrated Mathematics and Physics I
MATH*1160 [0.50] Linear Algebra I
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter

CHEM*1050 [0.50] General Chemistry II
CIS*1500 [0.50] Introduction to Programming
IPS*1510 [1.00] Integrated Mathematics and Physics II
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Semester 3 - Fall

COOP*1100 [0.00] Introduction to Co-operative Education
MATH*2200 [0.50] Advanced Calculus I
MATH*2270 [0.50] Applied Differential Equations
PHYS*2240 [0.50] Thermal Physics
PHYS*2330 [0.50] Electricity and Magnetism I
0.50 Arts or Social Science electives*

Semester 4 - Winter

PHYS*2180 [0.50] Experimental Techniques in Physics
PHYS*2310 [0.50] Mechanics
PHYS*2340 [0.50] Electricity and Magnetism II
One of:
CIS*2500 [0.50] Intermediate Programming
0.50 electives
0.50 electives

Summer Semester

COOP*1000 [0.00] Co-op Work Term I ++

Semester 5 - Fall

NANO*3600 [0.50] Computational Methods in Materials Science
PHYS*3130 [0.50] Mathematical Physics
PHYS*3230 [0.50] Quantum Mechanics I
PHYS*3400 [0.50] Advanced Mechanics
0.50 electives

Winter Semester

COOP*2000 [0.00] Co-op Work Term II ++
(8-month work term in conjunction with COOP*3000)

Summer Semester

COOP*3000 [0.00] Co-op Work Term III ++
(8-month work term in conjunction with COOP*2000)

Semester 6 - Fall +

PHYS*4180 [0.50] Advanced Electromagnetic Theory
One of:
CIS*2520 [0.50] Data Structures
0.50 electives**
One of:
PHYS*4240 [0.50] Statistical Physics II
0.50 electives**
1.00 electives **

Semester 7 - Winter +

PHYS*3000 [0.50] Optics: Fundamentals and Applications
PHYS*3510 [0.50] Intermediate Laboratory
PHYS*4040 [0.50] Quantum Mechanics II
PHYS*4300 [0.50] Inquiry in Physics

One of:
MATH*3260 [0.50] Complex Analysis
0.50 electives**

Summer Semester

COOP*4000 [0.00] Co-op Work Term IV ++

Fall Semester

COOP*5000 [0.00] Co-op Work Term V ++

Semester 8 - Winter +

PHYS*4500 [0.50] Advanced Physics Laboratory
One of:
PHYS*4130 [0.50] Subatomic Physics
0.50 electives**
One of:
PHYS*4150 [0.50] Solid State Physics
0.50 electives**
1.00 electives**

* 1.00 credits must be taken as Arts or Social Science electives in this Major

+ students going on to graduate school in physics should take PHYS*4130, PHYS*4150, and PHYS*4240

**At least 1.50 credits must be from lists A and B below. At least 1.00 credits must be from list A. Substitutions of courses in list B by other 3000 or 4000 level courses must be approved by the Physics Faculty Advisor.

++Four work terms are required for the completion of the co-op degree. It is also necessary that there be at least one work term in each of Fall, Winter and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. Whether the student completes four or five work terms, a report is required for each work term completed. Contact the co-op faculty advisor for further details.

List A

PHYS*4130 [0.50] Subatomic Physics
PHYS*4150 [0.50] Solid State Physics
PHYS*4240 [0.50] Statistical Physics II

List B

EDRD*3120 [0.50] Educational Communication
ENVS*3060 [0.50] Groundwater
GEOG*3420 [0.50] Remote Sensing of the Environment
MATH*3200 [0.50] Real Analysis
PHYS*3170 [0.50] Radioactivity and Radiation Interactions
PHYS*4070 [0.50] Clinical Applications of Physics in Medicine
PHYS*4540 [0.50] Molecular Biophysics
PHYS*4910 [0.50] Advanced Topics in Physics I
PHYS*4920 [0.50] Advanced Topics in Physics II
PHYS*4930 [0.50] Advanced Topics in Physics III
POLS*3370 [0.50] Environmental Politics and Governance
STAT*3240 [0.50] Applied Regression Analysis
STAT*3510 [0.50] Environmental Risk Assessment

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

8.50 - Required science courses semesters 3 – 8

1.50 - Restricted electives (1.00 credits from List A and 0.50 credits from List B, some restricted electives from List B do not count as science electives towards degree therefore may need additional science electives)

1.00 or 1.50 - Approved Science electives (depending on restricted electives chosen)

1.00 - Arts and/or Social Science electives

2.50 - 3.00 - Free electives - any approved elective for B.Sc. students. , could be less if restricted electives do not count as science

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Plant Science (PLSC)

Department of Plant Agriculture, Ontario Agricultural College

School of Environmental Sciences, Ontario Agricultural College

Department of Integrative Biology, College of Biological Science

Department of Molecular and Cellular Biology, College of Biological Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. The major requires the completion of 20.00 credits and students must declare one of the following areas of emphasis: Applied Plant Science, Botany, Plant Biotechnology, Plant Environmental Science or Unspecialized.

Semester 1

BIOL*1070 [0.50] Discovering Biodiversity
CHEM*1040 [0.50] General Chemistry I
MATH*1080 [0.50] Elements of Calculus I
PHYS*1080 [0.50] Physics for Life Sciences
0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1050 [0.50] General Chemistry II
PHYS*1070 [0.50] Physics for Life Sciences II
One of:
CIS*1200 [0.50] Introduction to Computing
CIS*1500 [0.50] Introduction to Programming
MATH*2080 [0.50] Elements of Calculus II
0.50 Arts or Social Science electives

Semester 3

AGR*2470 [0.50] Introduction to Plant Agriculture
BIOC*2580 [0.50] Introduction to Biochemistry
BOT*2100 [0.50] Life Strategies of Plants
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
0.50 Arts and Social Science electives

Semester 4

MCB*2050 [0.50] Molecular Biology of the Cell
STAT*2040 [0.50] Statistics I
One of:
AGR*2050 [0.50] Agroecology
BIOL*2060 [0.50] Ecology
1.00 electives or restricted electives

Semester 5

BOT*3410 [0.50] Plant Anatomy
2.00 electives or restricted electives

Semester 6

BOT*3310 [0.50] Plant Growth and Development
BOT*3710 [0.50] Plant Diversity and Evolution
1.50 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

BOT*4380 [0.50] Metabolism in the Whole Life of Plants
2.00 electives or restricted electives

Program Requirements

1. Students must declare an area of emphasis in of the 4 following areas: Applied Plant Science, Botany, Plant Biotechnology, Plant Environmental Science or Unspecialized.
2. Students must complete at least 5.00 credits from within their area of emphasis

Restricted Electives

1. A minimum of 1.50 credits of Arts and Social Science electives
2. 5.00 credits from within their areas of emphasis from the lists below

Note: Restricted electives, indicated with †, are non-science electives.

Note: Restricted electives, indicated with **, require other restricted electives as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements.

‡Students interested in graduate studies are encouraged to take two semesters of research projects which will count towards restricted elective requirements in an area of emphasis:

AGR*4450 [1.00] Research Project I
AGR*4460 [1.00] Research Project II
or
IBIO*4500 [0.75] Research in Integrative Biology I
IBIO*4510 [0.75] Research in Integrative Biology II
or
MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I **
MCB*4510 [1.00] Research Project in Molecular & Cellular Biology 2

Credit Summary (20.00 Total Credits)

4.00 - First year science core

5.50 - Required science courses semesters 3 - 8

5.00 - Restricted electives for the declared area of emphasis (#2) (some restricted electives do not count as science electives towards the degree therefore may need additional science electives

1.50 - Approved science electives, if all restricted electives chosen are approved science electives.

1.50 - Arts and/or Social Science electives

2.50 - Free electives - any approved elective for B.Sc. Students (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Area of Emphasis

Applied Plant Science (APSC)

CROP*4240	[0.50]	Weed Science
ENVS*2060	[0.50]	Soil Science
ENVS*3210	[0.50]	Plant Pathology
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests **

‡ 3.00 credits from:

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 **
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3140	[0.50]	Management of Turfgrass Diseases **
ENVS*3310	[0.50]	Soil Biodiversity and Ecosystem Function
ENVS*4090	[0.50]	Soil Management
HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3050	[0.50]	Management of Turfgrass Insect Pests and Weeds **
HORT*3150	[0.50]	Principles and Applications of Plant Propagation
HORT*3270	[0.50]	Medicinal Plants
HORT*3280	[0.50]	Greenhouse Production
HORT*3430	[0.50]	Wine-Grape Culture
HORT*3510	[0.50]	Vegetable Production
HORT*4200	[0.50]	Plants, the Environment and Society **
HORT*4300	[0.50]	Postharvest Physiology
HORT*4420	[0.50]	Fruit Crops
HORT*4450	[0.50]	Advanced Turfgrass Science **
LARC*2240	[0.50]	Plants in the Landscape
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
OAGR*2070	[1.00]	Introduction to Organic Agriculture
OAGR*4050	[1.00]	Design of Organic Production Systems
PBIO*3110	[0.50]	Crop Physiology
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4750	[0.50]	Genetic Engineering of Plants

Botany (BOT)

BOT*3050	[0.50]	Plant Functional Ecology **
MBG*3100	[0.50]	Plant Genetics
PBIO*4000	[0.50]	Molecular and Cellular Aspects of Plant-Microbe Interactions
PBIO*4150	[0.50]	Molecular and Cellular Aspects of Plant Development

‡ 3.00 credits from:

MBG*4300	[0.50]	Plant Molecular Genetics
MICR*2420	[0.50]	Introduction to Microbiology
MICR*3090	[0.50]	Mycology
MICR*3220	[0.50]	Plant Microbiology
PBIO*3110	[0.50]	Crop Physiology
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4750	[0.50]	Genetic Engineering of Plants

Plant Biotechnology (PBTC)

MBG*3100	[0.50]	Plant Genetics
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4750	[0.50]	Genetic Engineering of Plants

‡ minimum of 2.75 credits from:

BIOL*3300	[0.50]	Applied Bioinformatics
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics
MBG*3660	[0.50]	Genomics
MBG*4160	[0.50]	Plant Breeding
MBG*4300	[0.50]	Plant Molecular Genetics
MCB*4010	[0.50]	Advanced Cell Biology
MICR*2420	[0.50]	Introduction to Microbiology
MICR*3220	[0.50]	Plant Microbiology
MICR*3230	[0.50]	Immunology
MICR*3330	[0.50]	World of Viruses
PBIO*3110	[0.50]	Crop Physiology
PBIO*4150	[0.50]	Molecular and Cellular Aspects of Plant Development

Plant Environmental Science (PESC)

BOT*3050	[0.50]	Plant Functional Ecology
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*4350	[0.50]	Forest Ecology
GEOG*2480	[0.50]	Mapping and GIS

‡ 3.00 credits from:

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BIOL*3130	[0.50]	Conservation Biology **
BIOL*4500	[0.50]	Natural Resource Policy Analysis
ENVS*2060	[0.50]	Soil Science
ENVS*2120	[0.50]	Introduction to Environmental Stewardship **
ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
ENVS*3000	[0.50]	Nature Interpretation **
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3040	[0.50]	Natural Chemicals in the Environment
ENVS*3090	[0.50]	Insect Diversity and Biology
ENVS*3210	[0.50]	Plant Pathology
ENVS*3250	[0.50]	Forest Health and Disease
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests **
GEOG*2210	[0.50]	Environment and Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment **
GEOG*4210	[0.50]	Environmental Governance **
GEOG*4220	[0.50]	Local Environmental Management
LARC*3320	[0.50]	Principles of Landscape Ecology **
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*3370	[0.50]	Environmental Politics and Governance

Unspecialized (UNSP)

Choose 5.00 credits from any courses listed in the other areas of emphasis.

Minor (Honours Program)

A minor in Plant Science requires a minimum of 5.00 credits in the Plant Science Program chosen in consultation with the Faculty Advisor. The courses include:

AGR*2470	[0.50]	Introduction to Plant Agriculture
BOT*2100	[0.50]	Life Strategies of Plants
BOT*3310	[0.50]	Plant Growth and Development
BOT*3410	[0.50]	Plant Anatomy
BOT*3710	[0.50]	Plant Diversity and Evolution
BOT*4380	[0.50]	Metabolism in the Whole Life of Plants

2.00 credits from any courses listed in the areas of emphasis.

Restricted electives, indicated with , are non-science electives. Restricted electives, indicated with **, require other restricted electives as prerequisites.

Psychology: Brain & Cognition (PBC)

Department of Psychology, College of Social and Applied Human Sciences

The B.Sc. Major in Psychology: Brain and Cognition offers an opportunity for students to develop interests within learning, perception, cognition, and biopsychology from a sound base in physical and biological sciences. Students primarily interested in other areas within psychology should consult the schedule of studies for the Bachelor of Arts program. Psychology courses in the above focuses may also be studied via the B.A. program.

Note on Honours Courses

Honours Courses: courses designated with (H) are designed for students in a psychology honours specialization. This includes B.A. Honours Psychology (PYSC) major or minor, B.A. Information Systems and Human Behaviour (ISHB) major, B.Sc. Psychology: Brain and Cognition (PBC), major or minor, and the Neuroscience (NEUR) minor. (H) courses are Honours level requiring for registration a cumulative average of at least 70% in all course attempts in Psychology or registration in the ISHB major, NEUR minor, or PBC major or minor. Unless otherwise specified, all other courses may be taken by students in a general or honours program, providing the prerequisites are met.

Major (Honours Program)

Semester 1

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences
PSYC*1000	[0.50]	Introduction to Psychology

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

One of:

BIOL*1070	[0.50]	Discovering Biodiversity

BIOL*1080	[0.50]	Biological Concepts of Health

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

One of:

PSYC*1010	[0.50]	Quantification in Psychology
STAT*2040	[0.50]	Statistics I

Semester 3

One of:

PSYC*2330	[0.50]	Principles of Learning
PSYC*2410	[0.50]	Behavioural Neuroscience I

One of:

PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*2650	[0.50]	Cognitive Psychology

0.50 Arts/Non-Psychology Social Science electives *
1.00 elective or restricted electives*

Semester 4

PSYC*2040	[0.50]	Research Statistics
PSYC*2360	[0.50]	Introductory Research Methods

0.50 Psychology core (PSYC*2330, PSYC*2390, PSYC*2410, PSYC*2650)

One of:

PSYC*2310	[0.50]	Introduction to Social Psychology
PSYC*2450	[0.50]	Introduction to Developmental Psychology
PSYC*2740	[0.50]	Personality

0.50 Arts/Non-Psychology Social Science electives *

Semester 5 **

2.50 electives or restricted electives (Students contemplating graduate studies should see Graduate Studies Advisory Note below)

Semester 6 **

PSYC*3250	[0.50]	Psychological Measurement

2.00 electives or restricted electives

Semester 7 **

2.50 electives or restricted electives

Semester 8 **

2.50 electives or restricted electives*

Restricted Electives

1. A minimum of 1.00 credits of Approved Non-psychology Arts and Social Science electives
2. 3.00 credits from following psychology courses:

PSYC*3030	[0.50]	Neurochemical Basis of Behaviour
PSYC*3100	[0.50]	Evolutionary Psychology
PSYC*3330	[0.50]	Memory
PSYC*3340	[0.50]	Psycholinguistics
PSYC*3370	[0.50]	Experimental Design and Analysis
PSYC*3380	[0.50]	Non-experimental Research Methods
PSYC*3410	[0.50]	Behavioural Neuroscience II
PSYC*3440	[0.50]	Cognitive Development
PSYC*3850	[0.50]	Intellectual Disabilities
PSYC*3900	[0.50]	Psychology Research Internship ***
PSYC*4050	[0.50]	Seminar in Animal Learning
PSYC*4470	[0.50]	Advanced Topics in Behavioural and Cognitive Neuroscience
PSYC*4500	[0.50]	Current Theoretical Issues in Psychology ***
PSYC*4510	[0.50]	Current Issues in Psychology ***
PSYC*4600	[0.50]	Cognitive Neuroscience
PSYC*4750	[0.50]	Seminar in Motivation and Emotion
PSYC*4870	[0.50]	Honours Thesis I ***
PSYC*4880	[1.00]	Honours Thesis II ***
PSYC*4900	[0.50]	Psychology Seminar

Note: The selection of electives should take into consideration the prerequisites for preferred advanced courses. With the permission of the Psychology Department PRIOR to course selection, up to 2 non-psychology credits can be used towards the psychology credits if such courses enhance the student's psychology program.

Students should refer to the list of Approved Science and Arts/Social Science electives for BSc students:http://www.bsc.uoguelph.ca/Approved_electives.shtml

**** Graduate Studies Advisory Note**

Students planning to enter a graduate program in Psychology are advised to complete PSYC*3370 and PSYC*3380 in Semesters 5 and 6, as well as and PSYC*4880 in Semesters 7 and 8, respectively. PSYC*4370 or PSYC*4900 must be completed prior to or concurrently with either PSYC*4870 or PSYC*4880.

*** Depending upon the project chosen, these courses will be evaluated by the faculty advisor to determine their suitability as science electives.

Credit Summary (20.00 Total Credits)

4.50 - First year science core

3.00 - Required science courses semesters 3 - 8

3.00 - Restricted electives (#2)

5.50 - Approved Science electives

1.00 - Required Arts and Social Science courses, semesters 1 - 8

1.00 - Approved Non-Psychology Arts and/or Social Science electives (#1)

2.00 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Psychology: Brain and Cognition requires a minimum of 5.00 psychology credits as follows:

PSYC*1000	[0.50]	Introduction to Psychology
PSYC*2360	[0.50]	Introductory Research Methods

2.00 credits from 2000 level psychology core courses selected as follows:

a. 1.50 credits from:

PSYC*2330	[0.50]	Principles of Learning
PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*2410	[0.50]	Behavioural Neuroscience I
PSYC*2650	[0.50]	Cognitive Psychology

b. 0.50 credits from:

PSYC*2310	[0.50]	Introduction to Social Psychology
PSYC*2450	[0.50]	Introduction to Developmental Psychology
PSYC*2740	[0.50]	Personality

1.50 credits from courses in Restricted Electives list above

One of:

PSYC*1010	[0.50]	Quantification in Psychology
STAT*2040	[0.50]	Statistics I

Statistics (STAT)

Department of Mathematics and Statistics, College of Physical and Engineering Science

Statistics plays a fundamental role in virtually all scientific disciplines, including biology, physics, chemistry, medicine, epidemiology, kinesiology, and toxicology. Students minoring in Statistics will develop practical skills in data visualization and analysis, statistical computing, technical writing and communication in a variety of applications areas, preparing them well for careers in the modern workplace.

Students may enter this major in any semester. A student wishing to declare the major must consult the Faculty Advisor.

Minor (Honours Program)

A total of 5.00 credits is required to complete the minor, including:

(MATH*1080 or MATH*1200)*
(MATH*1210 or MATH*2080)**

MATH*1160	[0.50]	Linear Algebra I
STAT*2040	[0.50]	Statistics I
STAT*2050	[0.50]	Statistics II
STAT*3100	[0.50]	Introductory Mathematical Statistics I
STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3240	[0.50]	Applied Regression Analysis

0.50 additional credits in Statistics
0.50 additional credits in Statistics or Mathematics
* IPS*1500 can count toward this 0.50 credit
** IPS*1510 can count toward this 0.50 credit

Theoretical Physics (THPY)

Department of Physics, College of Physical and Engineering Science

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. Since some of the required courses are not offered every semester, students entering the Major in Theoretical Physics should plan their program in consultation with the Faculty Advisor.

Major (Honours Program)

This major requires the completion of 20.00 credits. At least 1.00 of these credits must be obtained from the completion of Arts and/or Social Science courses.

Semester 1

CHEM*1040	[0.50]	General Chemistry I
IPS*1500	[1.00]	Integrated Mathematics and Physics I
MATH*1160	[0.50]	Linear Algebra I

One of:

BIOL*1070	[0.50]	Discovering Biodiversity
BIOL*1080	[0.50]	Biological Concepts of Health

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050 [0.50] General Chemistry II
CIS*1500 [0.50] Introduction to Programming
IPS*1510 [1.00] Integrated Mathematics and Physics II
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Note: students who have taken physics courses other than IPS*1500 or PHYS*1000 in Semester 1 and IPS*1510 or PHYS*1010 in Semester 2, may proceed to semester 3 with the permission of the Department of Physics

Semester 3

MATH*2200 [0.50] Advanced Calculus I
MATH*2270 [0.50] Applied Differential Equations
PHYS*2240 [0.50] Thermal Physics
PHYS*2330 [0.50] Electricity and Magnetism I
0.50 Arts or Social Science electives

Semester 4

MATH*2210 [0.50] Advanced Calculus II
PHYS*2180 [0.50] Experimental Techniques in Physics
PHYS*2310 [0.50] Mechanics
PHYS*2340 [0.50] Electricity and Magnetism II
0.50 electives*

Semester 5

NANO*3600 [0.50] Computational Methods in Materials Science
PHYS*3130 [0.50] Mathematical Physics
PHYS*3230 [0.50] Quantum Mechanics I
PHYS*3400 [0.50] Advanced Mechanics
0.50 electives*

Semester 6

PHYS*3000 [0.50] Optics: Fundamentals and Applications
PHYS*3510 [0.50] Intermediate Laboratory
PHYS*4040 [0.50] Quantum Mechanics II
PHYS*4300 [0.50] Inquiry in Physics
0.50 electives*

Semester 7

PHYS*4120 [0.50] Atomic and Molecular Physics
PHYS*4180 [0.50] Advanced Electromagnetic Theory
PHYS*4240 [0.50] Statistical Physics II
Two of:
PHYS*4001 [0.50] Research in Physics
PHYS*4500 [0.50] Advanced Physics Laboratory
0.50 electives*
0.50 electives*

Semester 8

MATH*3260 [0.50] Complex Analysis
PHYS*4130 [0.50] Subatomic Physics
PHYS*4150 [0.50] Solid State Physics
One of:
PHYS*4002 [0.50] Research in Physics
PHYS*4300 [0.50] Inquiry in Physics
0.50 electives*
0.50 electives*

***Restricted Electives**

Students must complete 2.00 credits from the following list:

CIS*2500 [0.50] Intermediate Programming
MATH*2130 [0.50] Numerical Methods
MATH*3100 [0.50] Differential Equations II
MATH*3130 [0.50] Abstract Algebra
MATH*3160 [0.50] Linear Algebra II
MATH*3200 [0.50] Real Analysis
MATH*3240 [0.50] Operations Research

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

11.00 - Required science courses semesters 3 – 8

2.00 - Restricted electives

1.00 - Arts and/or Social Science electives

1.00 - Free electives - any approved elective for B.Sc. students. , could be less if restricted electives do not count as science

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Wildlife Biology and Conservation (WBC)

Department of Integrative Biology, College of Biological Science

The core of this major will provide students with an integrated foundation in three disciplines necessary to understand the origins, interactions, and protection of biological diversity: evolution, ecology, and conservation biology. After the second semester, the student has the opportunity to take a wide variety of electives, including courses that meet his/her specific interests within one or two of these disciplines. The program offers a sound scientific background in preparation for careers in resource management, conservation, ecological consulting, teaching, and government service. This major also qualifies students for post-graduate work in ecology, evolutionary biology, environmental sciences, or wildlife management.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum total of 20.00 credits is required to complete the major. At least 6.00 science credits must be at the 3000 or 4000 level, 2.00 of which must be at the 4000 level.

Semester 1

BIOL*1070 [0.50] Discovering Biodiversity
CHEM*1040 [0.50] General Chemistry I
MATH*1080 [0.50] Elements of Calculus I
PHYS*1080 [0.50] Physics for Life Sciences
0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1050 [0.50] General Chemistry II
PHYS*1070 [0.50] Physics for Life Sciences II
0.50 Arts or Social Science electives

Semester 3

BIOC*2580 [0.50] Introduction to Biochemistry
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
1.50 electives or restricted electives

Semester 4

BIOL*2060 [0.50] Ecology
BIOL*2400 [0.50] Evolution
STAT*2230 [0.50] Biostatistics for Integrative Biology
1.00 electives or restricted electives

Semester 5

BIOL*3010 [0.50] Laboratory and Field Work in Ecology
2.00 electives or restricted electives

Semester 6

BIOL*3040 [0.50] Methods in Evolutionary Biology
BIOL*3060 [0.50] Populations, Communities & Ecosystems
BIOL*3130 [0.50] Conservation Biology
1.00 electives or restricted electives

Semester 7

BIOL*4110 [1.00] Ecological Methods
BIOL*4150 [0.50] Wildlife Conservation and Management
1.00 electives or restricted electives

Note: For students considering graduate research programs, BIOL*4110 may be substituted by an independent research course (1.00 credits minimum). Course options include: (IBIO*4500 and IBIO*4510), IBIO*4521/IBIO*4522.

Semester 8

BIOL*4500 [0.50] Natural Resource Policy Analysis
2.00 electives or restricted electives

Restricted Electives

Note that some courses have prerequisites, so be sure to consult the undergraduate calendar.

1. A minimum of 1.00 credits of Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts
2. A minimum of 0.50 credits from:
   BOT*2100 [0.50] Life Strategies of Plants
   ZOO*2090 [0.50] Vertebrate Structure and Function
   ZOO*2700 [0.50] Invertebrate Morphology & Evolution
3. A minimum of 0.50 credits from:
   BOT*3050 [0.50] Plant Functional Ecology
   ZOO*3600 [0.50] Comparative Animal Physiology I

4. A minimum of 0.50 credits from:

BIOL*3020	[0.50]	Population Genetics
BIOL*4120	[0.50]	Evolutionary Ecology

5. A minimum of 3.00 credits from any of the following lists of courses. The courses are broken into disciplines for which they are most suitable to help students tailor their electives towards a specific field if desired.

*Some of the restricted electives will require additional courses outside of the required courses listed in Semesters 3-8

** Please note not all restricted electives are considered science electives for B.Sc students. If the non-science restricted electives are chosen, students are reminded that they will still be responsible for meeting the minimum of 16.00 credits in science and that the credit summary may vary from what is specified below.

Evolution

BIOL*3020	[0.50]	Population Genetics
BIOL*3300	[0.50]	Applied Bioinformatics
BOT*3710	[0.50]	Plant Diversity and Evolution
ENVS*3090	[0.50]	Insect Diversity and Biology
ENVS*3180	[0.50]	Sedimentary Environments *
MBG*4080	[0.50]	Molecular Genetics *
MBG*4110	[0.50]	Advanced Concepts in Genetics *
MBG*4270	[0.50]	DNA Replication, Recombination and Repair *
ZOO*2700	[0.50]	Invertebrate Morphology & Evolution
ZOO*3050	[0.50]	Developmental Biology

Ecology

ANSC*3180	[0.50]	Wildlife Nutrition *
BIOL*3450	[0.50]	Introduction to Aquatic Environments
ENVS*3000	[0.50]	Nature Interpretation
ENVS*3270	[0.50]	Forest Biodiversity *
ENVS*4350	[0.50]	Forest Ecology *
NUTR*3210	[0.50]	Fundamentals of Nutrition
ZOO*4300	[0.75]	Marine Biology and Oceanography *
ZOO*4570	[0.50]	Marine Ecological Processes *

Conservation

BIOL*4350	[0.50]	Limnology of Natural and Polluted Waters *
ECON*1050	[0.50]	Introductory Microeconomics
ECON*2100	[0.50]	Economic Growth and Environmental Quality *
ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*3010	[0.50]	Climate Change Biology
FARE*2700	[0.50]	Survey of Natural Resource Economics *
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3480	[0.50]	GIS and Spatial Analysis
GEOG*4230	[0.50]	Environmental Impact Assessment *
GEOG*4480	[1.00]	Applied Geomatics

Integrative/Cross-Disciplinary

IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
IBIO*4521/2	[2.00]	Thesis in Integrative Biology
MCB*2050	[0.50]	Molecular Biology of the Cell
ZOO*3610	[0.25]	Lab Studies in Animal Physiology I
ZOO*3620	[0.50]	Comparative Animal Physiology II
ZOO*3630	[0.25]	Lab Studies in Animal Physiology II
ZOO*3700	[0.50]	Integrative Biology of Invertebrates *
ZOO*4070	[0.50]	Animal Behaviour
ZOO*4910	[0.50]	Integrative Vertebrate Biology *
ZOO*4920	[0.25]	Lab Studies in Ornithology
ZOO*4940	[0.25]	Lab Studies in Herpetology
ZOO*4950	[0.25]	Lab Studies in Mammalogy

Field Courses

BIOL*4410	[0.75]	Field Ecology
BIOL*4610	[0.75]	Arctic Ecology
BIOL*4700	[0.50]	Field Biology
BIOL*4710	[0.25]	Field Biology
BIOL*4800	[0.50]	Field Biology
BIOL*4810	[0.25]	Field Biology
BIOL*4900	[0.50]	Field Biology

Credit Summary (20.00 Total Credits)

4.00 - First year science core

6.50 - Required science courses semesters 3 - 8

4.50 - Restricted electives (#2,3 and 4 in restricted electives list)**

1.00 - Approved Science electives

1.00 - Approved Arts and/or Social Science electives (#1 in restricted electives list)

3.00 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Zoology (ZOO)

Department of Integrative Biology, College of Biological Science

The Major in Zoology offers a broad education in the life sciences while providing a more specialized understanding of the structure, function and ecology of animals. This major qualifies students for post-graduate work in zoology and other life sciences and provides a sound science background for students wishing to pursue careers in teaching, government service or the private sector.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum total of 20.00 credits is required to complete the major. At least 6.00 science credits must be at the 3000 or 4000 level, 2.00 of which must be at the 4000 level.

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1080	[0.50]	Biological Concepts of Health
BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
PHYS*1070	[0.50]	Physics for Life Sciences II

0.50 Arts or Social Science electives

Semester 3

BIOL*2060	[0.50]	Ecology
BIOL*2400	[0.50]	Evolution
ZOO*2090	[0.50]	Vertebrate Structure and Function

1.00 electives or restricted electives *

Semester 4

BIOC*2580	[0.50]	Introduction to Biochemistry
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
STAT*2230	[0.50]	Biostatistics for Integrative Biology
ZOO*2700	[0.50]	Invertebrate Morphology & Evolution

0.50 electives or restricted electives *

Semester 5

ZOO*3000	[0.50]	Comparative Histology
ZOO*3600	[0.50]	Comparative Animal Physiology I
ZOO*3610	[0.25]	Lab Studies in Animal Physiology I
ZOO*3700	[0.50]	Integrative Biology of Invertebrates

Electives or restricted electives to a maximum of 2.75 total credits in this semester.

Semester 6

BIOL*3060	[0.50]	Populations, Communities & Ecosystems
ZOO*3050	[0.50]	Developmental Biology
ZOO*3620	[0.50]	Comparative Animal Physiology II
ZOO*3630	[0.25]	Lab Studies in Animal Physiology II

Electives or restricted electives to a maximum of 2.75 total credits in this semester.

Semester 7

ZOO*4070	[0.50]	Animal Behaviour
ZOO*4910	[0.50]	Integrative Vertebrate Biology

1.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

* CIS*1200 is recommended for those needing to improve their computer skills.

Restricted Electives must include:

1. A minimum of 1.00 credits of Arts and/or Social Science electives are required. The list of approved Arts and Social Science electives for B.Sc. students is available at: http://www.bsc.uoguelph.ca/Approved_electives.shtml#arts
2. A minimum of 0.50 credits from:

ZOO*4330	[0.50]	Biology of Fishes
ZOO*4920	[0.25]	Lab Studies in Ornithology
ZOO*4940	[0.25]	Lab Studies in Herpetology
ZOO*4950	[0.25]	Lab Studies in Mammalogy

3. A minimum of 0.50 credits from:

BIOL*4410	[0.75]	Field Ecology
BIOL*4610	[0.75]	Arctic Ecology
BIOL*4700	[0.50]	Field Biology

BIOL*4710	[0.25]	Field Biology
BIOL*4800	[0.50]	Field Biology
BIOL*4810	[0.25]	Field Biology
IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
IBIO*4521/2	[2.00]	Thesis in Integrative Biology
ZOO*4170	[0.50]	Experimental Comparative Animal Physiology
ZOO*4300	[0.75]	Marine Biology and Oceanography

Other field or research courses with approval of faculty advisor.

Credit Summary (20.00 Total Credits)

4.00 - First year science core

8.00 - Required science courses semesters 3 - 8

1.00 - Restricted electives (# 2, and 3 in restricted electives list)

3.00 - Approved Science electives

1.00 - Arts and/or Social Science electives (#1 in restricted electives)

3.00 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

Students in majors other than Zoology, Biodiversity, Wildlife Biology & Conservation and Marine & Freshwater Biology who have a strong interest in Zoology may choose to take a minor in Zoology.

A minor in Zoology requires a minimum of 5.00 credits, 4.00 of which must be from the following list:

BIOL*2060	[0.50]	Ecology
BIOL*2400	[0.50]	Evolution
BIOL*3060	[0.50]	Populations, Communities & Ecosystems
ZOO*2090	[0.50]	Vertebrate Structure and Function
ZOO*2700	[0.50]	Invertebrate Morphology & Evolution
ZOO*3000	[0.50]	Comparative Histology
ZOO*3050	[0.50]	Developmental Biology
ZOO*3600	[0.50]	Comparative Animal Physiology I
ZOO*3610	[0.25]	Lab Studies in Animal Physiology I
ZOO*3620	[0.50]	Comparative Animal Physiology II
ZOO*3630	[0.25]	Lab Studies in Animal Physiology II
ZOO*3700	[0.50]	Integrative Biology of Invertebrates
ZOO*4070	[0.50]	Animal Behaviour
ZOO*4330	[0.50]	Biology of Fishes
ZOO*4910	[0.50]	Integrative Vertebrate Biology
ZOO*4920	[0.25]	Lab Studies in Ornithology
ZOO*4940	[0.25]	Lab Studies in Herpetology
ZOO*4950	[0.25]	Lab Studies in Mammalogy

The remaining 1.00 credits may also come from this list or from outside this list, in consultation with a faculty advisor.

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 courses towards a more focused subject area. 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.

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:

Animal Science

Crop, Horticulture and Turfgrass Science

Honours Agricultural Science

Organic Agriculture

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.

Honours Minor

A minor is a group of courses which provides for exposure to and mastery of the fundamental principles of a subject. A minor consists of a minimum of 5.00 credits (normally 10 courses). It may also require certain other courses from other areas to be taken along with the specified courses of the minor. A minor is taken in conjunction with a major.

A maximum of 2.50 credits required in a major program may be applied to meet the requirements of a minor.

Students should seek advice from the B.Sc.(Agr.) Program Counsellor about the addition of a minor. Students in the B.Sc.(Agr.) are not eligible for a minor in Agriculture.

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 may 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)

Departments of Plant Agriculture and Animal and Poultry Science

The Honours Agriculture major combines a core curriculum of agricultural science courses with a wide range of electives focusing on agri-food business, animal and plant production, land stewardship and sustainability. This major allows students to create a curriculum uniquely tailored to their career goals and provides diverse opportunities to explore international agriculture and leading edge agricultural research in animal production, plant biotechnology and pest management. The flexibility provided in semesters 5 and 6 permits students to participate in international exchanges and semesters abroad. Students can also incorporate a variety of field trips, experiential learning in the workplace and independent study into their program of studies. The combination of a solid understanding of life science and current agricultural practice with specialized skills and experience provided by this program is greatly valued by prospective employers in this essential sector of Canada's economy.

Semester 1

AGR*1110	[1.00]	Introduction to the Agri-Food Systems
BIOL*1050	[0.50]	Biology of Plants & Animals in Managed Ecosystems
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*2050	[0.50]	Agroecology
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

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems, Health and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture
FARE*2700	[0.50]	Survey of Natural Resource Economics
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics

Semester 4

ANSC*2340	[0.50]	Structure of Farm Animals
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
STAT*2040	[0.50]	Statistics I

1.00 electives or restricted electives

Semester 5 to 8

Students must choose either Option A (Production and Management) or B (Research).

Option A - Production and Management

Semester 5

FOOD*3090	[0.50]	Food Science and Human Nutrition

2.00 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving

1.50 electives or restricted electives

Restricted Electives - Option A

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.

- A minimum of 1.00 credits from the list of restricted electives below:

AGR*2500	[0.50]	Field Course in International Agriculture
AGR*3010	[0.50]	Special Studies in Agricultural Science I
AGR*3450	[0.50]	Research Methods in Agricultural Science
AGR*3500	[0.50]	Experiential Education I
ANSC*4230	[0.50]	Challenges and Opportunities in Animal Production
ANSC*4610	[0.50]	Critical Analysis in Animal Science
CROP*4260	[0.50]	Crop Science Field Trip
EDRD*2020	[0.50]	Interpersonal Communication
EDRD*3050	[0.50]	Agricultural Communication I
EDRD*3140	[0.50]	Organizational Communication
FARE*3310	[0.50]	Operations Management
FARE*4220	[0.50]	Advanced Agribusiness Management

FARE*4310	[0.50]	Resource Economics
FARE*4360	[0.50]	Marketing Research
FARE*4550	[0.50]	Independent Studies I

- A minimum of 2.00 credits from the following lists:

A minimum of 0.50 credits from the following list:

CROP*3300	[0.50]	Grain Crops
CROP*3310	[0.50]	Protein and Oilseed Crops
CROP*3340	[0.50]	Managed Grasslands
ENVS*4090	[0.50]	Soil Management
ENVS*4160	[0.50]	Soil and Nutrient Management
HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3150	[0.50]	Principles and Applications of Plant Propagation
HORT*4380	[0.50]	Tropical and Sub-Tropical Crops
PBIO*3110	[0.50]	Crop Physiology
PBIO*3750	[0.50]	Plant Tissue Culture

A minimum of 0.50 credits from the following list:

CROP*4240	[0.50]	Weed Science
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3210	[0.50]	Plant Pathology
ENVS*3230	[0.50]	Agroforestry Systems

A minimum of 0.50 credits from the following list:

ACCT*1220	[0.50]	Introductory Financial Accounting
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
FARE*2410	[0.50]	Agrifood Markets and Policy
FARE*3170	[0.50]	Cost-Benefit Analysis

Students may also take any of the following courses as restricted electives:

BIOC*2580	[0.50]	Introduction to Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3060	[0.50]	Quantitative Genetics
OAGR*2070	[1.00]	Introduction to Organic Agriculture

- 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.
- A humanities or social science courses (0.50 credits) at the 1000-level or above. See Program Counsellor for acceptable list of courses.

Option B - Research

Semester 5

AGR*3450	[0.50]	Research Methods in Agricultural Science
FOOD*3090	[0.50]	Food Science and Human Nutrition

1.50 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

AGR*4450	[1.00]	Research Project I

1.50 electives or restricted electives

Semester 8

AGR*4460	[1.00]	Research Project II

1.50 electives or restricted electives

Restricted Electives - Option B

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

A minimum of 0.50 credits from the following list:

CROP*3300	[0.50]	Grain Crops
CROP*3310	[0.50]	Protein and Oilseed Crops
CROP*3340	[0.50]	Managed Grasslands
ENVS*4090	[0.50]	Soil Management
ENVS*4160	[0.50]	Soil and Nutrient Management
HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3150	[0.50]	Principles and Applications of Plant Propagation
HORT*4380	[0.50]	Tropical and Sub-Tropical Crops
PBIO*3110	[0.50]	Crop Physiology
PBIO*3750	[0.50]	Plant Tissue Culture

A minimum of 0.50 credits from the following list:

CROP*4240	[0.50]	Weed Science
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3210	[0.50]	Plant Pathology
ENVS*3230	[0.50]	Agroforestry Systems

A minimum of 0.50 credits from the following list:

ACCT*2220	[0.50]	Financial Accounting
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
FARE*2410	[0.50]	Agrifood Markets and Policy
FARE*3170	[0.50]	Cost-Benefit Analysis

Students may also take any of the following courses as restricted electives:

BIOC*2580	[0.50]	Introduction to Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3060	[0.50]	Quantitative Genetics
OAGR*2070	[1.00]	Introduction to Organic Agriculture

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 courses (0.50 credits) at the 1000-level or above. See Program Counsellor for acceptable list of courses.

Agriculture (AGR)

OAC Dean's Office

Minor (Honours Program)

The requirement of 5.00 credits for the minor is divided into three groups of courses: required courses and two lists of 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:

AGR*1110	[1.00]	Introduction to the Agri-Food Systems

1.50 credits from the following Restricted Elective list:

AGR*2050	[0.50]	Agroecology
AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems, Health and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture
AGR*2500	[0.50]	Field Course in International Agriculture
EDRD*3400	[0.50]	Sustainable Communities
FARE*1400	[1.00]	Economics of the Agri-Food System
FOOD*3090	[0.50]	Food Science and Human Nutrition

2.50 credits from the following Restricted Elective list, without regard to group:

Note: At least 0.50 credits from the following list 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*1210	[1.00]	Principles of Animal Care and Welfare
ANSC*2330	[0.50]	Horse Management Science
ANSC*2340	[0.50]	Structure of Farm Animals
ANSC*3080	[0.50]	Agricultural Animal Physiology
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics
MBG*3060	[0.50]	Quantitative Genetics

Environmental Biology:

ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*3020	[0.50]	Pesticides and the Environment
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

Horticultural Science:

HORT*3150	[0.50]	Principles and Applications of Plant Propagation
HORT*3280	[0.50]	Greenhouse Production
HORT*4300	[0.50]	Postharvest Physiology
PBIO*3110	[0.50]	Crop Physiology
PBIO*3750	[0.50]	Plant Tissue Culture

Resource Management:

ENVS*2120	[0.50]	Introduction to Environmental Stewardship
ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
ENVS*3050	[0.50]	Microclimatology

ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*4090	[0.50]	Soil Management
ENVS*4160	[0.50]	Soil and Nutrient Management

Animal Science (ANSC)

Department of Animal Biosciences

The animal science curriculum is designed to provide a broad opportunity to study animal physiology, nutrition, genetics, behaviour and welfare across a range of large and small domestic animal species. The program is designed around an option to follow a Production and Management focus or a Research focus in semesters 5-8 with additional flexibility to allow for a semester of study abroad.

Semester 1

AGR*1110	[1.00]	Introduction to the Agri-Food Systems
BIOL*1050	[0.50]	Biology of Plants & Animals in Managed Ecosystems
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*2050	[0.50]	Agroecology
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

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems, Health and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics

One of:

FARE*2700	[0.50]	Survey of Natural Resource Economics
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics

Semester 4

ANSC*1210	[1.00]	Principles of Animal Care and Welfare
ANSC*2340	[0.50]	Structure of Farm Animals
BIOC*2580	[0.50]	Introduction to Biochemistry
STAT*2040	[0.50]	Statistics I

Semester 5 to 8

Students must choose either Option A (Production and Management) or B (Research).

Option A - Production and Management

Semester 5

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

1.00 electives or restricted electives

Semester 6

ANSC*3040	[0.50]	Animal Reproduction
ANSC*3270	[0.50]	Animal Disorders
MBG*3060	[0.50]	Quantitative Genetics

1.00 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving

1.50 electives or restricted electives

Restricted Electives - Option A

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. A minimum of 1.00 credits from the list:

AGR*2500	[0.50]	Field Course in International Agriculture
AGR*3010	[0.50]	Special Studies in Agricultural Science I
AGR*3450	[0.50]	Research Methods in Agricultural Science
AGR*3500	[0.50]	Experiential Education I
ANSC*4230	[0.50]	Challenges and Opportunities in Animal Production
ANSC*4610	[0.50]	Critical Analysis in Animal Science
CROP*4260	[0.50]	Crop Science Field Trip
EDRD*2020	[0.50]	Interpersonal Communication
EDRD*3050	[0.50]	Agricultural Communication I
EDRD*3140	[0.50]	Organizational Communication
FARE*3310	[0.50]	Operations Management
FARE*4220	[0.50]	Advanced Agribusiness Management
FARE*4310	[0.50]	Resource Economics
FARE*4360	[0.50]	Marketing Research
FARE*4550	[0.50]	Independent Studies I

2. A minimum of 3.00 credits is required from the following lists:

A minimum of 0.50 credits from the following list:

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

A minimum of 1.00 credits from the following list:

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*4560	[0.50]	Pet Nutrition
EQN*4020	[0.50]	Feeding the Performance Horse

A minimum of 1.00 credits from the following list:

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
EQN*3050	[0.50]	Equine Exercise Physiology

3. 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.
4. A humanities or social science courses (0.50 credits) at the 1000-level or above. See Program Counsellor for acceptable list of courses.

Option B - Research

Semester 5

AGR*3450	[0.50]	Research Methods in Agricultural Science
ANSC*3080	[0.50]	Agricultural Animal Physiology
ANSC*3120	[0.50]	Introduction to Animal Nutrition
NUTR*3210	[0.50]	Fundamentals of Nutrition

0.50 electives or restricted electives

Semester 6

ANSC*3040	[0.50]	Animal Reproduction
ANSC*3270	[0.50]	Animal Disorders
MBG*3060	[0.50]	Quantitative Genetics

1.00 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

Restricted Electives - Option B

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. A minimum of 1.00 credits from the following list (normally to be taken during semesters 7 and 8):

ANSC*4610	[0.50]	Critical Analysis in Animal Science
ANSC*4700	[0.50]	Research in Animal Biology I
ANSC*4710	[0.50]	Research in Animal Biology II

2. A minimum of 3.00 credits is required from the following lists:

A minimum of 0.50 credits from the following list:

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

A minimum of 1.00 credits from the following list:

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*4560	[0.50]	Pet Nutrition
EQN*4020	[0.50]	Feeding the Performance Horse

A minimum of 1.00 credits from the following list:

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
EQN*3050	[0.50]	Equine Exercise Physiology

3. 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.
4. A humanities or social science courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Crop, Horticulture and Turfgrass Sciences (CHAT)

Department of Plant Agriculture

The Crop, Horticultural and Turfgrass Sciences major is for students who want to apply the latest advancements in the biological sciences to contemporary problems in the plant production industries. This major is appropriate for students with a focus on the production of field crops for food, fuel or biomaterials, management of today's advanced commercial greenhouses, horticultural production, breeding improved crop varieties, or using turfgrass and other plant species to enhance urban environments. The flexibility provided in semester 6 permits students to participate in international exchanges and semesters abroad. Students can also incorporate a variety of field trips, experiential learning in the workplace and independent study into their program of studies.

Semester 1

AGR*1110	[1.00]	Introduction to the Agri-Food Systems
BIOL*1050	[0.50]	Biology of Plants & Animals in Managed Ecosystems
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*2050	[0.50]	Agroecology
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

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems, Health and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture
FARE*2700	[0.50]	Survey of Natural Resource Economics
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics

Semester 4

BIOC*2580	[0.50]	Introduction to Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
ENVS*2040	[0.50]	Plant Health and the Environment
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

Note: Students who wish to add business courses to their program are advised to takeACCT*1220 in semester 4 and ACCT*2230 in semester 5.

Semester 5 to 8

Students must choose either Option A (Production and Management) or B (Research).

Option A - Production and Management

Semester 5

FOOD*3090	[0.50]	Food Science and Human Nutrition
PBIO*3110	[0.50]	Crop Physiology

1.50 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

One of:

ENVS*4090	[0.50]	Soil Management
ENVS*4160	[0.50]	Soil and Nutrient Management

2.00 electives or restricted electives

Semester 8

AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving

1.50 electives or restricted electives

Restricted Electives - Option A

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. A minimum of 1.00 credits from the following list:

AGR*3010	[0.50]	Special Studies in Agricultural Science I
AGR*3450	[0.50]	Research Methods in Agricultural Science
AGR*3500	[0.50]	Experiential Education I
CROP*4260	[0.50]	Crop Science Field Trip
EDRD*3050	[0.50]	Agricultural Communication I
EDRD*3140	[0.50]	Organizational Communication
FARE*3310	[0.50]	Operations Management
FARE*4220	[0.50]	Advanced Agribusiness Management
FARE*4310	[0.50]	Resource Economics
FARE*4550	[0.50]	Independent Studies I

2. Students must select a minimum of 3.00 credits from the below, without regard to group. Courses are organized into three subject areas only to provide guidance to students who wish to concentrate in a particular area of plant agriculture.

Crop Science:

AGR*2500	[0.50]	Field Course in International Agriculture
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
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3210	[0.50]	Plant Pathology
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
HORT*4380	[0.50]	Tropical and Sub-Tropical Crops
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
OAGR*2070	[1.00]	Introduction to Organic Agriculture
OAGR*4050	[1.00]	Design of Organic Production Systems
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4070	[0.50]	Biological and Cultural Control of Plant Diseases
PBIO*4750	[0.50]	Genetic Engineering of Plants

Horticultural Science:

CROP*4240	[0.50]	Weed Science
ENVS*3210	[0.50]	Plant Pathology
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3150	[0.50]	Principles and Applications of Plant Propagation
HORT*3270	[0.50]	Medicinal Plants
HORT*3280	[0.50]	Greenhouse Production
HORT*3510	[0.50]	Vegetable Production
HORT*4300	[0.50]	Postharvest Physiology
HORT*4420	[0.50]	Fruit Crops
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4070	[0.50]	Biological and Cultural Control of Plant Diseases
PBIO*4750	[0.50]	Genetic Engineering of Plants

Turfgrass Science:

CROP*4240	[0.50]	Weed Science
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3140	[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]	Plants, the Environment and Society
HORT*4450	[0.50]	Advanced Turfgrass Science

3. 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
4. A humanities or social science courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Option B - Research

Semester 5

AGR*3450	[0.50]	Research Methods in Agricultural Science
FOOD*3090	[0.50]	Food Science and Human Nutrition
PBIO*3110	[0.50]	Crop Physiology

1.00 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

AGR*4450	[1.00]	Research Project I

One of:

ENVS*4090	[0.50]	Soil Management
ENVS*4160	[0.50]	Soil and Nutrient Management

1.00 electives or restricted electives

Semester 8

AGR*4460	[1.00]	Research Project II

1.50 electives or restricted electives

Restricted Electives - Option B

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. During semesters 4-8 students must select a minimum of 3.00 credits from the lists of restricted electives below, without regard to group. Courses are organized into three subject areas only to provide guidance to students who wish to concentrate in a particular area of plant agriculture.

Crop Science:

AGR*2500	[0.50]	Field Course in International Agriculture
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
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3210	[0.50]	Plant Pathology
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
HORT*4380	[0.50]	Tropical and Sub-Tropical Crops
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
OAGR*2070	[1.00]	Introduction to Organic Agriculture
OAGR*4050	[1.00]	Design of Organic Production Systems
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4070	[0.50]	Biological and Cultural Control of Plant Diseases
PBIO*4750	[0.50]	Genetic Engineering of Plants

Horticultural Science:

CROP*4240	[0.50]	Weed Science
ENVS*3210	[0.50]	Plant Pathology
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
HORT*2450	[0.50]	Introduction to Turfgrass Science
HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3150	[0.50]	Principles and Applications of Plant Propagation
HORT*3270	[0.50]	Medicinal Plants
HORT*3280	[0.50]	Greenhouse Production
HORT*3510	[0.50]	Vegetable Production
HORT*4300	[0.50]	Postharvest Physiology
HORT*4420	[0.50]	Fruit Crops
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4070	[0.50]	Biological and Cultural Control of Plant Diseases
PBIO*4750	[0.50]	Genetic Engineering of Plants

Turfgrass Science:

CROP*4240	[0.50]	Weed Science
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3140	[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]	Plants, the Environment and Society
HORT*4450	[0.50]	Advanced Turfgrass Science

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 the Program Counsellor for the list of agricultural science courses.
3. A humanities or social science courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Business Electives:

Students in either Option A or Option B who wish to add business courses to their program are advised to select courses from the following list:

FARE*3310	[0.50]	Operations Management
FARE*4220	[0.50]	Advanced Agribusiness Management
FARE*4240	[0.50]	Futures and Options Markets
FARE*4370	[0.50]	Food & Agri Marketing Management
MGMT*3320	[0.50]	Financial Management

Organic Agriculture (OAGR)

Department of Plant Agriculture and School of Environmental Sciences

The Major in Organic Agriculture encompasses agroecology, food safety and security, land stewardship, animal welfare, environmental health, and sustainable rural communities. It offers an integrated systems approach to the design and operation of crop and livestock production systems that are socially responsible, ecologically sound and economically sustainable. The program combines core courses in life sciences and modern agricultural practice with in depth analysis of organic production systems, soil and nutrient management, pest management and farm economies. Linkages between profitability and sustainability are explored through independent and group research projects, experiential learning, field trips and opportunities for study abroad. In addition to the core courses, students can incorporate experiential learning and independent research courses focusing on social, economic and scientific aspects of organic agriculture and sustainability to their program of studies. This innovative and flexible program will provide the knowledge and skills you will need for career success in this dynamic sector.

Semester 1

AGR*1110	[1.00]	Introduction to the Agri-Food Systems
BIOL*1050	[0.50]	Biology of Plants & Animals in Managed Ecosystems
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

AGR*2050	[0.50]	Agroecology
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

Semester 3

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems, Health and Industry
AGR*2470	[0.50]	Introduction to Plant Agriculture
FARE*2700	[0.50]	Survey of Natural Resource Economics
MBG*2400	[0.50]	Fundamentals of Plant and Animal Genetics

Semester 4

ENVS*2040	[0.50]	Plant Health and the Environment
OAGR*2070	[1.00]	Introduction to Organic Agriculture
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

Semester 5 to 8

Students must choose either Option A (Production and Management) or B (Research).

Option A- Production and Management

Semester 5

FOOD*3090	[0.50]	Food Science and Human Nutrition

2.00 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

OAGR*4050	[1.00]	Design of Organic Production Systems

1.50 electives or restricted electives

Semester 8

AGR*4600	[1.00]	Agriculture and Food Issues Problem Solving

1.50 electives or restricted electives

Restricted Electives - Option A

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. A minimum of 1.00 credits from the list:

AGR*2500	[0.50]	Field Course in International Agriculture
AGR*3010	[0.50]	Special Studies in Agricultural Science I
AGR*3450	[0.50]	Research Methods in Agricultural Science
AGR*3500	[0.50]	Experiential Education I
ANSC*4230	[0.50]	Challenges and Opportunities in Animal Production
ANSC*4610	[0.50]	Critical Analysis in Animal Science
CROP*4260	[0.50]	Crop Science Field Trip
EDRD*2020	[0.50]	Interpersonal Communication
EDRD*3050	[0.50]	Agricultural Communication I
EDRD*3140	[0.50]	Organizational Communication
FARE*3310	[0.50]	Operations Management
FARE*4220	[0.50]	Advanced Agribusiness Management
FARE*4310	[0.50]	Resource Economics
FARE*4360	[0.50]	Marketing Research
FARE*4550	[0.50]	Independent Studies I

2. Students must select a minimum of 3.50 credits from the following lists:

Minimum of 2.50 credits from the following list

ANSC*2340	[0.50]	Structure of Farm Animals

ANSC*3120	[0.50]	Introduction to Animal Nutrition
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
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3210	[0.50]	Plant Pathology
ENVS*4090	[0.50]	Soil Management
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
ENVS*4160	[0.50]	Soil and Nutrient Management
HORT*3510	[0.50]	Vegetable Production
HORT*4420	[0.50]	Fruit Crops
PBIO*3110	[0.50]	Crop Physiology

A minimum of 0.50 credits from the following list:

EDRD*3400	[0.50]	Sustainable Communities
GEOG*3320	[0.50]	Food Systems: Issues in Security and Sustainability
PHIL*2070	[0.50]	Philosophy of the Environment

Students may also take the following courses:

ACCT*1220	[0.50]	Introductory Financial Accounting
BIOC*2580	[0.50]	Introduction to Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
FARE*2410	[0.50]	Agrifood Markets and Policy
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3060	[0.50]	Quantitative Genetics
NUTR*3210	[0.50]	Fundamentals of Nutrition

3. 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.
4. A humanities or social science courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Option B - Research

Semester 5

AGR*3450	[0.50]	Research Methods in Agricultural Science
FOOD*3090	[0.50]	Food Science and Human Nutrition

1.50 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

AGR*4450	[1.00]	Research Project I
OAGR*4050	[1.00]	Design of Organic Production Systems

0.50 electives or restricted electives

Semester 8

AGR*4460	[1.00]	Research Project II

1.50 electives or restricted electives

Restricted Electives - Option B

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 in Option B must select a minimum of 3.50 credits from the following lists:

Minimum of 2.50 credits from the following list:

ANSC*2340	[0.50]	Structure of Farm Animals
ANSC*3120	[0.50]	Introduction to Animal Nutrition
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
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3210	[0.50]	Plant Pathology
ENVS*4090	[0.50]	Soil Management
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
ENVS*4160	[0.50]	Soil and Nutrient Management
HORT*3510	[0.50]	Vegetable Production
HORT*4420	[0.50]	Fruit Crops
PBIO*3110	[0.50]	Crop Physiology

A minimum of 0.50 credits from the following list:

EDRD*3400	[0.50]	Sustainable Communities
GEOG*3320	[0.50]	Food Systems: Issues in Security and Sustainability
PHIL*2070	[0.50]	Philosophy of the Environment

Students may also take the following courses as restricted electives:

ACCT*1220	[0.50]	Introductory Financial Accounting
BIOC*2580	[0.50]	Introduction to Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2310	[0.50]	Intermediate Microeconomics
FARE*2410	[0.50]	Agrifood Markets and Policy
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
MBG*3060	[0.50]	Quantitative Genetics
NUTR*3210	[0.50]	Fundamentals of 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 courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Bachelor of Science in Environmental Sciences [B.Sc.(Env.)]

Program Information

Objectives of the Program

The Environmental Sciences program is designed to provide a strong interdisciplinary grounding in specific environmental sciences including the socioeconomic context in which environmental issues are resolved.

There is an emphasis on management and decision-making skills for the application of scientific knowledge to environmental problems, and the evaluation of appropriate environmental policies. A practical perspective based on defining and resolving problems is central to the program, and this is often done in the context of group work.

Substantial emphasis is placed on communication skills, including the development of competence in both written and oral presentations. These skills will be progressively developed in core courses from the first to the fourth year. Students in the final year of their program will be expected to take part in more intensive communication skill development. Graduates will seek employment in a range of fields, from government agencies to private industry and research.

Academic Counselling

General information on the degree program is available from the Program Counsellor. Advising for each major is available through the assigned faculty advisor responsible for the major. Students are encouraged to seek the advice of the faculty advisors when choosing restricted electives and planning course selections.

Degree

The degree granted for the successful completion of this honours program will be the Bachelor of Science in Environmental Sciences--B.Sc.(Env.).

Continuation of Study

Students are advised to consult the regulations for Continuation of Study in Section VIII--Undergraduate Degree Regulations and Procedures of this Calendar.

Conditions for Graduation

In order to graduate from the B.Sc.(Env.) program, students must successfully complete a minimum of 20.00 credits including all the stated course requirements for the program. As well, students must achieve a cumulative average of 60% or higher over all course attempts.

Environmental Sciences (Co-op)

A 5-year Honours Program in Environmental Sciences is offered as a Co-operative Education Program. This option is offered within the B.Sc. (Env.) degree and is available to all majors. The course requirements are the same as those listed for the regular B.Sc. (Env.) program, by the Co-operative Education Program and as outlined in the Continuation of Study policy (Section VIII--Undergraduate Degree Regulations & Procedures).

3 co-op work terms (COOP*1000, COOP*2000, COOP*3000) are required. An optional 4th co-op work term (COOP*4000) is available. COOP*1100 must be completed during semester 2.

Environmental Sciences Co-op Work Term Schedule

Year	Fall	Winter	Summer
1	Academic Term 1	Academic Term 2	Off
2	Academic Term 3	COOP*1000	Academic Term 4
3	COOP*2000	Academic Term 5	COOP*3000
4	Academic Term 6	Academic Term 7	COOP*4000 (Optional)
5	Academic Term 8	N/A	N/A

Since some of the course requirements in the degree program (core or major) are not offered each semester, careful planning and program consultation with the Faculty Co-op Advisor is essential. In particular, students are encouraged to seek advice when choosing for their Summer academic semester.

The Environmental Sciences Program

The degree in Environmental Sciences consists of a minimum of 20.00 credits, as follows:

1. 7.00 Environmental Sciences Core
2. 8.50 - 11.00 Environmental Sciences prescribed and restricted electives according to major.
3. free electives*

Within these courses, students must include at least 6.00 credits at the 3000 or 4000 level, and no program may include more than 7.00 credits at the 1000 level.

* There are not specific subject requirements for the elective courses, however, you may NOT select the following: BIOL*1500, BOT*1200, CHEM*1100, CIS*1000, ENVS*1060, GEOL*1100 , MICR*1020 , MBG*1000, PHYS*1600.

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

First Year Curriculum

The first year courses have been selected to provide students with sufficient background and knowledge to enter any one of the Environmental Sciences majors.

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Note: Co-op students must select COOP*1100 Introduction to Co-operative Education

Environmental Sciences Core

In addition to the common first year curriculum, students are required to take the following core Environmental Sciences courses in the semesters recommended in the schedule of studies:

ENVS*4001	[0.50]	Project in Environmental Sciences
ENVS*4002	[0.50]	Project in Environmental Sciences

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics
GEOG*3210	[0.50]	Management of the Biophysical Environment

A required statistics course is prescribed by the student's choice of major.

Environmental Sciences Majors

Ecology

Environment and Resource Management

Environmental Economics and Policy

Environmental Sciences

Requirements for each of these majors are described in the detailed schedules of studies below.

Ecology (ECOL)

Department of Integrative Biology, College of Biological Science

This program provides a solid foundation in the principles of ecology, training in both pure and applied aspects of ecology and an introduction to economic, legal and policy issues related to the management of the environment. From the 2nd year on, students increasingly augment the core in ecology and policy with extensive restricted electives choices that allow the student to tailor the program to their interests. The major provides a sound science background for careers in conservation, resource management, ecological consulting, or nature interpretation used in teaching, government, non-government or the private sector; or for further post-graduate training in fundamental ecology, environmental biology and environmental management or policy.

Major

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3

BIOL*2060	[0.50]	Ecology

One of:

PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1300	[0.50]	Fundamentals of Physics

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics

1.00 electives or restricted electives

Note: Students lacking 4U physics or equivalent must take PHYS*1300. Students with 4U physics or equivalent must take PHYS*1080. PHYS*1130 may be substituted for PHYS*1080 and would be taken in a Winter semester.

Note: GEOG*3210 may be substituted for ECON*2100 or FARE*2700 and would be taken in semester 5.

Semester 4

BIOC*2580	[0.50]	Introduction to Biochemistry
BIOL*2400	[0.50]	Evolution
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
STAT*2230	[0.50]	Biostatistics for Integrative Biology

0.50 electives or restricted electives

Semester 5

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3600	[0.50]	Comparative Animal Physiology I

One of:

BOT*3410	[0.50]	Plant Anatomy
ZOO*2090	[0.50]	Vertebrate Structure and Function

1.00 electives or restricted electives

Note: ZOO*2700 may be substituted for BOT*3410 or ZOO*2090 and would be taken in semester 6.

Semester 6

BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BIOL*3130	[0.50]	Conservation Biology

1.50 electives or restricted electives

Semester 7

ENVS*4001	[0.50]	Project in Environmental Sciences

2.00 electives or restricted electives

Semester 8

ENVS*4002	[0.50]	Project in Environmental Sciences

2.00 electives or restricted electives

Note: See note in semester 7.

Restricted Electives

Students are required to take 5.50 restricted credits in Ecology as noted below. Of these, at least 1.00 credits must be at the 4000 level.

1. A minimum of 0.50 credits from:

BIOL*4150	[0.50]	Wildlife Conservation and Management
CIS*1500	[0.50]	Introduction to Programming
GEOG*2420	[0.50]	The Earth From Space
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3420	[0.50]	Remote Sensing of the Environment *
GEOG*3480	[0.50]	GIS and Spatial Analysis *
GEOG*4480	[1.00]	Applied Geomatics *

   * Additional prerequisites are required.

2. Students in the Ecology Major are required to take an additional 5.00 restricted elective credits from the following lists. Some courses may require other courses from the list as prerequisites.

   Ecology

ANSC*3180	[0.50]	Wildlife Nutrition
BIOL*3450	[0.50]	Introduction to Aquatic Environments
BOT*3050	[0.50]	Plant Functional Ecology
ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*3010	[0.50]	Climate Change Biology
ENVS*3270	[0.50]	Forest Biodiversity
ENVS*3290	[0.50]	Waterborne Disease Ecology
ENVS*4350	[0.50]	Forest Ecology
GEOG*2000	[0.50]	Geomorphology
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*3000	[0.50]	Fluvial Processes
GEOG*3610	[0.50]	Environmental Hydrology
NUTR*3210	[0.50]	Fundamentals of Nutrition
ZOO*4570	[0.50]	Marine Ecological Processes

   Conservation

BIOL*4120	[0.50]	Evolutionary Ecology
BIOL*4150	[0.50]	Wildlife Conservation and Management
BIOL*4350	[0.50]	Limnology of Natural and Polluted Waters
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
ENVS*3000	[0.50]	Nature Interpretation
ENVS*3010	[0.50]	Climate Change Biology
GEOG*2480	[0.50]	Mapping and GIS
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*3480	[0.50]	GIS and Spatial Analysis
GEOG*4110	[1.00]	Environmental Systems Analysis
GEOG*4230	[0.50]	Environmental Impact Assessment
GEOG*4480	[1.00]	Applied Geomatics

   Policy, Law and Management

BIOL*4500	[0.50]	Natural Resource Policy Analysis
ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics
GEOG*2210	[0.50]	Environment and Resources
GEOG*4210	[0.50]	Environmental Governance
GEOG*4220	[0.50]	Local Environmental Management
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*3370	[0.50]	Environmental Politics and Governance

   Independent Research and Field Courses

BIOL*4410	[0.75]	Field Ecology
BIOL*4700	[0.50]	Field Biology
BIOL*4710	[0.25]	Field Biology
BIOL*4800	[0.50]	Field Biology
BIOL*4810	[0.25]	Field Biology
ENVS*3410	[0.50]	Independent Research I
ENVS*3420	[0.50]	Independent Research II
ENVS*3430	[1.00]	Independent Research
IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
IBIO*4521	[1.00]	Thesis in Integrative Biology
IBIO*4522	[1.00]	Thesis in Integrative Biology
ZOO*4300	[0.75]	Marine Biology and Oceanography

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

5.00 credits - Ecology Required courses

5.50 credits - Ecology Restricted electives

2.50 credits - Free electives

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. With prior approval, students may be able to use courses not on these lists towards their Ecology restrictive electives.

Ecology (ECOL:C)

Department of Integrative Biology, College of Biological Science

This program provides a solid foundation in the principles of ecology, training in both pure and applied aspects of ecology and an introduction to economic, legal and policy issues related to the management of the environment. From the 2nd year on, students increasingly augment the core in ecology and policy with extensive restricted electives choices that allow the student to tailor the program to their interests. The major provides a sound science background for careers in conservation, resource management, ecological consulting, or nature interpretation used in teaching, government, non-government or the private sector; or for further post-graduate training in fundamental ecology, environmental biology and environmental management or policy.

Major

Semester 1 - Fall

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2 - Winter

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3 - Fall

BIOL*2060	[0.50]	Ecology

One of:

PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1300	[0.50]	Fundamentals of Physics

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics

1.00 electives or restricted electives

Note: Students lacking 4U physics or equivalent must take PHYS*1300. Students with 4U physics or equivalent must take PHYS*1080. PHYS*1130 may be substituted for PHYS*1080 and would be taken in a Winter semester.

Note: GEOG*3210 may be substituted for ECON*2100 or FARE*2700 and would be taken in semester 6.

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - Summer

BIOC*2580	[0.50]	Introduction to Biochemistry

2.00 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

BIOL*2400	[0.50]	Evolution
MBG*2040	[0.50]	Foundations in Molecular Biology and Genetics
STAT*2230	[0.50]	Biostatistics for Integrative Biology

1.00 electives or restricted electives

Summer Semester

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

Semester 6 - Fall

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
ENVS*4001	[0.50]	Project in Environmental Sciences

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3600	[0.50]	Comparative Animal Physiology I

One of:

BOT*3410	[0.50]	Plant Anatomy
ZOO*2090	[0.50]	Vertebrate Structure and Function

0.50 electives or restricted electives

Note: ZOO*2700 may be substituted for BOT*3410 or ZOO*2090 and would be taken in semester 7.

Semester 7 - Winter

BIOL*3060	[0.50]	Populations, Communities & Ecosystems
BIOL*3130	[0.50]	Conservation Biology
ENVS*4002	[0.50]	Project in Environmental Sciences

1.00 electives or restricted electives

Note: See note in semester 6.

Summer Semester (Optional)

COOP*4000	[0.00]	Co-op Work Term IV

Semester 8- Fall

2.50 electives or restricted electives

Restricted Electives

Students are required to take 5.50 restricted credits in Ecology as noted below. Of these, at least 1.00 credits must be at the 4000 level.

1. A minimum of 0.50 credits from:

BIOL*4150	[0.50]	Wildlife Conservation and Management
CIS*1500	[0.50]	Introduction to Programming
GEOG*2420	[0.50]	The Earth From Space
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3420	[0.50]	Remote Sensing of the Environment *
GEOG*3480	[0.50]	GIS and Spatial Analysis *
GEOG*4480	[1.00]	Applied Geomatics

   * Additional prerequisites are required.

2. Students in the Ecology Major are required to take an additional 5.00 restricted elective credits from the following lists. Some courses may require other courses from the list as prerequisites.

   Ecology

ANSC*3180	[0.50]	Wildlife Nutrition
BIOL*3450	[0.50]	Introduction to Aquatic Environments
BOT*3050	[0.50]	Plant Functional Ecology
ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*3010	[0.50]	Climate Change Biology
ENVS*3270	[0.50]	Forest Biodiversity
ENVS*3290	[0.50]	Waterborne Disease Ecology
ENVS*4350	[0.50]	Forest Ecology
GEOG*2000	[0.50]	Geomorphology
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*3000	[0.50]	Fluvial Processes
GEOG*3610	[0.50]	Environmental Hydrology
NUTR*3210	[0.50]	Fundamentals of Nutrition
ZOO*4570	[0.50]	Marine Ecological Processes

   Conservation

BIOL*4120	[0.50]	Evolutionary Ecology
BIOL*4150	[0.50]	Wildlife Conservation and Management
BIOL*4350	[0.50]	Limnology of Natural and Polluted Waters
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
ENVS*3000	[0.50]	Nature Interpretation
ENVS*3010	[0.50]	Climate Change Biology
GEOG*2480	[0.50]	Mapping and GIS
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*3480	[0.50]	GIS and Spatial Analysis
GEOG*4110	[1.00]	Environmental Systems Analysis
GEOG*4230	[0.50]	Environmental Impact Assessment
GEOG*4480	[1.00]	Applied Geomatics

   Policy, Law and Management

BIOL*4500	[0.50]	Natural Resource Policy Analysis
ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics
GEOG*2210	[0.50]	Environment and Resources
GEOG*4210	[0.50]	Environmental Governance
GEOG*4220	[0.50]	Local Environmental Management
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*3370	[0.50]	Environmental Politics and Governance

   Independent Research and Field Courses

BIOL*4410	[0.75]	Field Ecology
BIOL*4700	[0.50]	Field Biology
BIOL*4710	[0.25]	Field Biology
BIOL*4800	[0.50]	Field Biology
BIOL*4810	[0.25]	Field Biology
ENVS*3410	[0.50]	Independent Research I
ENVS*3420	[0.50]	Independent Research II
ENVS*3430	[1.00]	Independent Research
IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
IBIO*4521	[1.00]	Thesis in Integrative Biology
IBIO*4522	[1.00]	Thesis in Integrative Biology
ZOO*4300	[0.75]	Marine Biology and Oceanography

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

5.00 credits - Ecology Required courses

5.50 credits - Ecology Restricted electives

2.50 credits - Free electives

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. With prior approval, students may be able to use courses not on these lists towards their Ecology restrictive electives.

Environmental Sciences (ENVS)

School of Environmental Sciences, Ontario Agricultural College

This major combines a foundation in the breadth of environmental science while giving students practical experience in integrating the basic science in environmental problem solving. The integration of biophysical sciences with real-world applications provides students with a unique skill set for engaging with current and future environmental issues. The many opportunities in the major for experiential learning and independent research give students an ability to collect, analyze and interpret environmental data, and propose solutions that account for both the biophysical science and the socio-economic context. The second year core curriculum develops a cross-disciplinary understanding of the biophysical environment, while the third and fourth years allow students to engage more deeply with issues of interest to them. Students will graduate from this major ready to address diverse problems such as pollinator conservation, soil and water conservation, greenhouse gas mitigation, plant disease management and chemical movement in the environment. It provides a solid background for careers in environmental protection, resource management and research, in both the public and private sectors.

Major

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3

ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*2060	[0.50]	Soil Science
ENVS*2240	[0.50]	Fundamentals of Environmental Geology
ENVS*2310	[0.50]	Current Issues in Earth Surface Processes

0.50 restricted electives from List A or B

Semester 4

BIOL*2060	[0.50]	Ecology
ENVS*2320	[0.50]	Current Issues in Microbial and Molecular Science
STAT*2040	[0.50]	Statistics I

0.50 restricted electives from List A or B
0.50 electives or restricted electives

Semester 5

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics
GEOG*3210	[0.50]	Management of the Biophysical Environment

2.00 electives or restricted electives
Students wishing to register in BIOL*4350 must substitute BIOL*3450 in Semester 5 for ENVS*3150 in Semester 6.

Semester 6

ENVS*3150	[0.50]	Aquatic Systems

2.00 electives or restricted electives

Semester 7

ENVS*4001	[0.50]	Project in Environmental Sciences

2.00 electives or restricted electives

Semester 8

ENVS*4002	[0.50]	Project in Environmental Sciences

2.00 electives or restricted electives

Restricted Electives

Students must take a total of 6.50 restricted elective credits as prescribed by the following lists.

Students must take 0.50 credits from each of List A & B

List A

One of:

ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt

List B

One of:

PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1130	[0.50]	Physics with Applications
PHYS*1300	[0.50]	Fundamentals of Physics

Students lacking 4U Physics or equivalent must take PHYS*1300.

Students are required to choose a minimum of 5.50 credits from Lists C, D, E, and F. Students must take a minimum of 1.50 credits from List C, a minimum of 1.00 credits from List D, and students may not count more than 1.00 credits from List F towards their restricted electives. Students should note that many restricted electives, particularly in List D, require other courses as prerequisites. Students should consult the most recent Undergraduate Calendar for specific requirements.

List C

Students must take a minimum of 1.50 credits from the following list:

BIOL*3130	[0.50]	Conservation Biology
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*2120	[0.50]	Introduction to Environmental Stewardship
ENVS*2210	[0.50]	Apiculture and Honey Bee Biology
ENVS*2230	[0.50]	Communications in Environmental Science
ENVS*3000	[0.50]	Nature Interpretation
ENVS*3010	[0.50]	Climate Change Biology
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3030	[0.50]	Conservation Field Course
ENVS*3040	[0.50]	Natural Chemicals in the Environment
ENVS*3050	[0.50]	Microclimatology
ENVS*3060	[0.50]	Groundwater
ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3090	[0.50]	Insect Diversity and Biology
ENVS*3180	[0.50]	Sedimentary Environments
ENVS*3210	[0.50]	Plant Pathology
ENVS*3220	[0.50]	Terrestrial Chemistry
ENVS*3230	[0.50]	Agroforestry Systems
ENVS*3250	[0.50]	Forest Health and Disease
ENVS*3270	[0.50]	Forest Biodiversity
ENVS*3290	[0.50]	Waterborne Disease Ecology
ENVS*3310	[0.50]	Soil Biodiversity and Ecosystem Function
ENVS*3340	[0.50]	Use and Management of Environmental Data
ENVS*3370	[0.50]	Terrestrial Ecosystem Ecology
MICR*3220	[0.50]	Plant Microbiology
TOX*2000	[0.50]	Principles of Toxicology

List D

Students must take a minimum of 1.00 credits from the following list:

BIOL*4350	[0.50]	Limnology of Natural and Polluted Waters
ENVS*4070	[0.50]	Pollinator Conservation
ENVS*4090	[0.50]	Soil Management
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
ENVS*4130	[0.50]	Chemical Ecology: Principles & Practice
ENVS*4160	[0.50]	Soil and Nutrient Management
ENVS*4180	[0.50]	Insecticide Biological Activity and Resistance
ENVS*4190	[0.50]	Biological Activity of Herbicides
ENVS*4210	[1.00]	Meteorological and Environmental Instrumentation
ENVS*4230	[0.50]	Biology of Aquatic Insects
ENVS*4260	[0.50]	Field Entomology
ENVS*4320	[1.00]	Laboratory and Field Methods in Soil Biodiversity
ENVS*4350	[0.50]	Forest Ecology
ENVS*4360	[0.50]	Glacial Environments
ENVS*4370	[0.50]	Environmental Organic Chemistry
ENVS*4390	[1.00]	Soil Variability and Land Evaluation
PBIO*4530	[0.50]	Plants and Environmental Pollution

List E

ENVS*3100	[0.50]	Internship/Externship in Environmental Sciences
ENVS*3410	[0.50]	Independent Research I
ENVS*3420	[0.50]	Independent Research II
ENVS*3430	[1.00]	Independent Research
ENVS*3510	[0.50]	Independent Study I
ENVS*3520	[0.50]	Independent Study II
ENVS*3530	[1.00]	Independent Study
ENVS*4410	[1.00]	Advanced Independent Research I
ENVS*4420	[1.00]	Advanced Independent Research II
ENVS*4430	[2.00]	Advanced Independent Research
ENVS*4510	[0.50]	Advanced Independent Study I
ENVS*4520	[0.50]	Advanced Independent Study II
ENVS*4530	[1.00]	Advanced Independent Study

List F

Students may count up to 1.00 credits from the following list towards their 6.50 credit restricted electives.

GEOG*2420	[0.50]	The Earth From Space
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3420	[0.50]	Remote Sensing of the Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

4.50 credits - Required Courses for the Major

5.50 credits - Restricted Electives

3.00 credits - Free electives

Students are encouraged to seek advice from their faculty advisor and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000-4000 level. With prior approval, students may be able to use courses not on Lists C, D, E, or F toward their restricted electives

Environmental Sciences (ENVS:C)

School of Environmental Sciences, Ontario Agricultural College

This major combines a foundation in the breadth of environmental science while giving students practical experience in integrating the basic science in environmental problem solving. The integration of biophysical sciences with real-world applications provides students with a unique skill set for engaging with current and future environmental issues. The many opportunities in the major for experiential learning and independent research give students an ability to collect, analyze and interpret environmental data, and propose solutions that account for both the biophysical science and the socio-economic context. The second year core curriculum develops a cross-disciplinary understanding of the biophysical environment, while the third and fourth years allow students to engage more deeply with issues of interest to them. Students will graduate from this major ready to address diverse problems such as pollinator conservation, soil and water conservation, greenhouse gas mitigation, plant disease management and chemical movement in the environment. It provides a solid background for careers in environmental protection, resource management and research, in both the public and private sectors.

Major

Semester 1 - Fall

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2 - Winter

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education

FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3 - Fall

ENVS*2030	[0.50]	Meteorology and Climatology
ENVS*2060	[0.50]	Soil Science
ENVS*2240	[0.50]	Fundamentals of Environmental Geology
ENVS*2310	[0.50]	Current Issues in Earth Surface Processes

0.50 restricted electives from List A or B

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - Summer

STAT*2040	[0.50]	Statistics I

2.00 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

BIOL*2060	[0.50]	Ecology
ENVS*2320	[0.50]	Current Issues in Microbial and Molecular Science

0.50 restricted electives from List A or B
1.00 electives or restricted electives

Summer Semester

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

Semester 6 - Fall

ENVS*4001	[0.50]	Project in Environmental Sciences

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics
GEOG*3210	[0.50]	Management of the Biophysical Environment

1.50 electives or restricted electives
Students wishing to register in BIOL*4350 must substitute BIOL*3450 in Semester 6 for ENVS*3150 in Semester 7.

Semester 7 - Winter

ENVS*3150	[0.50]	Aquatic Systems
ENVS*4002	[0.50]	Project in Environmental Sciences

1.50 electives or restricted electives

Summer Semester - (Optional)

COOP*4000	[0.00]	Co-op Work Term IV

Semester 8 - Fall

2.50 electives or restricted electives

Restricted Electives

Students must take a total of 6.50 restricted elective credits as prescribed by the following lists.

Students must take 0.50 credits from each of List A & B

List A

One of:

ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt

List B

One of:

PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1130	[0.50]	Physics with Applications
PHYS*1300	[0.50]	Fundamentals of Physics

Students lacking 4U Physics or equivalent must take PHYS*1300.

Students are required to choose a minimum of 5.50 credits from Lists C, D, E, and F. Students must take a minimum of 1.50 credits from List C, a minimum of 1.00 credits from List D, and students may not count more than 1.00 credits from List F towards their restricted electives. Students should note that many restricted electives, particularly in List D, require other courses as prerequisites. Students should consult the most recent Undergraduate Calendar for specific requirements.

List C

Students must take a minimum of 1.50 credits from the following list:

BIOL*3130	[0.50]	Conservation Biology
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
ENVS*2040	[0.50]	Plant Health and the Environment
ENVS*2120	[0.50]	Introduction to Environmental Stewardship
ENVS*2210	[0.50]	Apiculture and Honey Bee Biology
ENVS*2230	[0.50]	Communications in Environmental Science
ENVS*3000	[0.50]	Nature Interpretation
ENVS*3010	[0.50]	Climate Change Biology
ENVS*3020	[0.50]	Pesticides and the Environment
ENVS*3030	[0.50]	Conservation Field Course
ENVS*3040	[0.50]	Natural Chemicals in the Environment
ENVS*3050	[0.50]	Microclimatology
ENVS*3060	[0.50]	Groundwater
ENVS*3080	[0.50]	Soil and Water Conservation
ENVS*3090	[0.50]	Insect Diversity and Biology
ENVS*3180	[0.50]	Sedimentary Environments
ENVS*3210	[0.50]	Plant Pathology
ENVS*3220	[0.50]	Terrestrial Chemistry
ENVS*3230	[0.50]	Agroforestry Systems
ENVS*3250	[0.50]	Forest Health and Disease
ENVS*3270	[0.50]	Forest Biodiversity
ENVS*3290	[0.50]	Waterborne Disease Ecology
ENVS*3310	[0.50]	Soil Biodiversity and Ecosystem Function
ENVS*3340	[0.50]	Use and Management of Environmental Data
ENVS*3370	[0.50]	Terrestrial Ecosystem Ecology
MICR*3220	[0.50]	Plant Microbiology
TOX*2000	[0.50]	Principles of Toxicology

List D

Students must take a minimum of 1.00 credits from the following list:

BIOL*4350	[0.50]	Limnology of Natural and Polluted Waters
ENVS*4070	[0.50]	Pollinator Conservation
ENVS*4090	[0.50]	Soil Management
ENVS*4100	[0.50]	Integrated Management of Invasive Insect Pests
ENVS*4130	[0.50]	Chemical Ecology: Principles & Practice
ENVS*4160	[0.50]	Soil and Nutrient Management
ENVS*4180	[0.50]	Insecticide Biological Activity and Resistance
ENVS*4190	[0.50]	Biological Activity of Herbicides
ENVS*4210	[1.00]	Meteorological and Environmental Instrumentation
ENVS*4230	[0.50]	Biology of Aquatic Insects
ENVS*4260	[0.50]	Field Entomology
ENVS*4320	[1.00]	Laboratory and Field Methods in Soil Biodiversity
ENVS*4350	[0.50]	Forest Ecology
ENVS*4360	[0.50]	Glacial Environments
ENVS*4370	[0.50]	Environmental Organic Chemistry
ENVS*4390	[1.00]	Soil Variability and Land Evaluation
PBIO*4530	[0.50]	Plants and Environmental Pollution

List E

ENVS*3100	[0.50]	Internship/Externship in Environmental Sciences
ENVS*3410	[0.50]	Independent Research I
ENVS*3420	[0.50]	Independent Research II
ENVS*3430	[1.00]	Independent Research
ENVS*3510	[0.50]	Independent Study I
ENVS*3520	[0.50]	Independent Study II
ENVS*3530	[1.00]	Independent Study
ENVS*4410	[1.00]	Advanced Independent Research I
ENVS*4420	[1.00]	Advanced Independent Research II
ENVS*4430	[2.00]	Advanced Independent Research
ENVS*4510	[0.50]	Advanced Independent Study I
ENVS*4520	[0.50]	Advanced Independent Study II
ENVS*4530	[1.00]	Advanced Independent Study

List F

Students may count up to 1.00 credits from the following list towards their 6.50 credit restricted electives.

GEOG*2420	[0.50]	The Earth From Space
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3420	[0.50]	Remote Sensing of the Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

4.50 credits - Required Courses for the Major

5.50 credits - Restricted Electives

3.00 credits - Free electives

Students are encouraged to seek advice from their faculty advisor and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000-4000 level. With prior approval, students may be able to use courses not on Lists C, D, E or F toward their restricted electives

Environmental Economics and Policy (EEP)

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

This major provides the foundation for applying science and economics to environmental issues to produce effective environmental policy. Students gain an understanding of the policy tools and market mechanisms for managing our natural resources effectively. Knowledge and skills learned in this major will enable students to identify, prioritize and solve environmental problems by integrating both scientific and economic theories and data. Equipped with the ability to look at current topics from the perspectives of economics, politics and environmental sciences, students have a number of interesting career opportunities in the public, private and NGO sectors. At the same time, the major fully prepares students to move onto professional and research graduate programs.

Major

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3

ECON*1100	[0.50]	Introductory Macroeconomics
ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
FARE*2700	[0.50]	Survey of Natural Resource Economics

One of:

BIOC*2580	[0.50]	Introduction to Biochemistry
BIOL*2060	[0.50]	Ecology
ENVS*2240	[0.50]	Fundamentals of Environmental Geology
ENVS*2310	[0.50]	Current Issues in Earth Surface Processes
GEOG*2480	[0.50]	Mapping and GIS
PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1300	[0.50]	Fundamentals of Physics
TOX*2000	[0.50]	Principles of Toxicology

0.50 restricted electives or electives

Note: Students lacking 4U physics or equivalent must take PHYS*1300. Students with 4U physics or equivalent must take PHYS*1080.

Semester 4

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics
ECON*2770	[0.50]	Introductory Mathematical Economics

One of:

BIOC*2580	[0.50]	Introduction to Biochemistry
BIOL*2060	[0.50]	Ecology
ENVS*2320	[0.50]	Current Issues in Microbial and Molecular Science
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2480	[0.50]	Mapping and GIS
PHYS*1070	[0.50]	Physics for Life Sciences II
PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1130	[0.50]	Physics with Applications

Note: STAT*2040 may be substituted for ECON*2740.

Semester 5

ECON*2100	[0.50]	Economic Growth and Environmental Quality
ECON*3710	[0.50]	Advanced Microeconomics
ECON*3740	[0.50]	Introduction to Econometrics

1.00 electives or restricted electives

Note: Students who wish to pursue graduate studies in Economics should take the following courses: ECON*3810, ECON*4710, ECON*4810 and ECON*4640.

Semester 6

FARE*3170	[0.50]	Cost-Benefit Analysis

2.00 electives or restricted electives

Semester 7

ECON*4930	[0.50]	Environmental Economics
ENVS*4001	[0.50]	Project in Environmental Sciences
FARE*4290	[0.50]	Land Economics

1.00 electives or restricted electives

Semester 8

ENVS*4002	[0.50]	Project in Environmental Sciences
FARE*4310	[0.50]	Resource Economics

1.50 restricted electives or electives

Restricted Electives

Students in the Environmental Economics and Policy major are required to complete 4.00 credits in restricted electives. A list of approved Restricted Electives is available from the Environmental Economics and Policy Faculty Advisor. 2.50 restricted elective credits have to be in FARE or ECON courses at the 3000 or 4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000 or 4000 level.

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

7.00 credits - Environmental Economics and Policy required courses

4.00 credits - Environmental Economics and Policy restricted electives

2.00 credits - Free electives

Environmental Economics and Policy (EEP:C)

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

This major provides the foundation for applying science and economics to environmental issues to produce effective environmental policy. Students gain an understanding of the policy tools and market mechanisms for managing our natural resources effectively. Knowledge and skills learned in this major will enable students to identify, prioritize and solve environmental problems by integrating both scientific and economic theories and data. Equipped with the ability to look at current topics from the perspectives of economics, politics and environmental sciences, students have a number of interesting career opportunities in the public, private and NGO sectors. At the same time, the major fully prepares students to move onto professional and research graduate programs.

Major

Semester 1 - Fall

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2 - Winter

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3 - Fall

ECON*1100	[0.50]	Introductory Macroeconomics
ENVS*2330	[0.50]	Current Issues in Ecosystem Science and Biodiversity
FARE*2700	[0.50]	Survey of Natural Resource Economics

One of:

BIOC*2580	[0.50]	Introduction to Biochemistry
BIOL*2060	[0.50]	Ecology
ENVS*2240	[0.50]	Fundamentals of Environmental Geology
ENVS*2310	[0.50]	Current Issues in Earth Surface Processes
GEOG*2480	[0.50]	Mapping and GIS
PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1300	[0.50]	Fundamentals of Physics
TOX*2000	[0.50]	Principles of Toxicology

0.50 restricted electives or electives

Note: Students lacking 4U physics or equivalent must take PHYS*1300. Students with 4U physics or equivalent must take PHYS*1080.

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - Summer

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2770	[0.50]	Introductory Mathematical Economics
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

Note: ECON*2740 may be substituted for STAT*2040.

Fall Semester

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

Semester 5 - Winter

ECON*3740	[0.50]	Introduction to Econometrics
FARE*3170	[0.50]	Cost-Benefit Analysis

One of:

BIOC*2580	[0.50]	Introduction to Biochemistry
BIOL*2060	[0.50]	Ecology
ENVS*2320	[0.50]	Current Issues in Microbial and Molecular Science
ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt

ENVS*3150	[0.50]	Aquatic Systems
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2480	[0.50]	Mapping and GIS
PHYS*1070	[0.50]	Physics for Life Sciences II
PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*1130	[0.50]	Physics with Applications

1.00 electives or restricted electives

Note: Students who wish to pursue graduate studies in Economics should take the following courses: ECON*3810, ECON*4710, ECON*4810 and ECON*4640.

Summer Semester

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

Semester 6 - Fall

ECON*2100	[0.50]	Economic Growth and Environmental Quality
ECON*3710	[0.50]	Advanced Microeconomics
ENVS*4001	[0.50]	Project in Environmental Sciences

1.00 electives or restricted electives

Semester 7 - Winter

ENVS*4002	[0.50]	Project in Environmental Sciences
FARE*4310	[0.50]	Resource Economics

1.50 electives or restricted electives

Summer Semester (Optional)

COOP*4000	[0.00]	Co-op Work Term IV

Semester 8 - Fall

ECON*4930	[0.50]	Environmental Economics
FARE*4290	[0.50]	Land Economics

1.50 electives or restricted electives

Restricted Electives

Students in the Environmental Economics and Policy major are required to complete 4.00 credits in restricted electives. A list of approved Restricted Electives is available from the Environmental Economics and Policy Faculty Advisor. 2.50 restricted elective credits have to be in FARE or ECON courses at the 3000 or 4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000 or 4000 level.

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

7.00 credits - Environmental Economics and Policy required courses

4.00 credits - Environmental Economics and Policy restricted electives

2.00 credits - Free electives

Students are reminded that 6.00 credits of their B.Sc. (Env.) degreemust be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. With prior approval, students may be able to use courses not on these lists towards their Environmental Economics and Policy restrictive electives.

Environment and Resource Management (ERM)

Department of Geography, College of Social and Applied Human Sciences

The major focuses on environmental interactions and problem solving by developing an integrated biophysical environment - human environment perspective. In ERM, students will gain knowledge across the natural sciences, an understanding of how they interact, the skills (tools and techniques) needed to support decision making, as well as the methods of management and governance that are critical for environmental decision making. Beginning in first year students learn in the classroom and through hands-on work in labs and in the field. Students are expected to design and conduct experiments and problem solve using state-of-the-art computing and analytical tools. This major provides the knowledge, skills and methods an environmental scientist requires as environmental consultant, environmental manager, environmental and/or resource planner, geographic information systems analyst or to facilitate future graduate work.

Major

Semester 1

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3

GEOG*2000	[0.50]	Geomorphology
GEOG*2460	[0.50]	Analysis in Geography

One of:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
FARE*2700	[0.50]	Survey of Natural Resource Economics

1.00 electives

Semester 4

ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*2480	[0.50]	Mapping and GIS

0.50 electives or restricted electives

Note: ENVS*2120 may be substituted for ENVS*2340 and could be taken in Semester 5.

Semester 5

GEOG*3000	[0.50]	Fluvial Processes
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment

1.00 electives or restricted electives

Note: GEOG*3610 may be substituted for GEOG*3000 and would be taken in Semester 6.

Semester 6

GEOG*3480	[0.50]	GIS and Spatial Analysis

2.00 electives or restricted electives

Semester 7

ENVS*4001	[0.50]	Project in Environmental Sciences
GEOG*4110	[1.00]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Governance

0.50 electives or restricted electives

Semester 8

ENVS*4002	[0.50]	Project in Environmental Sciences

2.00 electives or restricted electives

Restricted Electives

1.A minimum of 2 of the following courses:

ENVS*4390	[1.00]	Soil Variability and Land Evaluation
GEOG*4220	[0.50]	Local Environmental Management
GEOG*4230	[0.50]	Environmental Impact Assessment

2. An additional 1.00 credits in Geography (GEOG) at the 3000 level or higher.

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

6.00 credits - Environment and Resource Management Required courses

2.00 - 2.50 credits - Environment and Resource Management Restricted electives, depending on course selection

4.00 - 4.50 credits - Free electives, depending on course selection

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor.

Environment and Resource Management (ERM:C)

Department of Geography, College of Social and Applied Human Sciences

The major focuses on environmental interactions and problem solving by developing an integrated biophysical environment - human environment perspective. In ERM, students will gain knowledge across the natural sciences, an understanding of how they interact, the skills (tools and techniques) needed to support decision making, as well as the methods of management and governance that are critical for environmental decision making. Beginning in first year students learn in the classroom and through hands-on work in labs and in the field. Students are expected to design and conduct experiments and problem solve using state-of-the-art computing and analytical tools. This major provides the knowledge, skills and methods an environmental scientist requires as environmental consultant, environmental manager, environmental and/or resource planner, geographic information systems analyst or to facilitate future graduate work.

Major

Semester 1 - Fall

BIOL*1070	[0.50]	Discovering Biodiversity
CHEM*1040	[0.50]	General Chemistry I
ENVS*1030	[1.00]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

Semester 2 - Winter

BIOL*1090	[0.50]	Introduction to Molecular and Cellular Biology
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
FARE*1040	[1.00]	Intro to Environmental Economics, Law & Policy
GEOG*1300	[0.50]	Introduction to the Biophysical Environment

Semester 3 - Fall

GEOG*2000	[0.50]	Geomorphology
GEOG*2480	[0.50]	Mapping and GIS

1.50 electives or restricted electives

Note: FARE*2700 may be substituted for ECON*2100 and may be taken in Semester 3 or 6, GEOG*2460 may be substituted for STAT*2040 and may be taken in Semester 3 or 6.

Note: ENVS*2120 may be substituted for ENVS*2340 and could be taken in Semester 3 or 6.

Winter Semester

COOP*1000	[0.00]	Co-op Work Term I

Semester 4 - Summer

ECON*2100	[0.50]	Economic Growth and Environmental Quality
GEOG*2210	[0.50]	Environment and Resources
STAT*2040	[0.50]	Statistics I

1.00 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

ENVS*2340	[0.50]	Current Issues in Agriculture and Landscape Mgmt
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis

1.00 electives or restricted electives

Summer Semester

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

Semester 6 - Fall

ENVS*4001	[0.50]	Project in Environmental Sciences
GEOG*3000	[0.50]	Fluvial Processes
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment

0.50 electives or restricted electives

Note: GEOG*3610 may be substituted for GEOG*3000 and would be taken in Semester 6.

Semester 7 - Winter

ENVS*4002	[0.50]	Project in Environmental Sciences

1.50 electives or restricted electives

Summer Semester (Optional)

COOP*4000	[0.00]	Co-op Work Term IV

Semester 8 - Fall

GEOG*4110	[1.00]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Governance

1.00 electives or restricted electives

Restricted Electives

1.A minimum of 2 of the following courses:

ENVS*4390	[1.00]	Soil Variability and Land Evaluation
GEOG*4220	[0.50]	Local Environmental Management
GEOG*4230	[0.50]	Environmental Impact Assessment

2. An additional 1.00 credits in Geography (GEOG) at the 3000 level or higher.

2. An additional 1.00 credits in Geography (GEOG) at the 3000 level or higher.

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

6.00 credits - Environment and Resource Management Required courses

2.00 - 2.50 credits - Environment and Resource Management Restricted electives, depending on course selection

4.00 - 4.50 credits - Free electives, depending on course selection

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor.

Doctor of Veterinary Medicine (D.V.M.)

Program Information

The University of Guelph offers the degree program Doctor of Veterinary Medicine (D.V.M.) at the Ontario Veterinary College. The program is offered during the Fall and Winter semesters only and normally requires four years to complete. The college is accredited jointly by the Canadian and American Veterinary Medical Association, and the Royal College of Veterinary Surgeons of Britain. The D.V.M. degree from Guelph is respected by veterinarians throughout the world.

Objectives of the Program

1. The graduates should have the knowledge and skills appropriate to their career orientations and sufficient to allow the pursuit of a variety of careers in veterinary medicine, including graduate studies. They should be able to pass the examinations of all Canadian licensing bodies and must possess a fundamental core of academic veterinary science knowledge and of technical competence.
2. The graduates must be able to solve animal health problems and must have knowledge of the management of domestic animals and the functioning of the various animal industries.
3. The graduates must be able to communicate effectively, whether writing scientific papers or conversing with clients.
4. Through a commitment to continuing education, the graduates must accept the professional responsibility to stay abreast of new developments and to pursue solutions to new problems.
5. The graduates must have a genuine concern for the welfare of all animals. The graduates should be aware of their responsibilities to the profession in terms of ethical and professional conduct and have an understanding of the moral questions facing veterinarians.
6. The graduates must have had the opportunity during their university tenure to develop a range of non-veterinary interests sufficient to equip them to take a responsible role in society.

Regulations for Licence to Practise

Graduates are eligible to practise in Canada, but the degree in veterinary medicine does not in itself confer the right to practise. For information on matters relative to licence to practise in the various provinces of Canada, students should communicate with the Canadian Veterinary Medical Association, 339 Booth Street, Ottawa, Ontario, Canada K1R 7K1, who will refer them to the appropriate provincial veterinary association.

Admission to the Veterinary Medicine Program

Complete details on admission requirements and procedures are listed in Section IV--Admission Information. Additional information may be found at: http://www.ovc.uoguelph.ca/recruitment/en/index.asp

Academic Counselling

The Office of the Associate Dean, Students provides academic counselling and referral to other appropriate resources for all D.V.M. students. In particular, students who are requesting a Supplemental Privilege are required to meet with the Associate Dean so that the student can be informed of appropriate resources (such as Learning and Writing Services and the Counselling and Student Resource Centre) and use them to deal with his or her academic difficulties.

Conditions for Continuation of Study

For supplemental and deferred privileges, all students in the D.V.M. Program are subject to Deferred Privilege Procedures and Supplemental Privilege Procedures outlined in Chapter VIII--Undergraduate Degree Regulations and Procedures.

For continuation of study, a student must satisfy the conditions presented below. In order to graduate, students must fulfill the course requirements for the program and have achieved at least a 60% Program Average (PA). The Academic Review Sub-Committee will assess all cases where a student's academic progress does not meet the Continuation of Study requirements and will interpret the academic regulations. The requirements will be applied with due consideration to the credit weights of the course, the role of the course in the Phase and the degree of integration of the course with concurrently required courses, and in light of the student's particular circumstances (see VIII--Undergraduate Degree Regulations and Procedures).

Full-time Study

The D.V.M. program is offered as a full-time program and normally requires four years (over the equivalent of eight academic semesters at the University of Guelph) to complete. In exceptional extenuating circumstances, the Academic Review Sub-Committee may allow a student to take courses on a part-time basis. In these instances, the Academic Review Sub-Committee has the discretion to select the courses that the student will register in on a part-time basis. Students permitted to take courses on a part-time basis are cautioned that there is an enrolment limitation for the program and that access to certain courses or resumption of the program on a full-time basis will be conditional on the availability of space.

Failed Courses

1. Continuation of study from one phase of the D.V.M. Program to the next is dependent on the successful completion of all courses, or approved equivalents, in the published schedule of studies for the D.V.M. Program.
2. A student who fails one course in a Phase may be required to repeat all courses in the Phase. The consequences of failure of any particular course in the D.V.M. Program are as follows:
   a. Failure in any of the following courses result in the **Repeat of the Course:** VETM*3000 , VETM*3210, VETM*3390, VETM*3430, VETM*3220, VETM*3440, VETM*3510, VETM*4220, VETM*4450, VETM*4530, VETM*4610, VETM*4620, VETM*4660, VETM*4670, VETM*4680, VETM*4710, VETM*4720, VETM*4870, VETM*4880, VETM*4890, VETM*4900, VETM*4920, VETM*4930, VETM*4940.
   b. Failure in any of the following courses result in the **Repeat of the Phase:** VETM*3070, VETM*3080, VETM*3120, VETM*3400, VETM*3410, VETM*3450, VETM*3460, VETM*3470, VETM*4460, VETM*4470, VETM*4480, VETM*4490, VETM*4540.

   This information is also available as part of the Phase Handbooks.
3. A student will be allowed to fail a particular course only once. Any student who fails the same course twice will be required to withdraw and will be ineligible for readmission to the D.V.M. Program.
4. Grades obtained by D.V.M. students who repeat one or more VETM course(s) will be reported on the transcript in addition to the original course grade. In the instance where all courses in a Phase are repeated, the grades from the repeated VETM courses will constitute the new Phase Average (PHA). The new D.V.M. Program Average will include the grades obtained in both the original and repeated VETM course attempts.

Supplemental Privileges

1. In the circumstances of a failed course, the Academic Review Sub-Committee may, if appropriate and under special circumstances only, allow a student the opportunity to gain credit standing in a failed course by granting a supplemental privilege (see Failed Courses and Supplemental Privilege in Section VIII). Students must request a supplemental privilege by submitting the request to the Academic Review Sub-Committee, and the fee for the privilege, within 7 days of the release of grades for the phase in which the failure occurred. The Academic Review Sub-Committee, upon receiving a request from a student, and after consulting with the instructor and reviewing the student's course performance, will determine whether a supplemental privilege should be granted.
2. Students will be permitted supplemental privileges in a maximum of two courses over the entire D.V.M. Program. A supplemental privilege will not be granted for a second failure in a course. Any student granted a supplemental privilege must meet with the Associate Dean for Student Affairs who will inform the student of appropriate resources to be used to deal with his/her academic difficulties.

Conditions for Graduation

In order to qualify for graduation from the D.V.M. program, the student must have completed successfully all of the courses approved for the program. Students will not be allowed to graduate with a PA of < 60% or PHA of < 60% in Phase 4.

Voluntary Withdrawal from the Program

Students who have voluntarily withdrawn from the D.V.M. program and who wish to return must give notice to the Associate Dean, Students O.V.C of their intention to return by May 31 if they wish to return in September of the upcoming academic year. Students contemplating a withdrawal from the program are cautioned that there is an enrolment limitation for the program and that re-entry will be conditional on the availability of space. The Program Committee reserves the right to select the quota from among th e qualified applicants.

Estimate of Expenses

Attention is drawn to Section VI--Schedule of Fees for information on tuition, University student organizations and rabies immunization required for all students in the program. In addition, while the college supplies most laboratory equipment, students may wish to purchase instruments for personal use. Texts, protective clothing, and a minimum of supplies for personal use may cost approximately $500 per semester.

Health and Safety

Students must follow the health and safety policies required for the various courses in the veterinary program. Pregnant students and others with increased medical risks should consult Health Services concerning potential health risks which may occur during the normal course of their studies.

Immunization against rabies is a requirement for admission and continuation in the D.V.M. Program. Annual rabies titres and booster immunizations (if necessary) are mandatory for all Program participants. Prospective students and in-course students should contact Student Health Services (519-824-4120 extension 52131) for further information and guidance about the rabies surveillance program. Faculty and staff members should contact Occupational Health Services, extension 52133, for information about medical surveillance programs provided in accordance with University Safety Policy 851.13.03.

Schedule 5 (D.V.M. Continuation of Study)

Students admitted to the DVM in Fall 2008 or beyond follow Schedule 5.

Continuation of Study is assessed on the student's D.V.M. Program Average (not the University Cumulative Average) and according to the policy on failures as stated above.

In Phase 2 and beyond, eligibility to continue is also assessed at the end of each Phase using the Phase Average (PHA). Courses that are given a grade of Pass or Fail do not affect either the PA or PHA because they are not attached to any numerical grade.

Students required to repeat a Phase must achieve the required PA of greater than or equal to 60% by the end of the repeated Phase. If a student does not achieve the required standing by the end of the repeated Phase, he or she will normally be required to withdraw from the program.

The required averages are as follows:

For Course Attempts in Phase I

Continuation of Study Assessment for DVM Students in Phase 1

Program Average (PA)	**Status of Student**
PA < 50%	Required to Withdraw
PA ≥ 50% but < 60%	Required to Repeat Phase
PA ≥ 60%	Eligible to Continue

If Repeating Phase 1:

Continuation of Study Assessment for DVM Students Repeating Phase 1

Program Average (PA)	**Status of Student**
PA < 60%	Required to Withdraw
PA ≥ 60%	Eligible to Continue

For Course Attempts in Phase 2

Continuation of Study Assessment for DVM Students in Phase 2

Program Average (PA) and Phase Average (PHA)	**Status of Student**
PHA < 50%	Required to Withdraw
PA or PHA ≥ 50% but < 60%	Required to Repeat Phase
PA and PHA ≥ 60%	Eligible to Continue

If Repeating Phase 2:

Continuation of Study Assessment for DVM Students Repeating Phase 2

Program Average (PA)	**Status of Student**
PA < 60%	Required to Withdraw
PA ≥ 60%	Eligible to Continue

For Course Attempts in Phase 3

Continuation of Study Assessment for DVM Students in Phase 3

Program Average (PA) and Phase Average (PHA)	**Status of Student**
PHA < 50%	Required to Withdraw
PA or PHA ≥ 50% but < 60%	Required to Repeat Phase*
PA and PHA ≥ 60%	Eligible to Continue

* Students finishing Phase 3 with a PA or PHA > 50% but < 60%, will not be permitted to proceed to the Externship course or into Phase 4.

If Repeating Phase 3:

Continuation of Study Assessment for DVM Students Repeating Phase 3

Program Average (PA)	**Status of Student**
PA < 60%	Required to Withdraw
PA ≥ 60%	Eligible to Continue

For Course Attempts in Phase 4

Continuation of Study Assessment for DVM Students in Phase 4

Program Average (PA) and Phase Average (PHA)	**Status of Student**
PHA < 50%	Required to Withdraw
PA or PHA ≥ 50% but < 60%	Required to Remediate*
PA and PHA ≥ 60%	Eligible to Continue**

* Students finishing Phase 4 with a PA or PHA > 50% but < 60%, will not be permitted to graduate. The Academic Review Sub-Committee will establish the appropriate remediation requirements that must be fulfilled in order for the student to obtain the standing of Eligible to Graduate. These may include repeating a component of a course, one or more entire courses, or one or more clinical rotations.

** Students finishing Phase 4 with a PA and PHA ≥ 60% and having satisfied all course requirements for the program are Eligible to Graduate.

Schedule of Studies

Phase 1

VETM*3070	[2.00]	Veterinary Anatomy
VETM*3080	[2.00]	Veterinary Physiology and Biochemistry
VETM*3120	[0.75]	Veterinary Histology and General Pathology
VETM*3210	[0.50]	Art of Veterinary Medicine I
VETM*3390	[0.50]	Developmental Biology
VETM*3400	[0.75]	Health Management I
VETM*3430	[0.25]	Clinical Medicine I

Phase 2

VETM*3220	[0.50]	Art of Veterinary Medicine II
VETM*3410	[0.75]	Health Management II
VETM*3440	[0.50]	Clinical Medicine II
VETM*3450	[2.75]	Principles of Disease in Veterinary Medicine
VETM*3460	[0.75]	Theriogenology
VETM*3470	[0.75]	Anaesthesiology and Pharmacology
VETM*3510	[0.25]	Principles of Surgery

Phase 3

VETM*4220	[0.50]	Art of Veterinary Medicine III
VETM*4420	[0.25]	Clinical Pharmacology
VETM*4450	[0.50]	Equine Medicine and Surgery
VETM*4460	[1.00]	Food Animal Medicine and Surgery
VETM*4470	[1.00]	Medicine and Surgery of Dog and Cat
VETM*4480	[0.75]	Comparative Medicine
VETM*4490	[1.00]	Systems Pathology
VETM*4530	[0.50]	Health Management III
VETM*4540	[1.75]	Surgical Exercises
VETM*4870	[0.25]	Clinical Medicine III

Phase 4

Students entering into the Phase 4 of the DVM Program will select an area of emphasis from either: Small Animal Stream, Mixed Stream, Equine Stream or the Food Animal Stream.

Small Animal Stream:

VETM*4610	[7.50]	Small Animal Stream
VETM*4900	[2.50]	Veterinary Externship

Mixed Stream:

VETM*4660	[7.50]	Rural Community Practice Stream
VETM*4900	[2.50]	Veterinary Externship

Equine Stream:

VETM*4920	[7.50]	Equine Stream
VETM*4900	[2.50]	Veterinary Externship

Food Animal Stream:

VETM*4710	[7.50]	Food Animal Stream
VETM*4900	[2.50]	Veterinary Externship

Co-operative Education Programs

Co-operative Education (Co-op), delivered in concert with employer partners, constitutes part of the student's formal education and is available in over 35 majors for students. A form of work integrated learning, Co-op is a model of education that integrates a student's academic learning with periods of paid workplace learning in fields relevant to the student's academic and personal/professional goals. The academic and work schedules will vary with degree program and major. The first co-op work term is scheduled after the third or fourth academic semester, providing an academic foundation on which to build the work experience.

Each co-op position is developed and approved in collaboration with the employer and Co-operative Education Career Services (CECS). Students participate in a competitive employment process to secure an approved co-op position that is relevant to the student's area of academic study. COOP*1100 – Introduction to Co-operative Education, a mandatory, non-credit course, is a prerequisite for the first co-op work term and prepares the student for the employment process.

The student's performance in the workplace is supervised and evaluated by the student's employer using the Work Performance Evaluation tool. The student's progress during the work term is also monitored by Co-operative Education & Career Services, which will include a site visit during the co-op work term and a review of the student's official Learning Goals. A Co-op Work Report is required for each co-op work term and is graded by an assigned Co-op Faculty Advisor. All evaluation grades will appear on the student's official transcript.

The Co-operative Education program at the University of Guelph is accredited by the Canadian Association for Co-operative Education (CAFCE), therefore standardized guidelines regarding co-op programs will be followed at all times.

In Addition CECS supports, trains and leads students and alumni as they make career and further education planning decisions. Successful students connect with CECS early in their academic career and take full advantage of the career planning and job search services offered. CECS will help students to discern "what to do with their degree". As well, the CECS job posting service, Recruit Guelph, provides online job postings including full-time, part-time, contract, seasonal, summer and internships. Job & Career Fairs and employer networking events also provide exposure to the working world. Please refer to www.recruitguelph.ca for more information.

Admission Information

Normally students are admitted to a Co-operative Education program directly from high school in the Fall semester through Admission Services. For a complete listing of University of Guelph admission requirements refer to www.uoguelph.ca/admissions.

Some programs may admit a small number of in-course students after first or second semester. Refer to the schedule of dates in the Undergraduate Calendar for in-course application deadlines. The decision to admit an in-course student is dependent upon space in the program, the grades of the student, the approved Academic & Work Sequence Agreement, and any other information relevant to the program.

Eligibility

High school students must have a minimum average of 80% to apply to the co-op program. Once accepted to the University of Guelph, the student must maintain a 70% cumulative average in the first 2 semesters (full-time study) in order to continue in the co-op program.

Transfer students must meet normal admission requirements, as well as complete one academic semester at Guelph and achieve a minimum 70% cumulative average prior to participating in the co-op employment process. An academic and work schedule must also be approved prior to the student being accepted into the co-op program.

Continuation of Study

Students are required to meet a continuation requirement at the end of semester two. Students will be allowed to continue in the co-op program if their cumulative average, over 4.0 credits, is 70% or higher after two full-time academic semesters. * Students are also required to meet the conditions for continuation of study for their degree program as listed in the Undergraduate Calendar. In addition, all students must satisfactorily complete COOP*1100 - Introduction to Co-operative Education in the semester scheduled.

Co-op students are required to be registered full-time for the duration of their program as outlined in the schedule of studies listed in the Undergraduate Calendar. Co-op students are also required to meet other conditions, (e.g. satisfactory co-op work reports, work performance evaluations and Learning Goals) in order to continue in the co-op program. Complete conditions for continuation of study for a co-op program are outlined in the Policy Agreement for Student Involvement in Co-operative Education. The complete policy can be viewed at https://www.recruitguelph.ca/cecs/sites/recruitguelph.ca.cecs/files/Co-opPolicyAgreement.pdf .

* Students with an approved accommodation plan for a related disability may require additional semesters to complete this requirement.

Release of Academic Information

By applying to the Co-op program, students grant permission to the Office of Registrarial Services to release to Co-operative Education & Career Services their University of Guelph transcript and any transcript from other post-secondary institutions that may be part of the Academic Record held by the Office of Registrarial Services.

Students also grant permission to Co-operative Education & Career Services to release their resumes, cover letters and any transcripts released by the Office of Registrarial Services to prospective employers to whom the students are applying. Employment information, the Co-op Work Performance Evaluation grade, and the Co-op Work Report Evaluation grade will appear on the student's official academic transcript for each co-op work term accepted by the student.

Procedures for Work Semester Reports

A Co-op Work Report is required for each co-op work term in which the student is registered. Co-op Work Reports are graded by the Co-op Faculty Advisor and must be submitted to the Co-op Faculty Advisor according to the deadline indicated in the Undergraduate Calendar. Students completing two consecutive co-op work terms with the same employer should consult with their Co-op Faculty Advisor regarding co-op work report requirements for eight-month co-op work terms. A grade of Outstanding, Very Good, Good, Satisfactory, or Unsatisfactory will appear on the student's Academic Record.

A student who does not submit a Co-op Work Report will be required to withdraw from Co-op and a grade of "Required to Withdraw from Co-op" will be assigned to the student's official transcript. A student who receives an Unsatisfactory Co-op Work Report Evaluation will be given one opportunity to make revisions and resubmit the co-op report during the semester following the co-op work term. Students who are resubmitting a co-op work report within the prescribed timeline will not be eligible to proceed to the next employment process until receiving a grade of Satisfactory or higher on the report. If, upon resubmission, the co-op work report evaluation remains Unsatisfactory, the student will be required to withdraw from Co-op and will be transferred to the regular program.

Confidential Co-op Work Reports are not permitted.

Conditions for Graduation

In order to graduate, co-op students must follow the conditions for graduation for their degree program as outlined in the Undergraduate Calendar. In addition, co-op students must receive evaluations of Good or higher in all but one Work Performance Evaluations and an evaluation of Satisfactory or higher in all Co-op Work Report Evaluations. Students must also have paid all co-op fees, including eight academic semesters and all co-op work terms, prior to receiving co-op certification.

Students wanting to graduate with less than the required number of co-op work terms must submit a request in writing to CECScontact. As the University of Guelph co-op program is accredited by the The Canadian Association for Co-operative Education (CAFCE), standardized guidelines regarding co-op work terms will be followed at all times.

Co-op Fees

As determined by the University of Guelph Board of Governors, involvement in the Co-op Program requires Co-op students to pay a fee for a maximum of 8 academic semesters and all registered co-op work terms (see Section VI--Schedule of Fees). It is important to note that co-op fees are amortized over the entire program and not related to the specific services received in any one term.

Fees will be paid each academic and co-op work term semester and will be billed to the student's financial account. If registered for an academic course during a co-op work term both the academic and co-op work term semester fees will be billed. If registered in an academic course during an OFF semester the co-op academic fee will be charged. In both cases the co-op academic fee will count towards the maximum of 8 academic fees.

If a student does not follow the prescribed schedule in the Undergraduate Calendar, this may result in an under or over payment on the student's account. To resolve these issues, the student is required to contact CECS. Students are responsible for paying all other University Fees as outlined in the Undergraduate Calendar.

Withdrawing from Co-op after accepting a second co-op work term will result in the student being responsible for paying the balance of their remaining co-op academic fees at the time of withdrawal.

Withdrawing from Co-op after accepting an eight or twelve month co-op work term will result in the student being responsible for paying the balance of their remaining co-op academic fees at the time of withdrawal.

Schedule of Studies

Students are required to follow the schedule of studies as outlined in the Undergraduate Calendar. Where a program has two co-op stream options, students will be defaulted to an established "Stream A".

If, under exceptional circumstances, the schedule cannot be followed, the student must obtain written approval of an alternative Co-op Aacademic/ & Wwork Ssequence from the assigned Co-op Faculty Advisor and/or Program Counsellor and submit the form to Co-operative Education & Career Services for final approval.

University of Guelph-Humber

For University of Guelph-Humber programs please refer to http://www.guelphhumber.ca.

Associate Diploma Programs

For Associate Diploma Programs please refer to the Associate Diploma Program Calendar, available on the world wide web at http://www.uoguelph.ca/diploma_calendar/.