

## 2006-2007 Undergraduate Calendar

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2006-2007 academic year, including the Summer Semester 2006, the Fall Semester 2006 and the Winter Semester 2007.

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

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Revision Information:	
February 1, 2006	Initial Publication
March 14, 2006	Second Publication
August 22, 2006	Third Publication
January 23, 2007	Fourth Publication



# Disclaimer

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## University of Guelph 2006

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The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2006-2007 academic year, including the Summer Semester 2006, the Fall Semester 2006 and the Winter Semester 2007.

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

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Published by: Undergraduate Program Services

Editor: A.H. Goody, Associate Registrar

Assistant Editor: S.Holley, Program Co-ordinator

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## X. Degree Programs

### Specializations and Their Degrees

Subject Area		Honours			General	Co-op
		Major	Minor	Area of Emphasis		
Agricultural Business	AGBU	BComm				BComm
Agricultural Economics	AGEC	BA BSAG				
Agriculture	AGRS	BSAG				
Agroecosystem Management	AGMN	BSAG				
Agronomy	AGRO	BSAG				
Animal Biology	ABIO	BSC				
Animal Science	ANSC	BSAG				
Anthropology	ANTH	BA	BA BAS		BA	
Applied Human Nutrition	AHN	BASc				
Applied Mathematics & Statistics	APMS					BSC
Applied Pharmaceutical Chemistry	APPC					BSTC
Art History	ARTH	BA	BA BAS			
Arts and Sciences		BAS				
Atmospheric Resources	AR			BSES		
Art Theory and Criticism	ATC		BA BAS			
Biochemistry	BIOC	BSC	BAS BSC			BSC
Biological Chemistry	BCHM	BSC				
Biological Engineering	BENG	BSEN				BSEN
Biological Science	BIOS	BSC			BSC	
Biology	BIOL		BAS BSC			
Bio-Medical Science	BIOM	BSC				
Biomedical Toxicology	BTOX	BSC				BSC
Biophysical Environment & Development	BED			BAH.ID		
Biophysics	BIOP	BSC				BSC
Biotechnology	BIOT		BAS BSC			
Biotic Systems	BS			BSES		
Business Administration	BADM		BA BAS BSC			
Chemical Physics	CHPY	BSC				BSC
Chemistry	CHEM	BSC	BAS BSC			BSC
Child, Youth and Family	CYF	BASC				BASC
Classical Languages	CLAL	BA	BA BAS			
Classical Studies	CLAS	BA	BA BAS			
Cognitive Neuropsychology	CGNR		BA BAS			
Computing		BCOMP	BCOMP		BCOMP	BCOMP
Computing & Information Science	CIS	BA BSC	BA BAS BSC		BA	BA BSC
Criminal Justice & Public Policy	CJPP	BA	BA BAS			
Crop Ecology	CE			BSES		

Developmental Psychology	DPSY		BA BAS			
Development & Stewardship	DS			BSES		
Earth & Atmospheric Science	EAAS	BSES				BSES
Earth Surface Science	ESS	BSC				
Ecology	ECOL	BSC BSES	BAS BSC			BSES
Economic & Business Development	EBD			BAH.ID		
Economics	ECON	BA	BA BAS		BA	BA
Educational Psychology	EPSY		BA BAS			
Engineering Systems & Computing	ESC	BSES				BSES
English	ENGL	BA	BA BAS		BA	
Environmental Administration	EA			BSES		
Environmental Biology	ENVB	BSc				
Environmental Degradation	ED			BSES		
Environmental Economics & Policy	EEP	BSES				BSES
Environmental Engineering	ENVE	BSEN	BSEN			BSEN
Environmental Geography	ENVG	BSES				BSES
Environmental Impact Assessment	EIA			BSES		
Environmental Management in the U.S.	EMUS			BSES		
Environmental Management	ENVM	BBRM				
Environmental Monitoring & Analysis	EMA	BSES				BSES
Environmental Protection	ENVP	BSES				BSES
Environmental Quality	EQ			BSCH.ENVB		
Environmental Studies	ENVS		BA BAS			
Environmental Toxicology	ETOX	BSC				BSC
Environmetrics	ENVM	BSES				BSES
European Culture & Civilization	ECC			BAH.EURS		
European Business Studies	EBS			BAH.EURS		
European Studies	EURS	BA				
Experimental Ecology	EECO			BSCH.ECOL		
Family & Child Studies	FCS		BA BAS			
Finance	FIN			BCOMM		
Food Engineering	FENG		BSEN			
Food Science	FOOD	BSC	BAS BSC			BSC
Forest Science	FORS		BAS BSC			
French Studies	FREN	BA	BA BAS		BA	
Functional Foods & Nutraceuticals	FFAN		BAS BSC			
Gender and Development	GAD			BAH.ID		
General Ecology	GECO			BSCH.ECOL		
Genetics	GEN		BAS			
GIS & Environmental Analysis	GIS		BAS BSC			
Geography	GEOG	BA	BA BAS		BA	
Geology	GEOL		BAS BSC			
German	GERM		BA BAS			

Gerontology	GERN	BASC				BASC
Historical Perspective in Development	HPD			BAH.ID		
History	HIST	BA	BA BAS		BA	
Horticultural Science	HORT	BSAG				
Horticulture Management	HM	BBRM				
Hotel & Food Administration	HAFA	BComm				BComm
Human Kinetics	HK	BSC				
Human Resources Management	HRM	BComm				
Individual Studies	IS	BA				
Industry	IND			BCOMM		
Information Systems & Human Behaviour	ISHB	BA				
International Development	ID	BA	BA BAS		BA	
Interpretive Ecology	IE			BSCH.ECOL		
Italian	ITAL		BA BAS			
Land Resources	LR			BSES		
Landscape Architecture		BLA				
Landscape Ecology	LE			BSES		
Latin American Studies	LAS			BAH.ID		
Marine & Freshwater Biology	MFB	BSC				
Management Economics in Industry & Finance	MEIF	BComm				BComm
Marketing Management	MKMN	BComm	BA BAS			BComm
Mathematical Economics	MAEC	BA				
Mathematical Modelling & Risk Assessment	MMRA			BSES		
Mathematical Science	MSCI		BAS BSC			
Mathematics	MATH	BA BSC	BA BAS BSC		BA	
Microbiology	MICR	BSC	BAS BSC			BSC
Molecular Biology & Genetics	MBG	BSC	BSC			
Museum Studies	MS		BA BAS			
Music	MUSC	BA	BA BAS		BA	
Natural Resources Management	NRM	BSES				BSES
Neuroscience	NEUR		BAS BSC			
Nutritional Science	NSCI		BAS BSC			
Nutritional & Nutraceutical Sciences	NANS	BSC				
Organic Agriculture	OAGR	BSAG				
Organizational Behaviour	OBEH		BA BAS			
Philosophy	PHIL	BA	BA BAS		BA	
Physical Science	PSCI	BSC			BSC	
Physics	PHYS	BSC	BAS BSC			BSC
Physics & Technology	PHTC					BSTC
Plant Biology	PBIO	BSC	BAS BSC			
Plant Biotechnology	PBTC	BSC				
Plant Protection	PP			BSCH.ENVB		
Political Economy & Administrative Change	PEAC			BAH.ID		



Political Science	POLS	BA	BA BAS		BA	
Psychology	PSYC	BA BSC	BSC			BA
Public Management	PMGT	BComm				BComm
Real Estate & Housing	REH	BComm				BComm
Resource Conservation	RC			BSCH.ECOL		
Rural & Agricultural Development	RAD			BAH.ID		
Rural & Development Sociology	RDS	BA				
Rural Extension Studies	RES		BA BAS			
Social Psychology	SPSY		BA BAS			
Sociology	SOC	BA	BA BAS		BA	
Spanish	SPAN	BA	BA BAS		BA	
Statistics	STAT	BA BSC	BA BAS BSC		BA	
Studio Art	SART	BA	BA BAS			
Theatre Studies	THST	BA	BA BAS		BA	
Theoretical Physics	THPY	BSC				
Tourism Management	TMGT	BComm				
Veterinary Medicine		DVM				
Visual Arts of the Americas	VAA		BA BAS			
Water Resources	WR			BSES		
Water Resources Engineering	WRE	BSEN				BSEN
Wild Life Biology	WLB	BSC				
Women's Studies	WMST	BA	BA BAS		BA	
Zoology	ZOO	BSC	BAS BSC			

## 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:

Applied Human Nutrition  
Child, Youth and Family  
Gerontology

Co-operative Education is available in the following programs:

Child, Youth and Family  
Gerontology

Given the professional and applied character of the program, there are no minors associated with the degree. 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 Human Development 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. Students in the B.A.Sc. program may repeat any failed course only once. Failure to successfully complete a required (core) credit on the second attempt results in the student not being permitted to continue in his/her major and/or program.

### 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 or Continue on Probation

### 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.

## 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 14.00 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 departmental 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
HTM*2700	[0.50]	Introductory Foods
MICR*1020	[0.50]	Fundamentals of Applied Microbiology
PSYC*1200	[0.50]	Dynamics of Behaviour
SOC*1100	[0.50]	Sociology

Note: Students who do not have standing in OAC Biology, or equivalent, must substitute BIOL\*1020 for SOC\*1100 in Semester 1. Semester 2 must include SOC\*1100 if this substitution is made.

#### Semester 2

CHEM*1050	[0.50]	General Chemistry II
FRHD*1020	[0.50]	Couple and Family Relationships
NUTR*1010	[0.50]	Nutrition and Society
PSYC*1100	[0.50]	Principles of Behaviour

0.50 electives

#### Semester 3

BIOC*2580	[0.50]	Introductory Biochemistry
HTM*2030	[0.50]	Control Systems in the Hospitality and Tourism Industry
NUTR*2050	[0.50]	Family and Community Nutrition
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

BIOC*3560	[0.50]	Structure and Function in Biochemistry
NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*2090	[0.50]	Introductory Applied Statistics II

1.00 electives or restricted electives

#### Semester 5\*

BIOM*3100	[0.50]	Mammalian Physiology I
FRHD*3070	[0.50]	Research Methods - Family Studies

1.50 electives or restricted electives

\* students planning to apply for a dietetic internship must take HTM\*3090 in Semester 5 in place of elective or restricted elective

#### Semester 6

BIOM*3110	[0.50]	Mammalian Physiology II
FRHD*3400	[0.50]	Communication and Counselling Skills
HTM*3000	[0.50]	Human Resources Management
NUTR*3040	[0.50]	Clinical Nutrition I

0.50 electives or restricted electives

Note: HTM\*3000 may be taken in Semester 7.

#### Semester 7

NUTR*4010	[0.75]	Nutritional Assessment
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NUTR*4040	[0.75]	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
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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
FOOD*2410	[0.50]	Introduction to Food Processing
FOOD*2420	[0.50]	Introduction to Food Microbiology
FOOD*3010	[0.50]	Food Chemistry
FOOD*3020	[0.50]	Food Chemistry Laboratory
FOOD*3230	[0.75]	Food Microbiology
FOOD*3700	[0.50]	Sensory Evaluation of Foods
HTM*2740	[0.50]	Cultural Aspects of Food
HTM*3780	[0.50]	Economics of Food Usage

### Electives

There are 4.50 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. Departmental 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.

Courses in different departments which complement the major and which may be taken as electives include:

AGR*1250	[0.50]	Agrifood System Trends & Issues
MBG*1000	[0.50]	Genetics and Society
MCS*1000	[0.50]	Introductory Marketing
NUTR*3330	[0.50]	Micronutrients, Phytochemicals and Health
NUTR*4200	[0.50]	Nutrition and Immune Function
NUTR*4210	[0.50]	Nutrition, Exercise and Energy Metabolism
NUTR*4850	[0.50]	Field Experience in Nutrition Education
PHIL*2030	[0.50]	Philosophy of Medicine

## 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 graduate as 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. 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 14.50 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 departmental 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 departmental advisor, take some courses in alternative semesters.

## Major

### Semester 1

MBG*1000	[0.50]	Genetics and Society
PSYC*1200	[0.50]	Dynamics of Behaviour

One of:

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

One of:

ENGL*1200	[0.50]	Reading the Contemporary World
FREN*1200	[0.50]	French Language I

0.50 electives

Note: BIOL\*1020 must be taken in Semester 1 if the student does not have OAC Biology or equivalent.

### Semester 2

FRHD*1020	[0.50]	Couple and Family Relationships
FRHD*2260	[0.50]	Infant Development
NUTR*1010	[0.50]	Nutrition and Society
PSYC*1100	[0.50]	Principles of Behaviour

0.50 electives

### Semester 3

BIOM*2000	[0.50]	Concepts of Physiology
FRHD*2100	[0.50]	Development of Human Sexuality
FRHD*2270	[0.50]	Development in Early and Middle Childhood
STAT*2080	[0.50]	Introductory Applied Statistics I

0.50 electives

### Semester 4

FRHD*2060	[0.50]	Adult Development and Aging
FRHD*2110	[0.50]	Exceptional Children and Youth
FRHD*2280	[0.50]	Adolescent Development
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

### Semester 5

FRHD*3040	[0.50]	Parenting: Research and Applications
FRHD*3070	[0.50]	Research Methods - Family Studies
FRHD*3150	[0.50]	Strategies for Behaviour Change
FRHD*3200	[1.00]	Practicum - Child, Youth and Family I

### Semester 6

FRHD*3120	[0.50]	Families in Canadian Context
FRHD*3180	[0.50]	Observation and Assessment
FRHD*3400	[0.50]	Communication and Counselling Skills

1.00 electives

### Semester 7

FRHD*4170	[1.00]	Practicum--Child, Youth and Family II
FRHD*4310	[0.50]	Professional Issues

1.00 electives or restricted electives

### Semester 8

FRHD*4320	[0.50]	Social Policies for Children, Youth and Families
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2.00 electives or restricted electives

### Restricted Electives

In addition to the 14.50 required credits, 0.50 must be taken from the Department of Family Relations and Applied Nutrition at the 4000 level.

### Electives - Recommended and Program Options

#### Child and Youth Services

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

FRHD*3090	[0.50]	Child and Family Poverty
FRHD*3190	[0.50]	Administration of Programs for Children and Youth
FRHD*4020	[0.50]	Family Theory
FRHD*4180	[0.50]	Assessment and Intervention
FRHD*4200	[0.50]	Issues in Human Sexuality
FRHD*4400	[0.50]	Youth, Risk and Resilience
FRHD*4810	[0.50]	Thesis I
FRHD*4910	[1.00]	Thesis II
NUTR*2050	[0.50]	Family and Community Nutrition
PSYC*3440	[0.50]	Cognitive Development
PSYC*3450	[0.50]	Social and Personality Development
PSYC*3710	[0.50]	Psychology of Learning Difficulties and Disabilities I
PSYC*3720	[0.50]	Psychology of Learning Difficulties and Disabilities II
PSYC*3850	[0.50]	Intellectual Disabilities

REXT*3100	[0.50]	Teaching and Learning in Non-Formal Education
SOAN*2290	[0.50]	Identities and Cultural Diversity
SOC*1500	[0.50]	Crime and Criminal Justice
SOC*2070	[0.50]	Social Deviance
SOC*3040	[0.50]	Sociology of Social Welfare
SOC*3710	[0.50]	Young Offenders

### Early Childhood Education

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

DRMA*2400	[0.50]	Theatre for Young Audiences
ENGL*2740	[0.50]	Children's Literature
FRHD*3090	[0.50]	Child and Family Poverty
FRHD*3190	[0.50]	Administration of Programs for Children and Youth
FRHD*4180	[0.50]	Assessment and Intervention
FRHD*4210	[0.50]	Senior Seminar in Early Education and Care
FRHD*4810	[0.50]	Thesis I
FRHD*4910	[1.00]	Thesis II
NUTR*2050	[0.50]	Family and Community Nutrition
PSYC*3710	[0.50]	Psychology of Learning Difficulties and Disabilities I
PSYC*3720	[0.50]	Psychology of Learning Difficulties and Disabilities II
PSYC*3850	[0.50]	Intellectual Disabilities
SOAN*2290	[0.50]	Identities and Cultural Diversity

### Education - Primary / Junior / Intermediate

Graduates interested in elementary school teaching need an additional year of 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.

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 13.5 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:

#### Semester 1 - Fall

MBG*1000	[0.50]	Genetics and Society
PSYC*1200	[0.50]	Dynamics of Behaviour

One of:

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

One of:

ENGL*1200	[0.50]	Reading the Contemporary World
FREN*1200	[0.50]	French Language I

0.50 electives

Note: BIOL\*1020 must be taken in Semester 1 if the student does not have OAC Biology or equivalent.

#### Semester 2 - Winter

FRHD*1020	[0.50]	Couple and Family Relationships
FRHD*2260	[0.50]	Infant Development
NUTR*1010	[0.50]	Nutrition and Society
PSYC*1100	[0.50]	Principles of Behaviour

0.50 electives

#### Semester 3 - Fall

BIOM*2000	[0.50]	Concepts of Physiology
FRHD*2060	[0.50]	Adult Development and Aging
FRHD*2100	[0.50]	Development of Human Sexuality
FRHD*2270	[0.50]	Development in Early and Middle Childhood
STAT*2080	[0.50]	Introductory Applied Statistics I

#### Semester 4 - Winter

FRHD*2110	[0.50]	Exceptional Children and Youth
FRHD*2280	[0.50]	Adolescent Development
FRHD*3120	[0.50]	Families in Canadian Context
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

#### Summer Semester

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

COOP*2000	[0.00]	Co-op Work Term II
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#### Semester 5 - Winter

FRHD*3150	[0.50]	Strategies for Behaviour Change
FRHD*3180	[0.50]	Observation and Assessment
FRHD*3200	[1.00]	Practicum - Child, Youth and Family I
FRHD*4320	[0.50]	Social Policies for Children, Youth and Families

#### Semester 6 - Summer

FRHD*3400	[0.50]	Communication and Counselling Skills
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2.00 electives

#### Semester 7 - Fall

FRHD*3040	[0.50]	Parenting: Research and Applications
FRHD*3070	[0.50]	Research Methods - Family Studies
FRHD*4310	[0.50]	Professional Issues

1.00 electives or restricted electives

#### Winter Semester

COOP*3000	[0.00]	Co-op Work Term III
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#### Semester 8 - Summer

2.50 electives

#### Restricted Electives

0.50 restricted electives at the 4000 level.

### Gerontology (GERN)

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

The Gerontology major is designed to provide students with an appreciation of the aged and the aging experience from social, psychological, and biological perspectives. The major places this study within the broader framework of life span human development and dynamics of functioning in a variety of social contexts. A focus on basic knowledge of aging as well as the application of that knowledge is reflected in required courses and suggested electives.

Students enrolled in the Gerontology major study aging within the perspective of the family. This approach provides the student with a broad, applied social science education as well as a fully integrated package of aging related courses. Students graduate with a degree leading to a variety of professional career opportunities in the human service, education, mental health, life skills support and counselling, and social policy fields. Our graduates also may pursue graduate study in family studies, human development, or one of the base social science disciplines. All students in the Gerontology Major must complete a minimum of 20.00 credits including the core of 14.50 required credits as outlined in the Schedule of Studies. In addition to these core requirements, there are many courses in various departments throughout the University which may be taken as electives.

### Major

#### Semester 1

COST*1800	[0.50]	Housing and Community Planning
FRHD*1010	[0.50]	Human Development
PSYC*1200	[0.50]	Dynamics of Behaviour
SOC*1100	[0.50]	Sociology

One of:

ENGL*1200	[0.50]	Reading the Contemporary World
FREN*1200	[0.50]	French Language I

#### Semester 2

FRHD*1020	[0.50]	Couple and Family Relationships
FRHD*2060	[0.50]	Adult Development and Aging
NUTR*1010	[0.50]	Nutrition and Society
PSYC*1100	[0.50]	Principles of Behaviour

0.50 electives\*

\* elective in Semester 2 must be BIOL\*1020 if the student does not have standing in OAC

Biology or equivalent

### Semester 3

NUTR*2050	[0.50]	Family and Community Nutrition
POLS*1400	[0.50]	Issues in Canadian Politics
STAT*2080	[0.50]	Introductory Applied Statistics I

One of:

BIOM*2000	[0.50]	Concepts of Physiology
MBG*1000	[0.50]	Genetics and Society
PSYC*2410	[0.50]	Behavioural Neuroscience I

0.50 electives

### Semester 4

STAT*2090	[0.50]	Introductory Applied Statistics II
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One of:

CIS*1000	[0.50]	Introduction to Computer Applications
CIS*1200	[0.50]	Introduction to Computing
MCS*2020	[0.50]	Information Management

1.50 electives

### Semester 5

FRHD*3060	[0.50]	Principles of Social Gerontology
FRHD*3070	[0.50]	Research Methods - Family Studies
FRHD*3400	[0.50]	Communication and Counselling Skills

1.00 electives

### Semester 6

FRHD*3120	[0.50]	Families in Canadian Context
HTM*2200	[0.50]	Organizational Behaviour I
HTM*3000	[0.50]	Human Resources Management

1.00 electives

### Semester 7

FRHD*4061	[1.00]	Family and Community: Field Placement
FRHD*4160	[0.50]	Family Relations in Gerontology
FRHD*4190	[0.50]	Assessment in Gerontology
FRHD*4250	[0.50]	Aging and Health

### Semester 8

FRHD*4062	[1.00]	Family and Community: Field Placement
FRHD*4260	[0.50]	Social Policy and Gerontology

1.00 electives

## Gerontology (Co-op) (GERN:C)

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

Students in the Co-op program must also complete COOP\*1100 in the second semester.

### Summer Semester

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

FRHD*3060	[0.50]	Principles of Social Gerontology
FRHD*3070	[0.50]	Research Methods - Family Studies

1.50 electives

### Winter Semester

COOP*2000	[0.00]	Co-op Work Term II
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### Semester 6 - Summer

FRHD*3400	[0.50]	Communication and Counselling Skills
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2.00 electives

### Fall Semester

COOP*3000	[0.00]	Co-op Work Term III
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### Semester 7 - Winter

FRHD*3120	[0.50]	Families in Canadian Context
FRHD*4260	[0.50]	Social Policy and Gerontology
HTM*2200	[0.50]	Organizational Behaviour I
HTM*3000	[0.50]	Human Resources Management

0.50 electives

### Semester 8 - Fall

FRHD*4160	[0.50]	Family Relations in Gerontology
FRHD*4190	[0.50]	Assessment in Gerontology
FRHD*4250	[0.50]	Aging and Health

1.00 electives

## Restricted Electives and Electives

As for the regular program.

## 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.**

In fulfilling distribution requirements a) and b) students must in semester 1 choose 2 courses from 2 different schools or departments in the College of Arts and 2 courses from 2 of the following departments in the College of Social and Applied Human Sciences: Economics, Geography, Political Science, Psychology, Sociology and Anthropology.

Students entering the B.A. program with advanced standing must complete the distribution requirements a) and b) as soon as possible after entrance to the program. Requirement c) need not be completed immediately but is a graduation requirement.

Note: Courses taken to satisfy the distribution requirements may also be counted toward a specialization in the general or honours program.

### 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 Computing and Information Science, 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.

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

- A. A minimum of 1.50 credits over at least 2 different subject areas in the College of Arts:

- ARTH Art History
- 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
- SART Studio Art
- SPAN Spanish Studies
- THST Theatre Studies
- WMST Women's Studies

- B. A minimum of 1.50 credits over at least two of the following subject areas in the College of Social and Applied Human 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

- C. 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 OAC credit in a specific area):

BIOL*1020	[0.50]	Introduction to Biology
BIOL*1120	[0.50]	Environment and Human Health
BIOM*2000	[0.50]	Concepts of 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
ENVB*2210	[0.50]	Introductory Apiculture
GEOG*1350	[0.50]	Earth: Hazards and Global Change
GEOL*1100	[0.50]	Principles of Geology
MATH*1050	[0.50]	Introduction to Mathematical Modeling
MBG*1000	[0.50]	Genetics and Society
MCS*2020	[0.50]	Information Management
MET*1000	[0.50]	The Atmospheric Environment
MICR*1010	[0.50]	The Microbial World
PHYS*1600	[0.50]	Contemporary Astronomy
PHYS*1810	[0.50]	Physics of Music
SOIL*2010	[0.50]	Soil Science
ZOO*1500	[0.50]	Humans in the Natural World - a Zoological Perspective

Courses available for students with adequate preparation (e.g. Grade 12 in the discipline or its equivalent):

BIOL*1030	[0.50]	Biology I
BIOL*1040	[0.50]	Biology II
CHEM*1040	[0.50]	General Chemistry I
CIS*1XXX	[0.50]	Any CIS course at the 1000 level
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
HK*2XXX	[0.00]	Any HK course at the 2000 level
MATH*1XXX	[0.00]	Any MATH course at the 1000 level
MET*2030	[0.50]	Meteorology and Climatology
MUSC*1090	[0.50]	Physics of Music
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 major or minor may be courses taken in fulfillment of the first major where required courses are the same. Double counting is not allowed in the General Program.

#### 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:

- earn 15.00 credits. These must include courses that fulfill the distribution requirements (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 credits requirement.

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), the Department of Computing and Information Science, or the Department of Mathematics and Statistics.

- 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:

- earn 20.00 credits. These must include courses that fulfill the distribution requirements (see below), 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.
- 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.
- 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.

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.

Honours B.A. students, except those doing a major in Computing and Information Science, Mathematics or Statistics, must take a minimum of 12.00 credits from either or both of the departments in the College of Arts and the departments of Economics, Geography, Political Science, Psychology, Sociology and Anthropology (in the College of Social and Applied Human Sciences).

### Semester One Requirements

Students in the General and Honours Programs must take:

#### Semester 1

1.00 credits from the following:

Art History - ARTH\*1220, ARTH\*1510

Classical Studies - CLAS\*1000

English - ENGL\*1080, ENGL\*1200

European Studies - EURO\*1050, EURO\*1200

French Studies - FREN\*1000, FREN\*1200

German Studies - GERM\*1100, GERM\*1110, GERM\*2490 (OAC Required)

Greek - GREK\*1100

History - HIST\*1010, HIST\*1150, HIST\*1250

Italian Studies - ITAL\*1060

Latin - LAT\*1100

Music - MUSC\*1060, MUSC\*1180, MUSC\*1500

Philosophy - PHIL\*1000, PHIL\*1010, PHIL\*1050

Studio Art - SART\*1050, SART\*1060

Spanish Studies - SPAN\*1100, SPAN\*1110

Theatre Studies - THST\*1040, THST\*1200

Women's Studies - WMST\*1000

PLUS

1.00 credits from the following:

Anthropology - ANTH\*1150

Economics - ECON\*1050

Geography - GEOG\*1200, GEOG\*1220, GEOG\*1300

Political Science - POLS\*1150, POLS\*1400, POLS\*1500

Psychology - PSYC\*1100, PSYC\*1200

Sociology - SOC\*1100, SOC\*1500

Women's Studies - WMST\*1000

### 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 departmental advisor or the Director of the School of Languages and Literatures.

### Special Study Option

#### London Study Semester

A special program of studies designed to make use of the uniquely rich resources of London, England, is offered as a regular part of the B.A. program every Fall semester. The program is supervised by a faculty member from Guelph who directs the studies in London and supervises correspondence with faculty in Guelph. Courses in London are of 2 kinds: London based courses and correspondence courses. London based courses in music, theatre and fine art are given by British tutors, and the coordinator offers courses in his/her area of interest. Students are also permitted to arrange correspondence courses to meet their particular needs. Students wishing to apply for the London Semester should have good academic standing and should have completed at least 2 semesters at the University of Guelph at the time of application; although preference will be given to those with a cumulative average of 70% or above, all applications will be given careful consideration. More detailed information about academic requirements, bursaries, courses, etc. can be obtained from the B.A. Program Counselling Office, Room 130 in the MacKinnon Building.

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

#### General Program Areas of Concentration

Anthropology

Computing and Information Science

Economics

English

French Studies

Geography

History

International Development

Mathematics

Music

Philosophy

Political Science

Sociology

Spanish

Statistics

Theatre Studies

Women's Studies

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

#### Honours Program Majors

Agricultural Economics

Anthropology

Art History

Classical Languages

Classical Studies

Computing and Information Science\*

Criminal Justice and Public Policy

Economics\*

English  
 European Studies  
 French Studies  
 Geography  
 History  
 Individual Studies  
 Information Systems and Human Behaviour  
 International Development  
 Mathematical Economics  
 Mathematics  
 Music  
 Philosophy  
 Political Science  
 Psychology\*  
 Rural and Development Sociology  
 Sociology  
 Spanish  
 Statistics  
 Studio Art  
 Theatre Studies  
 Women's 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  
 Art Theory and Criticism  
 Business Administration  
 Classical Languages  
 Classical Studies  
 Cognitive Neuropsychology  
 Computing and Information Science  
 Criminal Justice and Public Policy  
 Developmental Psychology  
 Economics  
 Educational Psychology  
 English  
 Environmental Studies  
 European Culture and Civilization  
 Family and Child Studies  
 French Studies  
 Geography  
 German  
 History  
 International Development  
 Italian  
 Marketing Management  
 Mathematics  
 Museum Studies  
 Music  
 Organizational Behaviour  
 Philosophy  
 Political Science  
 Rural Extension Studies  
 Social Psychology  
 Sociology  
 Spanish  
 Statistics  
 Studio Art  
 Theatre Studies  
 Visual Arts of the Americas  
 Women's Studies

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

## Agricultural Economics (AGEC)

### Department of Agricultural Economics and Business, Ontario Agricultural College

The study of agricultural economics prepares students for careers as economic analysts in the agrifood sector and in public agencies. In addition, this major provides excellent background for those students planning to do graduate work in agricultural and resource economics and other fields of applied economics.

Agricultural Economics is offered as a major in the honours program. A detailed program planning guide is available in the Department of Agricultural Economics and Business.

### Major (Honours Program)

A minimum of 9.50 credits, consisting of the 15 courses specified below plus 4 restricted electives, is required, including:

AGEC*2220	[0.50]	Financial Accounting
AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGEC*3030	[0.50]	The Firm and Markets
AGEC*4000	[0.50]	Agricultural and Food Policy
AGEC*4500	[0.50]	Decision Science
AGR*1100	[0.50]	Introduction to the Agrifood Systems
AGR*1250	[0.50]	Agrifood System Trends & Issues
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*2770	[0.50]	Introductory Mathematical Economics
ECON*3600	[0.50]	Macroeconomics in an Open Economy
ECON*3710	[0.50]	Advanced Microeconomics
ECON*3740	[0.50]	Introduction to Econometrics

Four additional courses, at least three of which must be in agricultural economics and at least one of which must be at the 4000 level, chosen from the following list:

AGEC*2230	[0.50]	Management Accounting
AGEC*4210	[0.50]	World Agriculture and Economic Development
AGEC*4220	[0.50]	Advanced Farm Management
AGEC*4240	[0.50]	Futures and Options Markets
AGEC*4290	[0.50]	Land Economics
AGEC*4310	[0.50]	Resource Economics
ECON*3510	[0.50]	Money, Credit and the Financial System
ECON*3530	[0.50]	Industrial Organization
ECON*3580	[0.50]	Economics of Regulation
ECON*3610	[0.50]	Public Economics
ECON*3620	[0.50]	International Trade
ECON*3720	[0.50]	History of the World Economy Since 1850

**Notes:** Prerequisites for the above courses will require students to take MATH\*1000, MATH\*1080, or MATH\*1200 during their first year of study. 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.

## 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.

Anthropology credit may also be given for some Sociology courses, with the exception of SOC\*3840 through SOC\*4910 inclusive. See a Sociology/Anthropology Faculty Advisor for approval of substitutions.

### Area of Concentration (General Program)

A minimum of 6.00 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]	History of Anthropological Thought
ANTH*3770	[0.50]	Kinship and Social Organization
SOAN*2120	[0.50]	Introductory Methods

One of:

LING*1000	[0.50]	Introduction to Linguistics
MUSC*2110	[0.50]	Music of the Circum-Atlantic and the Americas
MUSC*2200	[0.50]	Music of the Near and Far East
PHIL*2100	[0.50]	Critical Thinking

1.50 additional credits in ANTH

1.00 additional credits in SOAN

Note: 1.50 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]	History of Anthropological Thought
ANTH*3770	[0.50]	Kinship and Social Organization
ANTH*4700	[0.50]	Issues in Contemporary Anthropological Theory
LING*1000	[0.50]	Introduction to Linguistics
SOAN*2120	[0.50]	Introductory Methods
SOAN*3070	[0.50]	Qualitative and Observational Methods

One of:

MUSC*2110	[0.50]	Music of the Circum-Atlantic and the Americas
MUSC*2200	[0.50]	Music of the Near and Far East
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 6.00 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]	History of Anthropological Thought
ANTH*3770	[0.50]	Kinship and Social Organization
SOAN*2120	[0.50]	Introductory Methods

One of:

LING*1000	[0.50]	Introduction to Linguistics
MUSC*2110	[0.50]	Music of the Circum-Atlantic and the Americas
MUSC*2200	[0.50]	Music of the Near and Far East
PHIL*2100	[0.50]	Critical Thinking

1.50 additional credits in ANTH

1.00 additional credits in SOAN

Note: 1.50 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 in each of three areas of focus in the program: Western Art; Visual Arts of the Americas; and Art Theory, Critical Methodology and Museology. The groups of courses that comprise these areas of focus are listed below.

Students interested in the study of Art History in conjunction with other programs are recommended to look at the Minors offered in Visual Arts of the Americas, Museum Studies, and Art Theory and Criticism. 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 [2.00 credits]:

ARTH*1220	[0.50]	The Visual Arts Today
ARTH*1510	[0.50]	Art Historical Studies I

ARTH\*1520 [0.50] Art Historical Studies II  
and one [0.50] of the following:

SART*1050	[0.50]	Integrated 2-D Media
SART*1060	[0.50]	Media Convergence

### Major (Honours Program)

A minimum of 9.00 credits is required, including:

- the Art History core
- 2.00 credits from the Western Art and Cross-Cultural Perspectives area of focus including: 0.50 credits in Ancient (ARTH\*2150, ARTH\*3150), 0.50 credits in Medieval (ARTH\*2540, ARTH\*3540), 0.50 credits in Renaissance & Baroque (ARTH\*2550, ARTH\*2950, ARTH\*3100, ARTH\*3550, ARTH\*3640), 0.50 credits in Modern (ARTH\*2280, ARTH\*2290, ARTH\*2580, ARTH\*2600, ARTH\*3520, ARTH\*3570)
- 1.50 credits from the Arts of the Americas area of focus
- 1.00 credits from the Art Theory, Critical Methodology and Museology area of focus
- 2.50 additional credits in Art History

**Note:** a minimum of 4.00 credits in Art History must be at the 3000 level or above, including at least 1.00 credits in Art History at the 4000 level.

### Minor (Honours Program)

A minimum of 5.00 credits is required, including:

- ARTH\*1220, ARTH\*1510, ARTH\*1520
- 3.50 additional credits in Art History including 0.50 credits in each of the three areas of focus and at least 2.00 credits at the 3000 or 4000 level.

### Areas of Focus

#### Western Art and Cross-Cultural Perspectives

ARTH*2150	[0.50]	Art and Archaeology of Greece
ARTH*2280	[0.50]	Modern Architecture
ARTH*2290	[0.50]	History of Photographic Media
ARTH*2540	[0.50]	Medieval Art
ARTH*2550	[0.50]	The Italian Renaissance
ARTH*2580	[0.50]	Late Modern Art: 1900-1950
ARTH*2600	[0.50]	Early Modern Art to 1900
ARTH*2950	[0.50]	Baroque Art
ARTH*3100	[0.50]	Perspectives: Structure and Space in Renaissance and Baroque Art
ARTH*3150	[0.50]	Space: Roman Art and Urbanism
ARTH*3200	[0.50]	Colour: Practice and Meanings in Western Art
ARTH*3520	[0.50]	Idea: Art Since 1950
ARTH*3540	[0.50]	Image: The Arts in the Medieval Era
ARTH*3550	[0.50]	Lives: Aspects of High Renaissance Art
ARTH*3570	[0.50]	Display: Visual Culture in Late 19th Century Europe
ARTH*3640	[0.50]	Objects: Baroque Art and Rococo Art
ARTH*4150	[0.50]	Seminar in Western Art I
ARTH*4160	[0.50]	Seminar in Western Art II

#### Arts of the Americas

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*2490	[0.50]	History of Canadian Art
ARTH*3010	[0.50]	Contemporary Canadian Art
ARTH*3050	[0.50]	Pre-Columbian Art
ARTH*3060	[0.50]	Public Art
ARTH*4050	[0.50]	Seminar in the Americas I
ARTH*4060	[0.50]	Seminar in the Americas II

#### Art Theory, Critical Methodology and Museology

ARTH*2120	[0.50]	Introduction to Museology
ARTH*2480	[0.50]	Introduction to Art Theory and Criticism
ARTH*3210	[0.50]	Critical Issues in Art History
ARTH*3220	[0.50]	Nationalism and Identity in Art
ARTH*3780	[0.50]	Gender and Art
ARTH*4550	[0.50]	Questions in Criticism
ARTH*4620	[0.50]	Museum Studies

**Note:** Details of advanced standing for transfer students from the Ontario College of Art can be found in the section on Admission Information.

### Art Theory and Criticism (ATC)

#### School of Fine Art and Music

The Minor program in Art Theory and Criticism offers students the opportunity to engage critically with the most significant interpretative methods art historians and critics use to analyze artwork. Courses will provide an overview of important debates in the field and of their contexts, as well as informed discussions of the issues that are raised when textuality and visuality come together.

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

their Major area of study. Students wishing to combine this Minor with a Major in Art History are advised that the selection of their required courses should begin early in their degree, and that they should obtain counselling from faculty to ensure they can achieve the correct distribution.

### Minor (Honours Program)

A minimum of 5.00 credits is required, including:

- |    |  |        |  |
|----|--|--------|--|
| a. | ARTH*1220  | [0.50] | The Visual Arts Today                    |
|    | ARTH*1510  | [0.50] | Art Historical Studies I                 |
|    | ARTH*1520  | [0.50] | Art Historical Studies II                |
|    | PHIL*3050  | [0.50] | Philosophy of Art                        |
| b. | 3.00 additional credits in Art History as follows: |        |  |
|    | ARTH*2480  | [0.50] | Introduction to Art Theory and Criticism |
|    | ARTH*3210  | [0.50] | Critical Issues in Art History           |
|    | ARTH*3220  | [0.50] | Nationalism and Identity in Art          |
|    | ARTH*3520  | [0.50] | Idea: Art Since 1950                     |
|    | ARTH*3780  | [0.50] | Gender and Art                           |
|    | ARTH*4550  | [0.50] | Questions in Criticism                   |

### Business Administration (BADM)

#### Department of Economics, College of Social and Applied Human Sciences

Interdisciplinary study in Business Administration is offered as a minor in the honours program. Students in this program will be counselled by the Department of Economics. It is possible for students to pursue a more intensive program in the area of business administration and economics; see the heading Applied Economics in the B.A. degree and the heading Management Economics in Industry and Finance in the B.Comm. degree.

### Minor (Honours Program)

A minimum of 5.00 credits is required, including:

- |           |        |   |
|-----------|--------|---|
| AGEC*2220 | [0.50] | Financial Accounting                    |
| AGEC*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*3560 | [0.50] | Theory of Finance                       |
| MCS*3040  | [0.50] | Business and Consumer Law               |
| One of:   |        |   |
| AGEC*3310 | [0.50] | Operations Management                   |
| HTM*4390  | [0.50] | Individuals and Groups in Organizations |
| One of:   |        |   |
| AGEC*4370 | [0.50] | Marketing Management                    |
| MCS*1000  | [0.50] | Introductory Marketing                  |

### Classical Languages (CLAL)

#### School of Languages and Literatures, College of Arts

The Classical Languages program imparts an advanced knowledge of Greek and Latin and is designed for students who have a special interest in literature, history and philosophy or plan to do postgraduate study in any area of Classics.

### Core Requirements

GREK\*1100, GREK\*1110, GREK\*2020, LAT\*1100, LAT\*1110, LAT\*2000

### Major (Honours Program)

A minimum of 9.00 credits is required, including:

- the Classical Languages core
- any 5.00 credits from CLAS\*3050, CLAS\*3060, CLAS\*3070, CLAS\*3080, CLAS\*3090, CLAS\*3120, CLAS\*4010
- LAT\*4100, LAT\*4150

### Minor (Honours Program)

A minimum of 6.00 credits is required, including:

- the Classical Languages core
- any 3.00 credits from those listed under Item (b) above

### 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

- CLAS\*1000, plus EITHER (GREK\*1100, GREK\*1110, GREK\*2020) OR (LAT\*1100, LAT\*1110, LAT\*2000)
- one of CLAS\*2000, CLAS\*2150, CLAS\*2350, CLAS\*3100
- one of CLAS\*3000, CLAS\*3010, CLAS\*3020
- one of CLAS\*3030, CLAS\*3040
- one of CLAS\*3150, CLAS\*3200, HIST\*2850, PHIL\*2140

### Major (Honours Program)

A minimum of 8.00 credits is required, including:

- the Classical Studies Core
- CLAS\*4000, CLAS\*4150, CLAS\*4400
- 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 English 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:

- the Classical Studies Core
- two of CLAS\*4000, CLAS\*4150, CLAS\*4400

### Cognitive Neuropsychology (CGNR)

#### Department of Psychology, College of Social and Applied Human Sciences

Ellis and Young (1988) defined cognitive psychology as the "study of those mental processes which underlie and make possible our everyday ability to recognize familiar objects and people, to find our way around in the world, to speak, read and write, and to plan and execute actions, to think, make decisions and remember." They proposed two complementary aims in the study of cognitive neuropsychology:

- To explain the patterns of impaired and intact cognitive performance seen in brain-injured patients in terms of damage to one or more of the components of a theory or model of normal cognitive functioning.
- To draw conclusions about normal, intact cognitive processes from the patterns of impaired and intact capabilities seen in brain-injured patients.

The Minor program in Cognitive Neuropsychology is targeted for students seeking to broaden their knowledge beyond their major area of study. It may be of particular interest to students specializing in biology or computer science. A Minor in cognitive neuropsychology will prove valuable to students seeking careers in research and medicine.

### Minor (Honours Program)

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

A minimum of 6.00 credits is required, including:

- |           |        |  |
|-----------|--------|--|
| PSYC*1100 | [0.50] | Principles of Behaviour                |
| PSYC*1200 | [0.50] | Dynamics of Behaviour                  |
| PSYC*2360 | [0.50] | Introductory Research Methods          |
| PSYC*2390 | [0.50] | Principles of Sensation and Perception |
| PSYC*2410 | [0.50] | Behavioural Neuroscience I             |
| PSYC*2650 | [0.50] | Cognitive Psychology                   |
| PSYC*3330 | [0.50] | Memory                                 |
| PSYC*3340 | [0.50] | Psycholinguistics                      |
| PSYC*3410 | [0.50] | Behavioural Neuroscience II            |
| PSYC*4600 | [0.50] | Cognitive Neuroscience                 |

One of:

- |           |        |                              |
|-----------|--------|------------------------------|
| PSYC*2010 | [0.50] | Quantification in Psychology |
| STAT*2040 | [0.50] | Statistics I                 |

0.50 additional credits in Psychology

**Note:** Courses designated with (H) in Section XII--Course Descriptions are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology.

### Computing and Information Science (CIS)

#### Department of Computing and Information Science, College of Physical and Engineering Science

The Computing and Information Science program emphasizes the applications of computing in other academic disciplines and in business environments. "B" grades are required for but do not guarantee admission to semester three of C.I.S. programs. The BA Program serves students who want computing at the core of a liberal education. The BA is also suited for students who wish to manipulate quantities of data or apply computing techniques across disciplines, especially in the social sciences, humanities or fine arts. Students with a more narrowly focused area of application might consider the BSc program for the natural and biological sciences or the B.Comp Program for other specializations. All three programs can lead to graduate work or positions in industry.

### Area of Concentration (General Program)

A minimum of 5.25 credits is required, including:

- |          |        |  |
|----------|--------|--|
| 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               |

1.00 additional C.I.S. credits at the 2000 level or higher

### Major (Honours Program)

#### Semester 1

CIS\*1500 [0.50] Introduction to Programming  
 MATH\*1200 [0.50] Calculus I  
 1.00 electives from different subject areas in the College of Arts (ENGL\*1080 or ENGL\*1200 is recommended)  
 0.50 electives from selected subject areas in the College of Social and Applied Human Sciences\*

#### Semester 2

CIS\*1910 [0.50] Discrete Structures in Computing I  
 CIS\*2500 [0.50] Intermediate Programming  
 0.50 electives from the College of Arts  
 1.00 electives from selected subject areas in the College of Social and Applied Human Sciences\*

#### 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 electives

#### Semester 4

CIS\*2750 [0.75] Software Systems Development and Integration  
 CIS\*3110 [0.50] Operating Systems  
 STAT\*2040 [0.50] Statistics I  
 0.75 electives

Note: 0.50 electives may be selected in semester 4 followed by 0.50 electives in semester 5

#### Semester 5

CIS\*2460 [0.50] Modelling of Computer Systems  
 CIS\*3530 [0.50] Data Base Systems and Concepts  
 CIS\*3750 [0.75] System Analysis and Design in Applications  
 0.50 C.I.S. electives at 3000 level or above (CIS\*3210 [0.50] is recommended)  
 0.25 elective

#### Semester 6

CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms  
 1.00 C.I.S. electives at 3000 level or above  
 1.00 electives

#### Semester 7

1.00 C.I.S.. credits at the 4000 level  
 1.50 electives

#### Semester 8

1.00 C.I.S. credits at the 4000 level  
 1.50 electives

\*1.50 electives in semesters 1 and 2 must be from at least two of the following subject areas in the College of Social and Applied Human Sciences: ANTH, ECON, GEOG, POLS, PSYC, SOAN, SOC, WMST

### Minor (Honours Program)

A minimum of 5.25 credits is required, including:

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  
 1.00 additional credits from C.I.S. or STAT courses at the 2000 level or above

### Computing and Information Science (Co-op) (CIS:C)

#### Department of Computing and Information Science, College of Physical and Engineering Science

The 4 year Honours Program Major in Computing and Information Science is also available as a Co-operative Education Program. Three co-op work terms are required.

COOP\*1100 must be completed in the 2nd academic semester (Winter of year 1). Students may apply for these options at the time of University admission or completion of semester 2. A five year option with four work terms is also available. Please see the department's co-op academic advisor for details.

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

Recommended work terms are shown below:

#### Work/Study Semesters

### List A

#### Semester 1(Fall)

CIS\*1500 [0.50] Introduction to Programming  
 MATH\*1200 [0.50] Calculus I  
 1.00 electives from different subject areas in the College of Arts (ENGL\*1080 or ENGL\*1200 is recommended)  
 0.50 electives from selected subject areas in the College of Social and Applied Human Sciences\*

#### Semester 2(Winter)

CIS\*1910 [0.50] Discrete Structures in Computing I  
 CIS\*2500 [0.50] Intermediate Programming  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 0.50 electives from the College of Arts  
 1.00 electives from selected subject areas in the College of Social and Applied Human Sciences\*

#### Semester 3(Summer)

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 electives in the Area of Application or electives

#### Fall Semester

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

#### Semester 4(Winter)

CIS\*2750 [0.75] Software Systems Development and Integration  
 CIS\*3110 [0.50] Operating Systems  
 STAT\*2040 [0.50] Statistics I  
 0.75 electives

#### Summer Semester

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

#### Semester 5(Fall)

CIS\*2460 [0.50] Modelling of Computer Systems  
 CIS\*3530 [0.50] Data Base Systems and Concepts  
 CIS\*3750 [0.75] System Analysis and Design in Applications  
 0.50 C.I.S. electives at 3000 level or above (CIS\*3210 recommended)  
 0.25 elective

#### Winter Semester

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

#### Semester 6(Summer)

CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms  
 1.00 C.I.S. electives at 3000 level or above  
 1.00 electives

#### Semester 7(Fall)

1.00 C.I.S. credits at the 4000 level  
 1.50 electives

#### Semester 8(Winter)

1.00 C.I.S. credits at the 4000 level  
 1.50 electives

\*1.50 electives in semesters 1 and 2 must be from at least two of the following subject areas in the College of Social and Applied Human Sciences: ANTH, ECON, GEOG, POLS, PSYC, SOAN, SOC, WMST

### List B

#### Semester 1(Fall)

CIS\*1500 [0.50] Introduction to Programming  
 MATH\*1200 [0.50] Calculus I  
 1.00 electives from different subject areas in the College of Arts ( ENGL\*1060 or ENGL\*1200 is recommended)  
 0.50 electives from selected subject areas in the College of Social and Applied Human Sciences\*

#### Semester 2(Winter)

CIS\*1910 [0.50] Discrete Structures in Computing I  
 CIS\*2500 [0.50] Intermediate Programming  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 0.50 electives from the College of Arts  
 1.00 electives from selected subject areas in the College of Social and Applied Human Sciences\*

#### Semester 3(Summer)

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 electives in the Area of Application or electives

**Fall Semester**

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

**Semester 4(Winter)**

CIS\*2750 [0.75] Software Systems Development and Integration  
 CIS\*3110 [0.50] Operating Systems  
 CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms  
 STAT\*2040 [0.50] Statistics I

0.25 credit in the Area of Application or elective

**Summer Semester**

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

**Semester 5(Fall)**

CIS\*2460 [0.50] Modelling of Computer Systems  
 CIS\*3530 [0.50] Data Base Systems and Concepts  
 CIS\*3750 [0.75] System Analysis and Design in Applications

0.75 credits in the Area of Application or electives

**Winter Semester**

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

**Semester 6(Summer)**

Alternative 1 [Recommended]

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

OR Alternative 2

1.50 C.I.S. electives at the 3000 level or above

1.00 credits in the Area of Application or electives

**Semester 7(Fall)**

1.00 credits in the Area of Application or electives

0.50 credits in the C.I.S. at 3000 level or above

1.00 credits in C.I.S. at the 4000 level

**Semester 8(Winter)**

CIS\*4000 [0.50] Applications of Computing Seminar

1.00 C.I.S. credits at the 4000 level

1.50 credits in the Area of Application or electives

0.50 credits in the C.I.S. at 4000 level

\*1.50 electives in semesters 1 and 2 must be from at least two of the following subject areas in the College of Social and Applied Human Sciences: ANTH, ECON, GEOG, POLS, PSYC, SOAN, SOC, WMST

**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 [0.50] Public Administration  
 POLS\*2300 [0.50] Canadian Government  
 SOAN\*2120 [0.50] Introductory Methods  
 SOC\*1500 [0.50] Crime and Criminal Justice  
 SOC\*2700 [0.50] Criminological Theory

Note: The requirement for an average of 70% or better applies only to students admitted to the University of Guelph after 30 April 2002.

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.

**Note:** There is no CJPP Area of Concentration in the General Program as of Fall 2002.

**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 [0.50] Public Administration  
 POLS\*2300 [0.50] Canadian Government

SOAN\*2120 [0.50] Introductory Methods  
 SOC\*1500 [0.50] Crime and Criminal Justice  
 SOC\*2700 [0.50] Criminological Theory

One of:

POLS\*3650 [0.50] The Systematic Study of Politics  
 SOAN\*3120 [0.50] Quantitative Methods

Three of:

SOC\*2070 [0.50] Social Deviance  
 SOC\*2750 [0.50] Serial Murder  
 SOC\*3490 [0.50] Law and Society  
 SOC\*3710 [0.50] Young Offenders  
 SOC\*3730 [0.50] Courts and Society  
 SOC\*3740 [0.50] Corrections and Penology  
 SOC\*3750 [0.50] Police in Society

Three of:

POLS\*3110 [0.50] Politics of Ontario  
 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\*3440 [0.50] Corruption, Scandal and Political Ethics  
 POLS\*3670 [0.50] Comparative Public Policy and Administration

One of:

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

Three of:

POLS\*4100 [0.50] Women, Justice and Public Policy  
 POLS\*4120 [0.50] Civil Rights and Civil Liberties in Canada and the U.S.  
 POLS\*4160 [0.50] Multi-Level Governance in Canada  
 POLS\*4250 [0.50] Problems in Public Administration and Public Policy  
 POLS\*4260 [0.50] Topics in Public Policy  
 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 6.00 credits is required, including:

PHIL\*1010 [0.50] Introductory Philosophy: Social and Political Issues  
 POLS\*1400 [0.50] Issues in Canadian Politics  
 POLS\*2250 [0.50] Public Administration  
 POLS\*2300 [0.50] Canadian Government  
 SOAN\*2120 [0.50] Introductory Methods  
 SOC\*1500 [0.50] Crime and Criminal Justice  
 SOC\*2700 [0.50] Criminological Theory

Two of:

SOC\*2070 [0.50] Social Deviance  
 SOC\*2750 [0.50] Serial Murder  
 SOC\*3490 [0.50] Law and Society  
 SOC\*3710 [0.50] Young Offenders  
 SOC\*3730 [0.50] Courts and Society  
 SOC\*3740 [0.50] Corrections and Penology  
 SOC\*3750 [0.50] Police in Society

Two of:

POLS\*3110 [0.50] Politics of Ontario  
 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

One of:

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

**Developmental Psychology (DPSY)****Department of Psychology, College of Social and Applied Human Sciences**

The focus of Developmental Psychology is the study of the theory, research, and applied interventions associated with the way humans develop and change over time. This focus is especially significant for anyone interested in how we might solve the challenges presented by life. These include the special challenges presented by schooling, parenting, socialization within and beyond the family, coping with stress, and some of the individual differences and atypical behaviors exhibited by ourselves or others. 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 a Psychology Honours Major)

A minimum of 6.00 credits is required, including:

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour

2.50 credits across 5 Psychology Core Courses, to include PSYC\*2330, PSYC\*2450, PSYC\*2650

2.00 credits from the following courses at the 3000 level:

PSYC*3440	[0.50]	Cognitive Development
PSYC*3450	[0.50]	Social and Personality Development
PSYC*3460	[0.50]	Abnormal Development
PSYC*3710	[0.50]	Psychology of Learning Difficulties and Disabilities I
PSYC*3850	[0.50]	Intellectual Disabilities

0.50 elective credits in Psychology at the 3000 level or above, with PSYC\*3570, PSYC\*3800 or the 5th course from the above restricted elective list recommended.

**Note:** Courses designated with (H) in Section XII--Course Descriptions are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology.

### Economics (ECON)

Department of Economics, College of Social and Applied Human Sciences

The Department of Economics offers courses in economic theory, applied economics and quantitative methods. Students may take courses leading to a B.A. in either the honours or the general program. 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

#### Area of Concentration (General Program)

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

- the Economics core
- 2.50 other credits in Economics at the 3000 or 4000 level

### Major (Honours Program)

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

The Economics core requirements

ECON*2770	[0.50]	Introductory Mathematical Economics
ECON*3100	[0.50]	Game Theory
ECON*3600	[0.50]	Macroeconomics in an Open Economy
ECON*3710	[0.50]	Advanced Microeconomics
ECON*3740	[0.50]	Introduction to Econometrics
ECON*4710	[0.50]	Advanced Topics in Microeconomics
ECON*4810	[0.50]	Advanced Macroeconomic Theory

(Note: ECON\*2770 requires a first year university calculus course)

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

2.50 other 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:

- the Economics core
- 2.50 other credits in economics at the 3000 or 4000 level

**Notes:**

- ECON\*3740 is recommended.
- Students wishing to pursue a more structured Economics minor should take ECON\*3710 as well as ECON\*3740.

- Only one of ECON\*2200 or ECON\*3200 may be counted towards the minor. 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, College of Social and Applied Human Sciences

The Economics Co-op program provides an integrated academic/work experience for students with co-operating employer organizations. Students in the program must complete 4 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 1000 level calculus course		
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
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#### Fall Semester

COOP*2000	[0.00]	Co-op Work Term II
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#### Semester 5 (Winter)

ECON*3100	[0.50]	Game Theory
ECON*3600	[0.50]	Macroeconomics in an Open Economy
One 3000 level economics course		
1.00 electives		

#### Summer Semester

Optional -- at the discretion of the student.

#### Semester 6 (Fall)

ECON*3710	[0.50]	Advanced Microeconomics
One 4000 level Economics course (ECON*4640 is recommended)		
1.50 electives		

#### Winter Semester

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

COOP*4000	[0.00]	Co-op Work Term IV
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#### Semester 7 (Fall)

ECON*4710	[0.50]	Advanced Topics in Microeconomics
One 4000 level Economics course		
1.00 electives		
0.50 restricted electives		

#### Semester 8 (Winter)

ECON*4810	[0.50]	Advanced Macroeconomic Theory
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0.50 Economics at the 4000 level

1.50 electives

\*the economic history course may be taken in any semester

### Educational Psychology (EPSY)

#### Department of Psychology, College of Social and Applied Human Sciences

This program allows for specialization in Psychology as it relates to Education. It may be of particular interest to teachers, those considering teaching as a career, or anyone interested in the field of Educational Psychology.

#### Minor (Honours Program)

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

A minimum of 6.00 credits is required, including:

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
PSYC*2010	[0.50]	Quantification in Psychology
PSYC*2450	[0.50]	Introduction to Developmental Psychology
PSYC*3250	[0.50]	Psychological Measurement
PSYC*3710	[0.50]	Psychology of Learning Difficulties and Disabilities I
PSYC*3800	[0.50]	Psychology and Education

0.50 credits from the following courses at the 2000 level:

PSYC*2330	[0.50]	Principles of Learning
PSYC*2650	[0.50]	Cognitive Psychology

2.00 credits from the following courses at the 3000 level:

PSYC*3310	[0.50]	Applied Social Psychology
PSYC*3330	[0.50]	Memory
PSYC*3340	[0.50]	Psycholinguistics
PSYC*3440	[0.50]	Cognitive Development
PSYC*3450	[0.50]	Social and Personality Development
PSYC*3460	[0.50]	Abnormal Development
PSYC*3720	[0.50]	Psychology of Learning Difficulties and Disabilities II
PSYC*3850	[0.50]	Intellectual Disabilities

**Note:** Courses designated with (H) in Section XII--Course Descriptions are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology.

### English (ENGL)

#### School of English and Theatre Studies, College of Arts

The School of English and Theatre Studies offers courses in the BA 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, especially 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.

#### Area of Concentration (General Program)

A minimum of 5.50 English credits is required, including:

- 1.00 credits from ENGL\*1080 and ENGL\*2080
- 1.00 credits from ENGL\*2120 and one of ENGL\*2130, ENGL\*3940, ENGL\*3960
- 2.00 credits from 3000 level lecture courses to fulfill degree requirements as listed below

In addition, students must complete:

- 1.00 credits from any other 3000 level lecture courses
- 0.50 credits from any other seminar or lecture course

It is recommended that students take 0.50 credits at the 2000 level in a lecture course.

General Program Degree requirements to be fulfilled in part through 2.00 credits from 3000 level lecture courses in the following areas:

- 0.50 credits in Early Modern Literature
- 0.50 credits in 18th and 19th Century Literature
- 0.50 credits in Colonialisms/Postcolonialisms
- 0.50 credits in Canadian Literature/American Literature

#### Major (Honours Program)

A minimum of 8.50 English credits is required, including:

- 1.00 credits from ENGL\*1080 and ENGL\*2080
- 2.00 credits from ENGL\*2120, ENGL\*2130, ENGL\*3940, ENGL\*3960
- 3.50 credits from 3000 level lecture courses which fulfill degree requirements listed below
- 1.00 credits from 4000 level courses
- 1.00 credits from any other lecture courses on offer.

It is recommended that students take two 2000 level lecture courses.

Honours Program Major Degree Requirements to be fulfilled in part through 3.50 credits from 3000 level lecture courses in the following areas:

- 1.00 credits in Early Modern Literature

- 1.00 credits in 18th and 19th Century Literature

- 0.50 credits in American Literature

- 0.50 credits in Canadian Literature

- 0.50 credits in Colonialisms/Postcolonialisms

**Note:** 4000 level courses may in some instances fulfill these area requirements, depending on their content. See the School of English and Theatre Studies for details.

**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\*4690 (Contemporary Literary Theory)
- take at least 2.00 credits in English courses at the 4000 level

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 Studies (ENVS)

#### Interdisciplinary Program

Environmental Studies is an interdisciplinary subject stressing the integration of biophysical and human behavioral dimensions of environmental issues. The requirement of 5.00 credits for the minor is broken into 2 groups of courses, required courses and restricted electives. Students should ensure that they obtain standing in the necessary prerequisites for required and restricted elective courses. There are limitations on courses used for credit in other areas of study which may be used for credit in the Environmental Studies minor. Students should seek counselling from the Department of Geography early in their program.

#### Minor (Honours Program)

A minimum of 5.00 credits is required, including:

BIOL*1030	[0.50]	Biology I
BIOL*2060	[0.50]	Ecology
ISS*4000	[0.50]	Research Project in Environmental Studies

Two of the following social sciences courses:

ECON*2100	[0.50]	Economic Growth and Environmental Quality
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration

The remaining 2.50 credits required for the minor must be selected from the following list. The social science course listed above not taken as a required course may be taken as a restricted elective. However, students are strongly advised to consult with the program coordinator before choosing electives.

AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGEC*4310	[0.50]	Resource Economics
BIOL*1040	[0.50]	Biology II
BIOL*3450	[0.50]	Introduction to Aquatic Environments
BOT*2050	[0.50]	Plant Ecology
CROP*2280	[0.50]	Crops in Land Reclamation
ECON*4930	[0.50]	Environmental Economics
ENGG*3650	[0.50]	Hydrology
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*3000	[0.50]	Nature Interpretation
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*4780	[0.50]	Forest Ecology
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*4110	[0.50]	Environmental Systems Analysis
LARC*2820	[0.50]	Urban and Regional Planning
PHIL*2070	[0.50]	Philosophy of the Environment
SOC*2280	[0.50]	Society and Environment
SOIL*2010	[0.50]	Soil Science
SOIL*3050	[0.50]	Land Utilization

### 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. Those who can demonstrate that they have written a major academic paper or exam in their chosen language while participating in an approved study year may be waived from the required course 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 13.00 credits is required, including:

- the three components of the European Studies core (8.00 credits)
- 5.00 credits in either the European Culture and Civilization or the European Business Studies area of emphasis

### Core Requirements

- EURO\*1050 [0.50] The Emergence of a United Europe  
EURO\*1200 [0.50] European Culture from the Mid 18th to the Mid 19th Century  
EURO\*2070 [0.50] European Integration, 1957-1992  
EURO\*2200 [0.50] European Culture from the Mid 19th Century to the 1920's  
EURO\*2300 [0.50] European Culture since 1920  
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, upon approval of the Coordinator for European Studies EURO\*4740 will be waived.

- 3.00 credits in one language:

- FREN\*2020 [0.50] France: Literature and Society  
FREN\*2030 [0.50] French Language II  
FREN\*2520 [0.50] French Composition I  
FREN\*2540 [0.50] Spoken French: Theory and Practice  
FREN\*3520 [0.50] French Composition II  
FREN\*3530 [0.50] Business French  
OR  
GERM\*2400 [0.50] Contemporary Germany  
GERM\*2490 [0.50] Intermediate German I  
GERM\*2500 [0.50] Intermediate German II  
GERM\*2560 [0.50] Themes in German Literature/Culture  
GERM\*3500 [0.50] Advanced German

One of:

- GERM\*2590 [0.50] Classics of German Literature  
GERM\*3530 [0.50] German in the Workplace

OR

- ITAL\*2060 [0.50] Intermediate Italian I  
ITAL\*2070 [0.50] Intermediate Italian II  
ITAL\*3060 [0.50] Advanced Italian  
ITAL\*3200 [0.50] Novels of Resistance  
ITAL\*3950 [0.50] Topics in Italian Literature

One of:

- ITAL\*2100 [0.50] Renaissance Lovers and Fools  
ITAL\*3150 [0.50] Medieval Italian Literature

OR

- SPAN\*2000 [0.50] Spanish Language I  
SPAN\*2010 [0.50] Spanish Language II  
SPAN\*2040 [0.50] Spanish Civilization  
SPAN\*2990 [0.50] Hispanic Literary Studies  
SPAN\*3500 [0.50] Spanish Grammar and Composition I  
SPAN\*3530 [0.50] Business Spanish

- CLAS\*1000 [0.50] Introduction to Classical Culture  
ISS\*2500 [0.50] Management in Organizations  
HIST\*2510 [0.50] The Emergence of Modern European Society 1789-1945  
POL\*3450 [0.50] European Governments and Politics

### Areas of Emphasis

#### European Business

Required courses:

- AGEC\*2220 [0.50] Financial Accounting  
AGEC\*2230 [0.50] Management Accounting  
AGEC\*3320 [0.50] Financial Management  
ECON\*1050 [0.50] Introductory Microeconomics  
ECON\*1100 [0.50] Introductory Macroeconomics

One of:

- AGEC\*3310 [0.50] Operations Management  
AGEC\*4370 [0.50] Marketing Management

2.00 credits (4 courses) chosen from:

One of:

- AGEC\*3310 [0.50] Operations Management  
AGEC\*4370 [0.50] Marketing Management

Note: each of these courses counts as either required or restricted elective, may not be double counted

- AGEC\*4250 [0.50] Business Policy  
ECON\*2310 [0.50] Intermediate Microeconomics  
ECON\*2410 [0.50] Intermediate Macroeconomics  
ECON\*3560 [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  
HTM\*2200 [0.50] Organizational Behaviour I  
HTM\*3000 [0.50] Human Resources Management  
HTM\*3100 [0.50] Dimensions of Tourism  
HTM\*3160 [0.50] Destination Management and Marketing  
HTM\*4170 [0.50] International Tourism Development and Management  
HTM\*4390 [0.50] Individuals and Groups in Organizations  
MCS\*1000 [0.50] Introductory Marketing  
MCS\*2100 [0.50] Personal Financial Management  
MCS\*2600 [0.50] Fundamentals of Consumer Behaviour  
MCS\*3020 [0.50] Services Marketing  
MCS\*3040 [0.50] Business and Consumer Law  
STAT\*2060 [0.50] Statistics for Business Decisions

#### European Culture and Civilization

Students must take 5.00 credits including at least 0.50 credits from each of the following four groups. The remaining 3.00 credits may be chosen from any of the courses in the four groups.

##### Group A

- CLAS\*2000 [0.50] Classical Mythology  
CLAS\*2350 [0.50] The Classical Tradition  
EURO\*3150 [0.50] Topics in European Film  
FREN\*1000 [0.50] Understanding the French Speaking World  
FREN\*2500 [0.50] French Translation I  
GERM\*2240 [0.50] Germany Through the Ages  
HIST\*2850 [0.50] History of Greece and Rome  
HUMN\*2100 [0.50] Renaissance Lovers and Fools  
HUMN\*3130 [0.50] Women in Modern Spanish Fiction  
HUMN\*3170 [0.50] Women, Virtue and Honour in Spanish Drama (In English)  
HUMN\*3440 [0.50] Ideals and Anxieties in 19th-Century German Literature  
HUMN\*3450 [0.50] 20th Century German Literature and Film  
HUMN\*4170 [0.50] Don Quixote and the Picaresque Novel (In English)

##### Group B

- HIST\*1010 [0.50] Europe and the Early Modern World  
HIST\*2200 [0.50] The Medieval World  
HIST\*2820 [0.50] Modern France, 1750-1992: From Louis XV to Mitterrand  
HIST\*2830 [0.50] The Emergence of Modern Germany 1871-1990  
HIST\*3090 [0.50] Nationalism and Internationalism in Europe 1914-1957  
HIST\*3540 [0.50] World War Two  
HIST\*3570 [0.50] Women in Modern Europe  
HIST\*3750 [0.50] The Reformation  
HIST\*3820 [0.50] Early Modern France  
HIST\*4090 [0.50] Modern European History  
HIST\*4470 [0.50] Special History Project Seminar I  
HIST\*4570 [0.50] Topics in Revolution  
HIST\*4580 [0.50] Topics in 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 to 1900  
ARTH\*3100 [0.50] Perspectives: Structure and Space in Renaissance and Baroque Art  
ARTH\*3550 [0.50] Lives: Aspects of High Renaissance Art  
ARTH\*3570 [0.50] Display: Visual Culture in Late 19th Century Europe  
ARTH\*3640 [0.50] Objects: Baroque Art and Rococo Art  
MUSC\*1060 [0.50] Introduction to Music  
MUSC\*2010 [0.50] The Musical Avant-Garde  
MUSC\*2280 [0.50] Masterworks of Music

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]	The State in Comparative Perspective
POLS*2200	[0.50]	International Relations
POLS*3460	[0.50]	Communism and Post-Communism

### Minor in European Culture and Civilization

The minor in European Culture and Civilization is designed for students interested in the interdisciplinary study of European culture and history. It 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.

### Program Requirements

**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 5.50 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\*2300 [0.50] European Culture since 1920
2. 2.00 credits in one language, at second or third year level, chosen from the following list:

FREN*2020	[0.50]	France: Literature and Society
FREN*2030	[0.50]	French Language II
FREN*2520	[0.50]	French Composition I
FREN*2540	[0.50]	Spoken French: Theory and Practice
FREN*3520	[0.50]	French Composition II
FREN*3530	[0.50]	Business French

OR

GERM*2400	[0.50]	Contemporary Germany
GERM*2490	[0.50]	Intermediate German I
GERM*2500	[0.50]	Intermediate German II
GERM*2560	[0.50]	Themes in German Literature/Culture
GERM*3500	[0.50]	Advanced German

One of:

GERM*2590	[0.50]	Classics of German Literature
GERM*3530	[0.50]	German in the Workplace

OR

ITAL*2060	[0.50]	Intermediate Italian I
ITAL*2070	[0.50]	Intermediate Italian II
ITAL*3060	[0.50]	Advanced Italian
ITAL*3200	[0.50]	Novels of Resistance
ITAL*3950	[0.50]	Topics in Italian Literature

One of:

ITAL*2100	[0.50]	Renaissance Lovers and Fools
ITAL*3150	[0.50]	Medieval Italian Literature

OR

SPAN*2000	[0.50]	Spanish Language I
SPAN*2010	[0.50]	Spanish Language II
SPAN*2040	[0.50]	Spanish Civilization
SPAN*2990	[0.50]	Hispanic Literary Studies
SPAN*3500	[0.50]	Spanish Grammar and Composition I
SPAN*3530	[0.50]	Business Spanish

3. 2.00 credits; 0.50 credits from each of 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
EURO*3150	[0.50]	Topics in European Film
FREN*1000	[0.50]	Understanding the French Speaking World
FREN*2500	[0.50]	French Translation I
FREN*3010	[0.50]	Twentieth-Century French Novel
FREN*3020	[0.50]	Twentieth-Century French Theatre
GERM*2240	[0.50]	Germany Through the Ages
HIST*2850	[0.50]	History of Greece and Rome
HUMN*2100	[0.50]	Renaissance Lovers and Fools

HUMN*3020	[0.50]	Myth and Fairy Tales in Germany
HUMN*3170	[0.50]	Women, Virtue and Honour in Spanish Drama (In English)
HUMN*3450	[0.50]	20th Century German Literature and Film
HUMN*4170	[0.50]	Don Quixote and the Picaresque Novel (In English)

### Group B

HIST*1010	[0.50]	Europe and the Early Modern World
HIST*2200	[0.50]	The Medieval World
HIST*2510	[0.50]	The Emergence of Modern European Society 1789-1945
HIST*2820	[0.50]	Modern France, 1750-1992: From Louis XV to Mitterand
HIST*2830	[0.50]	The Emergence of Modern Germany 1871-1990
HIST*3090	[0.50]	Nationalism and Internationalism in Europe 1914-1957
HIST*3540	[0.50]	World War Two
HIST*3570	[0.50]	Women in Modern Europe
HIST*3750	[0.50]	The Reformation
HIST*3820	[0.50]	Early Modern France
HIST*4090	[0.50]	Modern European History
HIST*4470	[0.50]	Special History Project Seminar I
HIST*4570	[0.50]	Topics in Revolution
HIST*4580	[0.50]	Topics in 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 to 1900
ARTH*3100	[0.50]	Perspectives: Structure and Space in Renaissance and Baroque Art
ARTH*3550	[0.50]	Lives: Aspects of High Renaissance Art
ARTH*3570	[0.50]	Display: Visual Culture in Late 19th Century Europe
ARTH*3640	[0.50]	Objects: Baroque Art and Rococo Art
MUSC*1060	[0.50]	Introduction to Music
MUSC*2010	[0.50]	The Musical Avant-Garde
MUSC*2280	[0.50]	Masterworks of Music

**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]	The State in Comparative Perspective
POLS*2200	[0.50]	International Relations
POLS*3450	[0.50]	European Governments and Politics
POLS*3460	[0.50]	Communism and Post-Communism

### 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:

HUMN\*3501/2 is 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 as a Letter of Permission 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 departmental 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: Research and Applications
NUTR*1010	[0.50]	Nutrition and Society

A further 2.50 courses offered by the Department of Family Relations and Applied Nutrition (FRHD or NUTR\*2050), of which at least 1.50 must be at the 3000 level or above including at least 0.50 at the 4000 level.

**Note:** where students have or plan to have credit for PSYC\*2450, an alternative course to FRHD\*2270 must be selected, in consultation with the departmental advisor, from those offered under the Family Studies (FRHD) listings

**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\*1100. Francophone students may 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 CLAS\*1000 and 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.

**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. Credit for programs of study successfully completed may be applied towards the University of Guelph degree requirements. Requests should be addressed well in advance of registration to the Director of the School of Languages and Literatures. A letter of permission is required (see the Section VIII--Undergraduate Degree Regulations & Procedures). Students may also take advantage of federal-provincial programs such as the Second-Language Monitor program.

**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.

**Area of Concentration (General Program)**

A minimum of 5.00 French credits taught in French is required, including FREN\*1200, FREN\*2020, FREN\*2030, FREN\*2060, FREN\*2520, FREN\*3520.

**Major (Honours Program)**

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

- FREN\*1200, FREN\*2020, FREN\*2030, FREN\*2060, FREN\*2520, FREN\*3230
- at least 0.50 credits from FREN\*2500, FREN\*2540
- at least 2.00 additional credits from FREN\*3000, FREN\*3010, FREN\*3020, FREN\*3070, FREN\*3150, FREN\*3200, FREN\*3210, FREN\*3220, FREN\*3240, FREN\*3290, FREN\*3560
- at least 1.00 credits from FREN\*3500, FREN\*3520, FREN\*3530
- at least 1.50 credits at the 4000 level

**Minor (Honours Program)**

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

- FREN\*1200, FREN\*2020, FREN\*2030, FREN\*2060, FREN\*2520, FREN\*3520
- 1.00 credits in French literature from FREN\*3000, FREN\*3010, FREN\*3020, FREN\*3070, FREN\*3240, FREN\*3290, FREN\*3560, FREN\*4300
- 1.00 additional credits from French

**Notes:**

- Students are strongly urged to take 0.50 language credits each semester.
- Students in the general program may take 4000 level courses, but must previously have taken FREN\*3520.
- 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.
- FREN\*1000, FREN\*1090, FREN\*1100, FREN\*1150, FREN\*1120 are not counted toward a specialization in French.
- Native speakers of French (or non-francophone equivalent) will not normally be admitted into FREN\*1200 and FREN\*2030. It is recommended they start their program with FREN\*2020, FREN\*2060, FREN\*2500, or FREN\*2520 with the approval of the Faculty Advisor.

**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 departmental 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 departmental advisor regarding course selection.

The following courses offered by the Department of Land Resource Science may be counted as Geography credits: 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 Social 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 Social 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
GEOG*2260	[0.50]	Applied Social Geography

3.00 credits in Geography at the 3000 level and including at least one course at the 4000 level.

**German (GERM)****School of Languages and Literatures, College of Arts**

All language courses carry 0.50 credits. Students with one year of high school German or equivalent may not be admitted into GERM\*1100. Students with OAC German may not be admitted into GERM\*1100 and GERM\*1110. Students with OAC German credit or its equivalent may be admitted into GERM\*1110 only with the approval of the department. 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 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. Requests should be addressed well in advance to either the department or a particular section of the department. A letter of permission is required (see the Section VIII--Undergraduate Degree Regulations & Procedures).

### Minor (Honours Program)

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

GERM*2240	[0.50]	Germany Through the Ages
GERM*2490	[0.50]	Intermediate German I
GERM*2500	[0.50]	Intermediate German II
GERM*2560	[0.50]	Themes in German Literature/Culture
GERM*2590	[0.50]	Classics of German Literature
GERM*3500	[0.50]	Advanced German

2.00 credits from (GERM\*1100 or GERM\*1110), GERM\*2400, GERM\*3020, GERM\*3420, GERM\*3430, GERM\*3450, GERM\*3530

Note that for students beginning with GERM\*1100 or GERM\*1110 a maximum of 2.50 language credits is allowed. For students with OAC German or equivalent, a maximum of 2.00 language credits is allowed. Language courses beyond the 1000 level include GERM\*2490, GERM\*2500, GERM\*3500, GERM\*3530.

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\*1010, HIST\*2100, HIST\*2450, HIST\*2600
- 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:

- at least 1.50 credits in History must be at the 3000 level (excluding HIST\*3470)
- 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\*4600, WMST\*4010.

### Major (Honours Program)

A minimum of 8.00 credits in History courses is required, including:

- the History Core Requirements
- 4.50 additional credits in History including 1.00 at the 4000 level (excluding HIST\*4470 and HIST\*4970) and an additional 0.50 credits at the 4000 level which may include either HIST\*4470 or HIST\*4970

### Minor (Honours Program)

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

- the History Core Requirements
- 1.50 other credits in History including 1.00 at the 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\*4600, WMST\*4010. 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:**

- minimum of 9.00 credits
- minimum of 4.00 credits at the 3000 level and above, including at least 1.00 credits at the 4000 level
- minimum of 1.00 credits in methods and/or theory
- maximum of 1.50 credits at the 1000 level
- 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 clear statement of theme or areas of study
- a clear statement of the contribution of the major to a post-graduation field of work or study
- a clearly set out rationale for inclusion of the specific courses and how they relate to or develop the theme or areas of study
- 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 Department of Computing and Information Science, Department of Psychology, and Department of Sociology and Anthropology. Students in this program will be advised by the program coordinator in the Department of Psychology.

### Major (Honours Program)

#### Computing and Information 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*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
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
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
SOC*2190	[0.50]	Technology and Society
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
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### 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
ECON*2650	[0.50]	Introductory Development Economics
GEOG*2030	[0.50]	International Political Geography
GEOG*3050	[0.50]	Development and the City
IDEV*2010	[0.50]	International Development Studies
POLS*2080	[0.50]	Development and Underdevelopment

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:

POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*3790	[0.50]	The Political Economy of International Relations

#### Major (Honours Program)

A minimum of 12.00 credits is required, including the core of 7.00 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, Biophysical 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]	International Political Geography
GEOG*3050	[0.50]	Development and the City
IDEV*2010	[0.50]	International Development Studies *
IDEV*4500	[0.75]	International Development Seminar **
POLS*2080	[0.50]	Development and Underdevelopment

One of:

IDEV*3010	[0.50]	Case Studies in International Development
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0.50 credits from an approved semester abroad or exchange program

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:		
ANTH*2160	[0.50]	Social Anthropology ***
REXT*4020	[0.50]	Rural Extension in Change and Development
SOC*2080	[0.50]	Rural Sociology ****

One of:

POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*3790	[0.50]	The Political Economy of International Relations

\* students must complete IDEV\*2010 before Semester 5

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

\*\*\* ANTH\*2160 is recommended for the Gender area of emphasis

\*\*\*\* SOC\*2080 is recommended for the Rural area of emphasis

### Areas of Emphasis

#### Biophysical 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
GEOG*4210	[0.50]	Environmental Resource Analysis

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ANTH*3670	[0.50]	Indigenous Peoples: Global Context
ECON*2100	[0.50]	Economic Growth and Environmental Quality
HIST*2250	[0.50]	Environment and History
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
SOC*2280	[0.50]	Society and Environment

One of:

GEOG*2000	[0.50]	Geomorphology
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2460	[0.50]	Analysis in Geography
GEOG*2480	[0.50]	Mapping and GIS

Two of:

GEOG*3020	[0.50]	Global Environmental Change
GEOG*3090	[0.50]	Gender and Environment
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3320	[0.50]	Agriculture and Society
GEOG*3480	[0.50]	GIS and Spatial Analysis
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*3620	[0.50]	Desert Environments

0.50 additional credits at the 4000 level with a GEOG prefix

#### Economic and Business Development

AGEC*2220	[0.50]	Financial Accounting
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics *

Two of:

AGEC*4310	[0.50]	Resource Economics
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

1.50 additional credits at the 2000 level or above in AGECE or ECON, 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.

\* Entry into ECON\*2740 requires one of MATH\*1000, MATH\*1050, MATH\*1080, MATH\*1200.

#### Gender and Development

ANTH*2230	[0.50]	Regional Ethnography
SOAN*2120	[0.50]	Introductory Methods
SOAN*4240	[0.50]	Women and the Development Process

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

ANTH*2160	[0.50]	Social Anthropology
SOAN*2040	[0.50]	Globalization of Work and Organizations
SOC*2080	[0.50]	Rural Sociology

One of:

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

Two of:

ANTH*3400	[0.50]	The Anthropology of Gender
ANTH*3670	[0.50]	Indigenous Peoples: Global Context
ANTH*3690	[0.50]	History of Anthropological Thought
ANTH*3770	[0.50]	Kinship and Social Organization
ANTH*3840	[0.50]	Seminar in Anthropology
SOAN*3100	[0.50]	Comparative 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*3580	[0.50]	Women's History in Asia
PHIL*2060	[0.50]	Philosophy of Feminism I
POLS*3160	[0.50]	Women and Politics in the Third World
POLS*3710	[0.50]	Politics and Sexuality

0.50 credits in WMST

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

### Historical Perspectives in Development

HIST\*2450 [0.50] The Practicing Historian

One of:

HIST*1010	[0.50]	Europe and the Early Modern World
HIST*1150	[0.50]	20th-Century Global History

Two of:

HIST*2070	[0.50]	World Religions in Historical Perspective
HIST*2110	[0.50]	The Atlantic World 1500-1850
HIST*2250	[0.50]	Environment and History
HIST*2500	[0.50]	Britain and the World Since 1600
HIST*2800	[0.50]	The History of the Modern Family
HIST*2890	[0.50]	History of the Islamic World
HIST*2910	[0.50]	History of Modern Asia
HIST*2920	[0.50]	Republican Latin America
HIST*2960	[0.50]	Topics in the History of Slavery

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 South Asia
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*3380	[0.50]	British Imperialism in Asia and Africa
HIST*3410	[0.50]	The History of Pre-Colonial Africa
HIST*3420	[0.50]	Colonial Latin America
HIST*3430	[0.50]	Topics in Environment and Society
HIST*3470	[0.50]	Independent Reading
HIST*3580	[0.50]	Women's History in Asia
HIST*3590	[0.50]	Culture and Society in South Asia
HIST*3910	[0.50]	Africa Since 1800

Two of:

HIST*4100	[0.50]	Africa and the Slave Trades
HIST*4120	[0.50]	Topics in Global History
HIST*4280	[0.50]	Poverty and Policy in the Victorian Age
HIST*4470	[0.50]	Special History Project Seminar I
HIST*4560	[0.50]	Topics in Revolution
HIST*4570	[0.50]	Topics in Revolution
HIST*4580	[0.50]	Topics in Revolution
HIST*4670	[0.50]	Seminar in Science and Society
HIST*4900	[0.50]	Imperialism and Nationalism in South Asia

0.50 additional credits with a regional focus at the 2000 level or above in ANTH, GEOG, IDEV, ISS, POLS, SOAN or SOC.

### Latin American Studies

SPAN*1110	[0.50]	Intermediate Spanish
SPAN*2000	[0.50]	Spanish Language I
SPAN*2010	[0.50]	Spanish Language II
SPAN*3500	[0.50]	Spanish Grammar and Composition I

One of:

POLS*3650	[0.50]	The Systematic Study of Politics
SOAN*2120	[0.50]	Introductory Methods

Two of:

HIST*2920	[0.50]	Republican Latin America
POLS*3080	[0.50]	Politics of Latin America
SPAN*2990	[0.50]	Hispanic Literary Studies
SPAN*3080	[0.50]	Spanish American Culture

Choose Option A or B

Option A:

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Any 1.50 additional credits in SPAN at the 3000 level or above, at least 0.50 being at the 4000 level.

Option B:

Any 1.50 additional credits in ANTH, ECON, GEOG, HIST, IDEV, ISS, POLS, SOAN, or SOC with a focus on Latin America or the Caribbean at the 3000 level or above, at least 0.50 being at the 4000 level. The faculty advisor for International Development maintains a list of appropriate courses.

### Political Economy and Administrative Change

POLS\*3650 [0.50] The Systematic Study of Politics

Two of:

POLS*2000	[0.50]	Political Theory
POLS*2100	[0.50]	The State in Comparative Perspective
POLS*2200	[0.50]	International Relations

One of the following not taken as part of core:

POLS*3160	[0.50]	Women and Politics in the Third World
POLS*3370	[0.50]	Environmental Policy Formation and Administration
POLS*3390	[0.50]	Comparative Democratic Institutions
POLS*3440	[0.50]	Corruption, Scandal and Political Ethics
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

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

AGEC*4310	[0.50]	Resource Economics
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

1.00 additional credits in POLS at the 4000 level

1.00 additional credits with a regional focus at the 2000 or 3000 level in HIST or POLS, at least 0.50 being in POLS.

### Rural and Agricultural Development

SOAN\*2120 [0.50] Introductory Methods

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

ANTH*2160	[0.50]	Social Anthropology
ANTH*2230	[0.50]	Regional Ethnography
SOC*2080	[0.50]	Rural Sociology

One of:

GEOG*3480	[0.50]	GIS and Spatial 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:

AGEC*4210	[0.50]	World Agriculture and Economic Development
ANTH*3670	[0.50]	Indigenous Peoples: Global Context
ANTH*3690	[0.50]	History of Anthropological Thought
SOAN*3680	[0.50]	Development/Underdevelopment
SOC*3380	[0.50]	Society and Nature

Any REXT courses at the 3000 level or above.

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGR*1250	[0.50]	Agrifood System Trends & Issues
AGR*2500	[0.50]	Field Trip in International Agriculture
BOT*1200	[0.50]	Plants and Human Use
ENVB*2010	[0.50]	Food Production and the Environment
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*1350	[0.50]	Earth: Hazards and Global Change
SOIL*2120	[0.50]	Introduction to Environmental Stewardship

One of:

GEOG*2000	[0.50]	Geomorphology
SOIL*2010	[0.50]	Soil Science *

0.50 additional credits at the 3000 or 4000 levels in AGR, CROP, ENVB, GEOL, HORT, SOIL or any biophysical course in GEOG.

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

\* SOIL\*2010 is needed for senior GEOL and SOIL courses relevant to this area.

### Minor (Honours Program)

A minimum of 5.50 credits is required, including:

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]	International Political Geography
GEOG*3050	[0.50]	Development and the City

IDEV*2010	[0.50]	International Development Studies
POLS*2080	[0.50]	Development and Underdevelopment
SOAN*3680	[0.50]	Development/Underdevelopment
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:		
POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*3790	[0.50]	The Political Economy of International Relations

### Italian (ITAL)

#### School of Languages and Literatures, College of Arts

All language courses carry 0.50 credits. Students with Year 4 or OAC 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\*2060, ITAL\*2070, ITAL\*3060
- two of the following courses ITAL\*2100, ITAL\*3150, ITAL\*3200
- 1.50 additional credits from List A
- at least 1.00 credits from List B

#### List A

ITAL*1060	[0.50]	Introductory Italian I
ITAL*1070	[0.50]	Introductory Italian II
ITAL*2100	[0.50]	Renaissance Lovers and Fools
ITAL*3150	[0.50]	Medieval Italian Literature
ITAL*3200	[0.50]	Novels of Resistance
ITAL*3950	[0.50]	Topics in Italian Literature
ITAL*3960	[0.50]	Topics in Italian Literature
ITAL*3970	[0.50]	Topics in Italian Literature
ITAL*4900	[0.50]	Research Paper in Italian Studies

#### List B

ARTH*2540	[0.50]	Medieval Art
ARTH*2550	[0.50]	The Italian Renaissance
ARTH*2950	[0.50]	Baroque Art
ARTH*3100	[0.50]	Perspectives: Structure and Space in Renaissance and Baroque Art
ARTH*3150	[0.50]	Space: Roman Art and Urbanism
ARTH*3540	[0.50]	Image: The Arts in the Medieval Era
ARTH*3550	[0.50]	Lives: Aspects of High Renaissance Art
ARTH*3640	[0.50]	Objects: Baroque Art and Rococo 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]	History of Greece and Rome
HIST*3750	[0.50]	The Reformation
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 Management (MKMN)

#### Department of Marketing and Consumer Studies, College of Social and Applied Human Sciences

A Marketing Management minor is designed for students who wish to pursue interdisciplinary studies that consider consumers and the marketplace, consumers and their decision processes and behaviours, markets and their structure and various interactive relationships, and issues concerning market management.

Students who wish to declare the Marketing Management Minor specialization must apply directly to the Department. In order to be eligible, applicants must have a cumulative average of 70% or better in all course attempts towards the minor.

#### Minor (Honours Program)

A minimum of 5.00 credits is required, including:

AGEC*2220	[0.50]	Financial Accounting
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
MCS*1000	[0.50]	Introductory Marketing
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour

One of:

HTM*2200	[0.50]	Organizational Behaviour I
ISS*2500	[0.50]	Management in Organizations

2.00 restricted electives from the list of Restricted Electives, 1.00 of which must be at the 3000 or 4000 level

#### Restricted Electives

AGEC*4360	[0.50]	Marketing Research
AGEC*4370	[0.50]	Marketing Management
ECON*2200	[0.50]	Industrial Relations
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2720	[0.50]	Business History
ECON*3200	[0.50]	Economics of Industrial Relations
ECON*3560	[0.50]	Theory of Finance
MCS*2020	[0.50]	Information Management
MCS*3020	[0.50]	Services Marketing
MCS*3030	[0.50]	Research Methods
MCS*3040	[0.50]	Business and Consumer Law
MCS*3100	[0.50]	Economic Behaviour of Households
MCS*3600	[0.50]	Consumer Information Processes
MCS*4050	[0.50]	The Evolution of Capitalism: A Canadian Perspective

One of:

ECON*2740	[0.50]	Economic Statistics
STAT*2060	[0.50]	Statistics for Business Decisions

#### Mathematical Economics (MAEC)

##### Department of Economics, College of Social and Applied Human Sciences

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.

**Note:** Students approaching the end of their program are strongly advised to take, by arrangement with the departmental advisor, at least one of the Special Study in Economics courses (ECON\*4900, ECON\*4910).

#### 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*3600	[0.50]	Macroeconomics in an Open Economy
1.50 electives or restricted electives*		

##### Semester 7

ECON*4640	[0.50]	Applied Econometrics I
ECON*4710	[0.50]	Advanced Topics in Microeconomics
ECON*4870	[0.50]	Mathematical Economics: Dynamics
1.00 electives or restricted electives*		

**Semester 8**

ECON*4810	[0.50]	Advanced Macroeconomic Theory
ECON*4900	[0.50]	Special Study in Economics

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

1.00 electives

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

**Mathematics (MATH)****Department of Mathematics and Statistics, College of Physical and Engineering Science**

Mathematics and Statistics have become crucial components in the understanding and exploration of more and more disciplines. Persons with a strong background in mathematical sciences have access to a broad range of rewarding opportunities. Within the B.A. program, the Department of Mathematics and Statistics offers areas of concentration, majors and minors, both in Mathematics and Statistics. The Mathematics programs are designed to provide considerable flexibility for students to pursue their own interests, whether they be in the concepts of "pure" mathematics or techniques and applications. As a result, these programs open up opportunities for careers in many sectors such as business, education, government, industry, or medicine.

**Area of Concentration (General Program)**

A minimum of 5.00 Mathematics credits is required, including:

- 4.00 credits in Mathematics, including at least 1.00 from courses at the 3000 level or above
- 1.00 additional credits from Mathematics, Statistics and/or Computing Science

**Honours Programs**

Students without 4U Advanced Function and Calculus or OAC Calculus should consult with the departmental advisor. Students without 4U Geometry and Discrete Mathematics or OAC Algebra and Geometry should take MATH\*2150 and then MATH\*2160.

**Core Requirements for Honours**

MATH*1200	[0.50]	Calculus I
MATH*1210	[0.50]	Calculus II
MATH*2000	[0.50]	Set Theory
MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I

**Note:** For both a major and a minor, it is strongly recommended that PHIL\*2110 be included as an elective and be taken as early as possible.

**Major (Honours Program)**

A minimum of 8.00 credits is required, including:

- the Mathematics core requirements
- MATH\*2210
- MATH\*3200
- STAT\*2040
- 0.50 credits in Statistics
- 0.50 credits in Computing Science (from CIS\*1500 or higher)
- 3.00 additional credits in Mathematics from courses at the 2000 level or above, including 1.00 at the 3000 level and 1.00 at the 4000 level

**Minor (Honours Program)**

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

2.50 credits from (MATH\*1080 or MATH\*1200), (MATH\*1210 or MATH\*2080), MATH\*2000, (MATH\*2150 or MATH\*2160), MATH\*2200

0.50 STAT credits at the 2000 level or above

2.00 additional Mathematics credits at the 2000 level or above, including 1.50 credits at the 3000 or 4000 level

**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:

a. ARTH*1220	[0.50]	The Visual Arts Today
ARTH*1510	[0.50]	Art Historical Studies I
ARTH*1520	[0.50]	Art Historical Studies II
b. 3.50 additional credits in Art History including:		
ARTH*2120	[0.50]	Introduction to Museology
ARTH*2480	[0.50]	Introduction to Art Theory and Criticism
ARTH*3220	[0.50]	Nationalism and Identity in Art
ARTH*3570	[0.50]	Display: Visual Culture in Late 19th Century Europe
ARTH*4620	[0.50]	Museum Studies

**Music (MUSC)****School of Fine Art and Music, College of Arts**

The School offers courses in music history, theory, ethnomusicology, and performance. Many courses are open to all students, while others require a 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 elect one or more areas of interest, such as individual study on an instrument, performing in vocal or instrumental ensembles, specialized historical or theoretical study, directed readings, or an independent project. Physics of Music (MUSC\*1090) is strongly recommended for all Music students and will count as one of the courses for the B.A. math/science requirement.

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. Students who wish to continue to the 2000 level in Applied Music must be enrolled in a Music program, general program; area of concentration; honours program, major or minor.

*Applied Music courses are designed to be taken during successive Fall and Winter terms. If this sequence is interrupted for a semester or more, students will be required to reaudition 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.*

**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 the general program area of concentration and honours program major must complete the following courses:

MUSC*1180	[0.50]	Musicianship I
MUSC*1250	[0.50]	Melody and Counterpoint
MUSC*2360	[0.50]	Tonal Harmony I
MUSC*2370	[0.50]	Tonal Harmony II
MUSC*2600	[0.50]	Music History: Chant to Josquin
MUSC*2610	[0.50]	Music History: The Reformation to J.S. Bach
MUSC*2620	[0.50]	Music History: Classical and Romantic Eras
MUSC*3630	[0.50]	20th Century Music

**Area of Concentration (General Program)**

A minimum of 6.00 Music credits is required, including:

- the Music core
- at least 1.00 Music credits at the 3000 level or above

**Major (Honours Program)**

A minimum of 8.00 Music credits is required, including:

- the Music core
- one of MUSC\*2140, MUSC\*2110, MUSC\*2200
- one of MUSC\*3020, MUSC\*3030, MUSC\*3840, MUSC\*3850
- one of MUSC\*3800, MUSC\*3810
- MUSC\*4401/2

*Participation in Applied Music courses and/or performing ensembles 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 at least 2.00 Music credits at the 3000 or 4000 level.

## Course Groups

Students who wish to concentrate in particular areas of Music should consider selecting one of the following course groups:

### Jazz, Popular, and World Music Studies

MUSC*1180	[0.50]	Musicianship I
MUSC*2140	[0.50]	History of Jazz
MUSC*2150	[0.50]	Music and Popular Culture
MUSC*2180	[0.50]	Musicianship II
MUSC*3820	[0.50]	Topics in Ethnomusicology

One of:

MUSC*2110	[0.50]	Music of the Circum-Atlantic and the Americas
MUSC*2200	[0.50]	Music of the Near and Far East

One of:

MUSC*2610	[0.50]	Music History: The Reformation to J.S. Bach
MUSC*2620	[0.50]	Music History: Classical and Romantic Eras

1.50 other music credits at the 3000 or 4000 level (MUSC\*1250 and MUSC\*2360 are highly recommended)

### Theory and Analysis

MUSC*1180	[0.50]	Musicianship I
MUSC*1250	[0.50]	Melody and Counterpoint
MUSC*2360	[0.50]	Tonal Harmony I
MUSC*2370	[0.50]	Tonal Harmony II

One of:

MUSC*2610	[0.50]	Music History: The Reformation to J.S. Bach
MUSC*2620	[0.50]	Music History: Classical and Romantic Eras
MUSC*3630	[0.50]	20th Century Music

One of:

MUSC*3020	[0.50]	Tonal Analysis
MUSC*3030	[0.50]	Post-tonal Analysis

1.50 other Music credits at the 3000 or 4000 level

### History and Literature

MUSC*1180	[0.50]	Musicianship I
MUSC*1250	[0.50]	Melody and Counterpoint
MUSC*2360	[0.50]	Tonal Harmony I

Three of:

MUSC*2600	[0.50]	Music History: Chant to Josquin
MUSC*2610	[0.50]	Music History: The Reformation to J.S. Bach
MUSC*2620	[0.50]	Music History: Classical and Romantic Eras
MUSC*3630	[0.50]	20th Century Music

2.00 other Music credits at the 3000 or 4000 level

### Applied Music

MUSC*1180	[0.50]	Musicianship I
MUSC*1500	[0.50]	Applied Music I
MUSC*1510	[0.50]	Applied Music II
MUSC*2180	[0.50]	Musicianship II

One of:

MUSC*2600	[0.50]	Music History: Chant to Josquin
MUSC*2610	[0.50]	Music History: The Reformation to J.S. Bach
MUSC*2620	[0.50]	Music History: Classical and Romantic Eras
MUSC*3630	[0.50]	20th Century Music

0.50 credits from one of the following 2 sets of 2 courses:

MUSC*2530	[0.25]	Instrumental Ensembles I
MUSC*2540	[0.25]	Instrumental Ensembles II

OR

MUSC*2550	[0.25]	Choral Ensembles I
MUSC*2560	[0.25]	Choral Ensembles II

2.00 other Music credits at the 3000 or 4000 level

Honours students considering graduate work in ethnomusicology, performance, theory, and other music specializations should consult the School Director or an academic adviser early in their program. Students should take MUSC\*2290, MUSC\*2350, MUSC\*3020, MUSC\*3030, MUSC\*3750 and Topics courses (MUSC\*3800 to MUSC\*3850) 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.

## Organizational Behaviour (OBEH)

### Department of Psychology, College of Social and Applied Human Sciences

The study of behaviour and the behavioural processes of individuals and groups within organizations is an especially important focus for those interested in human welfare and productivity. The Minor in Organizational Behaviour is for students seeking to broaden their knowledge beyond their major area of study and may be of particular value for those interested in the dynamics of organizational structures within the private and/or public domains. Although this program should provide a meaningful complement for a significant number of Major options, the program might be of particular interest to those students considering a future management and/or business career.

## Minor (Honours Program)

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

A minimum of 6.00 credits is required, including:

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
2.00 credits in 4 Psychology Core Courses, to include PSYC*2310		
PSYC*2010	[0.50]	Quantification in Psychology
PSYC*3060	[0.50]	Occupational Health Psychology
PSYC*3070	[0.50]	Psychology in Human Resource Management
PSYC*3080	[0.50]	Organizational Psychology
PSYC*3250	[0.50]	Psychological Measurement

0.50 additional credits in Psychology

Students should note the availability of courses PSYC\*3900 and PSYC\*3910 when considering potential Psychology electives which would fulfil this requirement. When selecting open electives for completion of the degree, students with this minor should consider selecting the following courses: HTM\*4390 and SOAN\*2040.

**Note:** Courses designated with (H) in Section XII--Course Descriptions are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology.

## 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 departmental 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)

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

- 1 of PHIL\*2140, PHIL\*2160, PHIL\*2170, PHIL\*3060, PHIL\*3080, PHIL\*3130, PHIL\*3200
- 1 of PHIL\*2110, PHIL\*2130, PHIL\*2180, PHIL\*3180, PHIL\*3190, PHIL\*3240, PHIL\*3250, PHIL\*3420, PHIL\*3910, PHIL\*3920, PHIL\*3930, PHIL\*4360, PHIL\*4370, PSYC\*3280
- 1 of PHIL\*2030, PHIL\*2060, PHIL\*2070, PHIL\*2120, PHIL\*2600, PHIL\*3040, PHIL\*3050, PHIL\*3230, PHIL\*4060, PHIL\*4310, PHIL\*4340
- 3.50 additional credits in Philosophy

**Note:** Students must have at least 1.50 Philosophy credits at the 3000 or 4000 level.

## Major (Honours Program)

A minimum of 8.50 credits is required, including:

- PHIL\*2110, PHIL\*2120, PHIL\*2140, PHIL\*2160, PHIL\*3080
- 2 of PHIL\*2170, PHIL\*2180, PHIL\*3180, PHIL\*3190, PHIL\*3240, PHIL\*3250, PHIL\*4360, PHIL\*4370, PSYC\*3280
- 2 of PHIL\*2060, PHIL\*3050, PHIL\*3230, PHIL\*4310, PHIL\*4340
- 2 of PHIL\*2030, PHIL\*2070, PHIL\*2130, PHIL\*2600, PHIL\*3130, PHIL\*3200, PHIL\*3420, PHIL\*3910, PHIL\*3920, PHIL\*3930, PHIL\*4060
- 3.00 additional credits in Philosophy

**Note:** Students must have at least 3.50 credits in Philosophy at the 3000 level or above, and at least 1.50 of these at the 4000 level.

Students planning to do graduate studies in philosophy should take PHIL\*2110, PHIL\*2120, PHIL\*2140, PHIL\*3080, PHIL\*3130, PHIL\*3200, PHIL\*4800.

## Minor (Honours Program)

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

- 1 of PHIL\*2140, PHIL\*2160, PHIL\*2170, PHIL\*3060, PHIL\*3080
- 1 of PHIL\*2110, PHIL\*2180, PHIL\*3180, PHIL\*3190, PHIL\*3240, PHIL\*3250, PHIL\*4360, PHIL\*4370, PSYC\*3280
- 1 of PHIL\*2060, PHIL\*2120, PHIL\*3050, PHIL\*3230, PHIL\*4310, PHIL\*4340
- 1 of PHIL\*2030, PHIL\*2070, PHIL\*2130, PHIL\*2600, PHIL\*3130, PHIL\*3200, PHIL\*3420, PHIL\*3910, PHIL\*3920, PHIL\*3930, PHIL\*4060
- 3.00 additional credits in Philosophy

**Note:** Students must have at least 3.50 credits in Philosophy at the 3000 level or above, and at least 1.50 of these at the 4000 level.

## 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: Theory and Analysis, Canada and the Americas, Public Policy and Administration, and Comparative

/ International Development. These areas are listed below to identify 3000 level courses that fulfill prerequisites for selected 4000 level courses (see course descriptions). A brochure describing each of these fields of study, and containing further course information, is available from the departmental office. The Department of Political Science also participates in several interdisciplinary programs, including European Studies and International Development 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\*3650. This course is also required for students in the honours program minor.

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, POLS\*2000, POLS\*2300
- POLS\*2080 or POLS\*2100
- POLS\*2200 or POLS\*2250

### Area of Concentration (General Program)

A minimum of 5.00 credits in Political Science is required, including:

- the Political Science core
- 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 in Political Science is required, including:

- the Political Science core
- POLS\*3650
- at least 0.50 credits at the 3000 level in three of the four fields in the department
- 2.00 credits at the 4000 level, two of which may include the POLS\*4970/POLS\*4980 Honours Thesis \*\*

\*\* 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 in Political Science is required, including:

- the Political Science core
- POLS\*3650
- 0.50 credits at the 4000 level

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

### 4000 Level Prerequisites

#### Political Theory and Analysis

POLS*3180	[0.50]	Political Inquiry and Analysis
POLS*3220	[0.50]	Classical Political Thought
POLS*3230	[0.50]	Modern Political Thought
POLS*3280	[0.50]	Modern Political Ideologies
POLS*3710	[0.50]	Politics and Sexuality

#### Canada and the Americas

POLS*3050	[0.50]	Canadian Political Parties, Elections and Pressure Groups
POLS*3110	[0.50]	Politics of Ontario
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*3330	[0.50]	Politics and Trade Liberalization in the Americas
POLS*3390	[0.50]	Comparative Democratic Institutions
POLS*3410	[0.50]	U.S. Politics and Government
POLS*3730	[0.50]	The Americas

#### Public Policy and Administration

POLS*3110	[0.50]	Politics of Ontario
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 Policy Formation and Administration
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
POLS*3930	[0.50]	Politics of the Agri-Food System
POLS*3940	[0.50]	Accountability and Canadian Government

#### Comparative/International Development

POLS*3000	[0.50]	Politics of Africa
POLS*3060	[0.50]	Politics of the Middle East and North Africa
POLS*3070	[0.50]	The Politics of Asian Development
POLS*3080	[0.50]	Politics of Latin America
POLS*3160	[0.50]	Women and Politics in the Third World
POLS*3330	[0.50]	Politics and Trade Liberalization in the Americas
POLS*3390	[0.50]	Comparative Democratic Institutions
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*3460	[0.50]	Communism and Post-Communism
POLS*3490	[0.50]	Conflict and Conflict Resolution
POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*3730	[0.50]	The Americas
POLS*3790	[0.50]	The Political Economy of International Relations
POLS*3890	[0.50]	Government and Politics of India
POLS*3920	[0.50]	Modern China

The Department of Political Science offers a comprehensive counselling service for students in Political Science. As part of their program, the department also permits students to include 0.50 credits towards the general degree and 1.00 credits towards the honours degree from an approved list of courses offered by other departments.

Students are encouraged to consult with the departmental 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 specialization in the B.Sc. program (described in the schedule of studies for B.Sc. programs). Through its different undergraduate programs, the Psychology Department attempts to provide 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 (e.g. social services); and c) a sound preparation for graduate study in psychology. Students intending to apply for admission to graduate programs in Psychology are advised to refer to the Graduate Advisory Note.

A cumulative average of at least 70% in all course attempts in Psychology is required to enter or continue in the Honours Psychology program major in semesters 4, 5, 6, 7, and 8.

#### Minors

Students interested in a Minor in Psychology should examine the schedule of studies for the Minors in Cognitive Neuropsychology, Developmental Psychology, Educational Psychology, Organizational Behaviour, or Social Psychology. Within the BA Degree program, these are the only Honours Minors available from the Psychology Department. The department does not offer Psychology as an Honours BA Minor, or as an Area of Concentration in the General BA Program.

#### Note on Honours Courses

Courses marked (H) are designed for students in a psychology honours program, the Information Systems and Human Behaviour program, the Developmental Psychology Minor program, the Educational Psychology Minor program, the Organizational Behaviour Minor program, the Social Psychology program, the Cognitive Neuropsychology Minor program, or Human Resources Management major of the Bachelor of Commerce program. Students in other programs wishing to take these courses must obtain the permission of the instructors concerned. Unless otherwise specified, all other courses may be taken by general, honours, and students from other programs, providing the prerequisites are met. **Courses designated with (H) are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology, or registration in either the HRM Major or ISHB Major.**

#### Core Requirements

Each of the Psychology programs requires that students complete at least 6 of the following 2000 level Psychology courses (3.00 credits). Psychology students are advised that they are normally expected to complete at least four 2000 level Psychology core courses prior to attempting any 3000 level Psychology courses.

However, students should take the 3000 level methodology courses PSYC\*3320(H), PSYC\*3370(H) and PSYC\*3380 (H) as early as possible, even though 4 core courses may not have been taken.

PSYC*2310	[0.50]	Introduction to Social Psychology
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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

### Major (Honours Program)

A minimum of 9.00 credits in Psychology is required, including (see notes below):

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
6 of the 2000 level Psychology core courses listed above		
PSYC*2010	[0.50]	Quantification in Psychology
PSYC*2360	[0.50]	Introductory Research Methods
PSYC*3250	[0.50]	Psychological Measurement
PSYC*3320	[0.50]	Statistical Principles in Psychological Research

1.50 additional credits at the 3000 level or above (Students electing to take PSYC\*3370 and PSYC\*3380 will need to select only 0.50 additional credits at the 3000 level or above in order to satisfy this requirement.) (see Graduate Advisory Note).

1.50 additional psychology credits at the 4000 level (See Graduate Advisory Note).

Notes:

1. PSYC\*2010 should normally be completed by the end of semester 3
2. PSYC\*2360 should normally be completed by the end of semester 4
3. PSYC\*3320 SHOULD NORMALLY BE COMPLETED BY THE END OF SEMESTER 4.
4. **NOTE: that PSYC\*3320 is a prerequisite for PSYC\*3370 and PSYC\*3380 and that PSYC\*3320 is an (H) designated course.**

**Note:** The regulations of the B.A. program govern the number of credits that must be taken at the 3000 level or above (see B.A. Program Regulations). With permission of the Psychology Department PRIOR to course selection, up to 1.00 non-psychology credits that would enhance the student's studies in Psychology, especially in preparation for post-graduate work, may be credited towards the total number of credits required for graduation in the honours program major in Psychology.

**Graduate Advisory Note:** Most graduate programs require the student to have at least a B+ average in order to be considered for admission. Students contemplating graduate work in Psychology are strongly advised to complete the major by completing 0.50 elective credits at the 3000 level or above and 0.50 elective credits at the 4000 level beyond PSYC\*4870 and PSYC\*4880 which would otherwise satisfy the 3000-4000 level elective requirement for the major.

These students are encouraged to complete the Psychology major as follows:

- a. PSYC\*1100 and PSYC\*1200
- b. 6 of the 2000 level Psychology core courses
- c. PSYC\*2010 and PSYC\*3320
- d. PSYC\*2360 and PSYC\*3370 and PSYC\*3380
- e. an additional 0.50 credits in Psychology at the 3000 level or above
- f. PSYC\*3250
- g. PSYC\*4370 or PSYC\*4900
- h. 0.50 electives at the 4000 level
- i. PSYC\*4870 plus PSYC\*4880

Students should note that an Honours Thesis is normally taken as a Fall-Winter sequence worth the equivalent of 1.50 credits toward the 20.00 credits Honours B.A. degree requirements.

### 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. One of the options is recommended for Co-op students expecting to apply for admission to graduate studies in Psychology. (See Graduate Advisory Note.)

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 Administration, 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.) Although not required, Co-op students are strongly encouraged to select a minor as part of the program.

Depending on career aspirations, students should have a good working knowledge of one or more of the following before their first work semester: psychological measurement, 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.

Last Revision: August 22, 2006

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.

**Note:** Courses designated with (H) in Section XII--Course Descriptions are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology.

### Major (Honours Program) - Stream A

**The following Co-op schedule of studies is for students not intending to apply for admission to graduate programs in Psychology (includes 3 work terms).**

**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.

#### Semester 1 - Fall

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
1.50 electives*		

#### Semester 2 - Winter

COOP*1100	[0.00]	Introduction to Co-operative Education
PSYC*2010	[0.50]	Quantification in Psychology
0.50 Psychology core***		
1.50 electives*		

#### Summer Semester

Optional, however completion of semester 3 requirements NOW would allow for additional flexibility in the scheduling of future work terms (see also optional schedule below for students intending to apply for graduate programs).

#### Semester 3 - Fall

PSYC*3320	[0.50]	Statistical Principles in Psychological Research
1.50 Psychology core***		
0.50 electives*		

#### Winter Semester

COOP*1000	[0.00]	Co-op Work Term I
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#### Semester 4 - Summer

1.00 Psychology core  
1.50 electives\*\*\*\*

#### Fall Semester

COOP*2000	[0.00]	Co-op Work Term II
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#### Semester 5 - Winter

PSYC*2360	[0.50]	Introductory Research Methods
PSYC*3250	[0.50]	Psychological Measurement
0.50 Psychology credits at the 3000 or 4000 level**		
1.00 electives		

#### Summer Semester

COOP*3000	[0.00]	Co-op Work Term III
PSYC*4910	[0.50]	Co-operative Education Project I

#### Semester 6 - Fall

1.00 Psychology electives at the 3000 or 4000 level\*\*  
1.50 electives

#### Semester 7 - Winter

1.00 Psychology electives at the 3000 or 4000 level\*\*  
1.50 electives

#### Semester 8 - Summer\*\*\*\*\*

2.00 electives

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

\*\* at least two of these Psychology courses must be at the 4000 level

\*\*\* see Semester 4 requirements as not all core courses are available in the Summer Semester

\*\*\*\* PSYC\*2310 and PSYC\*2740 are normally available in the Summer Semester

\*\*\*\*\* the schedule for COOP\*3000 and semester 8 requirements can be exchanged

### Major (Honours Program) - Stream B

**The following Co-op schedule of studies is recommended for those students intending to apply for graduate work in Psychology (includes 3 work terms and 18 Psychology courses).**

#### Semester 1 - Fall

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
1.50 electives*		

#### Semester 2 - Winter

COOP*1100	[0.00]	Introduction to Co-operative Education
PSYC*2010	[0.50]	Quantification in Psychology

1.00 Psychology core (other than PSYC\*2310 or PSYC\*2740)  
1.00 electives\*

### Semester 3 - Summer

PSYC\*2310 [0.50] Introduction to Social Psychology  
PSYC\*2740 [0.50] Personality  
1.50 electives\*

### Semester 4 - Fall

PSYC\*2360 [0.50] Introductory Research Methods  
PSYC\*3320 [0.50] Statistical Principles in Psychological Research  
1.00 Psychology core  
0.50 electives\*

### Winter Semester

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

### Summer Semester

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

### Semester 5 - Fall

PSYC\*3370 [0.50] Experimental Design and Analysis  
2.00 electives\*

### Semester 6 - Winter

PSYC\*3250 [0.50] Psychological Measurement  
PSYC\*3380 [0.50] Non-experimental Research Methods  
1.50 electives\*

### Summer Semester

Optional

### Fall Semester\*\*

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

One of:

PSYC\*4910 [0.50] Co-operative Education Project I  
0.50 PSYC\*  
0.50 electives

### Semester 7 - Winter\*\*

PSYC\*4870 [0.50] Honours Thesis I  
2.00 electives\*

### Semester 8 - Summer

PSYC\*4880 [1.00] Honours Thesis II  
1.00 electives\*

\*at least 1.00 of the elective credits in semester 5, 6, 7, or 8 must be a 3000 level or above Psychology elective (and include either PSYC\*4370 or PSYC\*4900). The total of electives should include the B.A. program distribution requirements and the completion of the total number of credits required at the 3000 level or above required by the B.A. degree.

\*\*the schedule for COOP\*3000 and semester 7 requirements can be exchanged

## Rural and Development Sociology (RDS)

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

The program of Rural and Development Sociology focuses on the study of rural institutions and processes in industrialized societies with an emphasis on changes in rural communities, agriculture and natural resources, including historical and comparative analyses of the development of rural life. It provides students with major research and conceptual tools needed for the understanding of rural transformation, their interdependence with the natural environment and with urban society.

### Major (Honours Program)

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

- ANTH\*1150, SOAN\*2111/2, SOAN\*2120, SOAN\*3070, SOAN\*3120, SOAN\*4500, SOC\*1100, SOC\*2080, (ANTH\*3690 or SOC\*3310), SOC\*3380, SOC\*4210,
- 4 of SOAN\*4220, SOAN\*4240, SOC\*2010, SOC\*2090, SOC\*2280, SOC\*2390, SOC\*4880, SOC\*4890, SOC\*4900, SOC\*4910
- at least 1.00 credits at the 4000 level

### Rural Extension Studies (RES)

### School of Environmental Design and Rural Development, Ontario Agricultural College

Rural Extension Studies is offered as a minor in the honours program. It is designed to provide students with an opportunity to pursue studies which focus on the development of non formal educational programs for rural people and rural communities and their organizations. The program comprises 5.00 credits. 3.00 of these are drawn from the area of Rural Extension studies; 2.00 electives must be chosen from 1 or several complementary disciplines in the social sciences. Students seeking counselling should consult with a departmental advisor in the School of Rural Extension Studies.

### Minor (Honours Program)

A minimum of 5.00 credits is required, including:

REXT\*2000 [0.50] Introduction to Rural Extension

REXT\*3000 [0.50] Program Development and Evaluation

Four of the following:

REXT\*3040 [0.50] Communication Process  
REXT\*3060 [0.50] International Communication  
REXT\*3080 [0.50] Technology in Extension  
REXT\*3100 [0.50] Teaching and Learning in Non-Formal Education  
REXT\*4020 [0.50] Rural Extension in Change and Development  
REXT\*4100 [0.50] Leadership Development in Rural Organization

### Electives

The remaining credits required for the minor must be selected from the following list. However, students are strongly advised to consult with the departmental advisor before choosing electives.

ECON\*4830 [0.50] Economic Development  
GEOG\*1220 [0.50] Human Impact on the Environment  
GEOG\*3320 [0.50] Agriculture and Society  
POL\*2080 [0.50] Development and Underdevelopment  
POL\*2200 [0.50] International Relations  
PSYC\*2310 [0.50] Introduction to Social Psychology  
PSYC\*2450 [0.50] Introduction to Developmental Psychology  
SOAN\*3300 [0.50] Community Development  
SOC\*2080 [0.50] Rural Sociology

## Social Psychology (SPSY)

### Department of Psychology, College of Social and Applied Human Sciences

Social Psychology focuses on the ways in which human experience is grounded in social interactions and social relationships. Although this Minor was designed for any student seeking to broaden their knowledge beyond their Major area of study, it may be of particular interest to students who are considering future careers in human service fields such as Social Work, Counselling, Criminology, and Occupational Therapy. The program may also be of special interest to students associated with the Collaborative Diploma Program in Public/Private Sector Administration.

### Minor (Honours Program)

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

A minimum of 6.00 credits is required, including:

PSYC\*1100 [0.50] Principles of Behaviour  
PSYC\*1200 [0.50] Dynamics of Behaviour  
PSYC\*3310 [0.50] Applied Social Psychology

2.50 credits in 5 Psychology Core Courses to include PSYC\*2310, PSYC\*2450

0.50 credits in a Psychology electives (it is recommended that this elective be chosen from the list of seven restricted electives below)

1.50 credits from three of the following seven courses:

PSYC\*3070 [0.50] Psychology in Human Resource Management  
PSYC\*3080 [0.50] Organizational Psychology  
PSYC\*3450 [0.50] Social and Personality Development  
PSYC\*3500 [0.50] Social Interactions  
PSYC\*3520 [0.50] Political Psychology  
PSYC\*3690 [0.50] Community Mental Health  
PSYC\*4310 [0.50] Advanced Topics in Social Psychology

**Note:** Courses designated with (H) in Section XII--Course Descriptions are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology.

## 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 and PHIL\*2180.

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.

Sociology credit may also be given for some Anthropology courses with the exception of ANTH\*3840 through ANTH\*4910 inclusive. See a Sociology/Anthropology Faculty Advisor for approval of substitutions.

### 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 from the Department of Sociology and Anthropology, including at least 1.00 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 from the Department of Sociology and Anthropology, including at least 1.50 at the 4000 level

### 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 from the Department of Sociology and Anthropology, including at least 1.00 credits at the 3000 level or above

The following courses may be used toward a sociology specialization: FRHD\*3060 and PHIL\*2180.

### Spanish (SPAN)

#### School of Languages and Literatures, College of Arts

The Spanish 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. Such students should consult the Head of Spanish before beginning their studies, so that pre-requisite waiver forms are completed. 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.

### Study Abroad

The Spanish Studies program encourages its students to take advantage of the University of Guelph's exchange programs and the semester abroad opportunities. Exchange programs with the University of Málaga and the University of La Rioja in Spain and with the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) in Mexico are very popular. 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 and 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 Coordinator of Spanish for more information.

### Area of Concentration (General Program)

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

- 3.00 credits from SPAN\*1100, SPAN\*1110, SPAN\*2000, SPAN\*2010, SPAN\*3500, SPAN\*3530, SPAN\*4500, SPAN\*4520
- SPAN\*2040, SPAN\*2990, SPAN\*3080
- 0.50 credits in literature

### Major (Honours Program)

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

- SPAN\*2000, SPAN\*2010, SPAN\*2040, SPAN\*2990, SPAN\*3080, SPAN\*3500, SPAN\*3530, SPAN\*4500, SPAN\*4520
- 3.50 credits in literature courses

**Note:** Students intending to proceed to graduate studies should take SPAN\*3170 and SPAN\*4170

### Minor (Honours Program)

A minimum of 5.50 credits in Spanish is required, including:

- 3.00 credits from SPAN\*1100, SPAN\*1110, SPAN\*2000, SPAN\*2010, SPAN\*3500, SPAN\*3530, SPAN\*4500, SPAN\*4520
- SPAN\*2040, SPAN\*2990, SPAN\*3080
- 1.00 credits in literature

**Note:** Students in the Spanish program may include one of the following courses for credit in their program:

ARTH*2050	[0.50]	Modern Latin American Art
ARTH*3050	[0.50]	Pre-Columbian Art
HIST*2110	[0.50]	The Atlantic World 1500-1850
HIST*2920	[0.50]	Republican Latin America
HIST*3150	[0.50]	History and Culture of Mexico
HIST*3420	[0.50]	Colonial Latin America
POLS*3080	[0.50]	Politics of Latin America

Any other substitution for required courses can only be made with the approval of the faculty advisor.

### Statistics (STAT)

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

The discipline of Statistics is essential in the social sciences, biological sciences, physical sciences, and health professions. The specialization in Statistics emphasizes applications of statistical theory and methods to other disciplines and is available in the B.A. Honours Program as a major or minor and as an area of concentration in the General Program.

Students are encouraged to combine the study of statistics with another field.

Statistical computing is a fundamental tool for the application of modern statistical methods. Students in these programs will develop skills in computer applications programming using such high-level languages as SAS and S-PLUS.

### Area of Concentration (General Program)

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

- no more than 1.00 credits from courses at the 1000 level
- 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
MATH*2150	[0.50]	Applied Matrix Algebra
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
STAT*3320	[0.50]	Sampling Theory with Applications

### Honours Programs

Students who major or 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.

### Major (Honours Program)

Students may enter this major in Semester I or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum of 20.00 credits is required to complete the degree, with a minimum of 9.50 credits required as below to complete the major.

1.50 credits as follows:

CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
MATH*1210	[0.50]	Calculus II

5.00 credits in Statistics and Mathematics as follows:

MATH*2130	[0.50]	Numerical Methods
MATH*2200	[0.50]	Advanced Calculus 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*3210	[0.50]	Experimental Design
STAT*3240	[0.50]	Applied Regression Analysis
STAT*3320	[0.50]	Sampling Theory with Applications

One of:

MATH*2150	[0.50]	Applied Matrix Algebra
MATH*2160	[0.50]	Linear Algebra I

2.50 credits in Statistics at the 3000 or 4000 level, of which at least 2.00 credits must be at the 4000 level.

0.50 credits in Mathematics or Statistics at the 2000-level or above.

### Recommended Schedule of Studies for Major (Honours Program)

#### Semester 1

MATH\*1200 [0.50] Calculus I

2.00 electives\*

#### Semester 2

CIS\*1500 [0.50] Introduction to Programming

MATH\*1210 [0.50] Calculus II

1.50 electives

#### Semester 3

MATH\*2200 [0.50] Advanced Calculus I

STAT\*2040 [0.50] Statistics I

One of:

MATH\*2150 [0.50] Applied Matrix Algebra

MATH\*2160 [0.50] Linear Algebra I

1.00 electives\*\*

#### Semester 4

MATH\*2130 [0.50] Numerical Methods

STAT\*2050 [0.50] Statistics II

1.50 electives\*\*

#### Semester 5

STAT\*3100 [0.50] Introductory Mathematical Statistics I

STAT\*3240 [0.50] Applied Regression Analysis

STAT\*3320 [0.50] Sampling Theory with Applications

1.00 electives\*\*

#### Semester 6

STAT\*3110 [0.50] Introductory Mathematical Statistics II

STAT\*3210 [0.50] Experimental Design

1.50 electives\*\*

#### Semester 7

2.50 electives\*\*

#### Semester 8

2.50 electives\*\*

\* See "Semester One Requirements" for Bachelor of Arts programs.

\*\*Electives must satisfy the following requirements:

1. Electives must include at least 2.50 credits in Statistics at the 3000 or 4000 level, and an additional 0.50 credits in Statistics or Mathematics at the 2000 level or above.
2. At least 2.00 credits in Statistics must be at the 4000 level.
3. Electives plus core courses must include at least 7.00 credits at the 3000 or 4000 level.

### Minor (Honours Program)

At least 5.00 credits in Statistics or Mathematics is required, including:

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

One of:

MATH\*2150 [0.50] Applied Matrix Algebra

MATH\*2160 [0.50] Linear Algebra I

0.50 additional credits in Statistics

0.50 additional credits in Statistics or Mathematics

### 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 for a more balanced study in the two disciplines. Both programs, however, require work in both Studio Art and 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

The students who elect to take a substantial number of credits in either Art History or Studio Art with the objective of graduate work are advised to obtain counselling from faculty regarding their choices. However, in general, 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. A Studio career to the graduate level will normally require some education in all the traditional and contemporary media as well as an awareness of art theory.

### Core Requirements

ARTH\*1220 [0.50] The Visual Arts Today

ARTH\*1520 [0.50] Art Historical Studies II

SART\*1050 [0.50] Integrated 2-D Media

SART\*1060 [0.50] Media Convergence

### 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:
  - i. 0.50 credits in Canadian Art (ARTH\*2060, ARTH\*2490, ARTH\*3010)
  - ii. 0.50 credits in Western Art (ARTH\*2150, ARTH\*2280, ARTH\*2540, ARTH\*2550, ARTH\*2950, ARTH\*3100, ARTH\*3150, ARTH\*3200, ARTH\*3540, ARTH\*3550, ARTH\*3640)
  - iii. 0.50 credits in Modern and Contemporary Art (ARTH\*2070, ARTH\*2290, ARTH\*2580, ARTH\*2600, ARTH\*3520, ARTH\*3570)
  - iv. 0.50 credits in Art Theory, Critical Methodology and Museology (ARTH\*2120, ARTH\*2480, ARTH\*3780)

d. 3.00 additional credits in Studio Art or Art History

**Note:** at least 1.50 credits from the total of 9.00 credits must be taken in Studio Art or Art History at the 4000 level.

### Minor (Honours Program)

A minimum of 6.00 credits is required, including:

- a. the Studio Art core
- b. 0.50 credits in Studio Art or Art History at the 4000 level
- c. 1.50 additional credits in Art History, including:
  - i. 0.50 credits in Canadian Art (ARTH\*2060, ARTH\*2490, ARTH\*3010)
  - ii. 0.50 credits in Modern and Contemporary Art (ARTH\*2070, ARTH\*2290, ARTH\*2580, ARTH\*2600, ARTH\*3520, ARTH\*3570)
- d. 2.00 additional credits in Studio Art, including 0.50 credits from List A and 0.50 from List B

### 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\*3750 [0.50] Photography II  
 SART\*4090 [0.50] Drawing III  
 SART\*4100 [0.50] Drawing IV  
 SART\*4200 [0.50] Painting III  
 SART\*4210 [0.50] Painting IV  
 SART\*4230 [0.50] Special Topics in Painting  
 SART\*4410 [0.50] Experimental Printmaking  
 SART\*4450 [0.50] Advanced Printmaking  
 SART\*4700 [0.50] Photography III  
 SART\*4710 [0.50] Photography IV  
 SART\*4830 [0.50] Interactive Multimedia

### List B

SART\*2300 [0.50] Sculpture I  
 SART\*2800 [0.50] Extended Media I  
 SART\*3300 [0.50] Sculpture II  
 SART\*3770 [0.50] Extended Media II  
 SART\*4300 [0.50] Sculpture III  
 SART\*4310 [0.50] Sculpture IV  
 SART\*4800 [0.50] Special Topics in Sculpture  
 SART\*4810 [0.50] Extended Media III  
 SART\*4820 [0.50] Extended Media IV  
 SART\*4870 [0.50] Special Topics in Sculpture

### Notes:

1. Students in the Art History Major or Minor cannot count more than 11.00 credits in Art History or 11.00 credits in Studio Arts towards their honours degree.
2. Details of advanced standing for transfer students from the Ontario College of Art and Design (OCAD) can be found in the section on Admission Information.
3. 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.
4. 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.

### 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 in dramatic literature, theatre history, criticism and theory, together with directing, acting, design, technical theatre, playwriting, and media studies.

The program has a special interest in the drama and theatre of Canada. Course offerings reflect this interest where appropriate.

#### Notes:

1. A maximum of 2.00 credits in Directed Readings or Special Studies Courses (THST\*3410, THST\*3420, THST\*3600, DRMA\*3610) 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 of English and Theatre Studies' website: <http://www.arts.uoguelph.ca/sets/>.

2. In connection with THST\*1040 and some seminar 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 are THST\*2230, THST\*3110, THST\*3120, THST\*3220, THST\*3230, THST\*3410, THST\*3420, THST\*4090, THST\*4250, THST\*4280.

### Area of Concentration (General Program)

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

- a. THST\*1040, THST\*2010, THST\*2080, THST\*2120, THST\*2230, THST\*2240, THST\*3550, THST\*3850
- b. at least one of THST\*3650, THST\*3660
- c. 0.50 other credits in Theatre Studies

### Major (Honours Program)

A minimum of 9.00 credits in Theatre Studies is required, including:

- a. THST\*1040, THST\*1150, THST\*2010, THST\*2080, THST\*2120, THST\*2230, THST\*2240, THST\*3550, THST\*3850, THST\*4280
- b. one of THST\*3650 or THST\*3660
- c. at least one of THST\*4320 or THST\*4330
- d. 2.00 other credits in Theatre Studies

### Minor (Honours Program)

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

- a. THST\*1040, THST\*2010, THST\*2080, THST\*2120, THST\*2230, THST\*2240, THST\*3550, THST\*3850
- b. one of THST\*3650 or THST\*3660
- c. 0.50 other credits in Theatre Studies

### Visual Arts of the Americas (VAA) (Minor)

#### School of Fine Art and Music

The Minor program in Visual Arts of the Americas enables students to study the art history of Canada, the United States, and Central and South America as an integrated field where certain basic conditions are shared: the existence of aboriginal traditions persisting from the pre-conquest period, the confrontation of a variety of European, African and Asian cultural heritages, and a continuing post-colonial evolution producing hybrid cultural identities.

This program of study is designed as a complement to a significant number of Major specialization, 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:

- a. ARTH\*1220 [0.50] The Visual Arts Today  
ARTH\*1510 [0.50] Art Historical Studies I  
ARTH\*1520 [0.50] Art Historical Studies II
- b. 3.50 additional credits in Art History as follows:  
ARTH\*2480 [0.50] Introduction to Art Theory and Criticism  
ARTH\*3220 [0.50] Nationalism and Identity in Art  
Two of:  
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\*2490 [0.50] History of Canadian Art  
Two of:  
ARTH\*3010 [0.50] Contemporary Canadian Art  
ARTH\*3050 [0.50] Pre-Columbian Art  
ARTH\*3060 [0.50] Public Art  
One of:  
ARTH\*4050 [0.50] Seminar in the Americas I  
ARTH\*4060 [0.50] Seminar in the Americas II

### Women's Studies (WMST)

#### Interdisciplinary Program

#### Women's Studies Office, College of Arts, Ext. 54344.

The Women's Studies program offers an interdisciplinary program that uses gender as its focus of analysis.

### Area of Concentration (General Program)

A minimum of 5.00 credits is required, including:

- a. 4.50 credits from List A
- b. 0.50 additional credits from Lists A or B

### Major (Honours Program)

A minimum of 8.00 credits is required, including:

- a. 4.50 credits from List A
- b. 3.50 additional credits from Lists A or B

At least 4.00 of these credits must be at the 3000 level or above.

### Minor (Honours Program)

A minimum of 5.00 credits is required, including:

- a. 4.50 credits from List A
- b. 0.50 additional credits from Lists A or B

### List A

WMST*1000	[0.50]	Introduction to Women's Studies
WMST*2000	[0.50]	Women and Representation
WMST*3000	[0.50]	Feminist Theory and Methods
WMST*3010	[0.50]	Gender and Diversity
WMST*4010	[0.50]	Seminar in Women's Studies
Two of:		
ARTH*3780	[0.50]	Gender and Art
ENGL*2880	[0.50]	Women in Literature
HIST*2930	[0.50]	Women and Cultural Change
PHIL*2060	[0.50]	Philosophy of Feminism I
PHIL*3210	[0.50]	Women in the History of Philosophy

### Two of:

ANTH*3400	[0.50]	The Anthropology of Gender
GEOG*3090	[0.50]	Gender and Environment
ISS*3420	[0.50]	Women Social and Political Theorists
POLS*2150	[0.50]	Gender and Politics
POLS*3710	[0.50]	Politics and Sexuality
PSYC*3300	[0.50]	The Psychology of Gender
SOAN*2400	[0.50]	Introduction to Gender Systems

### List B

ENGL*2190	[0.50]	Representation and Sexuality
ENGL*4220	[0.50]	Special Topics in Women's Writings
FREN*3560	[0.50]	Contemporary French Women's Writings
HIST*2800	[0.50]	The History of the Modern Family
HIST*3020	[0.50]	Sexuality and Gender in History
HIST*3570	[0.50]	Women in Modern Europe
HUMN*3170	[0.50]	Women, Virtue and Honour in Spanish Drama (In English)
PHIL*4060	[0.50]	Philosophy of Feminism II
SOAN*3100	[0.50]	Comparative Perspectives on Families and Households
SOAN*4220	[0.50]	Canadian Rural Women
SOAN*4240	[0.50]	Women and the Development Process
THST*3300	[0.50]	Sexuality and The Stage
WMST*3510	[0.50]	Directed Readings in Women's Studies
WMST*3520	[0.50]	Independent Workplace Learning in Women's Studies

WMST\*4510 [0.50] Advanced Topics in Women's Studies

WMST\*4520 [0.50] Advanced Topics in Women's Studies

An independent study or reading course on an appropriate topic from any subject area of the College of Arts or the College of Social and Applied Human Science may also be included in the program.

## 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 below 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 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](http://www.uoguelph.ca/uaic/students_faculty.shtml) 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. First Year Core - 4.00 credits (2.00 Science and 2.00 Arts/Social Sciences).
2. Subject Area Core - (ASCI) - 3.00 credits.
3. Arts/Social Science Minor - 5.00 credits.
4. Science Minor - 5.00 credits
5. Free Electives - 3.00 credits.

#### 1. First-year Core - 4.00 credits

Science Core - 2.00 credits including:

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I

One of:

MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

One of:

PHYS*1000	[0.50]	An Introduction to Mechanics
PHYS*1070	[0.50]	Introductory Physics for Life Sciences
PHYS*1110	[0.50]	Introductory Physics with Applications I

Arts and Social Science Core - 2.00 credits including:

- 1.00 credits over at least 2 different subject areas in the College of Arts: ARTH - Art History; CLAS - Classical Studies; DRMA - Drama; ENGL - English; EURO - European Studies; FREN - French Studies; GERM - German Studies; GREK - Greek; HIST - History; HUMN - Humanities; ITAL - Italian Studies; LAT - Latin Studies; LING - Linguistics; MUSC - Music; PHIL - Philosophy; SART - Studio Art; SPAN - Spanish Studies; WMST - Women's Studies
- 1.00 credits over at least 2 different subject areas in the College of Social and Applied Human Sciences: 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;

#### 2. Subject Area Core - 3.00 credits

- 1.50 credits from:
 

ASCI*1000	[0.50]	Society and Science I: Historical Perspectives
ASCI*1010	[0.50]	Society and Science II: Current Issues
ASCI*2000	[0.50]	Modes of Inquiry and Communication Across Disciplines
- 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*4000	[0.50]	Arts and Sciences Honours Seminar
ASCI*4010	[0.50]	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.

#### 3. Arts/Social Sciences Minors - 5.00 credits

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

Anthropology  
 Art History  
 Art Theory and Criticism  
 Business Administration  
 Classical Languages  
 Classical Studies  
 Cognitive Neuropsychology  
 Criminal Justice & Public Policy  
 Developmental Psychology  
 Economics  
 Educational Psychology  
 English  
 Environmental Studies  
 European Culture and Civilization  
 Family & Child Studies  
 French Studies  
 Geography  
 German  
 History  
 International Development  
 Italian  
 Marketing Management  
 Museum Studies  
 Music  
 Organizational Behaviour  
 Philosophy  
 Political Science  
 Rural Extension Studies  
 Social Psychology  
 Sociology  
 Spanish  
 Studio Art  
 Theater Studies  
 Visual Art of the Americas  
 Women's Studies

#### 4. Science Minor - 5.00 credits

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

Biochemistry  
 Biology  
 Biotechnology  
 Chemistry  
 Computing & Information Science  
 Ecology

Food Science  
Forest Science  
Functional Foods & Nutraceuticals  
Geology  
GIS\* & Environmental Analysis  
Mathematics  
Microbiology  
Molecular Biology and Genetics  
Neuroscience  
Nutritional Sciences  
Plant Biology  
Physics  
Psychology  
Statistics  
Zoology  
\* Geographic Information Systems

**5. Free Electives - 3.00 credits (maximum)**

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 for both their B.Sc. and B.A. minors.

**Double Counting Rule**

A maximum of 1.00 credits may be double-counted.

If a credit is double-counted towards both the first year core and one minor, it cannot be counted towards the second minor.



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

The University of Guelph, in collaboration with the regional campus at Ridgetown, 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 was designed for students who do not intend to pursue post-graduate studies and are strongly focused on securing employment that makes use of the knowledge acquired in their bachelor's degree.

This degree is a unique blend of applied and theoretical learning, with an emphasis on experiential learning opportunities. It is designed for those with a commitment to urban, regional, and/or rural stewardship and service of our living resources.

At the present time, two majors, Horticulture Management and Environmental Management, are available in the program through University of Guelph's Ridgetown campus (with Semester 5 to 8 credits available at the Guelph campus).

### Program Information

Students are required to follow the Schedule of Studies for the major in Horticulture Management. A solid grounding in applied aspects of science, technology and business provides graduates with sufficient breadth or expertise to become knowledgeable managers in all aspects of the horticultural business. The first 10.00 credits are available through the Ridgetown campus, and the additional 10.00 credits are available through the Guelph campus.

### Academic Advising and Counselling

#### Program Counselling

Program Counsellors are available at both the Ridgetown and Guelph campuses to assist students with course selection and other questions pertaining to the degree program. For information about how to contact a program counsellor, and for more information about academic advising and program counselling, see Section VII -- Academic Counselling of the current Undergraduate Calendar

#### Academic 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 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.

#### 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 (normally 5 courses). Students must successfully complete a minimum of 4.00 university credits and/or course equivalents at the 3000 level or higher, of which at least 1.00 credits must be at the 4000 level. In addition to core requirements, students must successfully complete at least 4.00 credits from the list of Restricted Electives available in Semesters 5-8.

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

#### Entry Credits

OSS Curriculum: Grade 12 U English; Grade 12 U Biology; 4 additional U or U/C credits.

#### Recommendations and Notes:

It is recommended that applicants include Grade 12U level science or math in their course of study. Students entering the degree program who are deficient in U level Mathematics or Chemistry should consult with the program counsellor. Summer semester courses will be available through a Ridgetown campus Summer Institute, Distance Education or other means. It is recommended that prior to enrolment in the degree program, students lacking Grade 12U Advanced Functions and Introductory Calculus enrol in the non-credit course "Getting Ready for Calculus" offered through the Office of Open Learning.

#### Special Expenses

Expenses for field trips can range from \$20 to \$50 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.

### Horticulture Management Major

This major will require the completion of 20.00 credits.

*Students deficient in U level Mathematics or Chemistry are required to enrol in the appropriate upgrading course(s), MATH\*1000 or CHEM\*1060 (available in a distance format) during their first year. MATH\*1000 is to be completed before Semester 2 (may substitute for SOIL\*2010 in Semester 1 and take SOIL\*2010 as the restricted elective in Semester 2). CHEM\*1060 must be completed before Semester 3. Students also may access summer distance education courses such as SOIL\*2010 or ECON\*1050, to maintain their progress.*

#### Semesters 1 to 4 offered at the Ridgetown campus

##### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CIS*1000	[0.50]	Introduction to Computer Applications
HORT*1050	[0.50]	Introduction to Horticultural Management
SOIL*2010	[0.50]	Soil Science
One of:		
HORT*1060	[0.50]	Plant Identification: Woody Plants
HORT*1070	[0.50]	Fruit Production
HORT*1080	[0.50]	Vegetable Production I

##### Semester 2 - Winter

AGEC*1100	[0.50]	Introduction to Business
AGR*1050	[0.50]	Communication Skills
ECON*1050	[0.50]	Introductory Microeconomics
One of:		
EDRD*1150	[0.50]	Landscape Design
ENVB*1010	[0.50]	Food Crop Pest Management
HORT*1100	[0.50]	Plant Propagation Techniques

0.50 restricted electives

##### Semester 3 - Fall

AGEC*2110	[0.50]	Sales and Society
AGEC*2220	[0.50]	Financial Accounting
BIOL*1040	[0.50]	Biology II
One of:		
HORT*1200	[0.50]	Vegetable Production II
HORT*2010	[0.50]	Greenhouse Management
HORT*2060	[0.50]	Plant Identification: Herbaceous Plants

0.50 restricted electives

##### Semester 4 - Winter

AGEC*2230	[0.50]	Management Accounting
AGR*2100	[0.50]	Human Resource Management
CHEM*1040	[0.50]	General Chemistry I
HORT*2200	[0.50]	Integrated Project

0.50 restricted electives

#### Semesters 5 to 8 offered on Guelph campus

##### Semester 5 - Fall

AGEC*3310	[0.50]	Operations Management
AGR*3500	[0.50]	Experiential Education
One of:		
BOT*2100	[0.50]	Life Strategies of Plants
ENVB*2040	[0.50]	Plant Health and the Environment

1.00 restricted electives

##### Semester 6 - Winter

SOIL*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
STAT*2060	[0.50]	Statistics for Business Decisions
One of:		
BOT*3310	[0.50]	Plant Growth and Development
PBIO*3110	[0.50]	Crop Physiology

0.50 restricted electives

0.50 electives

##### Semester 7 - Fall

AGR*4150	[0.50]	Experiential Education II
One of:		
MET*2020	[0.50]	Agrometeorology
SOIL*3080	[0.50]	Soil and Water Conservation

0.50 restricted electives

1.00 electives

##### Semester 8 - Winter

AGR*4050	[0.50]	Professionalism and Agrology
AGR*4500	[0.50]	Agrifood Industry Problem-Solving
0.50 restricted electives		
1.00 electives		

## Horticulture Management Major Restricted Electives

In addition to the 13.50 required credits listed above, students must take a minimum of 4.00 restricted electives throughout the program. Students must select at least 2.50 credits from List A (Science and Discipline) and at least 1.50 credits from List B (Business).

### List A: Science and Discipline

#### Available at Regional Campus

EDRD*1150	[0.50]	Landscape Design
EDRD*2050	[0.50]	Landscape Construction and Planning
ENVB*1010	[0.50]	Food Crop Pest Management
HORT*1060	[0.50]	Plant Identification: Woody Plants
HORT*1070	[0.50]	Fruit Production
HORT*1080	[0.50]	Vegetable Production I
HORT*1100	[0.50]	Plant Propagation Techniques
HORT*1200	[0.50]	Vegetable Production II
HORT*2010	[0.50]	Greenhouse Management
HORT*2060	[0.50]	Plant Identification: Herbaceous Plants
HORT*2080	[0.50]	Horticultural Weed Science
MCS*1000	[0.50]	Introductory Marketing

#### Available by Distance Education

LARC*1950	[0.50]	History of Cultural Form I
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#### Available at Guelph Campus

BOT*2100	[0.50]	Life Strategies of Plants
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*3110	[0.50]	Natural History of Insects
ENVB*3210	[0.50]	Plant Pathology
GEOG*3320	[0.50]	Agriculture and Society
HORT*2450	[0.50]	Turf Management I
HORT*3010	[0.50]	Annual, Perennial and Indoor Plants - Identification and Use
HORT*3260	[0.50]	Woody Plants
HORT*3280	[0.50]	Greenhouse Production
HORT*3340	[0.50]	Culture of Plants
HORT*3510	[0.50]	Vegetable Production
HORT*4250	[0.50]	Nursery Production
HORT*4300	[0.50]	Postharvest Physiology
HORT*4420	[0.50]	Fruit Crops
HORT*4450	[0.50]	Turf Management I
LARC*2820	[0.50]	Urban and Regional Planning
MET*2020	[0.50]	Agrometeorology
REXT*2000	[0.50]	Introduction to Rural Extension
REXT*3000	[0.50]	Program Development and Evaluation
REXT*3100	[0.50]	Teaching and Learning in Non-Formal Education
REXT*4100	[0.50]	Leadership Development in Rural Organization
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
SOIL*3050	[0.50]	Land Utilization
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management

### List B: Business

#### Available at Regional Campus

AGEC*2120	[0.50]	Business Marketing
ENVM*1090	[0.50]	Occupational Health and Safety
ENVM*2020	[0.50]	Environmental Law

#### Available by Distance Education

GEOG*3320	[0.50]	Agriculture and Society
MCS*1000	[0.50]	Introductory Marketing
PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
SOC*1100	[0.50]	Sociology

#### Available at Guelph Campus

AGEC*4210	[0.50]	World Agriculture and Economic Development
AGEC*4250	[0.50]	Business Policy
AGEC*4370	[0.50]	Marketing Management
AGR*2400	[0.50]	Economics of the Canadian Food System
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics
ECON*3560	[0.50]	Theory of Finance
MATH*1080	[0.50]	Elements of Calculus I
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
REXT*3080	[0.50]	Technology in Extension

## Environmental Management Major

This major will require the completion of 20.00 credits.

*Students deficient in U level Mathematics or Chemistry are required to enrol in the appropriate upgrading course(s), MATH\*1000 or CHEM\*1060 (available in a distance*

*format) during their first year. MATH\*1000 is to be completed before Semester 2 (may substitute for SOIL\*2010 in Semester 1 and take SOIL\*2010 as the restricted elective in Semester 2). CHEM\*1060 must be completed before Semester 3. Students also may access summer distance education courses such as SOIL\*2010 or ECON\*1050, to maintain their progress.*

### Semesters 1 to 4 offered at the Ridgetown campus

#### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CIS*1000	[0.50]	Introduction to Computer Applications
ENVM*1000	[0.50]	Introductory Environmental Issues
ENVM*1050	[0.50]	Surveying and GIS
SOIL*2010	[0.50]	Soil Science

#### Semester 2 - Winter

AGEC*1100	[0.50]	Introduction to Business
AGR*1050	[0.50]	Communication Skills
ECON*1050	[0.50]	Introductory Microeconomics
ENVM*1020	[0.50]	Introduction to Environmental Microbiology
0.50 restricted electives		

#### Semester 3 - Fall

BIOL*1040	[0.50]	Biology II
ENVM*1090	[0.50]	Occupational Health and Safety
ENVM*1100	[0.50]	Ecology
ENVM*2020	[0.50]	Environmental Law
0.50 restricted electives		

#### Semester 4 - Winter

AGR*2100	[0.50]	Human Resource Management
CHEM*1040	[0.50]	General Chemistry I
ENVM*1150	[0.50]	Water Resource Management
ENVM*2500	[0.50]	Integrated Project (Environmental)
0.50 restricted electives		

### Restricted Electives Available at Ridgetown:

ENVM*1070	[0.50]	Nutrient Management
ENVM*1120	[0.50]	Environmental Monitoring
ENVM*2050	[0.50]	Agriculture and Environmental Stewardship
ENVM*2060	[0.50]	Sewage and Wastewater Treatment
ENVM*2070	[0.50]	Water Treatment
ENVM*2080	[0.50]	Industrial Waste Management
ENVM*2090	[0.50]	Spills Response Planning

### Semesters 5 to 8 offered on Guelph campus

#### Semester 5 - Fall

AGR*3500	[0.50]	Experiential Education
AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGEC*4290	[0.50]	Land Economics
SOIL*3080	[0.50]	Soil and Water Conservation
0.50 selected course group or elective		

#### Semester 6 - Winter

GEOG*3130	[0.50]	Agrogeology
MET*2020	[0.50]	Agrometeorology
SOIL*3300	[0.50]	Land Resource Stewardship
STAT*2060	[0.50]	Statistics for Business Decisions
0.50 elective		

#### Semester 7 - Fall

One of:		
ENVB*4420	[0.50]	Problems in Environmental Biology
SOIL*4110	[0.50]	Natural Resources Management Field Camp
SOIL*4250	[0.50]	Soils in the Landscape
One of:		
GEOG*2480	[0.50]	Mapping and GIS
SOIL*3600	[0.50]	Remote Sensing

0.50 electives

1.00 credits from selected course group

#### Semester 8 - Winter

AGR*4050	[0.50]	Professionalism and Agrology
AGEC*4310	[0.50]	Resource Economics
GEOG*3060	[0.50]	Groundwater
0.50 selected course group		
0.50 electives		

### Course Groups

Students would be required to take a minimum of four courses in one selected group, and would be required to consult with a faculty advisor in planning their choice. Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

**Nutrient Management**

ENVB*4020	[0.50]	Water Quality and Environmental Management
PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3170	[0.50]	Soil Processes in Landscape
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management

**Natural Resource Management**

ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*4020	[0.50]	Water Quality and Environmental Management
ENVB*4780	[0.50]	Forest Ecology
GEOG*3610	[0.50]	Environmental Hydrology
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
SOIL*3050	[0.50]	Land Utilization
SOIL*3100	[0.50]	Resource Planning Techniques

**Environmental Protection**

BIOC*2580	[0.50]	Introductory Biochemistry
ENVB*2010	[0.50]	Food Production and the Environment
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*4240	[0.50]	Biological Activity of Pesticides
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants

Note: Students have three fall and one winter time slots available to take the courses above, and two fall and one winter spaces for free electives, during semesters 5-8. This meshes well with the course offerings except for the final group, where students may have to plan to use their winter free elective space for one of the courses.

## 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.

Given the professional and applied nature of the program, there are no double majors or minors associated with the degree. Elective options enable students to select courses which support or complement their primary field of study.

Students begin studying in one of the following eight specialized management majors during the first semester:

Agricultural Business\*  
 Hotel and Food Administration\*  
 Human Resources Management  
 Management Economics in Industry 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, a B.Comm. core ensures that each major also provides a comprehensive commerce education to all students in the program. Common core elements spanning each of the majors includes:

Accounting (1.00 credits)  
 Economics (1.00 credits)  
 Finance (1.00 credits)  
 Information Management (0.50 credits)  
 Marketing (0.50 credits)  
 Statistics (0.50 credits)  
 Operations Management (0.50 credits)  
 Strategy/Business Policy (0.50 credits)  
 Organizational Behaviour (0.50 credits)  
 Law (0.50 credits)  
 Liberal Education Requirement (1.50 credits)\*  
 \* (see advisory note)

### 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](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 VIII - Degree 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, Social Sciences and Mathematical and Natural Sciences.

The Liberal Education Requirement of 3 courses (1.50 credits) must be from at least two of the following prefixes:

ANSC Animal Science  
 ANTH Anthropology  
 ARTH Art History  
 BIOL Biology  
 BIOM Biomedical Sciences  
 BOT Botany  
 CHEM Chemistry  
 CIS Computing and Information Science  
 CLAS Classical Studies  
 CROP Crop Science  
 ENGL English  
 ENVB Environmental Biology  
 EURO European Studies  
 FOOD Food Science  
 FREN French Studies  
 FRHD Family Relations and Human Development  
 GEOG Geography  
 GEOL Geology  
 GERM German Studies  
 GREK Greek  
 HIST History  
 HUMN Humanities  
 IDEV International Development  
 ISS Interdisciplinary Social Science  
 ITAL Italian Studies  
 LAT Latin  
 LING Linguistics  
 MATH Mathematics  
 MBG Molecular Biology and Genetics  
 MUSC Music  
 NUTR Nutrition  
 PHIL Philosophy  
 PHYS Physics  
 POLS Political Science  
 PSYC Psychology  
 REXT Rural Extension  
 SART Studio Art  
 SOAN Sociology and Anthropology  
 SOIL Soil Science  
 SOC Sociology  
 SPAN Spanish Studies  
 THST Theatre Studies

UNIV Interdisciplinary University  
 WMST Women's Studies  
 ZOO Zoology

### Double Counting of Courses

Double counting is not permitted within the B.Comm. Program. For example, students can not use courses required in their schedule of studies to meet the Liberal Education Requirement.

### 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.

### Agricultural Business (AGBU)

**Department of Agricultural Economics and Business, Ontario Agricultural College**  
 The Agricultural Business major is concerned with the management problems of business firms and prepares students for a range of management careers in agribusiness.

Graduates of the Agricultural Business program 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 has been fully accredited by the Agricultural Institute of Canada.

Included in the core requirements, the Agricultural Business program provides students with the option of selecting from the Restricted Electives list courses that will compliment their studies. The first option (List A) is designed for students more interested in the business relationships of farming and involves marketing and advanced farm management. The second option (List B) emphasizes the production aspects of farming and involves biology and either animal or plant systems.

The major is administered by the Department of Agricultural Economics and Business in the Ontario Agricultural College and students are urged to consult the departmental advisor. For this major, 15.00 of the 20.00 credits (including 1.50 credits from List A or List B) are specified as core requirements and the remaining 5.00 credits are specified as electives.

### 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

AGR\*1100 [0.50] Introduction to the Agrifood Systems  
 ECON\*1050 [0.50] Introductory Microeconomics  
 MATH\*1000 [0.50] Introductory Calculus

1.00 electives

Note: Students who are exceptionally strong in mathematics may substitute either MATH\*1080 or MATH\*1200 for MATH\*1000.

#### Semester 2

AGR\*1250 [0.50] Agrifood System Trends & Issues  
 CIS\*1200 [0.50] Introduction to Computing  
 ECON\*1100 [0.50] Introductory Macroeconomics  
 PSYC\*1200 [0.50] Dynamics of Behaviour

0.50 electives

#### Semester 3

AGEC\*2220 [0.50] Financial Accounting  
 AGR\*2400 [0.50] Economics of the Canadian Food System  
 ECON\*2310 [0.50] Intermediate Microeconomics  
 ECON\*2740 [0.50] Economic Statistics

0.50 from List A or List B

#### Semester 4

AGEC\*2230 [0.50] Management Accounting  
 AGECE\*2410 [0.50] Agrifood Markets and Policy  
 ECON\*2410 [0.50] Intermediate Macroeconomics  
 ECON\*2770 [0.50] Introductory Mathematical Economics

One of:

0.50 from List A and 0.50 electives for students selecting List A

1.00 electives for students selecting List B

#### Semester 5

AGEC\*3320 [0.50] Financial Management  
 MCS\*3040 [0.50] Business and Consumer Law  
 ECON\*3740 [0.50] Introduction to Econometrics

0.50 from List A or List B

0.50 electives

#### Semester 6

AGEC\*3310 [0.50] Operations Management  
 ECON\*3560 [0.50] Theory of Finance  
 HTM\*4390 [0.50] Individuals and Groups in Organizations

Students choosing List A take 1.00 electives

Students choosing List B take 0.50 from List B and 0.50 electives

#### Semester 7

AGEC\*3030 [0.50] The Firm and Markets  
 AGECE\*4250 [0.50] Business Policy  
 AGECE\*4370 [0.50] Marketing Management

1.00 electives

#### Semester 8

AGEC\*4000 [0.50] Agricultural and Food Policy  
 AGECE\*4240 [0.50] Futures and Options Markets  
 AGR\*4500 [0.50] Agrifood Industry Problem-Solving

One of:

0.50 from List A and 0.50 electives for students selecting List A

1.00 electives for students selecting List B

### Restricted Electives

After completion of the first year of the Agricultural Business program, students have the option of selecting three courses from List A or three courses from List B. In order to satisfy the core requirements, students must complete three courses from one of the lists. Students are encouraged to take these courses in the semester indicated in the schedule of studies.

#### List A

Semester 3  
 MCS\*1000 [0.50] Introductory Marketing  
 Semester 4  
 MCS\*2600 [0.50] Fundamentals of Consumer Behaviour  
 Semester 8  
 AGECE\*4220 [0.50] Advanced Farm Management

#### List B\*

BIOL\*1020 in Semester 3  
 (2 of ANSC\*2340, ANSC\*2350, ANSC\*2360, ANSC\*3150, AGR\*2470, and CROP\*2110)

\* students with OAC Biology may elect to take BIOL\*1030 in Semester 3

### Agricultural Business (Co-op) (AGBU:C)

**Department of Agricultural Economics and Business, Ontario Agricultural College**

### 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 - Fall

AGR\*1100 [0.50] Introduction to the Agrifood Systems  
 ECON\*1050 [0.50] Introductory Microeconomics  
 MATH\*1000 [0.50] Introductory Calculus

1.00 electives

Note: Students who are exceptionally strong in mathematics may substitute either MATH\*1080 or MATH\*1200 for MATH\*1000.

#### Semester 2 - Winter

AGR\*1250 [0.50] Agrifood System Trends & Issues  
 CIS\*1200 [0.50] Introduction to Computing  
 ECON\*1100 [0.50] Introductory Macroeconomics  
 PSYC\*1200 [0.50] Dynamics of Behaviour

0.50 electives

#### Semester 3 - Fall

AGEC\*2220 [0.50] Financial Accounting  
 AGR\*2400 [0.50] Economics of the Canadian Food System  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 ECON\*2310 [0.50] Intermediate Microeconomics  
 ECON\*2740 [0.50] Economic Statistics

0.50 electives from List A or List B

#### Semester 4 - Winter

AGEC\*2230 [0.50] Management Accounting  
 AGECE\*2410 [0.50] Agrifood Markets and Policy  
 ECON\*2410 [0.50] Intermediate Macroeconomics  
 ECON\*2770 [0.50] Introductory Mathematical Economics

0.50 from List A or List B

#### 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**

AGEC\*3310 [0.50] Operations Management  
 MCS\*3040 [0.50] Business and Consumer Law  
 ECON\*3740 [0.50] Introduction to Econometrics  
 1.00 electives

**Summer Semester**

Optional academic term.

**Semester 6 - Fall**

AGEC\*3320 [0.50] Financial Management  
 ECON\*3560 [0.50] Theory of Finance  
 HTM\*4390 [0.50] Individuals and Groups in Organizations  
 1.00 electives

**Winter Semester**

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

**Summer Semester**

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

**Semester 7 - Fall**

AGEC\*3030 [0.50] The Firm and Markets  
 AGECE\*4250 [0.50] Business Policy  
 AGECE\*4370 [0.50] Marketing Management

Students choosing List A take 1.00 electives

Students choosing List B take 0.50 from List B and 0.50 electives

**Semester 8 - Winter**

AGEC\*4000 [0.50] Agricultural and Food Policy  
 AGECE\*4240 [0.50] Futures and Options Markets  
 AGR\*4500 [0.50] Agrifood Industry Problem-Solving

Students choosing List A take 0.50 from List A and 0.50 electives

Students choosing List B take 1.00 electives

**Restricted Electives**

As for the regular program.

**Hotel and Food Administration (Hafa)****School of Hospitality and Tourism Management, College of Social and Applied Human Sciences**

The Hotel and Food Administration major prepares graduates to assume positions of responsibility in any aspect of the hospitality field. It includes principles of administration, theories of interpersonal relations, human resources management, and communications. Distinctive courses include Hospitality Facilities Management and Design and Lodging Management. The courses in this program relate to the management of both the accommodation and food service facilities used by the public and private sector. The major is administered by the School of Hospitality and Tourism Management. Students may consult the Faculty Advisor or the B.Comm. Program Counsellor for additional information.

For this major, 15.00 of the 20.00 credits are specified as core requirements, 2.50 as restricted electives, and 2.50 electives (including the Liberal Education Requirements of 1.50 credits.) Verified work experience in the hospitality industry is required for students to be eligible for graduation.

Group work is a significant part of core credit work.

**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  
 HTM\*1000 [0.50] Introduction to Hospitality and Tourism Management  
 POLS\*1400 [0.50] Issues in Canadian Politics  
 PSYC\*1200 [0.50] Dynamics of Behaviour

One of:\*

CHEM\*1100 [0.50] Chemistry Today  
 HTM\*2700 [0.50] Introductory Foods

\*CHEM\*1100 must be taken by students without Grade 12U or OAC Chemistry. If CHEM\*1100 is not required, then a total of 3.50 restricted electives are required.

**Semester 2**

ECON\*1100 [0.50] Introductory Macroeconomics  
 HTM\*2000 [0.50] Hospitality and Tourism Purchasing Management  
 HTM\*2100 [0.50] Lodging Operations  
 HTM\*2120 [0.50] Hospitality and Tourism Marketing I

0.50 from List A or List B or electives

**Semester 3**

2.50 from List A or List B or electives

**Semester 4**

STAT\*2060 [0.50] Statistics for Business Decisions  
 2.00 from List A or List B or electives

**Semester 5**

ECON\*3460 [0.50] Introduction to Finance  
 HTM\*3030 [0.50] Beverage Management  
 1.50 from List A or List B or electives

**Semester 6**

HTM\*3120 [0.50] Operations Analysis in the Hospitality and Tourism Industry  
 2.00 from List A or List B or electives

**Semester 7**

2.50 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 8.50 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 1 or 2**

HTM\*2700 [0.50] Introductory Foods

**Semester 2 or 3**

HTM\*2010 [0.50] Hospitality and Tourism Business Communications

**Semester 3 or 4**

AGEC\*2220 [0.50] Financial Accounting  
 MCS\*2020 [0.50] Information Management  
 MCS\*3040 [0.50] Business and Consumer Law  
 HTM\*2030 [0.50] Control Systems in the Hospitality and Tourism Industry  
 HTM\*2200 [0.50] Organizational Behaviour I

**Semester 4 or 5**

HTM\*3070 [0.50] Hospitality and Tourism Management Accounting

**Semester 5 or 6**

AGEC\*3320 [0.50] Financial Management  
 HTM\*3000 [0.50] Human Resources Management  
 HTM\*3080 [0.50] Hospitality and Tourism Marketing II  
 HTM\*3090 [1.00] Foodservice Operations Management

**Semester 7 or 8**

HTM\*4090 [0.50] Hospitality and Tourism Facilities Management and Design  
 HTM\*4100 [0.50] Organizational Behaviour II  
 HTM\*4190 [0.50] Hospitality and Tourism Operations Planning  
 HTM\*4200 [0.50] Policy Issues in Hospitality and Tourism Management

**List B - Restricted Electives**

In addition to the 14.50 required credits listed above, students must take a minimum of 3.00 restricted electives throughout the program. Students may choose to explore a variety of subjects or may choose to study an area allied to their major 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.

*Courses dealing with the social and economic environment of business firms and other administrative entities in the hospitality industry:*

ECON\*2310 [0.50] Intermediate Microeconomics  
 ECON\*2410 [0.50] Intermediate Macroeconomics  
 ECON\*3510 [0.50] Money, Credit and the Financial System  
 ECON\*3520 [0.50] Labour Economics  
 ECON\*3560 [0.50] Theory of Finance  
 PHIL\*1010 [0.50] Introductory Philosophy: Social and Political Issues  
 PHIL\*2600 [0.50] Business and Professional Ethics  
 SOC\*2190 [0.50] Technology and Society

*Courses for those interested in developing hospitality related real estate.*

MCS\*1820 [0.50] Real Estate and Housing  
 MCS\*2820 [0.50] Real Estate Finance  
 MCS\*3810 [0.50] Real Estate Market Analysis  
 MCS\*3820 [0.50] Real Estate Development  
 MCS\*3890 [0.50] Property Management  
 MCS\*4820 [0.50] Real Estate Appraisal  
 MCS\*4840 [0.50] Housing and Real Estate Law

*Courses dealing with human behaviour particularly as related to work and work groups:*

ANTH\*1150 [0.50] Introduction to Anthropology  
 ECON\*2200 [0.50] Industrial Relations  
 PSYC\*2310 [0.50] Introduction to Social Psychology

SOAN*2040	[0.50]	Globalization of Work and Organizations
SOC*1100	[0.50]	Sociology
<i>Courses dealing with market forces and consumer behaviour:</i>		
AGEC*4360	[0.50]	Marketing Research
MCS*1000	[0.50]	Introductory Marketing
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3600	[0.50]	Consumer Information Processes
MCS*3620	[0.50]	Marketing Communications
<i>Courses related to the study of tourism:</i>		
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*2050	[0.50]	Dimensions of Tourism
HTM*2170	[0.50]	Canadian Tourism Policy, Planning and Development
HTM*3250	[0.50]	Tourism in Canada

*Courses relating to institutional foodservice management:*

AGR*1250	[0.50]	Agri-food System Trends & Issues
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]	Nutrition and Society
NUTR*2050	[0.50]	Family and Community Nutrition

*Specialized courses in Hospitality and Tourism Management:*

HTM*2070	[0.50]	Meetings and Convention Management
HTM*3060	[0.50]	Lodging Management
HTM*3150	[0.50]	Experiential Learning in the Hospitality Industry
HTM*3180	[0.50]	Casino Operations Management
HTM*3200	[0.50]	Club Management Operations
HTM*3780	[0.50]	Economics of Food Usage
HTM*4050	[0.50]	Wine and Oenology
HTM*4110	[0.50]	Restaurant Operations
HTM*4120	[0.50]	Entrepreneurship in Hospitality and Tourism
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

*Other subjects related to the study of administration:*

AGEC*2230	[0.50]	Management Accounting
AGEC*3310	[0.50]	Operations Management
AGEC*3330	[0.50]	Intermediate Accounting
AGEC*4250	[0.50]	Business Policy
AGEC*4370	[0.50]	Marketing Management
AGEC*4410	[0.50]	Sales and Sales Management
MCS*2100	[0.50]	Personal Financial Management

*Other restricted electives:*

CIS*1000	[0.50]	Introduction to Computer Applications
MCS*3010	[0.50]	Quality Management
ECON*3520	[0.50]	Labour Economics
ENGL*1200	[0.50]	Reading the Contemporary World
ENGL*1410	[0.50]	Major English Writers
PHIL*2100	[0.50]	Critical Thinking
REXT*3040	[0.50]	Communication Process
REXT*3060	[0.50]	International Communication

Students may select up to 2.00 credits in any foreign language as restricted electives.

**Electives and Liberal Education Requirement**

In addition to the 15.00 required credits and the 2.50 restricted electives, the student has 2.50 electives throughout the program. These electives must include 1.50 credits toward the B.Comm. Liberal Education Requirement.

**Hotel and Food Administration (Co-op) (HAFAC)****School of Hospitality and Tourism Management, College of Social and Applied Human Sciences**

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. The major is administered by the School of Hospitality and Tourism Management. Students may consult the departmental Co-op Advisor or the B.Comm. Program Counsellor for additional information. The co-op work program consists of one twelve-month period. The work semester 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. The academic program consists of 20.00 credits, 15.50 of which are specified as core requirements, 2.00 as restricted electives, and 2.50 as electives.

**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 - Fall**

ECON*1050	[0.50]	Introductory Microeconomics
HTM*1000	[0.50]	Introduction to Hospitality and Tourism Management
POLS*1400	[0.50]	Issues in Canadian Politics
PSYC*1200	[0.50]	Dynamics of Behaviour

One of:\*

CHEM*1100	[0.50]	Chemistry Today
HTM*2700	[0.50]	Introductory Foods

\*CHEM\*1100 must be taken by students without Grade 12U or OAC Chemistry. If CHEM\*1100 is not required, then a total of 3.00 restricted electives are required.

**Semester 2 - Winter**

ECON*1100	[0.50]	Introductory Macroeconomics
HTM*2000	[0.50]	Hospitality and Tourism Purchasing Management
HTM*2100	[0.50]	Lodging Operations
HTM*2120	[0.50]	Hospitality and Tourism Marketing I

0.50 from List A or List B or electives

**Semester 3 - Fall**

COOP*1100	[0.00]	Introduction to Co-operative Education
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2.50 from List A or List B or electives

**Semester 4 - Winter**

STAT*2060	[0.50]	Statistics for Business Decisions
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2.00 from List A or List B or electives

**Summer Semester**

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

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

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 5 - Fall**

ECON*3460	[0.50]	Introduction to Finance
HTM*3030	[0.50]	Beverage Management

1.50 from List A or List B or electives

**Semester 6 - Winter**

HTM*3120	[0.50]	Operations Analysis in the Hospitality and Tourism Industry
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2.00 from List A or List B or electives

**Semester 7 - Fall**

2.50 from List A or List B or electives

**Semester 8 - Winter**

HTM*4300	[0.50]	Co-operative Education Seminar
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2.00 from List A or List B or electives

**Note:** For courses included in List A or List B refer to the regular major.

**Human Resources Management (HRM)****Department of Psychology, College of Social and Applied Human Sciences**

The HRM program provides some basic preparation for students contemplating a career as a Human Resources practitioner, and for potential certification by the Human Resources Professionals Association of Ontario (HRPAO). It complements a traditional business core with an emphasis on issues relating to people and the workplace. The program combines conceptual and quantitative elements and promotes the integration of theory with practice. A feature of the program is a required applied research course, where students conduct group projects in workplace settings under the direction of a faculty member.

Presently the HRM program meets all four academic requirements of the Tier I Compulsory Subjects set out by the Human Resources Professionals Association of Ontario. Our objective is to meet 50% of the Tier II Specialized Subjects.

For this major, 15.00 of the 20.00 credits are specified as core requirements and the remaining 5.00 as electives. A list of suggested electives follows the description of required courses.

**Note:** Psychology Courses designated with (H) in Section XII--Course Descriptions are Honours level Psychology courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology or registration in the Human Resources Management major of the Bachelor of Commerce program.

**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**

MCS*1000	[0.50]	Introductory Marketing
ECON*1050	[0.50]	Introductory Microeconomics
POLS*1400	[0.50]	Issues in Canadian Politics
PSYC*1200	[0.50]	Dynamics of Behaviour

0.50 electives

**Semester 2**

ECON*1100	[0.50]	Introductory Macroeconomics
PSYC*1100	[0.50]	Principles of Behaviour
PSYC*2010	[0.50]	Quantification in Psychology
PSYC*2310	[0.50]	Introduction to Social Psychology

0.50 electives

**Semester 3**

AGEC*2220	[0.50]	Financial Accounting
ECON*2200	[0.50]	Industrial Relations
ECON*2310	[0.50]	Intermediate Microeconomics
PSYC*2360	[0.50]	Introductory Research Methods

0.50 electives

**Semester 4**

AGEC*2230	[0.50]	Management Accounting
MCS*2020	[0.50]	Information Management
HTM*2200	[0.50]	Organizational Behaviour I
PHIL*2600	[0.50]	Business and Professional Ethics

0.50 electives

**Semester 5**

AGEC*3320	[0.50]	Financial Management
MCS*3040	[0.50]	Business and Consumer Law
PSYC*3060	[0.50]	Occupational Health Psychology
PSYC*3090	[0.50]	Training and Development

0.50 electives

**Semester 6**

AGEC*3310	[0.50]	Operations Management
ECON*3560	[0.50]	Theory of Finance
HTM*3000	[0.50]	Human Resources Management
PSYC*3010	[0.50]	Compensation Systems

0.50 electives

**Semester 7**

ECON*3520	[0.50]	Labour Economics
HTM*4100	[0.50]	Organizational Behaviour II
PSYC*4100	[0.50]	Applied Research in Human Resources Management

1.00 electives

**Semester 8**

AGEC*4250	[0.50]	Business Policy
HTM*4160	[0.50]	Human Resources Planning
PSYC*4330	[0.50]	Advanced Topics in I/O Psychology (H)

1.00 electives

**Electives**

The following is a list of courses which may be of interest to students selecting their electives.

AGEC*4370	[0.50]	Marketing Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics
ECON*4800	[0.50]	Theory of Strategic Management
MATH*1000	[0.50]	Introductory Calculus
PSYC*2740	[0.50]	Personality
PSYC*3250	[0.50]	Psychological Measurement
SOAN*2040	[0.50]	Globalization of Work and Organizations
SOC*1100	[0.50]	Sociology

**Management Economics in Industry and Finance (MEIF)**

Department of Economics, College of Social and Applied Human Sciences

The Management Economics in Industry and Finance major is designed to offer students an appreciation of business problems in the areas of industrial organization and finance using the analytical orientation of the discipline of Economics and the tools of Business Management, Marketing and Accounting. This major combines the applied thrust of business courses with the analytical rigor of Economics.

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, Business Administration, Law, and Public Policy. The major is administered by the Department of Economics and students are urged to consult the faculty advisor.

In addition to the Management Economics in Industry and Finance core, students will choose their restricted electives from the List of Restricted Electives. In selecting the restricted electives, students have a choice of either following a program of studies that covers a wide spectrum of topics in the areas of Industry and Finance or declaring an Area of Emphasis if they wish to pursue the study of Industry or Finance in more depth. Students that identify an Area of Emphasis will choose their restricted electives from the appropriate list of restricted electives below. Students wishing to have an Area of Emphasis are encouraged to declare their Area of Emphasis by Semester 4, in order to facilitate the availability of restricted electives. A planning guide is available in the department. Students should note that most courses carry prerequisites and that ECON\*1050 and ECON\*1100 are normally prerequisites for all other courses in Economics.

Students who fail any Economics course twice or who do not achieve a 65% average in Economics courses taken during the first 4 semesters in this major are likely to encounter difficulties in the more advanced courses. They are strongly advised to consult the faculty advisor in Economics to discuss the options available.

For this major, 10.00 credits are specified, 5.00 are restricted electives and 5.00 are free electives. (1.50 Liberal Education Requirement; 2.00 free electives).

**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
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One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

One of:

MATH*1000	[0.50]	Introductory Calculus
MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

1.00 electives

**Semester 2**

AGEC*2220	[0.50]	Financial Accounting
MCS*1000	[0.50]	Introductory Marketing
ECON*1100	[0.50]	Introductory Macroeconomics

1.00 electives

**Semester 3**

AGEC*2230	[0.50]	Management Accounting
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2720	[0.50]	Business History

One of:

MCS*3040	[0.50]	Business and Consumer Law
ECON*2770	[0.50]	Introductory Mathematical Economics

0.50 electives

**Note:** One of ECON\*2770 and MCS\*3040 must be taken in Semester 3; the other must be taken in Semester 4.

**Semester 4**

ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2740	[0.50]	Economic Statistics

One of:

ECON*2770	[0.50]	Introductory Mathematical Economics
MCS*3040	[0.50]	Business and Consumer Law

1.00 electives or restricted electives

**Semester 5**

AGEC*3310	[0.50]	Operations Management
AGEC*3320	[0.50]	Financial Management
ECON*3560	[0.50]	Theory of Finance
ECON*3740	[0.50]	Introduction to Econometrics

0.50 electives or restricted electives

**Semester 6**

ECON*3600	[0.50]	Macroeconomics in an Open Economy
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2.00 electives or restricted electives

**Note:** ECON\*4710 and ECON\*4810 are recommended for students wishing to pursue graduate studies.

**Semester 7**

HTM*4390	[0.50]	Individuals and Groups in Organizations
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2.00 electives or restricted electives

**Semester 8**

ECON*4800	[0.50]	Theory of Strategic Management
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2.00 electives or restricted electives

The restricted electives for the MEIF major are listed below. By choosing from this list, students will obtain a broad exposure to the areas of Finance and Industry. If, instead,



students wish to obtain a greater degree of specialization in either the area of Finance or Industry, they may opt to diverge from the restricted electives given below and instead choose their restricted electives so as to satisfy the Finance Area of Emphasis Restricted Electives or the Industry Area of Emphasis Restricted Electives.

### Restricted Electives

4.00 additional credits in economics, of which

- at least 0.50 credits can be at the 2000 level
- at least 0.50 credits must be at the 4000 level - only one of ECON\*4900, ECON\*4910 may count as one of the required minimum number of 4000 level economics credits in the B.Comm. program.
- 1.50 credits are from the following:
 

ECON*3510	[0.50]	Money, Credit and the Financial System
ECON*3520	[0.50]	Labour Economics
ECON*3530	[0.50]	Industrial Organization
ECON*3660	[0.50]	Economics of Equity Markets

1.00 credits from the following:

AGEC*3330	[0.50]	Intermediate Accounting
AGEC*4240	[0.50]	Futures and Options Markets
AGEC*4250	[0.50]	Business Policy
AGEC*4360	[0.50]	Marketing Research
AGEC*4370	[0.50]	Marketing Management
AGEC*4410	[0.50]	Sales and Sales Management

### Finance Area of Emphasis Restricted Electives:

Students must take the following:

ECON*3510	[0.50]	Money, Credit and the Financial System
ECON*3660	[0.50]	Economics of Equity Markets
ECON*3100	[0.50]	Game Theory
ECON*3710	[0.50]	Advanced Microeconomics
ECON*4560	[0.50]	Advanced Topics in Finance
AGEC*4240	[0.50]	Futures and Options Markets

2.00 additional credits in economics, of which

- 0.50 at most credits can be at the 2000 level
- at least 1.00 credits must be at the 4000 level - only one of ECON\*4900, ECON\*4910 may count as one of the required minimum number of 4000 level economics credits in the B.Comm. program.

### Industry Area of Emphasis Restricted Electives:

Students must take the following:

ECON*3530	[0.50]	Industrial Organization
ECON*3100	[0.50]	Game Theory
ECON*3710	[0.50]	Advanced Microeconomics
ECON*4780	[0.50]	Topics in Industrial Organization

One of:

ECON*3200	[0.50]	Economics of Industrial Relations
ECON*3520	[0.50]	Labour Economics
ECON*3580	[0.50]	Economics of Regulation

2.00 additional credits in economics, of which

- at most 0.50 credits can be at the 2000 level
- at least 1.00 credits must be at the 4000 level - only one of ECON\*4900, ECON\*4910 may count as one of the required minimum number of 4000 level economics credits in the B.Comm. program.

0.50 credits from the following:

AGEC*3330	[0.50]	Intermediate Accounting
AGEC*4240	[0.50]	Futures and Options Markets
AGEC*4250	[0.50]	Business Policy
AGEC*4360	[0.50]	Marketing Research
AGEC*4370	[0.50]	Marketing Management
AGEC*4410	[0.50]	Sales and Sales Management

### Management Economics in Industry and Finance (Co-op) (MEIF:C)

Department of Economics, College of Social and Applied Human Sciences

A principal aim of the Co-op program in Management Economics in Industry 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 consists of two eight month work terms. The first work term begins after the second year and extends from January to August. The Co-op program is normally completed over a 5 year period.

To be eligible to continue in the Co-op major, students must maintain a satisfactory average, must complete all course requirements as scheduled and must obtain a minimum evaluation of "satisfactory" on all required work term reports. Consult the Co-op advisor or Department for additional program information.

### 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
One of:		
CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
One of:		
MATH*1000	[0.50]	Introductory Calculus
MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

1.00 electives

#### Semester 2 - Winter

AGEC*2220	[0.50]	Financial Accounting
MCS*1000	[0.50]	Introductory Marketing
ECON*1100	[0.50]	Introductory Macroeconomics

1.00 electives

#### Semester 3 - Fall

AGEC*2230	[0.50]	Management Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2720	[0.50]	Business History
ECON*2740	[0.50]	Economic Statistics

0.50 electives

#### Semester 4 - Winter

MCS*3040	[0.50]	Business and Consumer Law
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2770	[0.50]	Introductory Mathematical Economics
ECON*3560	[0.50]	Theory of Finance

0.50 electives

#### Summer Semester

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

COOP*2000	[0.00]	Co-op Work Term II
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#### Semester 5 - Winter

AGEC*3310	[0.50]	Operations Management
ECON*3600	[0.50]	Macroeconomics in an Open Economy
ECON*3740	[0.50]	Introduction to Econometrics

1.00 electives or restricted electives

#### Semester 6 - Fall

AGEC*3320	[0.50]	Financial Management
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2.00 electives or restricted electives

**Note:** If in Finance or Industry take ECON\*3710.

**Note:** ECON\*4710 and ECON\*4810 are recommended for students wishing to pursue graduate studies.

#### Winter Semester

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

COOP*4000	[0.00]	Co-op Work Term IV
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#### Semester 7 - Fall

HTM*4390	[0.50]	Individuals and Groups in Organizations
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2.00 electives or restricted electives

#### Semester 8 - Winter

ECON*4800	[0.50]	Theory of Strategic Management
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2.00 electives or restricted electives

### Restricted Electives

4.00 additional credits in economics, of which

- at least 0.50 credits can be at the 2000 level
- at least 0.50 credits must be at the 4000 level - only one of ECON\*4900, ECON\*4910 may count as one of the required minimum number of 4000 level economics credits in the B.Comm. program.
- 1.50 credits are from the following:
 

ECON*3510	[0.50]	Money, Credit and the Financial System
ECON*3520	[0.50]	Labour Economics
ECON*3530	[0.50]	Industrial Organization
ECON*3660	[0.50]	Economics of Equity Markets

1.00 credits from the following:

AGEC*3330	[0.50]	Intermediate Accounting
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AGEC*4240	[0.50]	Futures and Options Markets
AGEC*4250	[0.50]	Business Policy
AGEC*4360	[0.50]	Marketing Research
AGEC*4370	[0.50]	Marketing Management
AGEC*4410	[0.50]	Sales and Sales Management

**Finance Area of Emphasis Restricted Electives:**

Students must take the following:

AGEC*4240	[0.50]	Futures and Options Markets
ECON*3510	[0.50]	Money, Credit and the Financial System
ECON*3660	[0.50]	Economics of Equity Markets
ECON*3100	[0.50]	Game Theory
ECON*3710	[0.50]	Advanced Microeconomics
ECON*4560	[0.50]	Advanced Topics in Finance

2.00 additional credits in economics, of which

- 0.50 at most credits can be at the 2000 level
- at least 1.00 credits must be at the 4000 level - only one of ECON\*4900, ECON\*4910 may count as one of the required minimum number of 4000 level economics credits in the B.Comm. program.

**Industry Area of Emphasis Restricted Electives:**

Students must take the following:

ECON*3530	[0.50]	Industrial Organization
ECON*3100	[0.50]	Game Theory
ECON*3710	[0.50]	Advanced Microeconomics
ECON*4780	[0.50]	Topics in Industrial Organization

One of:

ECON*3200	[0.50]	Economics of Industrial Relations
ECON*3520	[0.50]	Labour Economics
ECON*3580	[0.50]	Economics of Regulation

2.00 additional credits in Economics, of which

- at most 0.50 credits can be at the 2000 level
- at least 1.00 credits must be at the 4000 level - only one of ECON\*4900, ECON\*4910 may count as one of the required minimum number of 4000 level economics credits in the B.Comm. program.

0.50 credits from the following:

AGEC*3330	[0.50]	Intermediate Accounting
AGEC*4240	[0.50]	Futures and Options Markets
AGEC*4250	[0.50]	Business Policy
AGEC*4360	[0.50]	Marketing Research
AGEC*4370	[0.50]	Marketing Management
AGEC*4410	[0.50]	Sales and Sales Management

**Marketing Management (MKMN)****Department of Marketing and Consumer Studies, College of Social and Applied Human Sciences**

The Marketing Management major is interdisciplinary, follows a liberal education philosophy, and is built on our Department's long standing expertise in the field of consumer research. Therefore, the courses to be followed span departments and colleges across the University and are designed to support the University's learning objectives.

The Department of Marketing and Consumer Studies recognizes that we are not only responsible for preparing students for a career in marketing but for educating them so that they can be active, engaged citizens. This can only result from a balanced curriculum of marketing and liberal education courses capable of providing students with an understanding of the world they will work and live in, and the problem solving, communication, and visualization skills needed to function effectively in it. Therefore, as students learn about the management and leadership of product and services marketing in a global economy, they will be prepared to work and live effectively in today's world and to be flexible enough to pursue a variety of marketing career paths and diverse leadership roles. The major is administered by the Department of Marketing and Consumer Studies in the College of Social and Applied Human Sciences. Students can contact the B.Comm. Program Counsellors or the Faculty Advisors if they have questions.

**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**

MCS*1000	[0.50]	Introductory Marketing
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1000	[0.50]	Introductory Calculus
PSYC*1200	[0.50]	Dynamics of Behaviour

0.50 from List A or electives

Note: Students who are exceptionally strong in mathematics may consult with their academic advisor to substitute an alternative mathematics course for MATH\*1000 (MATH\*1080 or MATH\*1200).

**Semester 2**

AGEC*2220	[0.50]	Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
PSYC*2310	[0.50]	Introduction to Social Psychology

0.50 from List A

0.50 electives

**Semester 3**

AGEC*2230	[0.50]	Management Accounting
ECON*2310	[0.50]	Intermediate Microeconomics
MCS*2020	[0.50]	Information Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour

0.50 from List B

Note: MCS\*2600 may be taken in Semester 4.

**Semester 4**

ECON*2410	[0.50]	Intermediate Macroeconomics
MCS*3040	[0.50]	Business and Consumer Law
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 from List B

One of:

HTM*2200	[0.50]	Organizational Behaviour I
ISS*2500	[0.50]	Management in Organizations

**Semester 5**

AGEC*3320	[0.50]	Financial Management
MCS*3020	[0.50]	Services Marketing
MCS*3030	[0.50]	Research Methods
MCS*3610	[0.50]	Consumer Economics

0.50 from List A and/or up to 0.50 electives (if MCS\*3100 to be taken in Semester 6)

Note: Students only take one of MCS\*3610 in Semester 5 OR MCS\*3100 in Semester 6.

Note: MCS\*3020, MCS\*3030, MCS\*3610 may be taken in Semester 6.

**Semester 6**

AGEC*3310	[0.50]	Operations Management
MCS*3010	[0.50]	Quality Management
MCS*3100	[0.50]	Economic Behaviour of Households
MCS*3620	[0.50]	Marketing Communications

0.50 from List A and/or up to 0.50 electives

Note: Students only take one of MCS\*3610 in Semester 5 OR MCS\*3100 in Semester 6.

Note: MCS\*3100 may be taken in Semester 5 and MCS\*3620 may be taken in Semester 7.

**Semester 7**

MCS*3600	[0.50]	Consumer Information Processes
MCS*4040	[0.50]	Management in Product Development
ECON*3560	[0.50]	Theory of Finance

1.00 electives

Note: MCS\*3600 may be taken in Semester 6.

**Semester 8**

AGEC*4250	[0.50]	Business Policy
MCS*4050	[0.50]	The Evolution of Capitalism: A Canadian Perspective
MCS*4370	[0.50]	Marketing Strategy
MCS*4600	[0.50]	International Marketing

0.50 electives

Note: MCS\*4370 may be taken in Semester 7.

**List A - Restricted Electives (choose 2 from any 1 subgroup)**

These courses have been selected to help students broaden their international and cross-cultural perspectives.

**French Language Courses**

FREN*1100	[0.50]	Basic French: Listening
FREN*1150	[0.50]	Elementary French
FREN*1200	[0.50]	French Language I
FREN*2020	[0.50]	France: Literature and Society
FREN*2030	[0.50]	French Language II
FREN*2060	[0.50]	Quebec: Literature and Society
FREN*3530	[0.50]	Business French

**German Language Courses**

GERM*1100	[0.50]	Introductory German I
GERM*1110	[0.50]	Introductory German II
GERM*2400	[0.50]	Contemporary Germany
GERM*2490	[0.50]	Intermediate German I

**History and Politics Courses**

EURO*1050	[0.50]	The Emergence of a United Europe
EURO*2070	[0.50]	European Integration, 1957-1992
HIST*1150	[0.50]	20th-Century Global History
HIST*2510	[0.50]	The Emergence of Modern European Society 1789-1945

HIST*2910	[0.50]	History of Modern Asia
HIST*3090	[0.50]	Nationalism and Internationalism in Europe 1914-1957
POLS*1500	[0.50]	World Politics
POLS*2100	[0.50]	The State in Comparative Perspective
POLS*3080	[0.50]	Politics of Latin America
POLS*3280	[0.50]	Modern Political Ideologies
POLS*3460	[0.50]	Communism and Post-Communism
POLS*3890	[0.50]	Government and Politics of India
POLS*3920	[0.50]	Modern China

**Italian Language Courses**

ITAL*1060	[0.50]	Introductory Italian I
ITAL*1070	[0.50]	Introductory Italian II
ITAL*2060	[0.50]	Intermediate Italian I
ITAL*2070	[0.50]	Intermediate Italian II

**Spanish Language Courses**

SPAN*1100	[0.50]	Introductory Spanish
SPAN*1110	[0.50]	Intermediate Spanish
SPAN*2000	[0.50]	Spanish Language I
SPAN*2010	[0.50]	Spanish Language II
SPAN*2040	[0.50]	Spanish Civilization

**List B - Restricted Electives (choose 2)**

This group of courses encourages students to increase their fundamental background and/or add to business applications.

AGEC*4410	[0.50]	Sales and Sales Management
MCS*2100	[0.50]	Personal Financial Management
HTM*3000	[0.50]	Human Resources Management
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250	[0.50]	Public Administration
SOC*1100	[0.50]	Sociology

One of:

PHIL*2100	[0.50]	Critical Thinking
PHIL*2600	[0.50]	Business and Professional Ethics

**Marketing Management (Co-op) (MKMN:C)****Department of Marketing and Consumer Studies, College of Social and Applied Human Sciences**

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

The Co-op program consists of two eight month work terms. The first work term begins after the second year. The second work term commences after the third year of studies. The Co-op program is normally completed over a 5 year period.

To be eligible to continue in the Co-op Major students must maintain a satisfactory average, must complete all course requirements as scheduled and must obtain a minimum evaluation of "satisfactory" on all required work term reports. Consult the Co-op advisor or Department for additional information.

**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 - Fall**

MCS*1000	[0.50]	Introductory Marketing
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1000	[0.50]	Introductory Calculus
PSYC*1200	[0.50]	Dynamics of Behaviour

0.50 from List A or electives

Note: Students who are exceptionally strong in mathematics may consult with their academic advisor to substitute an alternative mathematics course for MATH\*1000 (MATH\*1080 or MATH\*1200).

**Semester 2 - Winter**

AGEC*2220	[0.50]	Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
PSYC*2310	[0.50]	Introduction to Social Psychology
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 from List A or 0.50 electives

**Semester 3 - Fall**

AGEC*2230	[0.50]	Management Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
MCS*2020	[0.50]	Information Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour

0.50 from List B

**Semester 4 - Winter**

ECON*2410	[0.50]	Intermediate Macroeconomics
MCS*3030	[0.50]	Research Methods
MCS*3040	[0.50]	Business and Consumer Law

0.50 from List B

One of:

HTM*2200	[0.50]	Organizational Behaviour I
ISS*2500	[0.50]	Management in Organizations

**Summer Semester**

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

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

AGEC*3310	[0.50]	Operations Management
MCS*3010	[0.50]	Quality Management
MCS*3020	[0.50]	Services Marketing
MCS*3100	[0.50]	Economic Behaviour of Households
MCS*3600	[0.50]	Consumer Information Processes

0.50 electives (if MCS\*3610 to be taken in Semester 6)

Note: Students only take one of MCS\*3100 in Semester 5 OR MCS\*3610 in Semester 6.

**Semester 6 - Fall**

AGEC*3320	[0.50]	Financial Management
MCS*3610	[0.50]	Consumer Economics
MCS*3620	[0.50]	Marketing Communications

0.50 from List A and/or up to 1.00 electives

Note: Students only take one of MCS\*3100 in Semester 5 OR MCS\*3610 in Semester 6.

**Winter Semester**

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

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 7 - Fall**

ECON*3560	[0.50]	Theory of Finance
MCS*4040	[0.50]	Management in Product Development
MCS*4050	[0.50]	The Evolution of Capitalism: A Canadian Perspective
MCS*4370	[0.50]	Marketing Strategy

0.50 from List A and/or electives

Note: MCS\*4050 may be taken in Semester 8.

**Semester 8 - Winter**

AGEC*4250	[0.50]	Business Policy
MCS*4600	[0.50]	International Marketing

1.00 or 1.50 electives

**List A -Restricted Electives (choose 2 from any 1 subgroup)**

These courses have been selected to help students broaden their international and cross-cultural perspectives.

**French Language Courses**

FREN*1100	[0.50]	Basic French: Listening
FREN*1150	[0.50]	Elementary French
FREN*1200	[0.50]	French Language I
FREN*2020	[0.50]	France: Literature and Society
FREN*2030	[0.50]	French Language II
FREN*2060	[0.50]	Quebec: Literature and Society
FREN*3530	[0.50]	Business French

**German Language Courses**

GERM*1100	[0.50]	Introductory German I
GERM*1110	[0.50]	Introductory German II
GERM*2400	[0.50]	Contemporary Germany
GERM*2490	[0.50]	Intermediate German I

**History and Politics Courses**

EURO*1050	[0.50]	The Emergence of a United Europe
EURO*2070	[0.50]	European Integration, 1957-1992
HIST*1150	[0.50]	20th-Century Global History
HIST*2510	[0.50]	The Emergence of Modern European Society 1789-1945
HIST*2910	[0.50]	History of Modern Asia
HIST*3090	[0.50]	Nationalism and Internationalism in Europe 1914-1957
POLS*1500	[0.50]	World Politics
POLS*2100	[0.50]	The State in Comparative Perspective
POLS*3080	[0.50]	Politics of Latin America
POLS*3280	[0.50]	Modern Political Ideologies
POLS*3460	[0.50]	Communism and Post-Communism
POLS*3890	[0.50]	Government and Politics of India
POLS*3920	[0.50]	Modern China

**Italian Language Courses**

ITAL*1060	[0.50]	Introductory Italian I
ITAL*1070	[0.50]	Introductory Italian II
ITAL*2060	[0.50]	Intermediate Italian I
ITAL*2070	[0.50]	Intermediate Italian II

**Spanish Language Courses**

SPAN*1100	[0.50]	Introductory Spanish
SPAN*1110	[0.50]	Intermediate Spanish
SPAN*2000	[0.50]	Spanish Language I
SPAN*2010	[0.50]	Spanish Language II
SPAN*2040	[0.50]	Spanish Civilization

**List B - Restricted Electives (choose 2)**

This group of courses encourages students to increase their fundamental background and/or add to business applications.

AGEC*4410	[0.50]	Sales and Sales Management
MCS*2100	[0.50]	Personal Financial Management
HTM*3000	[0.50]	Human Resources Management
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250	[0.50]	Public Administration
SOC*1100	[0.50]	Sociology

One of:

PHIL*2100	[0.50]	Critical Thinking
PHIL*2600	[0.50]	Business and Professional Ethics

**Public Management (PMGT)****Department of Political Science, College of Social and Applied Human Sciences**

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 both political 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. A co-ordinated sequence of courses may be capped in the final year by a year-long research project and thesis.

For this major, 16.00 of the 20.00 credits are specified as core requirements and the remaining 4.00 as electives. A list of suggested electives follows the description of required courses.

**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**

MCS*1000	[0.50]	Introductory Marketing
ECON*1050	[0.50]	Introductory Microeconomics
POLS*1400	[0.50]	Issues in Canadian Politics
PSYC*1200	[0.50]	Dynamics of Behaviour

0.50 electives

**Semester 2**

ECON*1100	[0.50]	Introductory Macroeconomics
POLS*2250	[0.50]	Public Administration
POLS*2300	[0.50]	Canadian Government

1.00 electives

**Semester 3**

AGEC*2220	[0.50]	Financial Accounting
ECON*2200	[0.50]	Industrial Relations
ECON*2310	[0.50]	Intermediate Microeconomics
POLS*3250	[0.50]	Public Policy: Challenges and Prospects

0.50 electives

**Semester 4**

AGEC*2230	[0.50]	Management Accounting
MCS*2020	[0.50]	Information Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
POLS*3270	[0.50]	Local Government in Ontario
STAT*2060	[0.50]	Statistics for Business Decisions

**Semester 5**

AGEC*3310	[0.50]	Operations Management
AGEC*3320	[0.50]	Financial Management
MCS*3040	[0.50]	Business and Consumer Law
POLS*3110	[0.50]	Politics of Ontario

0.50 electives

**Semester 6**

ECON*3610	[0.50]	Public Economics
PHIL*2600	[0.50]	Business and Professional Ethics
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3670	[0.50]	Comparative Public Policy and Administration

0.50 electives

**Semester 7**

ECON*3560	[0.50]	Theory of Finance
HTM*3000	[0.50]	Human Resources Management
POLS*3470	[0.50]	Business-Government Relations in Canada

One of:

POLS*4970	[0.50]	Honours Political Science Research I
0.50 credits at the 4000 level in Political Science		

0.50 electives

**Semester 8**

AGEC*4250	[0.50]	Business Policy
HTM*4390	[0.50]	Individuals and Groups in Organizations
POLS*4250	[0.50]	Problems in Public Administration and Public Policy

One of:

POLS*4980	[0.50]	Honours Political Science Research II
0.50 credits at the 4000 level in Political Science		

0.50 electives

**Electives**

The following is a list of courses which may be of interest to students selecting their electives.

ECON*2410	[0.50]	Intermediate Macroeconomics
POLS*3330	[0.50]	Politics and Trade Liberalization in the Americas
POLS*3370	[0.50]	Environmental Policy Formation and Administration
POLS*3440	[0.50]	Corruption, Scandal and Political Ethics
POLS*3790	[0.50]	The Political Economy of International Relations
POLS*3940	[0.50]	Accountability and Canadian Government
SOAN*2040	[0.50]	Globalization of Work and Organizations

**Public Management (Co-op) (PMGT:C)****Department of Political Science, College of Social and Applied Human Sciences**

A principal aim of the Co-op program in Public Management is to facilitate the transition of students from academic studies to professional career in government or the private sector by enhancing the integration of theory and practice.

Students who want to graduate with the Co-op designation must complete a minimum of four of the five work terms, including those in the fall and winter semesters and two of the three summer placements. In other words, should students so choose, one of the three summer work placements can be optional.

To be eligible to continue in the Co-op major, students must maintain a satisfactory average, complete all course requirements as scheduled, and obtain a minimum evaluation of "satisfactory" on all work term reports. Consult the Co-op advisor or Department for additional program information.

**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 - Fall**

MCS*1000	[0.50]	Introductory Marketing
ECON*1050	[0.50]	Introductory Microeconomics
POLS*1400	[0.50]	Issues in Canadian Politics
PSYC*1200	[0.50]	Dynamics of Behaviour

0.50 electives

**Semester 2 - Winter**

ECON*1100	[0.50]	Introductory Macroeconomics
POLS*2250	[0.50]	Public Administration
POLS*2300	[0.50]	Canadian Government

1.00 electives

**Semester 3 - Fall**

AGEC*2220	[0.50]	Financial Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2200	[0.50]	Industrial Relations
ECON*2310	[0.50]	Intermediate Microeconomics
POLS*3250	[0.50]	Public Policy: Challenges and Prospects

0.50 electives

**Semester 4 - Winter**

AGEC*2230	[0.50]	Management Accounting
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour

POLS*3270	[0.50]	Local Government in Ontario
STAT*2060	[0.50]	Statistics for Business Decisions
0.50 electives		
<b>Summer Semester</b>		
COOP*1000	[0.00]	Co-op Work Term I
<b>Fall Semester</b>		
COOP*2000	[0.00]	Co-op Work Term II
<b>Semester 5 - Winter</b>		
MCS*2020	[0.50]	Information Management
ECON*3610	[0.50]	Public Economics
PHIL*2600	[0.50]	Business and Professional Ethics
POLS*3210	[0.50]	The Constitution and Canadian Federalism
0.50 electives		

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6 - Fall**

AGEC*3310	[0.50]	Operations Management
MCS*3040	[0.50]	Business and Consumer Law
HTM*3000	[0.50]	Human Resources Management
POLS*3110	[0.50]	Politics of Ontario
POLS*3470	[0.50]	Business-Government Relations in Canada
0.50 electives		

**Winter Semester**

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

COOP*5000	[0.00]	Co-op Work Term V
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**Semester 7 - Fall**

AGEC*3320	[0.50]	Financial Management
ECON*3560	[0.50]	Theory of Finance
HTM*4390	[0.50]	Individuals and Groups in Organizations

One of:

POLS*4970	[0.50]	Honours Political Science Research I
0.50 credits at the 4000 level in Political Science		

0.50 electives

**Semester 8 - Winter**

AGEC*4250	[0.50]	Business Policy
POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*4250	[0.50]	Problems in Public Administration and Public Policy

One of:

POLS*4980	[0.50]	Honours Political Science Research II
0.50 credits at the 4000 level in Political Science		

0.50 electives

**Electives**

The following is a list of courses which may be of interest to students selecting their electives.

ECON*2410	[0.50]	Intermediate Macroeconomics
POLS*3330	[0.50]	Politics and Trade Liberalization in the Americas
POLS*3370	[0.50]	Environmental Policy Formation and Administration
POLS*3440	[0.50]	Corruption, Scandal and Political Ethics
POLS*3790	[0.50]	The Political Economy of International Relations
POLS*3940	[0.50]	Accountability and Canadian Government
SOAN*2040	[0.50]	Globalization of Work and Organizations

**Real Estate and Housing (REH)****Department of Marketing and Consumer Studies, College of Social and Applied Human Sciences**

The Real Estate and Housing major in the B.Comm. program is one of only two 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.

Students in the Real Estate and Housing major are required to take the courses listed below. In addition, some may wish to make use of groupings of elective courses in order to pursue individual interests or develop additional focus.

Students may consult the departmental Academic Advisor or B.Comm. Program Counsellor for additional information.

**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**

MCS*1000	[0.50]	Introductory Marketing
MCS*1820	[0.50]	Real Estate and Housing
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1000	[0.50]	Introductory Calculus

0.50 electives

Note: Students who are exceptionally strong in mathematics may substitute either MATH\*1080 or MATH\*1200 for MATH\*1000.

**Semester 2**

MCS*1400	[0.50]	Introduction to Design
ECON*1100	[0.50]	Introductory Macroeconomics
POLS*2300	[0.50]	Canadian Government

1.00 electives

**Semester 3**

AGEC*2220	[0.50]	Financial Accounting
MCS*2020	[0.50]	Information Management
ECON*2310	[0.50]	Intermediate Microeconomics
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

**Semester 4**

AGEC*2230	[0.50]	Management Accounting
MCS*2820	[0.50]	Real Estate Finance
MCS*2850	[0.50]	Service Learning in Housing

1.00 electives

**Semester 5**

MCS*3810	[0.50]	Real Estate Market Analysis
MCS*4840	[0.50]	Housing and Real Estate Law *
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*3560	[0.50]	Theory of Finance

0.50 to 1.00 electives

\* This course is offered every other year; should be taken in Semester 5 or 7.

**Semester 6**

MCS*3030	[0.50]	Research Methods
MCS*3820	[0.50]	Real Estate Development
ECON*3510	[0.50]	Money, Credit and the Financial System
LARC*2820	[0.50]	Urban and Regional Planning

0.50 electives

**Semester 7**

AGEC*3320	[0.50]	Financial Management
MCS*4820	[0.50]	Real Estate Appraisal
ECON*3500	[0.50]	Urban Economics
HTM*4390	[0.50]	Individuals and Groups in Organizations

0.50 electives or MCS\*4840 or if not taken in Semester 5

**Semester 8**

MCS*3890	[0.50]	Property Management
MCS*4810	[0.50]	Real Estate and Housing Project
POLS*3270	[0.50]	Local Government in Ontario

1.00 electives

**Real Estate and Housing (Co-op) (REH:C)****Department of Marketing and Consumer Studies, College of Social and Applied Human Sciences**

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

The Co-op program consists of two eight month work terms. The Co-op program is normally completed over a 5 year period.

To be eligible to continue in the Co-op Major students must maintain a satisfactory average, must complete all course requirements as scheduled and must obtain a minimum evaluation of "satisfactory" on all required work term reports. Consult the Co-op advisor or Department for additional information.

**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 - Fall**

MCS*1000	[0.50]	Introductory Marketing
MCS*1820	[0.50]	Real Estate and Housing
ECON*1050	[0.50]	Introductory Microeconomics
MATH*1000	[0.50]	Introductory Calculus

0.50 electives

Note: Students who are exceptionally strong in mathematics may substitute either MATH\*1080 or MATH\*1200 for MATH\*1000.

**Semester 2 - Winter**

MCS*1400	[0.50]	Introduction to Design
ECON*1100	[0.50]	Introductory Macroeconomics
POLS*2300	[0.50]	Canadian Government

1.00 electives

**Semester 3 - Fall**

AGEC*2220	[0.50]	Financial Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
MCS*2020	[0.50]	Information Management
ECON*2310	[0.50]	Intermediate Microeconomics
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

**Semester 4 - Winter**

AGEC*2230	[0.50]	Management Accounting
MCS*2820	[0.50]	Real Estate Finance
ECON*2410	[0.50]	Intermediate Macroeconomics

1.00 electives

**Summer Semester**

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

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

MCS*2850	[0.50]	Service Learning in Housing
MCS*3820	[0.50]	Real Estate Development
MCS*3890	[0.50]	Property Management
ECON*3510	[0.50]	Money, Credit and the Financial System

0.50 electives

**Semester 6 - Fall**

MCS*3030	[0.50]	Research Methods
MCS*3810	[0.50]	Real Estate Market Analysis
MCS*4840	[0.50]	Housing and Real Estate Law *
ECON*3560	[0.50]	Theory of Finance

0.50 or 1.00 electives

\* This course is offered every other year; should be taken in Semester 6 or 7.

**Winter Semester**

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

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 7 - Fall**

AGEC*3320	[0.50]	Financial Management
MCS*4820	[0.50]	Real Estate Appraisal
ECON*3500	[0.50]	Urban Economics
HTM*4390	[0.50]	Individuals and Groups in Organizations

0.50 electives or MCS\*4840 if not taken in Semester 6

**Semester 8 - Winter**

MCS*4810	[0.50]	Real Estate and Housing Project
LARC*2820	[0.50]	Urban and Regional Planning
POLS*3270	[0.50]	Local Government in Ontario

1.00 electives

**Tourism Management (TMGT)****School of Hospitality and Tourism Management, College of Social and Applied Human Sciences**

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 builds on a strong base of hospitality management courses (human resources management, accounting, finance, cost controls, hotel operations). In conjunction with these courses the program provides specialized courses dealing with the economic, social, cultural and environmental aspects of the industry as well as the critical functions of tourism marketing, distribution, planning and development. In addition, there are opportunities to develop expertise in eco-tourism and international tourism operations. Verified work experience in the hospitality and tourism industry is required for students to be eligible to graduate. Group work is a significant part of core

credit work. Students may consult the Faculty Advisor or the B.Comm. Program Counsellor for additional information.

For this major, 15.00 of the 20.00 credits are specified as core requirements, 2.50 as restricted electives (List A), and the remaining 2.50 as electives.

**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
GEOG*1220	[0.50]	Human Impact on the Environment
HTM*1000	[0.50]	Introduction to Hospitality and Tourism Management
POLS*1400	[0.50]	Issues in Canadian Politics
PSYC*1200	[0.50]	Dynamics of Behaviour

**Semester 2**

ECON*1100	[0.50]	Introductory Macroeconomics
HTM*2000	[0.50]	Hospitality and Tourism Purchasing Management
HTM*2010	[0.50]	Hospitality and Tourism Business Communications
HTM*2100	[0.50]	Lodging Operations
HTM*2120	[0.50]	Hospitality and Tourism Marketing I

**Semester 3**

AGEC*2220	[0.50]	Financial Accounting
MCS*2020	[0.50]	Information Management
HTM*2050	[0.50]	Dimensions of Tourism

1.00 from List A or electives

**Semester 4**

HTM*2030	[0.50]	Control Systems in the Hospitality and Tourism Industry
HTM*2170	[0.50]	Canadian Tourism Policy, Planning and Development
HTM*2200	[0.50]	Organizational Behaviour I
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 from List A or electives

**Semester 5**

MCS*3040	[0.50]	Business and Consumer Law
HTM*3070	[0.50]	Hospitality and Tourism Management Accounting
HTM*3080	[0.50]	Hospitality and Tourism Marketing II
HTM*3160	[0.50]	Destination Management and Marketing

0.50 from List A or electives

**Semester 6**

AGEC*3320	[0.50]	Financial Management
AGEC*4360	[0.50]	Marketing Research
HTM*3000	[0.50]	Human Resources Management
HTM*3120	[0.50]	Operations Analysis in the Hospitality and Tourism Industry

0.50 from List A or electives

**Semester 7**

ECON*3460	[0.50]	Introduction to Finance
HTM*4100	[0.50]	Organizational Behaviour II
HTM*4190	[0.50]	Hospitality and Tourism Operations Planning

1.00 from List A or electives

**Semester 8**

HTM*4170	[0.50]	International Tourism Development and Management
HTM*4200	[0.50]	Policy Issues in Hospitality and Tourism Management

1.50 from List A or electives

**List A - Restricted Electives**

In addition to the 15.00 required credits, students must also take a minimum of 2.50 restricted elective credits from the following list, throughout the program. Students may choose to explore a variety of subjects or may choose to study an 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 up to 2.00 credits in language courses as restricted electives. Students without a second language are strongly recommended to take language courses.

**Courses related to eco-tourism:**

AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGEC*4290	[0.50]	Land Economics
AGEC*4310	[0.50]	Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
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 Policy Formation and Administration

*Courses related to international tourism:*

ECON*2650	[0.50]	Introductory Development Economics
ECON*3620	[0.50]	International Trade
ECON*4830	[0.50]	Economic Development
EDRD*3500	[0.50]	Recreation and Tourism Planning
EDRD*4010	[0.50]	Tourism Planning in the Less Developed World
GEOG*3490	[0.50]	Tourism and Environment
HTM*2740	[0.50]	Cultural Aspects of Food
REXT*3060	[0.50]	International Communication

*Courses for those interested in developing tourism related real estate:*

MCS*1820	[0.50]	Real Estate and Housing
MCS*2820	[0.50]	Real Estate Finance
MCS*3810	[0.50]	Real Estate Market Analysis
MCS*3820	[0.50]	Real Estate Development
MCS*3890	[0.50]	Property Management
MCS*4820	[0.50]	Real Estate Appraisal
MCS*4840	[0.50]	Housing and Real Estate Law
GEOG*3490	[0.50]	Tourism and Environment
LARC*2820	[0.50]	Urban and Regional Planning

*Courses dealing with the social and economic environment of business:*

ECON*2410	[0.50]	Intermediate Macroeconomics
PHIL*1010	[0.50]	Introductory Philosophy: Social and Political Issues
PHIL*2600	[0.50]	Business and Professional Ethics

*Courses dealing with human behaviour particularly as related to work and work groups:*

ANTH*1150	[0.50]	Introduction to Anthropology
ANTH*2160	[0.50]	Social Anthropology
ECON*2200	[0.50]	Industrial Relations
PSYC*2310	[0.50]	Introduction to Social Psychology
PSYC*3060	[0.50]	Occupational Health Psychology

*Courses dealing with marketing and consumer behaviour:*

AGEC*4370	[0.50]	Marketing Management
MCS*1000	[0.50]	Introductory Marketing
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3600	[0.50]	Consumer Information Processes
MCS*3620	[0.50]	Marketing Communications
MCS*4050	[0.50]	The Evolution of Capitalism: A Canadian Perspective

*Courses related to Hospitality and Tourism Management:*

HTM*2070	[0.50]	Meetings and Convention Management
HTM*2700	[0.50]	Introductory 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]	Foodservice Operations Management
HTM*3180	[0.50]	Casino Operations Management
HTM*3200	[0.50]	Club Management Operations
HTM*3250	[0.50]	Tourism in Canada
HTM*3780	[0.50]	Economics of Food Usage
HTM*4050	[0.50]	Wine and Oenology
HTM*4090	[0.50]	Hospitality and Tourism Facilities Management and Design
HTM*4110	[0.50]	Restaurant Operations
HTM*4120	[0.50]	Entrepreneurship in Hospitality and Tourism
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

*Courses related to accounting and administration:*

AGEC*2230	[0.50]	Management Accounting
AGEC*3310	[0.50]	Operations Management
AGEC*3330	[0.50]	Intermediate Accounting
AGEC*4250	[0.50]	Business Policy
AGEC*4410	[0.50]	Sales and Sales Management
MCS*2100	[0.50]	Personal Financial Management

*Other restricted electives:*

CHEM*1100	[0.50]	Chemistry Today
CIS*1000	[0.50]	Introduction to Computer Applications
MCS*3010	[0.50]	Quality Management
ENGL*1410	[0.50]	Major English Writers
PHIL*2100	[0.50]	Critical Thinking
REXT*3040	[0.50]	Communication Process

**Electives and Liberal Education Requirement**

The 2.50 electives in the program must include 1.50 credits toward the B.Comm. Liberal Education Requirement.

## 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.

Guelph's Bachelor of Computing degree combines the necessary theoretical background with an applied focus to learning. Course projects which are based on real-world software development scenarios allow students to get the practical experience valued by today's high-tech employers. The focused study in a second discipline gives students the necessary background to effectively apply their knowledge.

For the degree of Bachelor of Computing the University of Guelph offers a specialized program requiring the equivalent of 8 semesters of successful full-time study (honours program) and a general program requiring the equivalent of 6 semesters of successful full-time study (general program). The honours program is also available as a Co-op degree.

A student may register in any of the 3 semesters (Summer, Fall, Winter). Since not all courses are offered in every semester and prerequisite dependencies must be observed, students are encouraged to consult the program counsellor for the B.Comp. program to plan an initial program of study or when considering modifications to the suggested schedule of studies list (below).

### Program Information

#### B.Comp. Program Regulations

The general program is designed to provide a sound general education in computing.

The honours program is designed to provide depth of study and specialization beyond that available in the general program, while at the same time ensuring a complementary background in an area of application.

#### 1. Requirements for a General Degree

To graduate from a general program a student must:

- 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.
- 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.
- 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

0.5 additional C.I.S. or STAT credits at the 2000 level or higher  
1.0 additional C.I.S. credits at 3000 level or higher
- 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.

#### 2. Requirements for an Honours Degree

To graduate from an honours program a student must:

- successfully complete 20.00 credits. These must include the 11.75 credits that fulfill the Computing Core Requirements (below), a minimum of 4.00 credits in an Area of Application (below) and an additional 4.25 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 credits at the 3000 level or above and 2.00 credits at the 4000 level, while 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.

- complete the following Computing Core Requirements:

CIS*1500	[0.50]	Introduction to Programming
CIS*1910	[0.50]	Discrete Structures in Computing I
CIS*2030	[0.50]	Structure and Application of Microcomputers
CIS*2430	[0.50]	Object Oriented Programming
CIS*2460	[0.50]	Modelling of Computer Systems
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*3110	[0.50]	Operating Systems
CIS*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts

CIS*3750	[0.75]	System Analysis and Design in Applications
CIS*4000	[0.50]	Applications of Computing Seminar
MATH*1200	[0.50]	Calculus I
STAT*2040	[0.50]	Statistics I

1.75 additional C.I.S. credits at the 3000 level or above

1.50 additional C.I.S. credits at the 4000 level or above

- obtain a cumulative average at least 70% in CIS courses. Students who do not satisfy this requirement at graduation may apply for a General Degree.
- earn at least 4.00 credits in an Area of Application with at least 1.00 credits at the 3000 level or above. These credits must be taken from a single department or subject other than Computing and Information Science.

An area of Application normally consists of 4.00 credits (normally 8 courses) of a minor. Minors in the B.A. program and B.Sc. 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 in semester 4.

Some courses may have enrolment restrictions placed on them.

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.

#### 3. 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.

#### Schedule of Studies

Since many courses are offered in only one semester and course prerequisites 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. This schedule assumes a Fall/Winter semester sequence.

#### Major (Honours Program)

School of Computing and Information Science, College of Physical and Engineering Science

##### 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

CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms

STAT\*2040 [0.50] Statistics I

0.25 credits in the Area of Application or elective

##### Semester 5

CIS\*2460 [0.50] Modelling of Computer Systems

CIS\*3530 [0.50] Data Base Systems and Concepts

CIS\*3750 [0.75] System Analysis and Design in Applications

0.75 credits in the Area of Application or electives

##### Semester 6

Alternative 1 [Recommended]

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

OR Alternative 2

(1.50 C.I.S. electives at the 3000 level or above

1.00 credits in the Area of Application or electives)

##### Semester 7

1.00 credits in the Area of Application or electives

0.50 credits in C.I.S. at 3000 level or above

1.00 credits in C.I.S. at the 4000 level

##### Semester 8

CIS\*4000 [0.50] Applications of Computing Seminar

1.50 credits in the Area of Application or electives



0.50 credits in C.I.S. at the 4000 level

### Schedule of Studies Co-op

Since many courses are offered in only one semester and course prerequisites 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. This schedule assumes a Fall/Winter semester sequence.

### Major Co-op (Honours Program)

#### School of Computing and Information Science, College of Physical and Engineering Science

The Honours Bachelor of Computing degree is also available as a Co-operative Education Program. Students may apply for this option at the time of University admission or completion of semester 2. Three co-op work terms are required in Stream A and four are required in Stream B. Please check with CIS. Co-op faculty advisor for semester planning.

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).

Other sequences may not be viable for the co-op student. Please check with the CIS Co-op faculty advisor for semester planning. COOP\*1000, COOP\*2000, COOP\*3000, and COOP\*4000 represent the first, second, third, and fourth work terms respectively.

**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.**

#### Work/Study Semesters

#### Stream A Co-Op Schedule of Studies

##### 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  
COOP\*1100 [0.00] Introduction to Co-operative Education

1.50 credits in the Area of Application or electives

##### Semester 3(Summer)

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

##### Fall Semester

COOP\*1000 Work Term 1

##### Semester 4(Winter)

CIS\*2750 [0.75] Software Systems Development and Integration  
CIS\*3110 [0.50] Operating Systems  
CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms  
STAT\*2040 [0.50] Statistics I

0.25 credits in the Area of Application or electives

##### Summer Semester

COOP\*2000 Work Term 2

##### Semester 5(Fall)

CIS\*2460 [0.50] Modelling of Computer Systems  
CIS\*3530 [0.50] Data Base Systems and Concepts  
CIS\*3750 [0.75] System Analysis and Design in Applications

0.75 credits in the Area of Application or electives

##### Winter Semester

COOP\*3000 Work Term 3

##### Semester 6(Summer)

Alternative 1 [Recommended]

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

OR Alternative 2

(1.50 C.I.S. electives at the 3000 level or above

1.00 credits in the Area of Application or electives)

##### Semester 7(Fall)

1.00 credits in the Area of Application or electives

0.50 credits in C.I.S. at 3000 level or above

1.00 credits in C.I.S. at the 4000 level

##### Semester 8(Winter)

CIS\*4000 [0.50] Applications of Computing Seminar

1.50 credits in the Area of Application or electives

0.50 credits in C.I.S. at the 4000 level

### The recommended schedule of studies for Co-op Stream B 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  
COOP\*1100 [0.00] Introduction to Co-operative Education

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

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  
CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms  
STAT\*2040 [0.50] Statistics I

0.25 credits in the Area of Application or elective

#### Summer Semester

COOP\*1000 Work Term 1

#### Semester 5(Fall)

CIS\*2460 [0.50] Modelling of Computer Systems  
CIS\*3530 [0.50] Data Base Systems and Concepts  
CIS\*3750 [0.75] System Analysis and Design in Applications

0.75 credits in the Area of Application or electives

Note: CIS\*3210 should be taken here to enable future courses in distributed computing.

#### Winter Semester

COOP\*2000 Work Term 2

#### Semester 6(Summer)

Alternative 1 [Recommended]

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

OR Alternative 2

(1.50 C.I.S. electives at the 3000 level or above

1.00 credits in the Area of Application or electives)

#### Fall Semester

COOP\*3000 Work Term 3

#### Semester 7(Winter)

1.00 credits in the Area of Application or electives

0.50 credits in C.I.S. at 3000 level or above

1.00 credits in C.I.S. at the 4000 level

#### Summer Semester

COOP\*4000 Work Term 4

#### Semester 8(Fall)

CIS\*4000 [0.50] Applications of Computing Seminar

1.50 credits in the Area of Application or electives

0.50 credits in C.I.S. at the 4000 level

## 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

In education and practice landscape architecture involves both planning and design. Its unique responsibility is to integrate societal needs with the natural environment in a manner which is non-polluting and results in minimal alteration to natural ecosystems. Frequently the landscape architect must work closely with architects, urban planners and engineers, and where the conservation and creation of natural settings is concerned they must work with scientists in this field. The challenge confronting the professional landscape architect is significant and promises to become even greater in the future.

Persons interested in pursuing a career in Landscape Architecture should possess several basic qualities. It is essential that the prospective student have a keen interest in art and design which may be cultivated to professional competence. They should have a strong interest in nature, a love of plants and a desire to arrange landscapes into beautiful and functional forms. Lastly, they should possess a strong interest in people as the art of landscape architecture is directed toward creating landscapes which fulfill people's requirements for use and enjoyment.

The program in Landscape Architecture prepares the prospective graduate for a wide variety of career opportunities in private practice or in public agencies at the municipal, provincial and national levels. The undergraduate training is a sound basis for graduate study in landscape architecture, urban and regional planning and resource development.

#### Accreditation

The baccalaureate degree program in Landscape Architecture is recognized by the Canadian Society of Landscape Architects and the American Society of Landscape Architects. The program is fully accredited by the Landscape Architectural Accreditation Board (L.A.A.B.) for the Canadian Society of Landscape Architects (C.S.L.A.), and this accreditation is recognized by the American Society of Landscape Architects (A.S.L.A.). Graduates are entitled to apply for registration as a Landscape Architect within the Province of Ontario after completing 2 years of acceptable experience as a Landscape Architectural Associate member of the Ontario Association of Landscape Architects and successful completion of 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 departmental advisor 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 their departmental advisor. A substitute course will normally be in the same academic area as that listed in the Landscape Architecture Program.

The following elective courses in Landscape Architecture are available. Refer to course descriptions for scheduling information.

LARC*3500	[0.50]	Independent Study
LARC*4520	[0.50]	Park and Recreation Administration
LARC*4730	[0.50]	Special Study in Landscape Architecture
LARC*4740	[0.50]	Case Studies

#### 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).

#### Schedule of Studies

##### Major (Honours Program)

###### Semester 1

BIOL*1030	[0.50]	Biology I
ENGL*1200	[0.50]	Reading the Contemporary 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*1100	[0.50]	Principles of Behaviour
SOC*1100	[0.50]	Sociology

###### Semester 2

LARC*2020	[0.75]	Design Studio
LARC*2330	[0.25]	Planting Design I
LARC*2420	[0.50]	Materials and Techniques
PHIL*2070	[0.50]	Philosophy of the Environment

One of:

- 0.50 Studio Arts electives (2000 level)\*
- 0.50 Social Science electives\*

\*One of either this semester (the alternate selection must be taken in Semester 4, therefore obtaining one Studio Arts electives and one Social Science electives over these two semesters). Note: "Social Science" is defined as Anthropology, Economics, Geography, International Development, Political Science, Psychology or Sociology.

###### Semester 3

HORT*3260	[0.50]	Woody Plants
LARC*2100	[0.50]	Landscape Analysis
LARC*2340	[0.25]	Planting Design II
LARC*2410	[0.50]	Site Engineering
LARC*3040	[0.75]	Site Planning and Design Studio

###### Semester 4

LARC*2820	[0.50]	Urban and Regional Planning
LARC*3050	[0.75]	Landscape Architecture I
LARC*3430	[0.50]	Landscape Construction I

One of:

- 0.50 Studio Arts electives (2000 level)\*
- 0.50 Social Sciences electives\*

0.50 electives

\*One of either this semester (the alternate selection must be taken in Semester 2, therefore obtaining one Studio Arts electives and one Social Science electives over these two semesters). Note: "Social Science" is defined as Anthropology, Economics, Geography, International Development, Political Science, Psychology or Sociology.

###### Semester 5

ENVS*3320	[0.50]	Principles of Landscape Ecology **
LARC*3060	[0.75]	Landscape Architecture II
LARC*3440	[0.75]	Landscape Construction II
LARC*4610	[0.50]	Professional Practice

0.50 electives (in odd years)

\*\* is offered in even-numbered years; to alternate with electives in odd years

###### Semester 6

Choose one of the following three options:

###### Option 1

2.00 - 2.50 electives

**Option 2**

LARC\*4620 [1.00] Internship in Landscape Architecture  
1.00 electives

**Option 3**

Exchange Program (2.00 - 2.50 credits)

**Semester 7**

ENVS\*3320 [0.50] Principles of Landscape Ecology \*\*  
LARC\*3070 [1.00] Landscape Architecture III  
LARC\*4101 [0.50] Design Thesis

0.50 electives (in odd years)

\*\* is offered in even-numbered years; to alternate with electives in odd years

**Semester 8**

LARC\*4090 [0.50] Seminar  
LARC\*4102 [1.00] Design Thesis

0.50 electives

0.50 electives (if needed)

## 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 required 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 1.50 credits (usually 3 courses) in each of the above areas. The courses to be taken in semesters 4 to 6 may be selected to allow a broad study of the sciences.

### Honours Program Requirements

In order to graduate in 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)

#### Honours Major

These programs 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 or OAC 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

PHYS\*1020 for students lacking physics

Not more than one of the above will be allowed for credit toward the B.Sc. degree.

### 2. Basic 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

No B.Sc. program may include more than 7.00 credits at the 1000 level.

### 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](http://www.bsc.uoguelph.ca/Approved_electives.shtml).

### 6. Double-Counting of Credits

A maximum of 2.00 credits required in a major program may be applied to meet the requirements of a minor program.

### 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 (usually 30 courses) as outlined in the Total Course Requirements for all students in the General Science Program.

## Recommended Schedule for Students in Biological Science Areas

### Semester 1\*

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences
0.50 Arts or Social Science electives		

### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
One of:		
MATH*2080	[0.50]	Elements of Calculus II
STAT*2040	[0.50]	Statistics I
One of:		
PHYS*1080	[0.50]	Physics for Life Sciences
PHYS*2040	[0.50]	Fundamental Electronics and Sensors
0.50 electives		

### Semester 3

0.50 credits in biological science

0.50 credits in chemistry  
 0.50 credits in physics  
 0.50 credits in mathematical science  
 0.50 electives

**Semester 4 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'.

\*refer to B.Sc. Program Requirements: Regulation 1, Entry Credits and Regulation 3, 1000 Level Credits

**Recommended Schedule for Students in Physical Science Areas****Semester 1\***

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

0.50 Arts or Social Science electives

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 electives

**Semester 3**

One of:

CIS*1200	[0.50]	Introduction to Computing
STAT*2040	[0.50]	Statistics I
STAT*2100	[0.50]	Introductory Probability and Statistics

0.50 credits in biological science

0.50 credits in chemistry

0.50 credits in physics

0.50 electives

**Semester 4 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'.

\*refer to B.Sc. Program Requirements: Regulation 3, 1000 Level Credits

**Total Course Requirements for all Students in the General Science Program**

Total of 15.00 credits (usually 30 courses) as follows:

1. The Science core - a minimum of 1.50 credits (usually 3 courses) beyond the 4U or OAC level, in each of biological science, chemistry, mathematical science, physics (Refer to "Regulation 3, 1000 Level Credits") - minimum of 6.00 (usually 12 courses)
2. Additional acceptable science credits\* - selected from biological science, chemistry, computing and information science, mathematics, statistics, physics, geology or other science courses - 6.00 credits (usually 12 courses)
3. Arts and social science credits - 2.00 credits (usually 4 courses)
4. Additional acceptable credits (these may include one of BIOL\*1020, CHEM\*1060, PHYS\*1020) - 1.00 credits (usually 2 courses)

\*at least 2.00 credits (usually 4 courses) of the additional science courses must be 3000 or 4000 level

**Honours Programs (BSCH)****Honours Program Majors**

The following honours majors are available:

**Biological Sciences:**

20.00 credits - Animal Biology  
 20.25 credits - Biochemistry  
 20.00 credits - Biological Science  
 20.00 credits - Bio-Medical Science  
 20.00 credits - Human Kinetics  
 20.00 credits - Marine and Freshwater Biology  
 20.00 credits - Microbiology  
 20.00 credits - Molecular Biology & Genetics  
 20.00 credits - Nutritional and Nutraceutical Sciences  
 20.00 credits - Plant Biology  
 20.00 credits - Plant Biotechnology  
 20.00 credits - Wild Life Biology  
 20.00 credits - Zoology

**Physical Sciences:**

20.00 credits - Biological Chemistry  
 21.25 credits - Biophysics  
 21.75 credits - Chemical Physics  
 20.25 credits - Chemistry

20.00 credits - Physical Science

21.25 credits - Physics

21.25 credits - Theoretical Physics

**Environmental Sciences:**

20.25 credits - Biomedical Toxicology  
 20.00 credits - Earth Surface Science\*  
 20.00 credits - Ecology\*  
 20.00 credits - Environmental Biology\*  
 20.00 credits - Environmental Toxicology  
 \*also see B.SC.(ENV.)

**Computing Science, Mathematics, Statistics**

20.00 credits - Computing & Information Science  
 20.00 credits - Mathematics  
 20.00 credits - Statistics

**Additional Disciplines:**

20.00 credits - Food Science  
 20.00 credits - Psychology

**Co-operative Educational Programs:**

20.00 credits - Applied Mathematics and Statistics  
 20.25 credits - Biochemistry  
 20.25 credits - Biomedical Toxicology  
 21.25 credits - Biophysics  
 21.25 credits - Chemical Physics  
 20.25 credits - Chemistry  
 20.00 credits - Computing & Information Science  
 20.00 credits - Environmental Toxicology  
 20.00 credits - Food Science  
 20.00 credits - Microbiology  
 21.25 credits - Physics

**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  
 5.00 credits - Biochemistry  
 5.00 credits - Biotechnology  
 5.00 credits - Functional Foods and Nutraceuticals  
 5.00 credits - Microbiology  
 5.00 credits - Molecular Biology and Genetics  
 5.00 credits - Neuroscience  
 5.00 credits - Nutritional Sciences  
 5.00 credits - Plant Biology  
 5.00 credits - Plant Biotechnology  
 5.00 credits - Zoology

**Physical Sciences:**

5.00 credits - Chemistry  
 5.00 credits - Physics

**Environmental Sciences:**

5.00 credits - Ecology  
 5.00 credits - Forest Science  
 5.00 credits - Geographic Info. Sys. (G.I.S.) and Environmental Analysis  
 5.00 credits - Geology

**Mathematical Sciences:**

5.25 credits - Computing & Information Science  
 5.00 credits - Mathematical Science  
 5.00 credits - Mathematics  
 5.00 credits - Statistics

**Additional Disciplines:**

5.00 credits - Business Administration  
 5.00 credits - Food Science  
 5.00 credits - Psychology

**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. Students must be either a Canadian Citizen or Permanent Resident. A cumulative average of 70% is required in courses taken in Semesters 1 and 2 to permit continuation in the program.

### 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 and Poultry 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

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

One of:

CIS*1000	[0.50]	Introduction to Computer Applications
CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

0.50 Arts or Social Science electives

#### Semester 3

AGR*2350	[0.50]	Animal Production Systems and Industry
BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2000	[0.50]	Introductory Genetics

0.50 Arts or Social Science electives

#### Semester 4

ANSC*2340	[0.50]	Structure of Farm Animals
MBG*2020	[0.50]	Introductory Molecular Biology
NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science 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*3150	[0.50]	Principles of Farm Animal Care and Welfare
ANSC*3300	[0.50]	Animal Reproduction
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

Students must complete 2.00 credits from Arts or Social Science courses.

0.50 credits is required from each of the following: Nutrition, Breeding and Genetics, and Physiology. Students are encouraged to consult with the Faculty Advisor for help in tailoring their selection to meet personal and career interests.

**Note:** Students are required to complete 16.00 credits in science of which a minimum of 6.00 credits must be at the 3000, 4000 level and at least 2.00 credits of these must be 4000 level.

#### 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*4550	[0.50]	Horse Nutrition
ANSC*4560	[0.50]	Pet Nutrition

#### Breeding & Genetics [0.50] Required

ANSC*4050	[0.50]	Biotechnology in Animal Science
MBG*3090	[0.50]	Applied Animal Breeding
MBG*4030	[0.50]	Animal Breeding Methods

#### Physiology [0.50] Required

ANSC*4090	[0.50]	Applied Animal Behaviour
ANSC*4100	[0.50]	Environmental Management and Animal Productivity
ANSC*4130	[0.50]	Reproductive Management and Technology
ANSC*4350	[0.50]	Experiments in Animal Biology
ANSC*4470	[0.50]	Animal Metabolism
ANSC*4490	[0.50]	Applied Endocrinology

An additional 3.00 credits must be obtained by selecting courses from the above lists and from the following:

AGR*2360	[0.50]	Challenges & Opportunities in Animal Production
ANSC*4610	[0.50]	Critical Analysis in Animal Science
ANSC*4650	[0.50]	Immune Mechanisms of Animals
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
MICR*3230	[0.50]	Immunology I
MICR*4230	[0.50]	Immunology II
PATH*3610	[0.50]	Principles of Disease
POPM*3240	[0.50]	Epidemiology
POPM*4230	[0.50]	Animal Health

### Applied Mathematics and Statistics (Co-op) (APMS:C)

#### Department of Mathematics and Statistics, 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. A total of 20.00 credits is required to complete this program which includes 4.50 credits in Mathematics, 2.50 credits in Statistics, 2.50 credits in Mathematics or Statistics at the 3000 level, and an additional 2.00 credits in Mathematics or Statistics at the 4000 level, 1.00 credits in Computing and Information Science, and 1.00 credits in Arts or Social Sciences courses.

#### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
CIS*2500	[0.50]	Intermediate Programming
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

#### Summer Semester

No study semester or work term.

#### Semester 3 - Fall

MATH*2000	[0.50]	Set Theory
MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

#### Winter Semester

COOP*1000	[0.00]	Co-op Work Term I
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Note: Suggested course sequences are available in the departmental brochure. Please consult with the departmental advisor.

#### Semester 4 - Summer

MATH*2130	[0.50]	Numerical Methods
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MATH\*2170 [0.50] Differential Equations I  
 STAT\*2050 [0.50] Statistics II  
 0.50 Arts or Social Science electives  
 0.50 electives

**Fall Semester**

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

**Semester 5 - Winter**

1.00 credits in Mathematics or Statistics at the 3000 level or above  
 1.50 electives

**Summer Semester**

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

**Semester 6 - Fall**

STAT\*3100 [0.50] Introductory Mathematical Statistics I  
 STAT\*3240 [0.50] Applied Regression Analysis

At least 1.00 credits from:

MATH\*3100 [0.50] Differential Equations II  
 MATH\*3200 [0.50] Real Analysis  
 MATH\*3240 [0.50] Operations Research

0.50 electives

**Semester 7 - Winter**

STAT\*3110 [0.50] Introductory Mathematical Statistics II  
 1.50 credits in Mathematics or Statistics at the 3000 level or above

0.50 electives

**Summer Semester**

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

**Semester 8 - Fall**

2.00 credits in Mathematics or Statistics at the 4000 level  
 0.50 electives

**Electives must include:**

1.00 credits in Arts and Social Science courses  
 2.50 credits in Mathematics or Statistics at the 3000 level  
 2.00 credits in Mathematics or Statistics at the 4000 level

**Biochemistry (BIOC)****Department of Molecular and Cellular Biology, College of Biological Science****Major (Honours Program)**

Students may enter this major in Semester I 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 20.25 credits as indicated below:

**Semester 1**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 MATH\*1200 [0.50] Calculus I  
 PHYS\*1000 [0.50] An Introduction to Mechanics

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL\*1040 [0.50] Biology II  
 CHEM\*1050 [0.50] General Chemistry II  
 CIS\*1500 [0.50] Introduction to Programming  
 MATH\*1210 [0.50] Calculus II  
 PHYS\*1010 [0.50] Introductory Electricity and Magnetism

**Semester 3**

BIOC\*2580 [0.50] Introductory Biochemistry  
 CHEM\*2060 [0.50] Structure and Bonding  
 CHEM\*2480 [0.50] Analytical Chemistry I  
 CHEM\*2880 [0.50] Physical Chemistry  
 MBG\*2000 [0.50] Introductory Genetics

**Semester 4**

BIOC\*3560 [0.50] Structure and Function in Biochemistry  
 BIOL\*2210 [0.50] Introductory Cell Biology  
 CHEM\*2700 [0.50] Organic Chemistry I  
 MBG\*2020 [0.50] Introductory Molecular Biology

0.50 electives

**Semester 5**

BIOC\*3570 [0.50] Analytical Biochemistry  
 CHEM\*3750 [0.50] Organic Chemistry II  
 MICR\*2030 [0.50] Microbial Growth  
 STAT\*2040 [0.50] Statistics I

0.50 electives

**Semester 6**

MBG\*3350 [0.75] Laboratory Methods in Molecular Biology I  
 PHYS\*2030 [0.50] Biophysics of Excitable Cells

1.50 electives

**Semester 7**

BIOC\*4520 [0.50] Metabolic Processes  
 MCB\*4080 [0.50] Applied Microbiology and Biochemistry  
 MICR\*3230 [0.50] Immunology I

One of:

MBG\*3070 [0.50] Bacterial Genetics  
 MBG\*3080 [0.50] Bacterial Genetics  
 MBG\*4080 [0.50] Molecular Genetics

0.50 electives

**Semester 8**

BIOC\*4540 [0.50] Enzymology  
 BIOC\*4580 [0.50] Membrane Biochemistry

1.50 electives

**Electives**

Selection of electives for the program is subject to the following rules:

- At least 1.00 credits must be in the Arts and Social Sciences.
- One of: MCB\*4050, TOX\*4590.
- One of: BIOM\*3100, MICR\*4230, PBIO\*3110, PBIO\*4750.

**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 [0.50] Analytical Biochemistry  
 BIOC\*4540 [0.50] Enzymology  
 CHEM\*2480 [0.50] Analytical Chemistry I  
 CHEM\*2700 [0.50] Organic Chemistry I

One of:

MBG\*2020 [0.50] Introductory Molecular Biology  
 MICR\*2030 [0.50] Microbial Growth

In addition, at least 2.00 credits must be chosen from the following courses, with at least 1.00 credits from the first four 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\*4080 [0.50] Applied Microbiology and Biochemistry  
 MICR\*3230 [0.50] Immunology I  
 TOX\*4590 [0.50] Biochemical Toxicology

**Biochemistry (Co-op) (BIOC:C)****Department of Molecular and Cellular Biology, College of Biological Science**

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.

**Stream A****Semester 1 - Fall**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 MATH\*1200 [0.50] Calculus I  
 PHYS\*1000 [0.50] An Introduction to Mechanics

0.50 Arts or Social Science electives

**Semester 2 - Winter**

BIOL\*1040 [0.50] Biology II  
 CHEM\*1050 [0.50] General Chemistry II  
 CIS\*1500 [0.50] Introduction to Programming  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 MATH\*1210 [0.50] Calculus II  
 PHYS\*1010 [0.50] Introductory Electricity and Magnetism

**Summer Semester**

No academic semester or work term

**Semester 3 - Fall**

BIOC\*2580 [0.50] Introductory Biochemistry

CHEM*2060	[0.50]	Structure and Bonding
CHEM*2480	[0.50]	Analytical Chemistry I
CHEM*2880	[0.50]	Physical Chemistry
MBG*2000	[0.50]	Introductory Genetics

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

BIOC*3570	[0.50]	Analytical Biochemistry
CHEM*2700	[0.50]	Organic Chemistry I
MBG*2020	[0.50]	Introductory Molecular Biology
STAT*2040	[0.50]	Statistics I

0.50 electives

**Semester 5 - Fall**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*3750	[0.50]	Organic Chemistry II
MICR*2030	[0.50]	Microbial Growth

0.50 electives

**Winter Semester**

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

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6 - Fall**

MICR*3230	[0.50]	Immunology I
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One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics
MBG*4080	[0.50]	Molecular Genetics

1.50 electives

**Semester 7 - Winter**

BIOC*4540	[0.50]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
PHYS*2030	[0.50]	Biophysics of Excitable Cells

0.50 electives

**Summer Semester**

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 8 - Fall**

BIOC*4520	[0.50]	Metabolic Processes
MCB*4080	[0.50]	Applied Microbiology and Biochemistry

1.50 electives

**Electives**

Selection of electives for the program is subject to the following rules:

1. At least 1.00 credits must be in the Arts and Social Sciences.
2. One of: MCB\*4050, TOX\*4590.
3. One of: BIOM\*3100, MICR\*4230, PBIO\*3110, PBIO\*4750.

**Stream B****Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

0.50 Arts or Social Science electives

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
CIS*1500	[0.50]	Introduction to Programming
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

**Summer Semester**

No academic semester or work term

**Semester 3 - Fall**

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2060	[0.50]	Structure and Bonding
CHEM*2480	[0.50]	Analytical Chemistry I
CHEM*2880	[0.50]	Physical Chemistry
MBG*2000	[0.50]	Introductory Genetics

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

BIOC*3570	[0.50]	Analytical Biochemistry
CHEM*2700	[0.50]	Organic Chemistry I
MBG*2020	[0.50]	Introductory Molecular Biology
STAT*2040	[0.50]	Statistics I

0.50 elective

**Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology
MICR*2030	[0.50]	Microbial Growth
PHYS*2030	[0.50]	Biophysics of Excitable Cells

0.50 electives

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6 - Fall**

CHEM*3750	[0.50]	Organic Chemistry II
MICR*3230	[0.50]	Immunology I

One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics
MBG*4080	[0.50]	Molecular Genetics

1.00 electives

**Semester 7 - Winter**

BIOC*4540	[0.50]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I

1.00 electives

**Summer Semester**

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 8 - Fall**

BIOC*4520	[0.50]	Metabolic Processes
MCB*4080	[0.50]	Applied Microbiology and Biochemistry

1.50 electives

**Electives**

Selection of electives for the program is subject to the following rules:

1. At least 1.00 credits must be in the Arts and Social Sciences.
2. One of: MCB\*4050, TOX\*4590.
3. One of: BIOM\*3100, MICR\*4230, PBIO\*3110, PBIO\*4750.

**Biological Chemistry (BCHM)****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. This major will require the completion of 20.00 credits as indicated below:

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 Arts or Social Science electives

**Semester 3**

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2060	[0.50]	Structure and Bonding
CHEM*2400	[0.75]	Analytical Chemistry I
MBG*2000	[0.50]	Introductory Genetics

0.50 electives or restricted electives \*

**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



MBG\*2020 [0.50] Introductory Molecular Biology  
0.50 electives or restricted electives \*

**Semester 5**

BIOC\*3570 [0.50] Analytical Biochemistry  
CHEM\*2880 [0.50] Physical Chemistry  
CHEM\*3640 [0.50] Chemistry of the Elements I  
CHEM\*3750 [0.50] Organic Chemistry II

0.50 electives or restricted electives \*

**Semester 6**

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

One of: \*\*

CHEM\*4630 [0.50] Bioinorganic Chemistry  
CHEM\*4720 [0.50] Organic Reactivity

0.50 electives or restricted electives \*

**Semester 7**

CHEM\*4730 [0.50] Synthetic Organic Chemistry  
1.00 Chemistry, Biochemistry or Molecular Biology and Genetics courses at the 3000 or 4000 level \*\*\*

0.75 electives or restricted electives \*

**Semester 8**

CHEM\*4740 [0.50] Topics in Bio-Organic Chemistry

One of: \*\*

CHEM\*4630 [0.50] Bioinorganic Chemistry  
CHEM\*4720 [0.50] Organic Reactivity

0.50 Chemistry, Biochemistry or Molecular Biology and Genetics course at the 3000 or 4000 level \*\*\*

1.00 electives or restricted electives \*

\* restricted electives required include:

BIOL\*2210 [0.50] Introductory Cell Biology

One of:

MICR\*2020 [0.50] Microbial Interactions and Associations  
MICR\*2030 [0.50] Microbial Growth

\*\* CHEM\*4630 and CHEM\*4720 are offered in alternating winter semesters and both courses are required.

\*\*\* the allowable Chemistry, Biochemistry and Molecular Biology and Genetics courses at the 3000 and 4000 level are:

BIOC\*4520 [0.50] Metabolic Processes  
BIOC\*4540 [0.50] Enzymology  
BIOC\*4550 [0.50] Biochemistry and Structure of Macromolecules  
BIOC\*4570 [0.50] Applied Biochemistry  
BIOC\*4580 [0.50] Membrane Biochemistry  
CHEM\*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation  
CHEM\*4900 [0.75] Chemistry and Biochemistry Research Project I  
CHEM\*4910 [0.75] Chemistry and Biochemistry Research Project II  
MBG\*3350 [0.75] Laboratory Methods in Molecular Biology I  
MBG\*4080 [0.50] Molecular Genetics  
TOX\*4590 [0.50] Biochemical Toxicology

**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:

1. First year Core - 4.00 credits
  - 1.00 - Biology BIOL\*1030 BIOL\*1040
  - 1.00 - Chemistry CHEM\*1040 CHEM\*1050
  - 1.00 - Physics (PHYS\*1070, PHYS\*1080) or (PHYS\*1000, PHYS\*1010)
  - 0.50 - Mathematics MATH\*1080 or MATH\*1200
  - 0.50 - Mathematical Science CIS\*1000, CIS\*1200, MATH\*1210, MATH\*2080,
2. Subject Area Core - 8.00 credits
  - 0.50 - BIOL\*2210
  - 0.50 - BIOC\*2580
  - 0.50 - MBG\*2000
  - 0.50 - STAT\*2040
  - 0.50 - from one of BIOL\*2060, BIOL\*3110, BOT\*2050
  - 0.50 - minimum from one of BIOM\*3100, BOT\*3310, HK\*3940, ZOO\*3200
  - 5.00 - biological science courses of which 4.00 must be at the 3000 or 4000 level\*
3. Science Electives - 4.00 credits
  - 1.00 - biological science courses
  - 3.00 - from science offerings on the list of Approved Courses of which at least 2.00 must be at the 3000 or 4000 level\*
4. Arts and Social Science Electives - 2.00 credits

2.00 - arts or social science courses from the list of Approved Courses

5. Free Electives - 2.00 credits

\*the program must include at total of 6.00 science credits at the 3000 or 4000 level, 2.00 must be at the 4000 level

**Recommended Schedule of Studies****Semester 1**

BIOL\*1030 [0.50] Biology I  
CHEM\*1040 [0.50] General Chemistry I

One of:

MATH\*1080 [0.50] Elements of Calculus I  
MATH\*1200 [0.50] Calculus I

One of:

PHYS\*1000 [0.50] An Introduction to Mechanics  
PHYS\*1070 [0.50] Introductory Physics for Life Sciences

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL\*1040 [0.50] Biology II  
CHEM\*1050 [0.50] General Chemistry II

0.50 Mathematical science from:

CIS\*1000 [0.50] Introduction to Computer Applications  
CIS\*1200 [0.50] Introduction to Computing  
MATH\*1210 [0.50] Calculus II  
MATH\*2080 [0.50] Elements of Calculus II

One of:

PHYS\*1010 [0.50] Introductory Electricity and Magnetism  
PHYS\*1080 [0.50] Physics for Life Sciences

0.50 Arts or Social Science electives

**Semester 3**

MBG\*2000 [0.50] Introductory Genetics

0.50 Ecology from:

BIOL\*2060 [0.50] Ecology  
BIOL\*3110 [0.50] Population Ecology  
BOT\*2050 [0.50] Plant Ecology

One of:

BIOC\*2580 [0.50] Introductory Biochemistry  
BIOL\*2210 [0.50] Introductory Cell Biology

1.00 electives

**Semester 4**

STAT\*2040 [0.50] Statistics I

One of:

BIOC\*2580 [0.50] Introductory Biochemistry  
BIOL\*2210 [0.50] Introductory Cell Biology

1.50 electives

**Semester 5**

One course in Physiology from:

BIOM\*3100 [0.50] Mammalian Physiology I  
BOT\*3310 [0.50] Plant Growth and Development  
HK\*3940 [1.25] Human Physiology  
ZOO\*3200 [0.50] Comparative Animal Physiology I

2.00 electives (1.25 electives if HK\*3940 is selected)

**Semester 6 to 8**

2.50 in each semester including 2.00 science credits per semester

Note: 6.00 in biological science must be taken in Semesters 6 through 8 of which 4.00 must be at the 3000 or 4000 level. In the total 6.00 of 3000 and 4000 level science courses, 2.00 must be at the 4000 level.

**Biology (BIOL)****College of Biological Science****Minor (Honours Program)**

A minor in Biology shall include the following courses:

BIOL\*1030 [0.50] Biology I  
BIOL\*1040 [0.50] Biology II  
BIOL\*2060 [0.50] Ecology  
BIOL\*2210 [0.50] Introductory Cell Biology  
MBG\*2000 [0.50] Introductory Genetics

and 2.50 of which 1.50 must be at the 3000 or 4000 level, from courses offered by the Human Health and Nutritional Sciences, Integrative Biology and Molecular and Cellular Biology. This minor is intended for students registered in majors in B.Sc. Physical Sciences 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 focuses on the maintenance and promotion of human and animal health through the study of function (biochemistry and physiology), structure (anatomy and histology), and the basic medical sciences (epidemiology and pharmacology). It will permit graduates from this B.Sc. program to contribute to society in the area of health maintenance. The program is a good preparation for students intending to develop professional or research careers in the medical and biological sciences. Through the use of electives, students may structure a program emphasizing either nutritional sciences or principles of health and disease prevention. For more information on recommended electives contact the Faculty Advisor of the major.

Students who are admitted into the Biomedical Science major from high school must meet additional requirements to continue in the major beyond first year. Continuation is based on the cumulative average in the first two full-time semesters (5.00 credits), including the seven core courses as prescribed by the Schedule of Studies (see below). Students with a minimum 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 were not admitted into the Biomedical Science major from high school and wish to declare the specialization at the end of the first year must apply directly to the Department of Biomedical Sciences by the last day of classes in the winter semester and meet the additional requirements specified above.

B.Sc. students beyond first year who wish to declare the specialization must apply directly to the Department of Biomedical Sciences by the last day of classes in the winter semester. Admission to the major will be based on the cumulative average in the previous two full-time semesters (5.00 credits). 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.

Students who are lacking in the fundamentals of word processing, spread sheet use and data management should arrange to complete CIS\*1000 as early in their program as possible.

This program is designed to partially meet the current requirements for an 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.

### 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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives or restricted electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

1.00 electives or restricted electives

#### Semester 3 (see admission statement above)

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2000	[0.50]	Introductory Genetics
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

#### Semester 4

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MBG*2020	[0.50]	Introductory Molecular Biology
NUTR*3210	[0.50]	Fundamentals of Nutrition

1.00 electives or restricted electives

#### Semester 5

POPM*3240	[0.50]	Epidemiology
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One of:

BIOM*3100	[0.50]	Mammalian Physiology I
HK*3940	[1.25]	Human Physiology

If BIOM\*3100 is selected, then BIOM\*3110 and BIOM\*3120 must be taken in Semester 6.

Electives or restricted electives (to a maximum of 2.75 total credits).

#### Semester 6

BIOM*3040	[0.50]	Medical Embryology
BIOM*3090	[0.50]	Principles of Pharmacology and Toxicology

Electives or restricted electives to a maximum of 2.75 total credits.

Note: As part of the electives or restricted electives students must select BIOM\*3110 and BIOM\*3120 in Semester 6 if BIOM\*3100 was selected in Semester 5.

#### Semester 7

One of:

MICR*3230	[0.50]	Immunology I
NUTR*4200	[0.50]	Nutrition and Immune Function

One of:

BIOM*3030	[0.75]	Biomedical Histology
ZOO*3000	[0.50]	Comparative Histology

Electives or restricted electives to a maximum of 2.75 total credits.

#### Semester 8

PATH*3610	[0.50]	Principles of Disease
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2.00 electives or restricted electives\*

#### Restricted Electives

- 1 anatomy course from BIOM\*3010, HK\*3401/2, ZOO\*2090 must be completed.
- A minimum of 1.00 and to a maximum of 2.00 in research experience may be met either by:
  - completing both HK\*4410 and HK\*4420
  - completing HK\*4410 and either HK\*4230 or BIOM\*4500
  - completing both HK\*4230 and BIOM\*4500
  - completing one of the 1.00 credits in research courses in either the Department of Human Health and Nutritional Sciences (HK\*4360 or HK\*4371/2) or in the Department of Biomedical Sciences (BIOM\*4510 or BIOM\*4521/2)
  - equivalent course from another department with the permission of the Faculty Advisor
- A total of 2.00 credits in Arts and Social Science courses including:
  - 0.50 credits in philosophy and ethics from PHIL\*2030, PHIL\*2070, PHIL\*2100, PHIL\*2120, PHIL\*2180
  - 0.50 credits in either psychology (PSYC\*XXXX) or sociology (SOC\*XXXX)

## Biomedical Toxicology (BTOX)

### Interdisciplinary Program, Department of Biomedical Sciences, Ontario Veterinary 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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives\*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences
STAT*2040	[0.50]	Statistics I

0.50 electives\*

#### Semester 3

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*2480	[0.50]	Analytical Chemistry I
TOX*2000	[0.50]	Principles of Toxicology

0.50 electives\*

#### Semester 4

CHEM*2700	[0.50]	Organic Chemistry I
MBG*2000	[0.50]	Introductory Genetics

NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*2050	[0.50]	Statistics II
0.50 electives*		
<b>Semester 5</b>		
BIOM*3030	[0.75]	Biomedical Histology
BIOM*3100	[0.50]	Mammalian Physiology I
MBG*2020	[0.50]	Introductory Molecular Biology
TOX*3300	[0.50]	Analytical Toxicology
0.50 electives*		
<b>Semester 6</b>		
BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOM*3090	[0.50]	Principles of Pharmacology and Toxicology
BIOM*3110	[0.50]	Mammalian Physiology II
BIOM*3120	[0.25]	Laboratory Exercises in Mammalian Physiology
PATH*3610	[0.50]	Principles of Disease
0.50 electives*		
<b>Semester 7</b>		
BIOM*4090	[0.50]	Pharmacology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
NUTR*4510	[0.50]	Toxicology, Nutrition and Food
TOX*4000	[0.50]	Medical Toxicology
TOX*4590	[0.50]	Biochemical Toxicology
<b>Semester 8</b>		
STAT*3510	[0.50]	Environmental Risk Assessment
TOX*4100	[0.50]	Toxicological Pathology
TOX*4200	[0.50]	Topics in Toxicology
0.50 electives*		

\*a minimum of 1.50 must be taken in the College of Arts or the College of Social and Applied Human Sciences

### Biomedical Toxicology (Co-op) (BTOX:C)

**Interdisciplinary Program, Department of Biomedical Sciences, Ontario Veterinary College**

#### Major (Honours Program)

A 70% average in courses completed in semesters 1 and 2 is normally required for admission to semester 3 of this program. An optional fourth co-op work term is available.

##### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives\*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

##### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
PHYS*1080	[0.50]	Physics for Life Sciences
STAT*2040	[0.50]	Statistics I

0.50 electives\*

##### Semester 3 - Fall

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
MBG*2000	[0.50]	Introductory Genetics
TOX*2000	[0.50]	Principles of Toxicology

0.50 electives

##### Winter

COOP*1000	[0.00]	Co-op Work Term I
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##### Semester 4 - Summer

BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*2700	[0.50]	Organic Chemistry I
PATH*3610	[0.50]	Principles of Disease
STAT*2050	[0.50]	Statistics II

0.50 electives

##### Fall

COOP*2000	[0.00]	Co-op Work Term II
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##### Semester 5 - Winter

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MBG*2020	[0.50]	Introductory Molecular Biology
NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*3510	[0.50]	Environmental Risk Assessment

0.50 electives

##### Summer

COOP*3000	[0.00]	Co-op Work Term III
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##### Semester 6 - Fall

BIOM*3030	[0.75]	Biomedical Histology
BIOM*3100	[0.50]	Mammalian Physiology I
NUTR*4510	[0.50]	Toxicology, Nutrition and Food
TOX*3300	[0.50]	Analytical Toxicology

0.50 electives

##### Semester 7 - Winter

BIOM*3090	[0.50]	Principles of Pharmacology and Toxicology
BIOM*3110	[0.50]	Mammalian Physiology II
BIOM*3120	[0.25]	Laboratory Exercises in Mammalian Physiology
TOX*4100	[0.50]	Toxicological Pathology
TOX*4200	[0.50]	Topics in Toxicology

0.50 electives

##### Semester 8 - Fall

BIOM*4090	[0.50]	Pharmacology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
TOX*4000	[0.50]	Medical Toxicology
TOX*4590	[0.50]	Biochemical Toxicology

0.50 electives

### Biophysics (BIOP)

**Department of Physics, College of Physical and Engineering Science**

#### Major (Honours Program)

The program emphasizes the physics of biological systems. It provides an excellent background for careers in the expanding interdisciplinary research laboratories of Government and Industry. Completion of the program at an appropriate level will qualify a student to pursue post-graduate studies in biophysics and certain areas of physics.

Since some of the required courses are not offered every semester, students entering the Major in Biophysics should plan their program in consultation with the Department of Physics Departmental 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 21.25 credits as indicated below:

##### Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming

One of (MATH\*1200 recommended):

MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

One of (PHYS\*1000 recommended):

PHYS*1000	[0.50]	An Introduction to Mechanics
PHYS*1070	[0.50]	Introductory Physics for Life Sciences
PHYS*1080	[0.50]	Physics for Life Sciences

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

##### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II

1 physics course from the following list (PHYS\*1010 recommended):

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 recommended):

MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II

0.50 Arts or Social Science electives

##### Semester 3

MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
PHYS*2440	[0.75]	Mechanics I
PHYS*2460	[0.75]	Electricity and Magnetism I

One of:

BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2000	[0.50]	Introductory Genetics

##### Semester 4

MATH*2170	[0.50]	Differential Equations I
PHYS*2030	[0.50]	Biophysics of Excitable Cells
PHYS*2260	[0.50]	Experimental Basis of Quantum Physics
PHYS*2450	[0.75]	Mechanics II

PHYS\*2470 [0.75] Electricity and Magnetism II

**Semester 5**

BIOC\*2580 [0.50] Introductory Biochemistry  
 MATH\*3100 [0.50] Differential Equations II  
 PHYS\*3100 [0.75] Electronics  
 PHYS\*3230 [0.50] Quantum Mechanics I  
 PHYS\*3240 [0.50] Statistical Physics I

**Semester 6**

BIOC\*3560 [0.50] Structure and Function in Biochemistry  
 PHYS\*3220 [0.50] Waves and Optics  
 PHYS\*3510 [0.50] Intermediate Laboratory  
 PHYS\*4040 [0.50] Quantum Mechanics II  
 PHYS\*4540 [0.50] Molecular Biophysics

**Semester 7**

MCB\*4050 [0.50] Protein and Nucleic Acid Structure  
 PHYS\*4240 [0.50] Statistical Physics II  
 PHYS\*4560 [0.50] Biophysical Methods

One of:

PHYS\*4120 [0.50] Atomic and Molecular Physics  
 0.50 electives

One of:

PHYS\*4500 [0.50] Advanced Physics Laboratory  
 0.50 electives

Note: At least one of PHYS\*4120 in semester 7 or PHYS\*4150 in semester 8 must be taken.

**Semester 8**

BIOC\*4580 [0.50] Membrane Biochemistry  
 PHYS\*4510 [0.50] Advanced Physics Project

One of:

PHYS\*4150 [0.50] Solid State Physics  
 0.50 electives

0.50 Arts or Social Science electives

0.50 electives

Note: At least one of PHYS\*4120 in semester 7 or PHYS\*4150 in semester 8 must be taken.

Note: PHYS\*4510 will be projects in biophysics, some of which may be in biological areas outside the Department of Physics.

**Biophysics (Co-op) (BIOP:C)**

Department of Physics, College of Physical and Engineering Science

**Major (Honours Program)**

Since some of the required courses are not offered every semester, students entering the Major in Biophysics (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.

This major requires the completion of 21.25 credits as indicated below:

**Semester 1 - Fall**

The program for the first semester is the same as the Major in Biophysics (regular) program.

**Semester 2 - Winter**

BIOL\*1040 [0.50] Biology II  
 CHEM\*1050 [0.50] General Chemistry II  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 1 physics course from the following list (PHYS\*1010 recommended):  
 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:

CIS\*2500 [0.50] Intermediate Programming  
 0.50 Arts or Social Science electives

One of:

MATH\*1210 [0.50] Calculus II  
 MATH\*2080 [0.50] Elements of Calculus II

**Semester 3 - Fall**

MATH\*2160 [0.50] Linear Algebra I  
 MATH\*2200 [0.50] Advanced Calculus I  
 PHYS\*2440 [0.75] Mechanics I  
 PHYS\*2460 [0.75] Electricity and Magnetism I

One of:

BIOL\*2210 [0.50] Introductory Cell Biology  
 MBG\*2000 [0.50] Introductory Genetics

**Winter Semester**

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

**Semester 4 - Summer**

BIOC\*2580 [0.50] Introductory Biochemistry  
 MATH\*2170 [0.50] Differential Equations I  
 PHYS\*2260 [0.50] Experimental Basis of Quantum Physics  
 PHYS\*3240 [0.50] Statistical Physics I  
 0.50 Arts or Social Science electives\*  
 \*1.00 must be taken as Arts or Social Science electives in this Major

**Fall Semester**

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

**Semester 5 - Winter**

BIOC\*3560 [0.50] Structure and Function in Biochemistry  
 PHYS\*2030 [0.50] Biophysics of Excitable Cells  
 PHYS\*2450 [0.75] Mechanics II  
 PHYS\*2470 [0.75] Electricity and Magnetism II  
 PHYS\*3220 [0.50] Waves and Optics

**Summer Semester**

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

**Semester 6 - Fall**

MATH\*3100 [0.50] Differential Equations II  
 PHYS\*3100 [0.75] Electronics  
 PHYS\*3230 [0.50] Quantum Mechanics I  
 1.00 electives

**Semester 7 - Winter**

BIOC\*4580 [0.50] Membrane Biochemistry  
 PHYS\*3510 [0.50] Intermediate Laboratory  
 PHYS\*4040 [0.50] Quantum Mechanics II  
 PHYS\*4540 [0.50] Molecular Biophysics  
 0.50 electives

**Summer Semester**

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

**Semester 8 - Fall**

MCB\*4050 [0.50] Protein and Nucleic Acid Structure  
 PHYS\*4120 [0.50] Atomic and Molecular Physics  
 PHYS\*4240 [0.50] Statistical Physics II  
 PHYS\*4560 [0.50] Biophysical Methods

One of:

PHYS\*4500 [0.50] Advanced Physics Laboratory  
 0.50 electives

**Biotechnology (BIOT)**

Department of Molecular and Cellular Biology, College of Biological Science

**Minor (Honours Program)**

A minimum of 5.00 credits is required.

BIOC\*3560 [0.50] Structure and Function in Biochemistry  
 MBG\*2020 [0.50] Introductory Molecular Biology  
 MICR\*2020 [0.50] Microbial Interactions and Associations  
 MICR\*2030 [0.50] Microbial Growth

One of:

ENGG\*2660 [0.50] Biological Engineering Systems I  
 ENGG\*3830 [0.50] Bio-Process Engineering  
 FOOD\*4350 [0.50] Processing Plant Technology

Two of:

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

Three of:

ANSC\*2200 [0.50] Principles of Aquaculture  
 ANSC\*4050 [0.50] Biotechnology in Animal Science  
 FOOD\*3260 [0.50] Industrial Microbiology  
 MBG\*4240 [0.50] Applied Molecular Genetics  
 MCB\*4080 [0.50] Applied Microbiology and Biochemistry  
 MICR\*3230 [0.50] Immunology I  
 MICR\*4180 [0.50] Microbial Processes in Environmental Management  
 PBIO\*3750 [0.50] Plant Tissue Culture

**Business Administration (BADM)**

Department of Economics, College of Social and Applied Human Sciences

**Minor (Honours Program)**

A minimum of 5.00 credits is required.

AGEC\*2220 [0.50] Financial Accounting  
 AGECE\*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*3560	[0.50]	Theory of Finance
MCS*3040	[0.50]	Business and Consumer Law

One of:

AGEC*3310	[0.50]	Operations Management
HTM*4390	[0.50]	Individuals and Groups in Organizations

One of:

AGEC*4370	[0.50]	Marketing Management
MCS*1000	[0.50]	Introductory Marketing

Students wishing to acquire further depth in Business Administration should consider taking electives from the areas of study listed under Management Economics in the B.A. degree.

### 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 21.75 credits is required.

##### Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics
CIS*1500	[0.50]	Introduction to Programming

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

##### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 Arts or Social Science electives

##### Semester 3

CHEM*2060	[0.50]	Structure and Bonding
MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
PHYS*2440	[0.75]	Mechanics I
PHYS*2460	[0.75]	Electricity and Magnetism I

##### Semester 4

CHEM*2070	[0.50]	Structure and Spectroscopy
CHEM*2480	[0.50]	Analytical Chemistry I
MATH*2170	[0.50]	Differential Equations I
PHYS*2450	[0.75]	Mechanics II
PHYS*2470	[0.75]	Electricity and Magnetism II

##### Semester 5

CHEM*2820	[0.50]	Thermodynamics and Kinetics
CHEM*3860	[0.50]	Quantum Chemistry
PHYS*3100	[0.75]	Electronics
PHYS*3230	[0.50]	Quantum Mechanics I
PHYS*3240	[0.50]	Statistical Physics I

##### Semester 6

CHEM*3430	[0.50]	Analytical Chemistry II: Instrumental Analysis
PHYS*3220	[0.50]	Waves and Optics
PHYS*4040	[0.50]	Quantum Mechanics II

One of:

CHEM*3870	[0.50]	Symmetry and Spectroscopy
CHEM*4880	[0.50]	Topics in Advanced Physical Chemistry

0.50 Arts or Social Science electives

##### Semester 7

CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
IPS*4001	[0.75]	Chemical Physics Research Project
MATH*3100	[0.50]	Differential Equations II
PHYS*4120	[0.50]	Atomic and Molecular Physics
PHYS*4240	[0.50]	Statistical Physics II

##### Semester 8

IPS*4002	[0.75]	Chemical Physics Research Project
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One of:

CHEM*3870	[0.50]	Symmetry and Spectroscopy
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CHEM*4880	[0.50]	Topics in Advanced Physical Chemistry
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1.50 electives

### 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 21.25 credits is required.

##### Semester 1 - Fall

The program for the first semester is the same as for the Major in Chemical Physics (regular) program.

##### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

One of:

CIS*2500	[0.50]	Intermediate Programming
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0.50 Arts or Social Science electives

##### Semester 3 - Fall

CHEM*2060	[0.50]	Structure and Bonding
MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
PHYS*2440	[0.75]	Mechanics I
PHYS*2460	[0.75]	Electricity and Magnetism I

##### Winter Semester

COOP*1000	[0.00]	Co-op Work Term I
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##### Semester 4 - Summer

CHEM*2070	[0.50]	Structure and Spectroscopy
CHEM*2480	[0.50]	Analytical Chemistry I
MATH*2170	[0.50]	Differential Equations I
PHYS*3240	[0.50]	Statistical Physics I

0.50 Arts or Social Science electives

##### Fall Semester

COOP*2000	[0.00]	Co-op Work Term II
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##### Semester 5 - Winter

CHEM*3430	[0.50]	Analytical Chemistry II: Instrumental Analysis
PHYS*2450	[0.75]	Mechanics II
PHYS*2470	[0.75]	Electricity and Magnetism II
PHYS*3220	[0.50]	Waves and Optics

One of:

CHEM*3870	[0.50]	Symmetry and Spectroscopy
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0.50 electives

##### Summer Semester

COOP*3000	[0.00]	Co-op Work Term III
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##### Semester 6 - Fall

CHEM*2820	[0.50]	Thermodynamics and Kinetics
CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
CHEM*3860	[0.50]	Quantum Chemistry
PHYS*3230	[0.50]	Quantum Mechanics I

One of:

CHEM*3640	[0.50]	Chemistry of the Elements I
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0.50 electives

##### Semester 7\*\* - Winter

PHYS*4040	[0.50]	Quantum Mechanics II
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One of:

CHEM*3870	[0.50]	Symmetry and Spectroscopy
CHEM*4880	[0.50]	Topics in Advanced Physical Chemistry

0.50 Arts or Social Science electives

1.00 electives

##### Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV
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##### Semester 8\*\* - Fall

MATH*3100	[0.50]	Differential Equations II
PHYS*3100	[0.75]	Electronics
PHYS*4120	[0.50]	Atomic and Molecular Physics
PHYS*4240	[0.50]	Statistical Physics II

0.50 electives

\*\* A minimum of 2.00 credits in science courses at the 4000 level is required for graduation.

**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 20.25 credits as indicated below:

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 electives

**Semester 3**

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2060	[0.50]	Structure and Bonding
CHEM*2400	[0.75]	Analytical Chemistry I

One of:

MATH*2150	[0.50]	Applied Matrix Algebra
MATH*2160	[0.50]	Linear Algebra I

0.50 electives\*

**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
MATH*2170	[0.50]	Differential Equations I

0.50 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
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3.00 Chemistry or Biochemistry\*\*

1.50 electives\*

\*selection of electives is subject to the following rules:

- at least 1.00 credits in the program must be in the Arts & Social Sciences
- PHYS\*2040 or PHYS\*2260
- students who lack a background in computer science must select one of their electives from CIS\*1200 or CIS\*1500 to be taken by the end of their second year
- approval of the chair of the Department of Chemistry and Biochemistry must be obtained for the selection of courses not specifically recommended
- 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 Departmental Advisor for more detail.

\*\*3.00 credits from the 3000/4000 level as follows:

- 1.50 comprising of (CHEM\*3870 or CHEM\*4880), (CHEM\*4620 or CHEM\*4630), (CHEM\*4720 or CHEM\*4730)
- 1.50 chosen from CHEM\*3870, CHEM\*4010, CHEM\*4400, BIOC\*4520, BIOC\*4540, BIOC\*4550, BIOC\*4570, BIOC\*4580, CHEM\*4620, CHEM\*4630, CHEM\*4720, CHEM\*4730, CHEM\*4740, CHEM\*4880, CHEM\*4900, CHEM\*4910, TOX\*4590

**Note:**

- Some of these courses may have to be taken in Semester 6.

- 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.

**Minor (Honours Program)**

A minor in Chemistry consists of at least 5.00 credits from the core course list and 2.50 from Chemistry at the 2000 level or above including 1.00 from the Restricted Electives list that follows:

**Core Courses**

CHEM*2060	[0.50]	Structure and Bonding
CHEM*2070	[0.50]	Structure and Spectroscopy
CHEM*2700	[0.50]	Organic Chemistry I

One of:

CHEM*2400	[0.75]	Analytical Chemistry I
CHEM*2480	[0.50]	Analytical Chemistry I

One of:

CHEM*2820	[0.50]	Thermodynamics and Kinetics
CHEM*2880	[0.50]	Physical Chemistry

**Restricted Electives - 1.00 credits from the following courses:**

CHEM*3870	[0.50]	Symmetry and Spectroscopy
CHEM*4010	[0.50]	Chemistry and Industry
CHEM*4400	[0.50]	Advanced Topics in Analytical Chemistry
CHEM*4620	[0.50]	Advanced Topics in Inorganic Chemistry
CHEM*4630	[0.50]	Bioinorganic Chemistry
CHEM*4720	[0.50]	Organic Reactivity
CHEM*4730	[0.50]	Synthetic Organic Chemistry
CHEM*4880	[0.50]	Topics in Advanced Physical Chemistry

**Chemistry (Co-op) (CHEM:C)****Department of Chemistry, College of Physical and Engineering Science****Major (Honours Program)**

The major will require the completion of 20.25 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. These can be taken as four single work terms (Stream A), or as a double work term between two single work terms (Stream B).

**Stream A:** single work term option

**Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 electives

**Semester 3 - Fall**

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2060	[0.50]	Structure and Bonding
CHEM*2400	[0.75]	Analytical Chemistry I

One of:

MATH*2150	[0.50]	Applied Matrix Algebra
MATH*2160	[0.50]	Linear Algebra I

0.50 electives\*

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**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
MATH*2170	[0.50]	Differential Equations I

0.50 electives\*

**Semester 5 - Fall**

CHEM*2820	[0.50]	Thermodynamics and Kinetics
CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
CHEM*3640	[0.50]	Chemistry of the Elements I

CHEM\*3860 [0.50] Quantum Chemistry  
0.50 electives\*

**Winter Semester**

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

**Semester 6 - Summer**

CHEM\*3750 [0.50] Organic Chemistry II

One of:

PHYS\*2260 [0.50] Experimental Basis of Quantum Physics

0.50 electives\*

1.50 electives\* or restricted electives\*\*

**Fall Semester**

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

**Semester 7 - 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\*4000 [0.00] Co-op Work Term IV

**Semester 8 - Fall**

2.50 electives\* or restricted electives\*\*

\* selection of electives is subject to the following rules:

1. At least 1.00 credits in the program must be in the Arts & Social Sciences.
2. PHYS\*2040 or PHYS\*2260
3. Students who lack a background in computer science must select one of their electives from CIS\*1200 or CIS\*1500 to be taken by the end of their second year.

\*\* 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\*4550, BIOC\*4570, BIOC\*4580, CHEM\*4620, CHEM\*4630, CHEM\*4720, CHEM\*4730, CHEM\*4740, CHEM\*4880, CHEM\*4900, CHEM\*4910, 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.

**Stream B:** double work term option

**Semester 1 - Fall**

BIOL\*1030 [0.50] Biology I

CHEM\*1040 [0.50] General Chemistry I

MATH\*1200 [0.50] Calculus I

PHYS\*1000 [0.50] An Introduction to Mechanics

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2 - Winter**

BIOL\*1040 [0.50] Biology II

CHEM\*1050 [0.50] General Chemistry II

COOP\*1100 [0.00] Introduction to Co-operative Education

MATH\*1210 [0.50] Calculus II

PHYS\*1010 [0.50] Introductory Electricity and Magnetism

0.50 electives

**Semester 3 - Fall**

BIOC\*2580 [0.50] Introductory Biochemistry

CHEM\*2060 [0.50] Structure and Bonding

CHEM\*2400 [0.75] Analytical Chemistry I

One of:

MATH\*2150 [0.50] Applied Matrix Algebra

MATH\*2160 [0.50] Linear Algebra I

0.50 electives\*

**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

MATH\*2170 [0.50] Differential Equations I

0.50 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

One of:

PHYS\*2260 [0.50] Experimental Basis of Quantum Physics

0.50 electives\*

1.00 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 rules:

1. At least 1.00 credits in the program must be in the Arts & Social Sciences.
2. PHYS\*2040 or PHYS\*2260
3. Students who lack a background in computer science must select one of their electives from CIS\*1200 or CIS\*1500 to be taken by the end of their second year.

\*\* 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\*4550, BIOC\*4570, BIOC\*4580, CHEM\*4620, CHEM\*4630, CHEM\*4720, CHEM\*4730, CHEM\*4740, CHEM\*4880, CHEM\*4900, CHEM\*4910, 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.

**Computing and Information Science (CIS)****Department of Computing and Information Science, College of Physical and Engineering Science**

The B.Sc. Programs in Computing and Information Science (CIS) provide a solid foundation in software design and computer applications, especially in the physical and biological sciences. The Major offers substantial computing experience, as well as an understanding of both fundamental principles and modern applications. The minor provides sufficient software experience to enable significant contribution to many areas of application.

**Computing and Information 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 12.0 credits in computing, mathematics and statistics, of which 2.5 credits are CIS electives. Other electives must include at least 1.50 in science courses with at least 0.50 at the 3000 level or above. At least 1.00 credits must be in the Arts of Social Sciences, and 0.50 remaining credits in the introductory science sequence (see note in semester 2)

**Semester 1**

BIOL\*1030 [0.50] Biology I

CHEM\*1040 [0.50] General Chemistry I

CIS\*1500 [0.50] Introduction to Programming

MATH\*1200 [0.50] Calculus I

PHYS\*1000 [0.50] An Introduction to Mechanics

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

CIS\*1910 [0.50] Discrete Structures in Computing I

CIS\*2500 [0.50] Intermediate Programming

MATH\*1210 [0.50] Calculus II

Two of (only one of PHYS\*1010 or PHYS\*1130 may be selected): \*

BIOL\*1040 [0.50] Biology II

CHEM\*1050 [0.50] General Chemistry II

PHYS\*1010 [0.50] Introductory Electricity and Magnetism

PHYS\*1130 [0.50] Physics with Applications

\*Note: A third course from this list must be taken before graduation.

### 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  
 MATH\*2150 [0.50] Applied Matrix Algebra

### Semester 4

CIS\*2750 [0.75] Software Systems Development and Integration  
 CIS\*3110 [0.50] Operating Systems  
 STAT\*2040 [0.50] Statistics I

0.75 electives

### Semester 5

CIS\*2460 [0.50] Modelling of Computer Systems  
 CIS\*3530 [0.50] Data Base Systems and Concepts  
 CIS\*3750 [0.75] System Analysis and Design in Applications

One of:

MATH\*3240 [0.50] Operations Research

0.50 electives

Note: MATH\*2130 in Semester 6 or MATH\*3240 in Semester 5 must be taken.

0.25 elective

### Semester 6

CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms

One of:

MATH\*2130 [0.50] Numerical Methods

0.50 electives

Note: MATH\*2130 in Semester 6 or MATH\*3240 in Semester 5 must be taken.

1.00 CIS electives at the 3000 level or above ( CIS\*3200 [0.75]recommended)

0.50 electives

### Semester 7

0.50 CIS electives at 3000 level or above

1.00 4000 level CIS credits

1.00 electives

### Semester 8

1.00 CIS credits at the 4000 level

1.50 electives

The minor program requires at least 5.25 credits, including:

### Minor (Honours Program)

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

1.00 additional credits from CIS or STAT courses at the 2000 level or above

### Computing and Information Science (Co-op) (CIS:C)

#### Department of Computing and Information Science, College of Physical and Engineering Science

The 4 year Honours Program Major in Computing and Information Science is also available as a Co-operative Education Program. Three co-op work terms are required. Recommended work terms are shown below:

COOP\*1100 must be completed in the 2nd academic semester (winter of year 1). Students may apply for these options at the time of University admission or completion of semester 2. A five year option with four work terms is also available. Please see the department's co-op faculty advisor for details.

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

Electives must include at least 1.50 at the 3000 level or above. At least 1.00 credits must be in the Arts or Social Sciences, and 0.50 remaining credit in the introductory science sequence (see note in semester 2).

### The recommended schedule of studies for Co-Op Stream A (4-year) is as follows:

#### Semester 1 - Fall

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 CIS\*1500 [0.50] Introduction to Programming  
 MATH\*1200 [0.50] Calculus I  
 PHYS\*1000 [0.50] An Introduction to Mechanics

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### Semester 2 - Winter

CIS\*1910 [0.50] Discrete Structures in Computing I  
 CIS\*2500 [0.50] Intermediate Programming  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 MATH\*1210 [0.50] Calculus II

Two of (only one of PHYS\*1010 or PHYS\*1130 may be selected): \*

BIOL\*1040 [0.50] Biology II  
 CHEM\*1050 [0.50] General Chemistry II  
 PHYS\*1010 [0.50] Introductory Electricity and Magnetism  
 PHYS\*1130 [0.50] Physics with Applications

\*Note: A third course from this list must be taken before graduation.

#### Semester 3- Summer

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  
 MATH\*2150 [0.50] Applied Matrix Algebra

#### Fall Semester

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

#### Semester 4 - Winter

CIS\*2750 [0.75] Software Systems Development and Integration  
 CIS\*3110 [0.50] Operating Systems  
 STAT\*2040 [0.50] Statistics I

0.75 electives

#### Summer Semester

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

#### Semester 5 - Fall

CIS\*2460 [0.50] Modelling of Computer Systems  
 CIS\*3530 [0.50] Data Base Systems and Concepts  
 CIS\*3750 [0.75] System Analysis and Design in Applications

One of:

MATH\*3240 [0.50] Operations Research

(Note: requires co-requisite of MATH\*2200)

0.50 electives

Note: MATH\*2130 in Semester 6 or MATH\*3240 in Semester 5 must be taken.

0.25 elective

#### Winter Semester

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

#### Semester 6 - Summer

CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms

One of:

MATH\*2130 [0.50] Numerical Methods

0.50 electives

Note: MATH\*2130 in Semester 6 or MATH\*3240 in Semester 5 must be taken.

1.00 CIS electives at the 3000 level or above ( CIS\*3200 [0.75]recommended)

0.50 electives

#### Semester 7 - Fall

0.50 CIS electives at 3000 level or above

1.00 electives

1.00 credits in CIS at the 4000 level

#### Semester 8 - Winter

1.50 electives

1.00 credits in CIS at the 4000 level

### The recommended schedule of studies for Co-Op Stream B(5-year) is as follows:

#### Semester 1 - Fall

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 CIS\*1500 [0.50] Introduction to Programming  
 MATH\*1200 [0.50] Calculus I  
 PHYS\*1000 [0.50] An Introduction to Mechanics

#### Semester 2 - Winter

CIS\*1910 [0.50] Discrete Structures in Computing I  
 CIS\*2500 [0.50] Intermediate Programming  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 MATH\*1210 [0.50] Calculus II

Two of (only one of PHYS\*1010 or PHYS\*1130 may be selected): \*

BIOL\*1040 [0.50] Biology II  
 CHEM\*1050 [0.50] General Chemistry II  
 PHYS\*1010 [0.50] Introductory Electricity and Magnetism



PHYS\*1130 [0.50] Physics with Applications  
 \*Note: A third course from this list must be taken before graduation.

**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  
 MATH\*2150 [0.50] Applied Matrix Algebra

**Semester 4 - Winter**

CIS\*2750 [0.75] Software Systems Development and Integration  
 CIS\*3110 [0.50] Operating Systems  
 STAT\*2040 [0.50] Statistics I

Note: STAT\*2100 (F) is an acceptable replacement for STAT\*2040 .

0.25 elective

**Summer Semester**

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

**Semester 5 - Fall**

CIS\*2460 [0.50] Modelling of Computer Systems  
 CIS\*3530 [0.50] Data Base Systems and Concepts  
 CIS\*3750 [0.75] System Analysis and Design in Applications

0.25 elective

One of:

MATH\*3240 [0.50] Operations Research

(Note: requires co-requisite of MATH\*2200).

0.50 electives

Note: MATH\*2130 in Semester 6 or MATH\*3240 in Semester 5 must be taken. CIS\*3210 should be taken here to enable subsequent courses in distributed systems.

**Winter Semester**

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

**Semester 6 - Summer**

CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms

One of:

MATH\*2130 [0.50] Numerical Methods

0.50 electives

Note: MATH\*2130 in Semester 6 or MATH\*3240 in Semester 5 must be taken.

1.00 CIS electives at the 3000 level or above ( CIS\*3200 [0.75] recommended)

0.50 electives

**Fall Semester**

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

**Semester 7 - Winter**

0.50 CIS electives at 3000 level or above

1.00 electives

1.00 credits in CIS at the 4000 level

**Summer Semester**

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

**Semester 8 - Fall**

1.50 electives

1.00 credits in CIS at the 4000 level

**Earth Surface Science (ESS)**

**Department of Geography, College of Social and Applied Human Sciences**

**Department of Land Resource Science, Ontario Agricultural College**

This program combines elements of Geomorphology, Geology and Meteorology and focuses on the study of processes and properties of the abiotic component of the environment.

Graduates of the program should meet the knowledge requirements for eligibility to apply for membership as Environmental Geoscientists in the Association of Professional Geoscientists of Ontario (APGO), allowing for use of the designation P. Geo.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. Students planning to enter the program are advised to consult advisors in either of the two departments. Students needing program approval should contact the B.Sc. Advisors in the Department of Geography.

**Major (Honours Program)****Semester 1**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 GEOL\*1050 [0.50] Geology and the Environment  
 PHYS\*1080 [0.50] Physics for Life Sciences

0.50 Mathematics course from:

MATH\*1080 [0.50] Elements of Calculus I

MATH\*1200 [0.50] Calculus I

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL\*1040 [0.50] Biology II  
 CHEM\*1050 [0.50] General Chemistry II  
 PHYS\*1130 [0.50] Physics with Applications  
 GEOG\*1300 [0.50] Introduction to the Biophysical Environment  
 0.50 Arts or Social Science electives

**Semester 3 and 4**

GEOG\*2000 [0.50] Geomorphology  
 GEOG\*2110 [0.50] Climate and the Biophysical Environment  
 GEOL\*2020 [0.50] Stratigraphy  
 GEOL\*2200 [0.50] Glacial Geology  
 MET\*2030 [0.50] Meteorology and Climatology  
 SOIL\*2010 [0.50] Soil Science

0.50 Mathematics/Computer Science from:

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

One of:

GEOG\*2460 [0.50] Analysis in Geography

STAT\*2040 [0.50] Statistics I

0.50 Arts or Social Science electives

0.50 electives

**Semester 5 and 6**

GEOG\*3000 [0.50] Fluvial Processes  
 GEOG\*3610 [0.50] Environmental Hydrology  
 GEOL\*2110 [0.50] Earth Material Science  
 GEOL\*3190 [0.50] Environmental Water Chemistry

1.50 from List A

1.50 electives

**Semester 7 and 8**

GEOG\*4150 [0.50] Sedimentary Processes

1.50 from List A

3.00 electives

**List A**

GEOG\*3620 [0.50] Desert Environments  
 GEOG\*4250 [0.50] Coastal Processes  
 GEOG\*4690 [1.00] Geography Field Research  
 GEOL\*3060 [0.50] Groundwater  
 GEOL\*3090 [0.50] Applied Structural Geology  
 GEOL\*3250 [0.50] Field Methods in Geosciences  
 GEOL\*4090 [0.50] Sedimentology  
 GEOL\*4130 [0.50] Clay and Humic Chemistry  
 MET\*3050 [0.50] Microclimatology

**Other Requirements**

1. At least 1.50 credits from List A must be at the 4000 level.
2. At least 2.50 electives must be acceptable science courses.
3. At least 6.00 of all science credits must be 3000 or 4000 level, of which at least 2.00 must be at the 4000 level.

**Ecology (ECOL)**

**Department of Integrative Biology, College of Biological Science**

The program provides a solid foundation in the principles of ecology, and further training in both pure and applied aspects of ecology. After the fourth semester, the student may choose to enter one (1) of three (3) areas of emphasis, or to design a course package that meets his/her own specific ecological interests (General Ecology). The program offers preparation for careers in conservation, resource management, ecological consulting, or nature interpretation; or for graduate training and research in fundamental ecology. This major qualifies students for post-graduate work in the environmental 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.

**Semester 1**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 MATH\*1080 [0.50] Elements of Calculus I  
 PHYS\*1070 [0.50] Introductory Physics for Life Sciences  
 0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

0.50 Arts or Social Science electives

**Semester 3**

BIOL*2210	[0.50]	Introductory Cell Biology
STAT*2040	[0.50]	Statistics I

One of:

GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOL*1050	[0.50]	Geology and the Environment

1.00 electives

**Semester 4**

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*3110	[0.50]	Population Ecology
MBG*2000	[0.50]	Introductory Genetics

One of:

BIOL*2250	[0.50]	Biostatistics and the Life Sciences
STAT*2050	[0.50]	Statistics II

0.50 electives

**Semester 5**

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
BIOL*3120	[0.50]	Community Ecology

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I

One of:

ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function

1.00 electives

**Semester 6**

One of:

MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution

2.00 electives

**Semester 7**

BIOL*4110	[0.75]	Ecological Methods
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1.75 electives

**Semester 8**

BIOL*4120	[0.50]	Evolutionary Ecology
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2.00 electives

**Areas of Emphasis****General Ecology (GECO)**

A minimum of 3.00 credits from the area-of-emphasis-specific credits, plus 1.50 additional science credits. Of the 4.50 credits, at least 3.50 must be at the 3000 or 4000 level.

**Experimental Ecology (EECO)**

ZOO*3200	[0.50]	Comparative Animal Physiology I
ZOO*4070	[0.50]	Animal Behaviour
ZOO*4170	[0.50]	Experimental Comparative Animal Physiology

0.75 credits from:

IBIO*4500	[0.75]	Research in Integrative Biology I
ZOO*4410	[0.75]	Field Ecology
ZOO*4600	[0.75]	Tropical Ecology
ZOO*4610	[0.75]	Arctic Ecology
ZOO*4700	[0.50]	Field Biology
ZOO*4710	[0.25]	Field Biology
ZOO*4800	[0.50]	Field Biology
ZOO*4810	[0.25]	Field Biology

One of the following not already successfully completed in Semester 6:

MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution

1.75 additional science credits, at least 1.50 of which are at the 3000 or 4000 level

**Interpretive Ecology (IE)**

ENVB*3000	[0.50]	Nature Interpretation
ZOO*4070	[0.50]	Animal Behaviour

0.75 credits from:

ZOO*4410	[0.75]	Field Ecology
ZOO*4600	[0.75]	Tropical Ecology

ZOO*4610	[0.75]	Arctic Ecology
ZOO*4700	[0.50]	Field Biology
ZOO*4710	[0.25]	Field Biology
ZOO*4800	[0.50]	Field Biology
ZOO*4810	[0.25]	Field Biology

At least 0.75 additional science credits at the 3000 or 4000 level

One of:

BIOL*3050	[0.50]	Mycology I
BOT*3710	[0.50]	Classification and Morphology of Seed Plants

One of:

ZOO*4020	[0.50]	Ichthyology
ZOO*4090	[0.50]	Ornithology
ZOO*4280	[0.50]	Mammalogy
ZOO*4430	[0.50]	Herpetology

One of:

BIOL*3450	[0.50]	Introduction to Aquatic Environments
ENVB*3110	[0.50]	Natural History of Insects

Recommended:

CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*4040	[0.50]	Behaviour of Insects
MICR*4140	[0.50]	Soil Microbiology and Biotechnology

**Resource Conservation (RC)**

AGEC*2700	[0.50]	Survey of Natural Resource Economics
BIOL*3130	[0.50]	Conservation Biology
ECON*1050	[0.50]	Introductory Microeconomics
ZOO*4050	[0.50]	Natural Resources Policy

2.50 additional science credits, at least 1.50 of which are at the 3000 or 4000 level

Recommended:

BIOL*4060	[0.50]	Restoration Ecology
BIOL*4150	[0.50]	Wildlife Conservation and Management
ECON*2100	[0.50]	Economic Growth and Environmental Quality
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*4780	[0.50]	Forest Ecology
ENVS*3320	[0.50]	Principles of Landscape Ecology

**Minor (Honours Program)**

A minimum of 5.00 credits is required to completed the minor, which must include:

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
BIOL*3110	[0.50]	Population Ecology
BIOL*3120	[0.50]	Community Ecology
BIOL*4110	[0.75]	Ecological Methods
BIOL*4120	[0.50]	Evolutionary Ecology

One of:

MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution

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
GEOL*1050	[0.50]	Geology and the Environment

0.75 credits chosen in consultation with the faculty advisor

**Environmental Biology (ENVB)****Department of Environmental Biology, 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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 Arts or Social Science elective

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

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]	Introductory Biochemistry
STAT*2040	[0.50]	Statistics I (if not taken in semester 2)
TOX*2000	[0.50]	Principles of Toxicology

1.00 electives or restricted electives chosen from lists A, B, C and/or D (or 1.50 if STAT\*2040 was taken in semester 2)

**Semester 4**

BIOL*3110	[0.50]	Population Ecology
ENVB*2100	[0.50]	Problem-Solving in Environmental Biology
MBG*2000	[0.50]	Introductory Genetics

1.00 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 ENVB course)

**Semester 6**

ENVB*3330	[0.50]	Ecosystem Processes and Applications
ZOO*3300	[0.50]	Evolution

1.50 electives or restricted electives chosen from lists A, B, C and/or D

**Semester 7**

Students contemplating graduate studies are encouraged to take ENVB\*4420 and/or ENVB\*4800 in semesters 7 or 8.

2.50 electives or restricted electives chosen from lists A, B, C and/or D

**Semester 8**

2.50 electives or restricted electives chosen from lists A, B, C and/or D

**Restricted Electives**

Select 4.50 credits from the following lists of restricted electives during Semesters 3-8. At least 1.00 of these credits must be from ENVB 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:

CROP*2110	[0.50]	Crop Ecology
CROP*2280	[0.50]	Crops in Land Reclamation
ENVB*2010	[0.50]	Food Production and the Environment
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*3210	[0.50]	Plant Pathology
ENVB*4040	[0.50]	Behaviour of Insects **
ENVB*4100	[0.50]	Applied Entomology **
ENVB*4130	[0.50]	Chemical Ecology: Principles & Practice **
MICR*3220	[0.50]	Plant Microbiology
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
PBIO*4750	[0.50]	Genetic Engineering of Plants **
SOIL*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management

**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
ENVB*3010	[0.50]	Climate Change Biology
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*4240	[0.50]	Biological Activity of Pesticides
ENVB*4550	[0.50]	Ecotoxicological Risk Characterization **
GEOG*3020	[0.50]	Global Environmental Change
MBG*4270	[0.50]	DNA Replication, Recombination and Repair **
MICR*4180	[0.50]	Microbial Processes in Environmental Management
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants **
TOX*3360	[0.50]	Environmental Chemistry and Toxicology
ZOO*4350	[0.50]	Biology of Polluted Waters **
ZOO*4610	[0.75]	Arctic Ecology

**List C - Conservation of Biodiversity & Natural Resources**

Minimum of 1.00 credits from the following list:

BIOL*3130	[0.50]	Conservation Biology
BIOL*4060	[0.50]	Restoration Ecology **
BIOL*4150	[0.50]	Wildlife Conservation and Management
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*3090	[0.50]	Insect Diversity and Biology
ENVB*3250	[0.50]	Forest Health and Disease
ENVB*3300	[0.50]	Applied Ecology and Environment **
ENVB*4020	[0.50]	Water Quality and Environmental Management **
ENVB*4220	[0.50]	Biology of Aquatic Insects **
ENVB*4260	[0.50]	Field Entomology **
ENVB*4270	[0.50]	Insect Biosystematics **
ENVB*4780	[0.50]	Forest Ecology **
ENVS*4220	[0.50]	Environmental Impact Assessment **
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
SOIL*3050	[0.50]	Land Utilization **
SOIL*3080	[0.50]	Soil and Water Conservation **
SOIL*3100	[0.50]	Resource Planning Techniques **
ZOO*4050	[0.50]	Natural Resources Policy
ZOO*4110	[0.50]	Principles of Fish and Wild Life Management
ZOO*4600	[0.75]	Tropical Ecology

**List D - Supporting Courses**

ENVB*4420	[0.50]	Problems in Environmental Biology
ENVB*4800	[0.50]	Topics in Applied Biology

The following restricted elective courses are required as prerequisites for some courses in lists A, B and C:

BIOL*3120	[0.50]	Community Ecology
BOT*2100	[0.50]	Life Strategies of Plants
MBG*2020	[0.50]	Introductory Molecular Biology
SOIL*2010	[0.50]	Soil Science

**Environmental Toxicology (ETOX)**

**Interdisciplinary Program, Department of Environmental Biology, 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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives\*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences
STAT*2040	[0.50]	Statistics I

0.50 electives\*

**Semester 3**

CHEM*2480	[0.50]	Analytical Chemistry I
BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
TOX*2000	[0.50]	Principles of Toxicology

0.50 electives\*

**Semester 4**

BIOL*2060	[0.50]	Ecology
CHEM*2700	[0.50]	Organic Chemistry I
MBG*2020	[0.50]	Introductory Molecular Biology
STAT*2050	[0.50]	Statistics II

0.50 electives\*

**Semester 5**

BOT*2100	[0.50]	Life Strategies of Plants
BIOC*3560	[0.50]	Structure and Function in Biochemistry
TOX*3300	[0.50]	Analytical Toxicology
ZOO*3200	[0.50]	Comparative Animal Physiology I

0.50 electives\*

**Semester 6**

ENVB*3030	[0.50]	Pesticides and the Environment
SOIL*2010	[0.50]	Soil Science

TOX*3360	[0.50]	Environmental Chemistry and Toxicology
ZOO*4170	[0.50]	Experimental Comparative Animal Physiology

0.50 electives\*

**Semester 7**

BIOL*3450	[0.50]	Introduction to Aquatic Environments
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*4180	[0.50]	Microbial Processes in Environmental Management
ZOO*4350	[0.50]	Biology of Polluted Waters

0.25 electives\*

**Semester 8**

PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants
STAT*3510	[0.50]	Environmental Risk Assessment
TOX*4200	[0.50]	Topics in Toxicology
TOX*4550	[0.50]	Ecotoxicological Risk Characterization

0.50 electives\*

\* a minimum of 1.50 credits must be from the College of Arts and/or the College of Social and Applied Human Sciences

**Environmental Toxicology (Co-op) (ETOX:C)**

**Interdisciplinary Program, Department of Environmental Biology, Ontario Agricultural College**

**Major (Honours Program)**

A 70% average in the science courses of semesters 1 and 2 is normally required for admission to semester 3 of this program. An optional fourth co-op work term is available.

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives\*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
PHYS*1080	[0.50]	Physics for Life Sciences
STAT*2040	[0.50]	Statistics I

0.50 electives\*

**Stream A****Semester 3 - Fall**

CHEM*2480	[0.50]	Analytical Chemistry I
BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
TOX*2000	[0.50]	Principles of Toxicology

0.50 electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

CHEM*2700	[0.50]	Organic Chemistry I
SOIL*2010	[0.50]	Soil Science
STAT*2050	[0.50]	Statistics II
TOX*3360	[0.50]	Environmental Chemistry and Toxicology

0.50 electives

**Semester 5 - Fall**

BIOL*2060	[0.50]	Ecology
BIOL*3450	[0.50]	Introduction to Aquatic Environments
TOX*3300	[0.50]	Analytical Toxicology
ZOO*3200	[0.50]	Comparative Animal Physiology I

0.50 electives

**Semester 6 - Winter**

BOT*2100	[0.50]	Life Strategies of Plants
BIOC*3560	[0.50]	Structure and Function in Biochemistry
ENVB*3030	[0.50]	Pesticides and the Environment
MBG*2020	[0.50]	Introductory Molecular Biology
ZOO*4170	[0.50]	Experimental Comparative Animal Physiology

**Summer Semester**

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

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 7 - Winter**

PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants
STAT*3510	[0.50]	Environmental Risk Assessment

TOX*4200	[0.50]	Topics in Toxicology
TOX*4550	[0.50]	Ecotoxicological Risk Characterization

0.50 electives

**Semester 8 - Fall**

MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*4180	[0.50]	Microbial Processes in Environmental Management
ZOO*4350	[0.50]	Biology of Polluted Waters

1.00 electives

**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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory 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 who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*2080	[0.50]	Elements of Calculus II
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

**Semester 3 - Fall**

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2880	[0.50]	Physical Chemistry
FOOD*2150	[0.50]	Introduction to Nutritional and Food Science
STAT*2040	[0.50]	Statistics I

0.50 electives

**Semester 4 - Winter**

FOOD*2100	[0.50]	Communication in Food Science I
FOOD*2620	[0.50]	Food Engineering Principles
MICR*2030	[0.50]	Microbial Growth
NUTR*3210	[0.50]	Fundamentals of Nutrition

0.50 electives

**Semester 5 - Fall**

FOOD*3010	[0.50]	Food Chemistry
FOOD*3160	[0.75]	Food Processing I
FOOD*3230	[0.75]	Food Microbiology

0.50 electives

**Semester 6 - Winter**

FOOD*3020	[0.50]	Food Chemistry Laboratory
FOOD*3170	[0.50]	Food Processing II

1.50 electives

**Semester 7 - Fall**

FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3700	[0.50]	Sensory Evaluation of Foods
FOOD*4120	[0.75]	Food Analysis

0.75 electives

**Semester 8 - Winter**

FOOD*4100	[0.25]	Communication in Food Science II
FOOD*4700	[0.50]	Food Product Development

1.75 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 0.5 must be from additional science electives.

**Restricted Electives:**

FOOD*4010	[0.50]	Food Plant Sanitation and Quality Control
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FOOD*4070	[0.50]	Food Packaging
FOOD*4090	[0.50]	Functional Foods and Nutraceuticals
FOOD*4110	[0.50]	Meat and Poultry Processing
FOOD*4140	[0.25]	Communication in Food Science III
FOOD*4220	[0.25]	Topics in Food Science
FOOD*4230	[0.25]	Research in Food Science I
FOOD*4240	[0.25]	Research in Food Science II
FOOD*4400	[0.50]	Dairy Processing
FOOD*4520	[0.50]	Cereal Technology
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

0.50 - Additional Science electives

2.00 - Free electives

**Minor (Honours Program)**

The Minor in Food Science consists of 5.00 credits as follows:

BIOC*2580	[0.50]	Introductory Biochemistry
FOOD*3010	[0.50]	Food Chemistry
FOOD*3230	[0.75]	Food Microbiology
MICR*2030	[0.50]	Microbial Growth

One of:

FOOD*2010	[0.50]	Principles of Food Science
FOOD*2150	[0.50]	Introduction to Nutritional and Food Science
NUTR*2150	[0.50]	Introduction to Nutritional and Food Sciences

One of:

FOOD*2410	[0.50]	Introduction to Food Processing
FOOD*3160	[0.75]	Food Processing I

**Restricted Electives**

Choose from the following list to bring the total to a minimum of 5.00 credits for the Minor:

FOOD*2620	[0.50]	Food Engineering Principles
FOOD*3170	[0.50]	Food Processing II
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3700	[0.50]	Sensory Evaluation of Foods
FOOD*4010	[0.50]	Food Plant Sanitation and Quality Control
FOOD*4070	[0.50]	Food Packaging
FOOD*4090	[0.50]	Functional Foods and Nutraceuticals
FOOD*4110	[0.50]	Meat and Poultry Processing
FOOD*4120	[0.75]	Food Analysis
FOOD*4400	[0.50]	Dairy Processing
FOOD*4520	[0.50]	Cereal Technology
FOOD*4700	[0.50]	Food Product Development
NUTR*3210	[0.50]	Fundamentals of Nutrition
POPM*4040	[0.50]	Epidemiology of Food-borne Diseases

**Food Science (Co-op) (FOOD:C)****Department of Food Science, Ontario Agricultural College****Major (Honours Program)****Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory 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 who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*2080	[0.50]	Elements of Calculus II
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 Arts or Social Science electives

**Summer Semester**

Off

**Semester 3 - Fall**

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

0.50 electives

**Semester 4 - Winter**

FOOD*2100	[0.50]	Communication in Food Science I
FOOD*2620	[0.50]	Food Engineering Principles
MICR*2030	[0.50]	Microbial Growth
NUTR*3210	[0.50]	Fundamentals of Nutrition

0.50 electives

**Summer Semester**

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

FOOD*3010	[0.50]	Food Chemistry
FOOD*3160	[0.75]	Food Processing I
FOOD*3230	[0.75]	Food Microbiology

0.50 electives

**Semester 6 - Winter**

FOOD*3020	[0.50]	Food Chemistry Laboratory
FOOD*3170	[0.50]	Food Processing II

1.50 electives

**Summer Semester**

Optional

**Fall Semester**

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

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 7 - Fall**

FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3700	[0.50]	Sensory Evaluation of Foods
FOOD*4120	[0.75]	Food Analysis

0.75 electives

**Semester 8 - Winter**

FOOD*4100	[0.25]	Communication in Food Science II
FOOD*4700	[0.50]	Food Product Development

1.75 electives

**Notes:**

See Notes and Credit Summary in Food Science Major.

**Forest Science (FORS)****Department of Environmental Biology, Ontario Agricultural College****Minor (Honours Program)**

A minor in Forest Science consists of 5.00 credits from the following courses:

BOT*2050	[0.50]	Plant Ecology
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*4420	[0.50]	Problems in Environmental Biology
ENVB*4780	[0.50]	Forest Ecology
HORT*3260	[0.50]	Woody Plants

(ENVB\*4420 senior thesis topic to be arranged with faculty advisor)

Three of:

ENVB*3090	[0.50]	Insect Diversity and Biology
GEOG*3110	[0.50]	Biotic and Natural Resources
HORT*3340	[0.50]	Culture of Plants
HORT*4250	[0.50]	Nursery Production
PBIO*4100	[0.50]	Soil Plant Relationships
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants

Two of:\*

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ENVB*3000	[0.50]	Nature Interpretation
GEOG*3210	[0.50]	Management of the Biophysical Environment
SOIL*3100	[0.50]	Resource Planning Techniques
ZOO*4050	[0.50]	Natural Resources Policy
ZOO*4410	[0.75]	Field Ecology

\* Resource Management majors may substitute SOIL\*4110 for ZOO\*4410

**Functional Foods and Nutraceuticals (FFAN)****Department of Human Health and Nutritional Sciences, College of Biological Science****Department of Food Science, Ontario Agricultural College.****Minor (Honours Program)**

A minor in Functional Foods and Nutraceuticals consists of 5.00 credits.

BIOC*2580	[0.50]	Introductory Biochemistry
ECON*1050	[0.50]	Introductory Microeconomics

NUTR*3210	[0.50]	Fundamentals of Nutrition
TOX*2000	[0.50]	Principles of Toxicology
One of:		
FOOD*2010	[0.50]	Principles of Food Science
FOOD*2150	[0.50]	Introduction to Nutritional and Food Science
NUTR*2150	[0.50]	Introduction to Nutritional and Food Sciences
One of:		
FOOD*4090	[0.50]	Functional Foods and Nutraceuticals
NUTR*4090	[0.50]	Functional Foods and Nutraceuticals

#### 2.00 Restricted Electives\*

\*restricted electives should be chosen in consultation with the Nutritional and Nutraceutical Sciences faculty advisor. Any 3000 and 4000 level courses from the following subject areas are eligible as restricted electives: Nutrition\*\*, Food Science\*\*, Biomedical Sciences\*\*, Toxicology, Population Medicine, Animal Science, Plant Biology, Human Kinetics\*\*, and Pathology.

\*\*students in these majors must select restricted electives outside of the 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 from:

GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*2420	[0.50]	Aerial-photo Interpretation
GEOG*2480	[0.50]	Mapping and GIS
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*4480	[0.50]	Applied Geographic Information Systems

One of:

GEOG*2000	[0.50]	Geomorphology
GEOG*2110	[0.50]	Climate and the Biophysical Environment

One of:

GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*3620	[0.50]	Desert Environments

And one of:

GEOG*4110	[0.50]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Resource Analysis

[Note: GEOG\*3110 or GEOG\*3610 is required as prerequisite for GEOG\*4110]

### **Geology (GEOL)**

#### **Department of Land Resource Science, Ontario Agricultural College**

#### **Minor (Honours Program)**

A minor will consist of at least 5.00 credits in Geology. The following 7 courses are mandatory:

GEOL*1050	[0.50]	Geology and the Environment
GEOL*2020	[0.50]	Stratigraphy
GEOL*2110	[0.50]	Earth Material Science
GEOL*2150	0.75	Glacial Geology
GEOL*3090	[0.50]	Applied Structural Geology
GEOL*3120	[0.50]	Paleontology
GEOL*4090	[0.50]	Sedimentology

The remaining credits can be chosen from Geology or the Geomorphology offerings in Geography in the calendar and must be 2000 level or above.

### **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)**

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.

#### **Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives or restricted electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### **Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

1.00 electives or restricted electives

#### **Semester 3**

BIOL*2210	[0.50]	Introductory Cell Biology
BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics

1.00 electives or restricted electives

#### **Semester 4**

HK*2270	[0.50]	Principles of Human Biomechanics
MBG*2020	[0.50]	Introductory Molecular Biology
NUTR*3210	[0.50]	Fundamentals of Nutrition
ZOO*2100	[0.50]	Developmental Biology

0.50 electives or restricted electives

#### **Semester 5**

HK*3401	[0.75]	Human Anatomy
HK*3600	[0.75]	Applied Human Biology
HK*3940	[1.25]	Human Physiology

#### **Semester 6**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
HK*3402	[0.75]	Human Anatomy
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

#### **Semester 7**

If desired, electives or restricted electives up to a maximum of 2.75 total credits.

#### **Semester 8**

If desired, electives or restricted electives up to a maximum of 2.75 total credits.

**Note:** Students are required to complete 16.00 credits in acceptable science courses.

#### **Restricted Electives**

Students must complete 2.00 credits from Arts or Social Science courses with the recommendation that 0.50 of the 2.00 credits be in philosophy. A minimum of 2.00 credits of restricted electives is required. They are to be selected from HK\*3100, HK\*4XXX, NUTR\*4090, NUTR\*4210.

### **Marine and Freshwater Biology (MFB)**

#### **Department of Integrative Biology, College of Biological Science**

The Major in Marine and Freshwater Biology provides a broad ecological perspective on aquatic environments based on the physical as well as the biological sciences. This major prepares students for post-graduate work in the aquatic 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.

#### **Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 Arts or Social Science electives\*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### **Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives\*

#### **Semester 3**

ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function
ZOO*2100	[0.50]	Developmental Biology

1.00 electives\*\*

#### **Semester 4**

BIOL*2210	[0.50]	Introductory Cell Biology
BIOC*2580	[0.50]	Introductory Biochemistry

MBG*2000	[0.50]	Introductory Genetics
ZOO*2080	[0.50]	Invertebrate Zoology II

0.50 electives\*\*

**Semester 5**

BIOL*3110	[0.50]	Population Ecology
BIOL*3450	[0.50]	Introduction to Aquatic Environments
ZOO*3200	[0.50]	Comparative Animal Physiology I
ZOO*3300	[0.50]	Evolution

0.50 electives\*\*

**Semester 6**

BIOL*3120	[0.50]	Community Ecology
ZOO*3210	[0.50]	Comparative Animal Physiology II

1.50 electives\*\*, \*\*\*

**Semester 7**

ZOO*4350	[0.50]	Biology of Polluted Waters
ZOO*4570	[0.50]	Marine Ecological Processes

1.50 electives\*\*

**Semester 8**

IBIO*4010	[0.50]	Adaptational Physiology
ZOO*4330	[0.50]	Environmental Biology of Fishes

1.50 electives\*\*

\* CIS\*1200 is recommended for those needing to improve their computer skills

\*\* suggested electives list available from the faculty advisors

\*\*\* BIOL\*2250 is strongly recommended if independent research project courses are anticipated in semesters 7 and/or 8

**Electives - must include:**

1. A minimum of 0.75 credits from:

BIOL*4110	[0.75]	Ecological Methods
IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
ZOO*4300	[0.75]	Marine Biology and Oceanography
ZOO*4410	[0.75]	Field Ecology
ZOO*4540	[0.50]	Marine and Freshwater Research
ZOO*4600	[0.75]	Tropical Ecology
ZOO*4610	[0.75]	Arctic Ecology
ZOO*4700	[0.50]	Field Biology
ZOO*4710	[0.25]	Field Biology
ZOO*4800	[0.50]	Field Biology
ZOO*4810	[0.25]	Field Biology

2. Other field or research courses with approval of faculty advisor.

3. At least 1.00 Arts and/or Social Science electives.

**Mathematical Science (MSCI)****Department of Mathematics & Statistics, College of Physical and Engineering Science****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 Mathematics, Statistics, or Computing and Information Science.

**Mathematics (MATH)****Department of Mathematics and Statistics, 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. A total of 20.00 credits is required to complete the Major which includes at least 10.00 credits in Mathematics & Statistics, 2.00 of which must be at the 4000 level. At least 1.00 credits in Arts and Social Science must be completed.

**Semester 1\***

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 electives (CIS\*2500 recommended)

**Semester 3**

MATH*2000	[0.50]	Set Theory
MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives

**Semester 4**

MATH*2130	[0.50]	Numerical Methods
MATH*2170	[0.50]	Differential Equations I
MATH*2210	[0.50]	Advanced Calculus II

1.00 electives (CIS\*2500 recommended if not taken earlier)

**Semester 5**

MATH*3100	[0.50]	Differential Equations II
MATH*3200	[0.50]	Real Analysis

One of:

MATH*3130	[0.50]	Algebraic Structures
MATH*3240	[0.50]	Operations Research

One of:\*\*

STAT*3100	[0.50]	Introductory Mathematical Statistics I
STAT*3240	[0.50]	Applied Regression Analysis

0.50 electives

**Semester 6**

MATH*3260	[0.50]	Complex Analysis
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0.50 credits from a 3000 level statistics

0.50 credits from a 3000 or 4000 level mathematics

1.00 electives

**Semester 7**

0.50 credits from a 4000 level mathematics\*\*\*

1.50 electives

One of:

MATH*3130	[0.50]	Algebraic Structures
MATH*3240	[0.50]	Operations Research

**Semester 8**

1.00 credits from a 4000 level mathematics\*\*\*

1.50 electives

\*students may be exempted from CIS\*1500 in Semester 1 upon taking a computer science assessment of computing skills. If exempted from CIS\*1500, you are advised to take CIS\*2500 in the first semester.

\*\*a student selecting STAT\*3100 should take STAT\*3110 in semester 6

\*\*\*a mathematics major must include 2.00 or more credits at the 4000 level in mathematics (which may include STAT\*4340) and must include at least 6.00 at the 3000 or 4000 level from the program committee approved list of science electives

**Minor (Honours Program)**

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

2.50 credits from:

(MATH\*1080 or MATH\*1200)

(MATH\*1210 or MATH\*2080)

MATH\*2000 [0.50] Set Theory

(MATH\*2150 or MATH\*2160)

MATH\*2200 [0.50] Advanced Calculus I

0.50 Statistics (STAT\*) credits at the 2000 level or above.

2.00 additional Mathematics credits at the 2000 level or above, including 1.50 credits at the 3000 or 4000 level.

**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 total of 20.00 credits is required to complete the major.

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

One mathematics/computer course from:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
MATH*2080	[0.50]	Elements of Calculus II

0.50 electives

**Semester 3**

BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
MICR*2020	[0.50]	Microbial Interactions and Associations
STAT*2040	[0.50]	Statistics I

0.50 electives

**Semester 4**

BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2020	[0.50]	Introductory Molecular Biology
MICR*2030	[0.50]	Microbial Growth

1.00 electives

**Semester 5**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MICR*3120	[0.50]	Systematic Bacteriology
MICR*3230	[0.50]	Immunology I

One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics

0.50 electives

**Semester 6**

BIOL*3050	[0.50]	Mycology I
MICR*3110	[0.50]	Techniques in Microbiology
MICR*3260	[0.50]	Microbial Adaptation and Development

1.00 electives

**Semester 7**

MICR*4120	[0.50]	Virology
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2.00 electives or restricted electives which can include MICR\*4310.

**Semester 8**

MICR*4290	[0.50]	Microbial Ecology
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2.00 electives or restricted electives which can include MICR\*4320

**Restricted Electives**

Of the 8.00 elective credits throughout the program, at least 2.00 must be from the Arts and Social Sciences. For the Major program, 1.50 must be selected from the list below and at least 2.50 must be from the list of approved science electives. (See exception for students taking a minor in an Arts or Social Science subject.) Students in the major program should ensure that at least 1.00 of the electives are 4000 level science courses.

BIOL*4050	[0.50]	Mycology II
BIOC*4540	[0.50]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
FOOD*3230	[0.75]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
MCB*4080	[0.50]	Applied Microbiology and Biochemistry
MICR*3220	[0.50]	Plant Microbiology
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4230	[0.50]	Immunology II
MICR*4240	[0.50]	Topics in Microbiology
MICR*4270	[0.50]	Microbial Design
MICR*4310	[1.00]	Research Project I
MICR*4320	[1.00]	Research Project II
MICR*4430	[0.50]	Medical Virology

One of:

MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management

**Minor (Honours Program)**

The minor in Microbiology consists of the following 5.00 credits:

2.00 credits including:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MICR*2020	[0.50]	Microbial Interactions and Associations
MICR*2030	[0.50]	Microbial Growth
MICR*3110	[0.50]	Techniques in Microbiology

2.00 credits from:

BIOL*3050	[0.50]	Mycology I
FOOD*3230	[0.75]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
MBG*2020	[0.50]	Introductory Molecular Biology
MICR*3120	[0.50]	Systematic Bacteriology
MICR*3220	[0.50]	Plant Microbiology
MICR*3230	[0.50]	Immunology I
MICR*3260	[0.50]	Microbial Adaptation and Development
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management

One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics

1.00 credits from:

BIOL*4050	[0.50]	Mycology II
MCB*4080	[0.50]	Applied Microbiology and Biochemistry
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4120	[0.50]	Virology
MICR*4230	[0.50]	Immunology II
MICR*4270	[0.50]	Microbial Design
MICR*4290	[0.50]	Microbial Ecology
MICR*4430	[0.50]	Medical Virology

**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\*1030, BIOL\*1040 and MICR\*2030. 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 may require an additional semester to meet all the program requirements. Students should plan their programs in consultation with the faculty advisor.

**Stream A****Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives

Students who are admitted to the Co-op Program but deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences
COOP*1100	[0.00]	Introduction to Co-operative Education

One mathematics/computer course from:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
MATH*2080	[0.50]	Elements of Calculus II

0.50 electives

**Summer Semester**

No Academic Semester or Work Term

**Semester 3 - Fall**

BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
MICR*2020	[0.50]	Microbial Interactions and Associations
MICR*2030	[0.50]	Microbial Growth

0.50 electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2020	[0.50]	Introductory Molecular Biology
STAT*2040	[0.50]	Statistics I

1.00 electives



**Semester 5 - Fall**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MICR*3120	[0.50]	Systematic Bacteriology
MICR*3230	[0.50]	Immunology I

One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics

0.50 electives

**Semester 6 - Winter**

BIOL*3050	[0.50]	Mycology I
MICR*3110	[0.50]	Techniques in Microbiology
MICR*3260	[0.50]	Microbial Adaptation and Development

1.00 electives

**Summer Semester**

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

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 7 - Winter**

MICR*4290	[0.50]	Microbial Ecology
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2.00 electives or restricted electives which can include MICR\*4310

**Summer Semester**

COOP*4000	[0.00]	Co-op Work Term IV (optional)
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**Semester 8 - Fall**

MICR*4120	[0.50]	Virology
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2.00 electives or restricted electives which can include MICR\*4320

**Stream B****Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives

Students who are admitted to the Co-op Program but deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences
COOP*1100	[0.00]	Introduction to Co-operative Education

One mathematics/computer course from:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming
MATH*2080	[0.50]	Elements of Calculus II

0.50 electives

**Summer Semester**

No Academic Semester or Work Term

**Semester 3 - Fall**

BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
MICR*2020	[0.50]	Microbial Interactions and Associations
MICR*2030	[0.50]	Microbial Growth

0.50 electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2020	[0.50]	Introductory Molecular Biology
STAT*2040	[0.50]	Statistics I

1.00 electives

**Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

BIOL*3050	[0.50]	Mycology I
BIOC*3560	[0.50]	Structure and Function in Biochemistry
MICR*3110	[0.50]	Techniques in Microbiology

1.00 electives

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6 - Fall**

MICR*3120	[0.50]	Systematic Bacteriology
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MICR*3230	[0.50]	Immunology I
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One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics

1.00 electives

**Semester 7 - Winter**

MICR*3260	[0.50]	Microbial Adaptation and Development
MICR*4290	[0.50]	Microbial Ecology

1.50 electives or restricted electives which can include MICR\*4310

**Summer Semester**

COOP*4000	[0.00]	Co-op Work Term IV (optional)
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**Semester 8 - Fall**

MICR*4120	[0.50]	Virology
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2.00 electives or restricted electives which can include MICR\*4320

**Restricted Electives**

Of the 8.00 elective credits throughout the program, at least 2.00 must be from the Arts and Social Sciences. For the Major program, 1.50 must be selected from the list below and at least 2.50 must be from the list of approved science electives. (See exception for students taking a minor in an Arts or Social Science subject.) Students in the major program should ensure that at least 1.00 of the electives are 4000 level science courses.

BIOL*4050	[0.50]	Mycology II
BIOC*4540	[0.50]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
FOOD*3230	[0.75]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
MCB*4080	[0.50]	Applied Microbiology and Biochemistry
MICR*3220	[0.50]	Plant Microbiology
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4230	[0.50]	Immunology II
MICR*4240	[0.50]	Topics in Microbiology
MICR*4270	[0.50]	Microbial Design
MICR*4310	[1.00]	Research Project I
MICR*4320	[1.00]	Research Project II
MICR*4430	[0.50]	Medical Virology

One of:

MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management

**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 departmental 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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I

One of:

PHYS*1000	[0.50]	An Introduction to Mechanics
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

One of:

MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

0.50 electives or restricted electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

One of:

PHYS*1010	[0.50]	Introductory Electricity and Magnetism
PHYS*1080	[0.50]	Physics for Life Sciences

0.50 electives or restricted electives

**Semester 3**

BIOL*2210	[0.50]	Introductory Cell Biology
BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

**Semester 4**

MBG*2020	[0.50]	Introductory Molecular Biology
MICR*2030	[0.50]	Microbial Growth
STAT*2050	[0.50]	Statistics II

1.00 electives or restricted electives

**Semester 5**

MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
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1.75 electives or restricted electives

**Semester 6**

2.50 electives or restricted electives

**Semester 7\***

MBG*4500	[1.00]	Research Project in Molecular Biology and Genetics I
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1.50 electives or restricted electives

**Semester 8\***

MBG*4510	[1.00]	Research Project in Molecular Biology and Genetics II
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1.50 electives or restricted electives

\*instead of the 2 semester sequence of MBG\*4500 / MBG\*4510 students may choose to take MBG\*4600 and 1.50 subject area electives

**Note:** Students are reminded that AT LEAST 2.00 credits must be at the 4000 level in order to complete the major.

**Restricted Electives**

## 1. Ecology Elective - 0.50 credits

BIOL*2060	[0.50]	Ecology
BIOL*3110	[0.50]	Population Ecology
BOT*2050	[0.50]	Plant Ecology
MICR*4290	[0.50]	Microbial Ecology

## 2. Arts and Social Science Electives - 2.00 credits

## 3. Physiology Elective - 0.50 credits

BIOM*3100	[0.50]	Mammalian Physiology I
BOT*3310	[0.50]	Plant Growth and Development
HK*3940	[1.25]	Human Physiology
ZOO*3200	[0.50]	Comparative Animal Physiology I

## 4. Subject Area Electives - 3.00 credits (4.50 if MBG\*4600 is taken instead of MBG\*4500 and MBG\*4510)

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOL*3300	[0.50]	Applied Bioinformatics
MBG*3000	[0.50]	Population Genetics
MBG*3050	[0.50]	Human Genetics
MBG*3060	[0.50]	Quantitative Genetics
MBG*3200	[0.50]	Genetics: Our Uncertain Heritage
MBG*3360	[0.75]	Laboratory Methods in Molecular Biology II
MBG*3600	[0.25]	Introduction to Genomics
MBG*4030	[0.50]	Animal Breeding Methods
MBG*4080	[0.50]	Molecular Genetics
MBG*4160	[0.50]	Plant Breeding
MBG*4200	[0.50]	Transmission Genetics
MBG*4240	[0.50]	Applied Molecular Genetics
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*4120	[0.50]	Virology

One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics

One of:

MBG*4040	[0.50]	Genetics and Molecular Biology of Development
MBG*4070	[0.50]	Genetics and Molecular Biology of Development

**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*2000	[0.50]	Introductory Genetics
MBG*2020	[0.50]	Introductory Molecular Biology

4.00 credits from:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOL*3300	[0.50]	Applied Bioinformatics
MBG*3000	[0.50]	Population Genetics
MBG*3050	[0.50]	Human Genetics

MBG*3060	[0.50]	Quantitative Genetics
MBG*3200	[0.50]	Genetics: Our Uncertain Heritage
MBG*3600	[0.25]	Introduction to Genomics
MBG*4030	[0.50]	Animal Breeding Methods
MBG*4080	[0.50]	Molecular Genetics
MBG*4160	[0.50]	Plant Breeding
MBG*4200	[0.50]	Transmission Genetics
MBG*4240	[0.50]	Applied Molecular Genetics
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*4120	[0.50]	Virology

One of:

MBG*3070	[0.50]	Bacterial Genetics
MBG*3080	[0.50]	Bacterial Genetics

One of:

MBG*4040	[0.50]	Genetics and Molecular Biology of Development
MBG*4070	[0.50]	Genetics and Molecular Biology of Development

**Neuroscience (NEUR)**

**Department of Human Health and Nutritional Sciences, College of Biological Science**

**Minor (Honours Program)**

A minor in Neuroscience shall include a minimum of 5.00 credits including:

BIOM*3000	[0.50]	Mammalian Neuroanatomy
CIS*1500	[0.50]	Introduction to Programming
PHYS*2030	[0.50]	Biophysics of Excitable Cells
PSYC*2410	[0.50]	Behavioural Neuroscience I
ZOO*2100	[0.50]	Developmental Biology

and at least 0.50 from:

BIOM*3100	[0.50]	Mammalian Physiology I
HK*3940	[1.25]	Human Physiology
ZOO*3200	[0.50]	Comparative Animal Physiology I

and 1.00 from an independent study project in the neurosciences, selected from a combination of:

BIOM*4510	[1.00]	Research in Biomedical Sciences II
BIOM*4521/2	[1.00]	Research in Biomedical Sciences II
HK*4230	[0.50]	Advanced Study in Human Biology and Nutritional Sciences

HK*4360	[1.00]	Research in Human Biology and Nutritional Sciences
HK*4371/2	[1.00]	Research in Human Biology and Nutritional Sciences II
IBIO*4500	[0.75]	Research in Integrative Biology I

and 1.00 from:

BIOM*3090	[0.50]	Principles of Pharmacology and Toxicology
HK*3100	[0.50]	Neuromuscular Physiology
NUTR*3210	[0.50]	Fundamentals of Nutrition
PATH*3610	[0.50]	Principles of Disease
PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*3030	[0.50]	Neurochemical Basis of Behaviour
PSYC*3040	[0.50]	Current Issues in Neuropsychology
PSYC*3410	[0.50]	Behavioural Neuroscience II
ZOO*4470	[0.50]	Comparative Endocrinology

**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 I 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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 electives or restricted electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
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CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

1.00 electives or restricted electives

**Semester 3**

BIOL*2210	[0.50]	Introductory Cell Biology
BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics

1.00 electives

**Semester 4**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MBG*2020	[0.50]	Introductory Molecular Biology
NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

**Semester 5**

HK*3940	[1.25]	Human Physiology
NUTR*3330	[0.50]	Micronutrients, Phytochemicals and Health
NUTR*3390	[0.50]	Applied Nutritional and Nutraceutical Sciences I

0.25 or 0.50 electives or restricted electives

**Semester 6**

BIOM*3090	[0.50]	Principles of Pharmacology and Toxicology
NUTR*4090	[0.50]	Functional Foods and Nutraceuticals
NUTR*4330	[0.50]	Applied Nutritional and Nutraceutical Sciences II
PATH*3610	[0.50]	Principles of Disease

0.50 electives or restricted electives

**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**

Students must complete 2.00 credits from Arts and Social Sciences courses and 1.00 credits from among the following:

HK*4410	[0.50]	Research Concepts
HK*4420	[0.50]	Research Modules
HK*4460	[0.50]	Regulation of Human Metabolism
NUTR*4200	[0.50]	Nutrition and Immune Function
NUTR*4320	[0.50]	Nutrition and Metabolic Control of Disease
NUTR*4360	[0.50]	Current Issues in Nutrigenomics

**Nutritional Sciences (NSCI)****Department of Human Health and Nutritional Sciences, College of Biological Science****Minor (Honours Program)**

A minor in Nutritional Sciences requires 5.00 credits as follows:

BIOC*2580	[0.50]	Introductory Biochemistry
NUTR*2150	[0.50]	Introduction to Nutritional and Food Sciences
NUTR*3210	[0.50]	Fundamentals of Nutrition
NUTR*3330	[0.50]	Micronutrients, Phytochemicals and Health
STAT*2040	[0.50]	Statistics I

At least 0.50 credits from:

BIOM*3100	[0.50]	Mammalian Physiology I
HK*3940	[1.25]	Human Physiology
ZOO*3200	[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*4160	[0.25]	Beef Cattle Nutrition
ANSC*4170	[0.25]	Dairy Cattle Nutrition
ANSC*4180	[0.25]	Poultry Nutrition
ANSC*4190	[0.25]	Swine Nutrition
ANSC*4500	[0.25]	Horse Nutrition
ANSC*4510	[0.25]	Pet Nutrition
HK*4230	[0.50]	Advanced Study in Human Biology and Nutritional Sciences
HK*4360	[1.00]	Research in Human Biology and Nutritional Sciences
HK*4371/2	[1.00]	Research in Human Biology and Nutritional Sciences II
NUTR*3390	[0.50]	Applied Nutritional and Nutraceutical Sciences I
NUTR*4090	[0.50]	Functional Foods and Nutraceuticals
NUTR*4200	[0.50]	Nutrition and Immune Function
NUTR*4210	[0.50]	Nutrition, Exercise and Energy Metabolism
NUTR*4320	[0.50]	Nutrition and Metabolic Control of Disease
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\*1030, BIOL\*1040)

1.00 - Chemistry (CHEM\*1040, CHEM\*1050)

1.00 - Physics [(PHYS\*1000, PHYS\*1010) or (PHYS\*1070, PHYS\*1080) or (PHYS\*1080, PHYS\*1130)]

1.00 - Mathematical Science [(MATH\*1080, MATH\*2080) or (MATH\*1200, MATH\*1210)]

**2. Subject Area Core - 8.00 credits**

0.50 (STAT\*2040 or STAT\*2100)

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**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I

One of:

PHYS*1000	[0.50]	An Introduction to Mechanics
PHYS*1070	[0.50]	Introductory Physics for Life Sciences
PHYS*1080	[0.50]	Physics for Life Sciences

One of:

MATH*1080	[0.50]	Elements of Calculus I
MATH*1200	[0.50]	Calculus I

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
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

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
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**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
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(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 Dean's Office, College of Physical and Engineering Science and on the world wide web at [http://www.cpes.uoguelph.ca/BSc/approved\\_electives.htm](http://www.cpes.uoguelph.ca/BSc/approved_electives.htm)

### 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 21.25 credits. At least 1.00 of these credits must be obtained from the completion of Arts and/or Social Science courses.

##### Semester 1\*

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

##### Semester 2\*

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 Arts or Social Science electives

\* students who have taken physics courses other than PHYS\*1000 in Semester 1 and PHYS\*1010 in Semester 2, may proceed to semester 3 with the permission of the Department of Physics

##### Semester 3

MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
PHYS*2440	[0.75]	Mechanics I
PHYS*2460	[0.75]	Electricity and Magnetism I

One of:

STAT*2040	[0.50]	Statistics I
0.50 Arts electives		
0.50 Social Science electives		

##### Semester 4

MATH*2170	[0.50]	Differential Equations I
PHYS*2260	[0.50]	Experimental Basis of Quantum Physics
PHYS*2450	[0.75]	Mechanics II
PHYS*2470	[0.75]	Electricity and Magnetism II

One of:

STAT*2040	[0.50]	Statistics I
STAT*2120	[0.50]	Probability and Statistics for Engineers
0.50 electives		

##### Semester 5

MATH*3100	[0.50]	Differential Equations II
PHYS*3100	[0.75]	Electronics
PHYS*3230	[0.50]	Quantum Mechanics I
PHYS*3240	[0.50]	Statistical Physics I

One of:

MATH*2000	[0.50]	Set Theory
0.50 electives		

##### Semester 6

PHYS*3220	[0.50]	Waves and Optics
PHYS*3400	[0.50]	Advanced Mechanics
PHYS*3510	[0.50]	Intermediate Laboratory
PHYS*4040	[0.50]	Quantum Mechanics II

One of:

MATH*3170	[0.50]	Partial Differential Equations and Special Functions
MATH*3260	[0.50]	Complex Analysis
0.50 electives		

##### Semester 7+

PHYS*4180	[0.50]	Advanced Electromagnetic Theory
PHYS*4500	[0.50]	Advanced Physics Laboratory

One of:

PHYS*4240	[0.50]	Statistical Physics II
0.50 electives		
1.00 electives **		

##### Semester 8+

PHYS*4510	[0.50]	Advanced Physics Project
2.00 electives **		

+ students going on to graduate school in physics should take PHYS\*4120, PHYS\*4130, PHYS\*4150, PHYS\*4240

\*\* For the electives chosen in Sem 7 and 8, 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

GEOL*3060	[0.50]	Groundwater
PHYS*4540	[0.50]	Molecular Biophysics
PHYS*4560	[0.50]	Biophysical Methods
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 Policy Formation and Administration
REXT*3100	[0.50]	Teaching and Learning in Non-Formal Education
SOIL*3600	[0.50]	Remote Sensing
STAT*3240	[0.50]	Applied Regression Analysis
STAT*3510	[0.50]	Environmental Risk Assessment

#### Minor (Honours Program)

A minor in Physics requires 5.00 credits in physics courses including at least 1.00 at the 3000 or 4000 level.

The following four courses, with a weight of 0.75 each, are required:

PHYS*2440	[0.75]	Mechanics I
PHYS*2450	[0.75]	Mechanics II
PHYS*2460	[0.75]	Electricity and Magnetism I
PHYS*2470	[0.75]	Electricity and Magnetism II

The following courses are strongly recommended:

PHYS*1000	[0.50]	An Introduction to Mechanics
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

#### 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.

#### Major (Honours Program)

This major requires the completion of 21.25 credits.

##### Semester 1 - Fall

The program for the first semester is the same as the Major in Physics (regular) program.

##### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

One of:

CIS*2500	[0.50]	Intermediate Programming
0.50 Arts or Social Science electives*		

##### Semester 3 - Fall

MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
PHYS*2440	[0.75]	Mechanics I
PHYS*2460	[0.75]	Electricity and Magnetism I

One of:

MATH*2000	[0.50]	Set Theory
STAT*2040	[0.50]	Statistics I
0.50 Arts or Social Science electives*		

**Winter Semester**

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

**Semester 4 - Summer**

MATH\*2170 [0.50] Differential Equations I  
 PHYS\*2260 [0.50] Experimental Basis of Quantum Physics  
 PHYS\*3240 [0.50] Statistical Physics I

One of:

CIS\*2520 [0.50] Data Structures

0.50 electives\*

0.50 electives\*

**Fall Semester**

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

**Semester 5 - Winter**

PHYS\*2450 [0.75] Mechanics II  
 PHYS\*2470 [0.75] Electricity and Magnetism II  
 PHYS\*3220 [0.50] Waves and Optics

One of:

STAT\*2040 [0.50] Statistics I  
 STAT\*2120 [0.50] Probability and Statistics for Engineers  
 MATH\*3260 [0.50] Complex Analysis

0.50 electives

0.50 electives

**Summer Semester**

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

**Semester 6 - Fall +**

MATH\*3100 [0.50] Differential Equations II  
 PHYS\*3100 [0.75] Electronics  
 PHYS\*3230 [0.50] Quantum Mechanics I

1.00 electives \*\*

**Semester 7 - Winter +**

PHYS\*3400 [0.50] Advanced Mechanics  
 PHYS\*3510 [0.50] Intermediate Laboratory  
 PHYS\*4040 [0.50] Quantum Mechanics II

One of:

MATH\*3170 [0.50] Partial Differential Equations and Special Functions

0.50 electives\*\*

0.50 electives\*\*

**Summer Semester**

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

**Semester 8 - Fall +**

PHYS\*4180 [0.50] Advanced Electromagnetic Theory  
 PHYS\*4240 or 0.50 electives  
 PHYS\*4500 [0.50] Advanced Physics Laboratory

1.00 electives\*\*

\* 1.00 must be taken as Arts or Social Science electives in this Major

+ and \*\* refer to the notes in the Major in Physics program

**Plant Biology (PBIO)****Department of Integrative Biology, College of Biological Science****Department of Environmental Biology, Ontario Agricultural College****Department of Plant Agriculture, Ontario Agricultural College****Major (Honours Program)**

Students may enter this major in Semester I or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor.

**Semester 1**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 MATH\*1080 [0.50] Elements of Calculus I  
 PHYS\*1070 [0.50] Introductory Physics for Life Sciences

0.50 Arts or Social Science electives \*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL\*1040 [0.50] Biology II  
 CHEM\*1050 [0.50] General Chemistry II  
 PHYS\*1080 [0.50] Physics for Life Sciences

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  
 BOT\*2100 [0.50] Life Strategies of Plants  
 BIOC\*2580 [0.50] Introductory Biochemistry  
 MBG\*2000 [0.50] Introductory Genetics

One of:

0.50 electives

0.50 Arts and Social Science electives

**Semester 4**

BIOL\*2210 [0.50] Introductory Cell Biology  
 BOT\*3310 [0.50] Plant Growth and Development  
 ENVB\*2040 [0.50] Plant Health and the Environment  
 MBG\*2020 [0.50] Introductory Molecular Biology

One of:

0.50 electives

0.50 Arts and Social Science electives

**Semester 5**

BOT\*3410 [0.50] Plant Anatomy  
 STAT\*2040 [0.50] Statistics I

0.50 Arts or Social Science electives

1.00 electives \*\*

**Semester 6**

BOT\*3710 [0.50] Classification and Morphology of Seed Plants

2.00 electives \*\*

**Semester 7**

2.50 electives \*\*

**Semester 8**

BOT\*4380 [0.50] Metabolism in the Whole Life of Plants

2.00 electives \*\*

\* it is recommended that 0.50 Arts or Social Science electives be chosen from:

ECON\*1100 [0.50] Introductory Macroeconomics  
 ENGL\*1200 [0.50] Reading the Contemporary World  
 GEOG\*1220 [0.50] Human Impact on the Environment  
 HIST\*1250 [0.50] Science and Society Since 1500  
 PHIL\*1000 [0.50] Introductory Philosophy: Major Texts  
 POLS\*1400 [0.50] Issues in Canadian Politics  
 PSYC\*1100 [0.50] Principles of Behaviour

**Electives\*\***

1. One of:

BIOL\*2060 [0.50] Ecology  
 BOT\*2050 [0.50] Plant Ecology  
 CROP\*2110 [0.50] Crop Ecology

2. A minimum of 2.50 credits must be from the following list of preferred electives:

BIOL\*3300 [0.50] Applied Bioinformatics  
 MBG\*4300 [0.50] Plant Molecular Genetics  
 PBIO\*3110 [0.50] Crop Physiology  
 PBIO\*3750 [0.50] Plant Tissue Culture  
 PBIO\*4000 [0.50] Molecular and Cellular Aspects of Plant-Microbe Interactions  
 PBIO\*4100 [0.50] Soil Plant Relationships  
 PBIO\*4150 [0.50] Molecular and Cellular Aspects of Plant Development  
 PBIO\*4530 [0.50] Environmental Pollution Stresses on Plants  
 PBIO\*4600 [0.75] Plant Environment Interaction and Stress Physiology  
 PBIO\*4750 [0.50] Genetic Engineering of Plants

3. A minimum of 3.00 credits must be from the following list:

BIOL\*3050 [0.50] Mycology I  
 CROP\*3300 [0.50] Grain Crops  
 CROP\*3310 [0.50] Protein and Oilseed Crops  
 CROP\*3330 [0.50] Forage Crops: Science and Technology  
 CROP\*4240 [0.50] Weed Science  
 ENVB\*2030 [0.50] Current Issues in Forest Science  
 ENVB\*3210 [0.50] Plant Pathology  
 ENVB\*4000 [0.50] Plant Disease Management  
 ENVB\*4070 [0.50] Biological and Cultural Control of Plant Diseases  
 ENVB\*4420 [0.50] Problems in Environmental Biology  
 ENVB\*4780 [0.50] Forest Ecology  
 HORT\*3010 [0.50] Annual, Perennial and Indoor Plants - Identification and Use  
 HORT\*3230 [0.50] Plant Propagation  
 HORT\*3260 [0.50] Woody Plants  
 HORT\*3340 [0.50] Culture of Plants  
 HORT\*4300 [0.50] Postharvest Physiology  
 HORT\*4420 [0.50] Fruit Crops  
 IBIO\*4500 [0.75] Research in Integrative Biology I

IBIO*4510	[0.75]	Research in Integrative Biology II
MBG*3000	[0.50]	Population Genetics
MBG*3100	[0.50]	Plant Genetics
MBG*4160	[0.50]	Plant Breeding
MICR*3220	[0.50]	Plant Microbiology

4. 1.50 Arts and Social Science electives.

5. A minimum of 6.00 science credits must be completed at the 3000 and 4000 levels with a minimum 2.00 credits at the 4000 level.

### Minor (Honours Program)

A minor in Plant Biology requires 5.00 credits in the Plant Biology program chosen in consultation with the faculty advisor. The courses will include:

BOT*3310	[0.50]	Plant Growth and Development
BOT*4380	[0.50]	Metabolism in the Whole Life of Plants
ENVB*2040	[0.50]	Plant Health and the Environment

One of:

AGR*2470	[0.50]	Introduction to Plant Agriculture
BOT*2100	[0.50]	Life Strategies of Plants

One of:

BOT*3410	[0.50]	Plant Anatomy
BOT*3710	[0.50]	Classification and Morphology of Seed Plants

One of:

BIOL*2060	[0.50]	Ecology
BOT*2050	[0.50]	Plant Ecology
CROP*2110	[0.50]	Crop Ecology

2.00 credits from list of preferred electives in PBIO Major.

### Plant Biotechnology (PBTC)

Department of Molecular and Cellular Biology, College of Biological Sciences

Department of Environmental Biology, Ontario Agricultural College

Department of Plant Agriculture, 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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 Arts or Social Science electives

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

0.50 Arts or Social Science electives

#### Semester 3

BIOL*2210	[0.50]	Introductory Cell Biology
BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics

One of:

AGR*2470	[0.50]	Introduction to Plant Agriculture
BOT*2100	[0.50]	Life Strategies of Plants

0.50 electives or restricted electives

#### Semester 4

BOT*3310	[0.50]	Plant Growth and Development
MBG*2020	[0.50]	Introductory Molecular Biology
MICR*2030	[0.50]	Microbial Growth
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

#### Semester 5

MBG*3100	[0.50]	Plant Genetics
PBIO*3750	[0.50]	Plant Tissue Culture

1.50 electives or restricted electives

#### Semester 6

MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MBG*4300	[0.50]	Plant Molecular Genetics

One of:

PBIO*4150	[0.50]	Molecular and Cellular Aspects of Plant Development
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PBIO*4750	[0.50]	Genetic Engineering of Plants
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0.75 electives or restricted electives

#### Semester 7

PBIO*4000	[0.50]	Molecular and Cellular Aspects of Plant-Microbe Interactions
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PBIO*4300	[1.00]	Research Opportunities in Plant Biotechnology I
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1.00 electives or restricted electives

#### Semester 8

BOT*4380	[0.50]	Metabolism in the Whole Life of Plants
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One of:

PBIO*4150	[0.50]	Molecular and Cellular Aspects of Plant Development
PBIO*4750	[0.50]	Genetic Engineering of Plants

1.50 electives or restricted electives

#### Restricted Electives

##### List A

A minimum of 2.00 credits must be taken from the following list:

BIOL*3300	[0.50]	Applied Bioinformatics
BOT*3410	[0.50]	Plant Anatomy
MBG*3200	[0.50]	Genetics: Our Uncertain Heritage
MBG*3600	[0.25]	Introduction to Genomics
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*3220	[0.50]	Plant Microbiology
MICR*3230	[0.50]	Immunology I
MICR*4120	[0.50]	Virology
MICR*4230	[0.50]	Immunology II
PBIO*3110	[0.50]	Crop Physiology
PBIO*4310	[1.00]	Research Opportunities in Plant Biotechnology II
PBIO*4600	[0.50]	Plant Environment Interaction and Stress

Note: Students are strongly recommended to take PBIO\*4310.

##### List B

A minimum of 1.00 credits must be taken from the following list:

CROP*2110	[0.50]	Crop Ecology
CROP*3300	[0.50]	Grain Crops
CROP*3310	[0.50]	Protein and Oilseed Crops
ENVB*3210	[0.50]	Plant Pathology
HORT*3230	[0.50]	Plant Propagation
HORT*4300	[0.50]	Postharvest Physiology
HORT*4420	[0.50]	Fruit Crops
MBG*4160	[0.50]	Plant Breeding

### Minor (Honours Program)

A minor in Plant Biotechnology requires 5.00 credits in the Plant Biotechnology Program chosen in consultation with the Faculty Advisor. The courses include:

MBG*2020	[0.50]	Introductory Molecular Biology
PBIO*3750	[0.50]	Plant Tissue Culture
PBIO*4750	[0.50]	Genetic Engineering of Plants

One of:

AGR*2470	[0.50]	Introduction to Plant Agriculture
BOT*2100	[0.50]	Life Strategies of Plants

1.50 credits from Restricted Electives List A (listed under Major above)

0.50 credits from Restricted Electives List B (listed under Major above)

1.00 credits from the following courses:

BOT*3310	[0.50]	Plant Growth and Development
BOT*4380	[0.50]	Metabolism in the Whole Life of Plants
MBG*3100	[0.50]	Plant Genetics
MBG*4300	[0.50]	Plant Molecular Genetics
PBIO*4000	[0.50]	Molecular and Cellular Aspects of Plant-Microbe Interactions

PBIO*4150	[0.50]	Molecular and Cellular Aspects of Plant Development
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### Psychology (PSYC)

Department of Psychology, College of Social and Applied Human Sciences

The B.Sc. Major in Psychology offers an opportunity for students to develop interests within learning, perception, cognition, and physiological psychology 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

Courses marked (H) are designed for students in a psychology honours program, the Information Systems and Human Behaviour program, the Developmental Psychology Minor program, the Educational Psychology Minor program, the Organizational Behaviour Minor program, the Social Psychology program, the Cognitive Neuropsychology Minor program, or Human Resources Management major of the Bachelor of Commerce program. Students in other programs wishing to take these courses must obtain the permission of

the instructors concerned. Unless otherwise specified, all other courses may be taken by general, honours, and students from other programs, providing the prerequisites are met.

**Courses designated with (H) are Honours level courses requiring for registration a cumulative average of at least 70% in all course attempts in Psychology, or registration in either the HRM Major or ISHB Major.**

### Major (Honours Program)

#### Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

One of: \*

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

#### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

One of: \*

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour

#### Semester 3

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

One of:

PSYC*2010	[0.50]	Quantification in Psychology
STAT*2040	[0.50]	Statistics I

1.00 electives \*\*

#### Semester 4

PSYC*2360	[0.50]	Introductory Research Methods
PSYC*3320	[0.50]	Statistical Principles in Psychological Research

0.50 Psychology core (PSYC\*2330, PSYC\*2390, PSYC\*2410, PSYC\*2650)

0.50 electives\*\*

One of:

PSYC*2310	[0.50]	Introduction to Social Psychology
PSYC*2450	[0.50]	Introduction to Developmental Psychology
PSYC*2740	[0.50]	Personality

#### Semester 5

PSYC*3370	[0.50]	Experimental Design and Analysis
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2.00 electives \*\*

#### Semester 6

PSYC*3250	[0.50]	Psychological Measurement
PSYC*3380	[0.50]	Non-experimental Research Methods

1.50 electives \*\*

#### Semester 7\*\*\*

2.50 electives \*\*

#### Semester 8\*\*\*

2.50 electives\*\*

\* PSYC\*1100 should be completed prior to semester 3, PSYC\*1200 prior to semester 4

\*\* Electives in semester 3-8 must satisfy the following requirements:

- 1.00 arts and/or non-psychology social science credits
- 4 credits at the 3000 level
- 2 credits at the 4000 level
- 3.5 Psychology B.Sc. elective credits from List A
- 3.5 Non-psychology B.Sc. elective credits (suitable course prefixes are provided in List B)

\*\*\* students planning to enter a graduate program in Psychology are advised to complete PSYC\*4870 and PSYC\*4880 in Semesters 7 and 8, respectively. Note that PSYC\*4370 or PSYC\*4900 must be completed prior to or concurrently with either PSYC\*4870 or PSYC\*4880

**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.

### List A Psychology B.Sc. Electives

PSYC*3030	[0.50]	Neurochemical Basis of Behaviour
PSYC*3040	[0.50]	Current Issues in Neuropsychology
PSYC*3100	[0.50]	Evolutionary Psychology
PSYC*3220	[0.50]	Ergonomics: the Scientific Study of People-System Relationships
PSYC*3330	[0.50]	Memory
PSYC*3340	[0.50]	Psycholinguistics
PSYC*3410	[0.50]	Behavioural Neuroscience II
PSYC*3430	[0.50]	Topics in Animal Learning and Cognition
PSYC*3850	[0.50]	Intellectual Disabilities
PSYC*4370	[0.50]	History of Psychology
PSYC*4600	[0.50]	Cognitive Neuroscience
PSYC*4750	[0.50]	Motivation
PSYC*4870	[0.50]	Honours Thesis I
PSYC*4880	[1.00]	Honours Thesis II
PSYC*4900	[0.50]	Psychology Seminar

### List B

List of Approved Science Electives Courses for B.Sc. students, excluding psychology: Courses with the following prefixes are examples of particularly suitable science electives for students in this program: BIOL; BIOM; CIS; ENGG; ENVB; HK; MATH; STAT; ZOO; ENVB.

### Minor (Honours Program)

A minor in Psychology requires 5.00 psychology credits as follows:

PSYC*1100	[0.50]	Principles of Behaviour
PSYC*1200	[0.50]	Dynamics of Behaviour
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

1.00 credits from courses in List A

One of:

PSYC*2010	[0.50]	Quantification in Psychology
STAT*2040	[0.50]	Statistics I

### Statistics (STAT)

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

Students in this program will acquire the ability to use modern statistical methods in a variety of applications, the theoretical understanding necessary to develop statistical methods to meet new needs and a solid preparation for further study. As well, since statistical computing is a fundamental tool for the application and development of modern statistical methods, students will develop skills in computer applications programming using such high-level languages as SAS and S-PLUS.

Students may enter this major in any semester. A student wishing to declare the major must consult the Faculty Advisor. A total of 20.00 credits is required to complete the major. Required 1000 level courses are listed under Semester 1 and Semester 2 of the recommended Schedule of Studies for Major. At least 8.00 credits in Statistics and Mathematics are required at the 2000 level or above, as follows: MATH\*2130, MATH\*2150, MATH\*2160, MATH\*2200, STAT\*2040, STAT\*2050, STAT\*3100, STAT\*3110, STAT\*3210, STAT\*3240, STAT\*3320. Five other courses (2.50 credits) in Statistics at the 3000 or 4000 level, of which at least four (2.00 credits) must be at the 4000 level. One other course (0.50 credits) in Mathematics or Statistics at the 2000 level or above.

### Recommended Schedule of Studies for Major (Honours Program)

#### Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism

0.50 Arts or Social Science electives\*

**Semester 3**

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

One of:

MATH*2150	[0.50]	Applied Matrix Algebra
MATH*2160	[0.50]	Linear Algebra I

0.50 Arts or Social Science electives

0.50 electives\*\*

**Semester 4**

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

1.50 electives\*\*

**Semester 5**

STAT*3100	[0.50]	Introductory Mathematical Statistics I
STAT*3240	[0.50]	Applied Regression Analysis
STAT*3320	[0.50]	Sampling Theory with Applications

1.00 electives\*\*

**Semester 6**

STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3210	[0.50]	Experimental Design

1.50 electives\*\*

**Semester 7**

2.50 electives\*\*

**Semester 8**

2.50 electives\*\*

\*The recommended Arts or Social Science elective can be postponed to a future semester if the student wishes to take STAT\*2040 in Semester 2.

\*\* Electives must satisfy the following requirements:

1. Electives must include at least 2.50 credits in Statistics at the 3000 or 4000 level, and an additional 0.50 credits in Statistics or Mathematics at the 2000 level or above.
2. At least 2.00 credits in Statistics must be at the 4000 level.
3. Electives plus core courses must include at least 6.00 credits at the 3000 or 4000 level from the B.Sc. Program Committee approved list of science electives.
4. At least 1.00 credits in Arts or Social Science must be completed.

**Minor (Honours Program)**

A total of 5.00 credits in Statistics and Mathematics are required, including:

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

One of:

MATH*2150	[0.50]	Applied Matrix Algebra
MATH*2160	[0.50]	Linear Algebra I

0.50 additional credits in Statistics

0.50 additional credits in Statistics or Mathematics

**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 21.25 credits. At least 1.00 of these credits must be obtained from the completion of Arts and/or Social Science courses.

**Semester 1 to 3**

The program for the first three semesters is the same as the Major in Physics program.

**Semester 4**

MATH*2170	[0.50]	Differential Equations I
PHYS*2260	[0.50]	Experimental Basis of Quantum Physics
PHYS*2450	[0.75]	Mechanics II
PHYS*2470	[0.75]	Electricity and Magnetism II

One of:\*

MATH*2210	[0.50]	Advanced Calculus II
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0.50 electives

**Semester 5**

MATH*3100	[0.50]	Differential Equations II
PHYS*3100	[0.75]	Electronics
PHYS*3230	[0.50]	Quantum Mechanics I
PHYS*3240	[0.50]	Statistical Physics I

One of:

MATH*2000	[0.50]	Set Theory
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0.50 electives

**Semester 6**

MATH*3260	[0.50]	Complex Analysis
PHYS*3220	[0.50]	Waves and Optics
PHYS*3400	[0.50]	Advanced Mechanics
PHYS*3510	[0.50]	Intermediate Laboratory
PHYS*4040	[0.50]	Quantum Mechanics II

**Semester 7**

PHYS*4120	[0.50]	Atomic and Molecular Physics
PHYS*4180	[0.50]	Advanced Electromagnetic Theory
PHYS*4240	[0.50]	Statistical Physics II

One 3000 or 4000 level mathematics course or 0.50 electives

One of:

PHYS*4500	[0.50]	Advanced Physics Laboratory
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0.50 electives

**Semester 8**

PHYS*4130	[0.50]	Subatomic Physics
PHYS*4150	[0.50]	Solid State Physics
PHYS*4510	[0.50]	Advanced Physics Project

One 3000 or 4000 level mathematics course

0.50 electives

\*those not taking MATH\*2210 in Semester 4 must consult the Department of Physics Departmental Advisor

**Wild Life Biology (WLB)****Department of Integrative Biology, College of Biological Science**

The Major in Wild Life Biology provides exposure to the ecological principles upon which the scientific management of wild life is based. This major prepares students for post-graduate work in ecology and management of wild life 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.

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 Arts or Social Science electives \*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives \*

**Semester 3**

BIOC*2580	[0.50]	Introductory Biochemistry
ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function
ZOO*2100	[0.50]	Developmental Biology

0.50 electives \*\*

**Semester 4**

BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2000	[0.50]	Introductory Genetics
NUTR*3210	[0.50]	Fundamentals of Nutrition
ZOO*2080	[0.50]	Invertebrate Zoology II

0.50 electives \*\*

**Semester 5**

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
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BIOL*3110	[0.50]	Population Ecology
BOT*2050	[0.50]	Plant Ecology
ZOO*3200	[0.50]	Comparative Animal Physiology I
ZOO*3300	[0.50]	Evolution

**Semester 6**

ANSC*3180	[0.50]	Wildlife Nutrition
BIOL*3120	[0.50]	Community Ecology
ZOO*3210	[0.50]	Comparative Animal Physiology II

1.00 electives \*\*, \*\*\*

**Semester 7 \*\*\*\***

BIOL*4110	[0.75]	Ecological Methods
ZOO*4070	[0.50]	Animal Behaviour

1.25 electives \*\*

**Semester 8**

BIOL*4150	[0.50]	Wildlife Conservation and Management
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2.00 electives \*\*

\* CIS\*1200 is recommended for those needing to improve their computer skills

\*\* suggested electives list available from faculty advisors

\*\*\* BIOL\*2250 is strongly recommended if independent research project courses are anticipated in semester 7 and/or 8

\*\*\*\* a minimum of 0.75 credits from these courses may be taken as an alternative to BIOL\*4110 in semester 7:

IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
ZOO*4300	[0.75]	Marine Biology and Oceanography
ZOO*4410	[0.75]	Field Ecology
ZOO*4600	[0.75]	Tropical Ecology
ZOO*4610	[0.75]	Arctic Ecology
ZOO*4700	[0.50]	Field Biology
ZOO*4710	[0.25]	Field Biology
ZOO*4800	[0.50]	Field Biology
ZOO*4810	[0.25]	Field Biology

Other field or research courses with approval of faculty advisor.

**Electives must include:**

1. A minimum of 1.00 credits from:

ZOO*4090	[0.50]	Ornithology
ZOO*4280	[0.50]	Mammalogy
ZOO*4430	[0.50]	Herpetology

2. At least 1.00 Arts and/or Social Science electives.

**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.

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1070	[0.50]	Introductory Physics for Life Sciences

0.50 Arts or Social Science electives \*

Students who are admitted deficient in one OAC/4U course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The first-year science core in that subject should be completed by Semester 3.

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
PHYS*1080	[0.50]	Physics for Life Sciences
STAT*2040	[0.50]	Statistics I

0.50 Arts or Social Science electives \*

**Semester 3**

ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function
ZOO*2100	[0.50]	Developmental Biology

1.00 electives \*\*

**Semester 4**

BIOL*2210	[0.50]	Introductory Cell Biology
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BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
ZOO*2080	[0.50]	Invertebrate Zoology II

0.50 electives \*\*

**Semester 5**

BIOL*3110	[0.50]	Population Ecology
ZOO*3200	[0.50]	Comparative Animal Physiology I
ZOO*3300	[0.50]	Evolution

1.00 electives \*\*

**Semester 6**

BIOL*3120	[0.50]	Community Ecology
ZOO*3210	[0.50]	Comparative Animal Physiology II

1.50 electives \*\*, \*\*\*

**Semester 7**

ZOO*3000	[0.50]	Comparative Histology
ZOO*4070	[0.50]	Animal Behaviour

1.50 electives \*\*

**Semester 8**

2.50 electives \*\*

\* CIS\*1200 is recommended for those needing to improve their computer skills

\*\* suggested electives list available from the faculty advisors

\*\*\* BIOL\*2250 is strongly recommended if independent research project courses are anticipated in semesters 7 and/or 8

**Electives must include:**

1. A minimum of 0.50 credits from:

IBIO*4500	[0.75]	Research in Integrative Biology I
IBIO*4510	[0.75]	Research in Integrative Biology II
ZOO*4170	[0.50]	Experimental Comparative Animal Physiology
ZOO*4300	[0.75]	Marine Biology and Oceanography
ZOO*4410	[0.75]	Field Ecology
ZOO*4600	[0.75]	Tropical Ecology
ZOO*4610	[0.75]	Arctic Ecology
ZOO*4700	[0.50]	Field Biology
ZOO*4710	[0.25]	Field Biology
ZOO*4800	[0.50]	Field Biology
ZOO*4810	[0.25]	Field Biology

Other field or research courses with approval of faculty advisor.

2. At least 1.00 Arts or Social Science electives.

3. This major must contain at least 6.00 science credits at the 3000 or 4000 level, which must include at least 2.00 at the 4000 level. The restricted elective in point number 1 above counts as part of this 3000 or 4000 level requirement.

**Note:** The Major in Zoology is a flexible program which allows students in consultation with faculty advisors, to design a program to meet their own needs and interests. For example, students may wish to concentrate in Evolutionary Physiology, Quantitative Zoology, or Systematic Zoology for which lists of electives are available from faculty advisors.

**Minor (Honours Program)**

Students in programs other than Zoology, Wildlife Biology, Marine and Freshwater Biology and Ecology 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 and will include:

BIOL*1030	[0.50]	Biology I
BIOL*1040	[0.50]	Biology II

4.00 additional credits in Zoology (ZOO\*) courses at the 2000 level or higher

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

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

### Program Information

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

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

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

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

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

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

#### Additional Majors:

Agricultural Economics  
Agroecosystem Management  
Agronomy  
Animal Science  
Horticultural Science  
Organic Agriculture

### Declaration of a Major

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

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

### Study Abroad

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

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

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

### Doctor of Veterinary Medicine

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

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

### Continuation of Study

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

### Conditions of Graduation

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

### Honours Agriculture (AGRS)

#### Semester 1

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

#### Semester 2

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

0.50 electives

#### Semester 3

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

0.50 restricted electives

#### Semester 4

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

One of:

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

One of:

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

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

0.50 restricted electives

#### Semester 5

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

1.50 electives or restricted electives

#### Semester 6

EDRD*3400	[0.50]	Sustainable Rural Communities
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2.00 electives

#### Semester 7 & 8

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

##### Option A:

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

##### Option B

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

3.00 electives

### Restricted Electives

1. 2 of the following Restricted Electives are required:

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

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

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

**Agricultural Economics (AGEC)****Department of Agricultural Economics and Business****Semester 1**

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

**Semester 2**

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

**Semester 3**

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

Two of:

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

0.50 electives or restricted electives

**Semester 4**

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

0.50 electives or restricted electives

**Semester 5**

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

One of:

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

1.00 electives or restricted electives

**Semester 6**

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

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

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

1.50 electives or restricted electives

**Semester 8**

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

1.50 electives or restricted electives

**Option B****Semester 7**

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

0.50 electives or restricted electives

**Semester 8**

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

1.00 electives or restricted electives

**Restricted Electives**

- Students are required to take at least 1.50 additional credits at the 3000 or 4000 level in the following subject areas: AGECE, MCS, ECON, or in an area otherwise approved by the faculty advisor. At least 1.00 of these additional credits must be at the 4000 level.
- A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.

**Agroecosystem Management (AGMN)****Department of Land Resource Science****Semester 1**

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

**Semester 2**

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

0.50 electives

**Semester 3**

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

**Semester 4**

MET*2020	[0.50]	Agrometeorology
SOIL*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management

STAT*2040	[0.50]	Statistics I
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1.00 electives or restricted electives

**Semester 5**

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

1.00 electives or restricted electives

**Semester 6**

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

One of:

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

0.50 electives or restricted electives

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

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

2.00 electives or restricted electives

**Semester 8**

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

1.50 electives or restricted electives

**Option B****Semester 7**

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

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

1.00 electives or restricted electives

**Semester 8**

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

1.00 electives or restricted electives

**Restricted Electives**

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

Climate &amp; Agroecosystems Management:

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

SOIL*4090	[0.50]	Soil Management
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Nutrient Management:

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

SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management
Organic Agriculture		
CROP*2050	[0.50]	Gateway to Organic Agriculture
CROP*2110	[0.50]	Crop Ecology
GEOL*2200	[0.50]	Glacial Geology
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management
Tropical Agroecosystem Management:		
AGEC*4210	[0.50]	World Agriculture and Economic Development
AGR*2500	[0.50]	Field Trip in International Agriculture
AGR*4000	[0.50]	Seminar in International Agriculture
GEOL*2110	[0.50]	Earth Material Science
HORT*4380	[0.50]	Tropical and Sub-Tropical Horticultural Crops
SOIL*4090	[0.50]	Soil Management
Natural Resource Management:		
ENVB*2030	[0.50]	Current Issues in Forest Science
GEOG*3610	[0.50]	Environmental Hydrology
GEOL*2200	[0.50]	Glacial Geology
SOIL*3050	[0.50]	Land Utilization
SOIL*3100	[0.50]	Resource Planning Techniques
ENVB*4780	[0.50]	Forest Ecology
Source Water Protection:		
BIOL*3450	[0.50]	Introduction to Aquatic Environments
ENVB*4020	[0.50]	Water Quality and Environmental Management
GEOG*3610	[0.50]	Environmental Hydrology
GEOL*2200	[0.50]	Glacial Geology
GEOL*3190	[0.50]	Environmental Water Chemistry
UNIV*3400	[0.50]	Watershed Planning Practice
ZOO*4350	[0.50]	Biology of Polluted Waters

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

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

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

## Agronomy (AGRO)

### Departments of Plant Agriculture, and Land Resource Science

#### Semester 1

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

#### Semester 2

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

0.50 electives

#### Semester 3

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

#### Semester 4

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

1.00 electives or restricted electives

#### Semester 5

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

0.50 electives or restricted electives

#### Semester 6

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

## Semester 7 & 8

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

### Option A:

#### Semester 7

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

1.50 electives or restricted electives

#### Semester 8

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

1.50 electives or restricted electives

### Option B

#### Semester 7

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

SOIL*4090	[0.50]	Soil Management
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0.50 electives or restricted electives

#### Semester 8

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

1.00 electives or restricted electives

### Restricted Electives

1. Select two of the following Agronomy major electives:

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

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

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

Highly Recommended courses:

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

## Animal Science (ANSC)

### Department of Animal and Poultry Science

#### Semester 1

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

#### Semester 2

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

0.50 electives

#### Semester 3

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

#### Semester 4

ANSC*2340	[0.50]	Structure of Farm Animals
BIOC*2580	[0.50]	Introductory Biochemistry
MICR*2020	[0.50]	Microbial Interactions and Associations
STAT*2040	[0.50]	Statistics I

0.50 electives

#### Semester 5

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

0.50 electives

#### Semester 6

2.50 electives or restricted electives

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

POPM\*4230 [0.50] Animal Health

2.00 electives or restricted electives

**Semester 8**

AGR\*4500 [0.50] Agrifood Industry Problem-Solving

2.00 electives or restricted electives

**Option B****Semester 7**

AGR\*4450 [1.00] Research Project in Agriculture I

POPM\*4230 [0.50] Animal Health

1.00 electives or restricted electives

**Semester 8**

AGR\*4460 [1.00] Research Project in Agriculture II

1.50 electives or restricted electives

**Restricted Electives**

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

Animal Breeding:

ANSC\*4050 [0.50] Biotechnology in Animal Science

MBG\*3060 [0.50] Quantitative Genetics

MBG\*4030 [0.50] Animal Breeding Methods

Animal Nutrition:

ANSC\*3120 [0.50] Introduction to Animal Nutrition

ANSC\*3170 [0.50] Nutrition of Fish and Crustacea

ANSC\*3180 [0.50] Wildlife Nutrition

ANSC\*4260 [0.50] Beef Cattle Nutrition

ANSC\*4270 [0.50] Dairy Cattle Nutrition

ANSC\*4280 [0.50] Poultry Nutrition

ANSC\*4290 [0.50] Swine Nutrition

ANSC\*4470 [0.50] Animal Metabolism

ANSC\*4550 [0.50] Horse Nutrition

ANSC\*4560 [0.50] Pet Nutrition

Animal Physiology and Behaviour:

ANSC\*3150 [0.50] Principles of Farm Animal Care and Welfare

ANSC\*3300 [0.50] Animal Reproduction

ANSC\*4090 [0.50] Applied Animal Behaviour

ANSC\*4100 [0.50] Environmental Management and Animal Productivity

ANSC\*4130 [0.50] Reproductive Management and Technology

ANSC\*4490 [0.50] Applied Endocrinology

2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
3. A humanities or social science course (0.50 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

**Horticultural Science (HORT)****Department of Plant Agriculture****Semester 1**

AGR\*1100 [0.50] Introduction to the Agrifood Systems

BIOL\*1030 [0.50] Biology I

CHEM\*1040 [0.50] General Chemistry I

ECON\*1050 [0.50] Introductory Microeconomics

MATH\*1080 [0.50] Elements of Calculus I

**Semester 2**

AGR\*1250 [0.50] Agrifood System Trends &amp; Issues

BIOL\*1040 [0.50] Biology II

CHEM\*1050 [0.50] General Chemistry II

ENGL\*1200 [0.50] Reading the Contemporary World

0.50 electives

**Semester 3**

AGR\*2320 [0.50] Soils in Agroecosystems

AGR\*2400 [0.50] Economics of the Canadian Food System

AGR\*2470 [0.50] Introduction to Plant Agriculture

BOT\*2100 [0.50] Life Strategies of Plants

0.50 electives or restricted electives

**Semester 4**

BIOC\*2580 [0.50] Introductory Biochemistry

STAT\*2040 [0.50] Statistics I

1.50 electives or restricted electives

**Semester 5**

FOOD\*3070 [0.50] Introduction to Food Processing

HORT\*3230 [0.50] Plant Propagation

HORT\*3510 [0.50] Vegetable Production

PBIO\*3110 [0.50] Crop Physiology

0.50 electives or restricted electives

**Semester 6**

EDRD\*3400 [0.50] Sustainable Rural Communities

HORT\*3280 [0.50] Greenhouse Production

1.50 electives or restricted electives

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

HORT\*4420 [0.50] Fruit Crops

SOIL\*4090 [0.50] Soil Management

1.50 electives or restricted electives

**Semester 8**

AGR\*4500 [0.50] Agrifood Industry Problem-Solving

HORT\*4300 [0.50] Postharvest Physiology

1.50 electives or restricted electives

**Option B****Semester 7**

AGR\*4450 [1.00] Research Project in Agriculture I

HORT\*4420 [0.50] Fruit Crops

SOIL\*4090 [0.50] Soil Management

0.50 electives or restricted electives

**Semester 8**

AGR\*4460 [1.00] Research Project in Agriculture II

HORT\*4300 [0.50] Postharvest Physiology

1.00 electives or restricted electives

**Restricted Electives**

1. Select two of the following Horticulture major electives:

CROP\*4240 [0.50] Weed Science

ENVB\*3210 [0.50] Plant Pathology

ENVB\*4100 [0.50] Applied Entomology

PBIO\*3750 [0.50] Plant Tissue Culture

PBIO\*4750 [0.50] Genetic Engineering of Plants

2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
3. A humanities or social science course (0.50 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

**Organic Agriculture(OAGR)****Department of Plant Agriculture and Department of Land Resource Science****Semester 1**

AGR\*1100 [0.50] Introduction to the Agrifood Systems

BIOL\*1030 [0.50] Biology I

CHEM\*1040 [0.50] General Chemistry I

ECON\*1050 [0.50] Introductory Microeconomics

MATH\*1080 [0.50] Elements of Calculus I

**Semester 2**

AGR\*1250 [0.50] Agrifood System Trends &amp; Issues

BIOL\*1040 [0.50] Biology II

CHEM\*1050 [0.50] General Chemistry II

ENGL\*1200 [0.50] Reading the Contemporary World

0.50 electives

**Semester 3**

AGR\*2320 [0.50] Soils in Agroecosystems

AGR\*2350 [0.50] Animal Production Systems and Industry

AGR\*2400 [0.50] Economics of the Canadian Food System

AGR\*2470 [0.50] Introduction to Plant Agriculture

CROP\*2050 [0.50] Gateway to Organic Agriculture

**Semester 4**

STAT\*2040 [0.50] Statistics I

GEOL\*3130 [0.50] Agrogeology

1.50 electives or restricted electives

**Semester 5**

AGR\*3500 [0.50] Experiential Education

BOT\*2100 [0.50] Life Strategies of Plants

FOOD\*3070 [0.50] Introduction to Food Processing

SOIL\*3030 [0.50] Tutorials in Organic Agriculture I

0.50 electives or restricted electives

### Semester 6

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

1.50 electives or restricted electives

### Semester 7

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

1.50 electives or restricted electives

### Semester 8

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

1.50 electives or restricted electives

### Restricted Electives

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

ANSC*2360	[0.50]	Challenges and Opportunities in Animal Production
ANSC*3150	[0.50]	Principles of Farm Animal Care and Welfare
CROP*2110	[0.50]	Crop Ecology
CROP*4240	[0.50]	Weed Science
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3210	[0.50]	Plant Pathology
ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*4100	[0.50]	Applied Entomology
GEOG*3320	[0.50]	Agriculture and Society
HORT*3260	[0.50]	Woody Plants
PBIO*4100	[0.50]	Soil Plant Relationships
PHIL*2070	[0.50]	Philosophy of the Environment
REXT*2000	[0.50]	Introduction to Rural Extension
SOAN*4220	[0.50]	Canadian Rural Women
SOC*3380	[0.50]	Society and Nature
SOC*4210	[0.50]	Advanced Topics in Rural Sociology
SOIL*3170	[0.50]	Soil Processes in Landscape
SOIL*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management

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

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

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

### Electives

#### List A - Preferred Electives in Humanities and Social Science

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

#### List B - Electives in Agricultural Science and Related Disciplines

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

#### Agricultural Economics and Business

*Department of Agricultural Economics and Business*

Business Management:

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

Farm Management:

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

Finance:

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

Operations:

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

Prices and Policy:

AGEC*3030	[0.50]	The Firm and Markets
AGEC*4000	[0.50]	Agricultural and Food Policy
ECON*2770	[0.50]	Introductory Mathematical Economics
ECON*3740	[0.50]	Introduction to Econometrics
Resource and Environmental Economics:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGEC*4290	[0.50]	Land Economics
AGEC*4310	[0.50]	Resource Economics
ECON*2410	[0.50]	Intermediate Macroeconomics
Sales and Marketing:		
AGEC*4240	[0.50]	Futures and Options Markets
AGEC*4360	[0.50]	Marketing Research
AGEC*4370	[0.50]	Marketing Management
AGEC*4410	[0.50]	Sales and Sales Management

### Agronomy

*Department of Plant Agriculture, and Department of Land Resource Science*

Crop Management Systems:

CROP*4220	[0.50]	Cropping Systems
CROP*4240	[0.50]	Weed Science

One of:

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

Crop Physiology:

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

Plant Biotechnology:

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

One of:

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

Plant Genetic Resources:

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

One of:

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

Soil Management and Fertility:

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

One of:

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

Waste Management/Agriculture:

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

Water Management/Agriculture:

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

### Animal and Poultry Science

*Department of Animal and Poultry Science*

Animal Breeding:

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

Animal Nutrition:

ANSC*3120	[0.50]	Introduction to Animal Nutrition
ANSC*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*4550	[0.50]	Horse Nutrition
ANSC*4560	[0.50]	Pet Nutrition

Animal Physiology and Behaviour:

ANSC*3300	[0.50]	Animal Reproduction
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ANSC*4130	[0.50]	Reproductive Management and Technology
ANSC*4490	[0.50]	Applied Endocrinology
ANSC*4090	[0.50]	Applied Animal Behaviour
ANSC*4100	[0.50]	Environmental Management and Animal Productivity

**Environmental Biology***Department of Environmental Biology*

## Environmental Stress Physiology:

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

## Pest Management:

CROP*4240	[0.50]	Weed Science
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3210	[0.50]	Plant Pathology
ENVB*4100	[0.50]	Applied Entomology

**Food Science***Department of Food Science*

## Food Business:

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

## Food Science:

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

## Food Technology:

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

**Horticultural Science***Department of Plant Agriculture*

## Fruit/Vegetable Horticulture:

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

## Ornamental Horticulture:

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

## Urban Horticulture &amp; Environmental Management:

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

**Interdepartmental/Interdisciplinary**

## Animal Health:

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

## Aquatic Health:

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

## Biotechnology:

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

## International Development:

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

## Toxicology:

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

**Land Resource Science**

## Agroforestry:

BOT*2050	[0.50]	Plant Ecology
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*4780	[0.50]	Forest Ecology
HORT*3260	[0.50]	Woody Plants
SOIL*4090	[0.50]	Soil Management

## Atmospheric Science:

GEOG*2110	[0.50]	Climate and the Biophysical Environment
MET*2020	[0.50]	Agrometeorology
MET*2030	[0.50]	Meteorology and Climatology
MET*3050	[0.50]	Microclimatology
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry

## Computer-Assisted Resource Analysis:

CIS*1500	[0.50]	Introduction to Programming
GEOG*2480	[0.50]	Mapping and GIS
GEOG*4480	[0.50]	Applied Geographic Information Systems
SOIL*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
SOIL*3600	[0.50]	Remote Sensing

## One of:

ENGG*3340	[0.50]	Geographic Information Systems in Environmental Engineering
GEOG*3480	[0.50]	GIS and Spatial Analysis

## Natural Resource Management:

GEOG*3320	[0.50]	Agriculture and Society
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
SOIL*3050	[0.50]	Land Utilization
SOIL*3100	[0.50]	Resource Planning Techniques
SOIL*4110	[0.50]	Natural Resources Management Field Camp

## Soil Science:

GEOL*4130	[0.50]	Clay and Humic Chemistry
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4070	[0.50]	Problems in Land Resource Science
SOIL*4090	[0.50]	Soil Management
SOIL*4170	[0.50]	Soil Processes in the Landscape

## Terrestrial Ecology:

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

**Rural Extension Studies**

## Communications:

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

## Bachelor of Science in Engineering [B.Sc.(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 systems and computing, biological, environmental 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; 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 the Canadian Council of Professional Engineers. 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. 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 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.Sc.(Eng.) Program Guide available from the director or program counsellor of the School of Engineering.

#### Programs

The choice of program is made at the time of application. Change of program requires the approval of the director.

The available programs are:

**Biological Engineering** - the application of engineering to the control and management of biological processes, environments, and human factors in engineering design.

**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.

**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 OAC courses are advised to consult the Recommendations and Notes in Section IV--Admission Information-B.Sc.(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.Sc. (Eng.) program and will not be readmitted to the degree program if the same course is failed three times.

Normally, students in the B.Sc. (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.Sc. (Eng.) program, obtaining a minimum of 23.50 credits 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.SC. (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.

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 (i.e. be a Canadian citizen or a permanent resident in Canada)
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.

Co-op Work Schedule					
	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Yr. 5
Fall	1	3	5	6	work
Winter	2	4	work	7	8
Spring		work	work	work	

All candidates must complete a minimum of 4 of the preceding 5 work terms.

#### 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
HIST*1250	[0.50]	Science and Society Since 1500
MATH*1200	[0.50]	Calculus I

##### Semester 2 - Regular or Co-op

CHEM*1050	[0.50]	General Chemistry II
ENGG*1210	[0.50]	Engineering Mechanics I
ENGG*1500	[0.50]	Engineering Analysis
MATH*1210	[0.50]	Calculus II
PHYS*1130	[0.50]	Physics with Applications

##### Semester 3 - Regular or Co-op

COOP*1100	[0.00]	Introduction to Co-operative Education
ENGG*2100	[0.75]	Engineering and Design II
ENGG*2120	[0.50]	Material Science
ENGG*2160	[0.50]	Engineering Mechanics II



ENGG*2400	[0.50]	Engineering Systems Analysis
MATH*2270	[0.50]	Applied Differential Equations
MICR*1020	[0.50]	Fundamentals of Applied Microbiology

**Semester 4 - Regular or Co-op**

BIOC*2580	[0.50]	Introductory Biochemistry
ENGG*2230	[0.50]	Fluid Mechanics
ENGG*2450	[0.50]	Network Theory
ENGG*2660	[0.50]	Biological Engineering Systems I
MATH*2130	[0.50]	Numerical Methods
STAT*2120	[0.50]	Probability and Statistics for Engineers

**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

0.50 restricted electives

**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*4390	[0.75]	Bio-instrumentation Design
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2.75 restricted electives

**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)**

- 2.00 credits in Complementary Studies Electives
- 0.75 credits in required Design electives
- 1.00 credits in Biological Engineering Electives
- 1.00 credits in Life Science Electives
- 0.50 credits in Free 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
HIST*1250	[0.50]	Science and Society Since 1500
MATH*1200	[0.50]	Calculus I

**Semester 2 - Regular or Co-op**

CIS*1900	[0.50]	Discrete Structures in Computer Science
CIS*2500	[0.50]	Intermediate Programming
ENGG*1210	[0.50]	Engineering Mechanics I
ENGG*1500	[0.50]	Engineering Analysis
MATH*1210	[0.50]	Calculus II
PHYS*1130	[0.50]	Physics with Applications

**Semester 3 - Regular or Co-op**

CIS*2430	[0.50]	Object Oriented Programming
COOP*1100	[0.00]	Introduction to Co-operative Education
ENGG*2100	[0.75]	Engineering and Design II
ENGG*2120	[0.50]	Material Science
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**

CIS*3110	[0.50]	Operating Systems
ENGG*2230	[0.50]	Fluid Mechanics

ENGG*2450	[0.50]	Network Theory
MATH*2130	[0.50]	Numerical Methods
STAT*2120	[0.50]	Probability and Statistics for Engineers

0.50 restricted electives

**Semester 5 - Regular or Co-op**

CIS*2520	[0.50]	Data Structures
ENGG*3260	[0.50]	Thermodynamics
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**

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 or 1.25 restricted electives

**Semester 7 Regular / Semester 6 Co-op**

ENGG*3240	[0.50]	Engineering Economics
ENGG*4420	[0.75]	Real-time Systems Design
ENGG*4450	[0.50]	Large-Scale Software Architecture Engineering

1.00 or 1.25 restricted electives

**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)**

2.00 credits in Complementary Studies

1.50 credits in ES&amp;C Engineering Electives

0.75 credits in Engineering Design Electives

**Environmental Engineering Program Regular and Co-op (ENVE/ENVE:C)****School of Engineering, College of Physical and Engineering Science**

In recent years there has been concern about the degradation of the environment. The School of Engineering has responded to this concern by developing an Environmental Engineering program. Graduates will possess design and skills to minimize and prevent the impact of human activities on water, soil and air systems. 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
HIST*1250	[0.50]	Science and Society Since 1500
MATH*1200	[0.50]	Calculus I

**Semester 2 - Regular or Co-op**

CHEM*1050	[0.50]	General Chemistry II
ENGG*1210	[0.50]	Engineering Mechanics I
ENGG*1500	[0.50]	Engineering Analysis
MATH*1210	[0.50]	Calculus II
PHYS*1130	[0.50]	Physics with Applications

**Semester 3 - Regular or Co-op**

COOP*1100	[0.00]	Introduction to Co-operative Education
ENGG*2100	[0.75]	Engineering and Design II
ENGG*2120	[0.50]	Material Science
ENGG*2400	[0.50]	Engineering Systems Analysis
MATH*2270	[0.50]	Applied Differential Equations

0.50 restricted electives

One of:

BIOL*1030	[0.50]	Biology I
MICR*1020	[0.50]	Fundamentals of Applied Microbiology

**Semester 4 - Regular or Co-op**

ENGG*2230	[0.50]	Fluid Mechanics
ENGG*2450	[0.50]	Network Theory
ENGG*2560	[0.50]	Environmental Engineering Systems
MATH*2130	[0.50]	Numerical Methods
STAT*2120	[0.50]	Probability and Statistics for Engineers

One of:

BIOL*1040	[0.50]	Biology II
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0.50 restricted electives

Note: Students select 0.50 restricted electives in Semester 4 if MICR\*1020 was selected in Semester 3.

**Semester 5 - Regular or Co-op**

ENGG*3180	[0.50]	Air Quality
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ENGG*3240	[0.50]	Engineering Economics
ENGG*3260	[0.50]	Thermodynamics
ENGG*3590	[0.50]	Water Quality
ENGG*3650	[0.50]	Hydrology

0.50 restricted electives

#### 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
ENGG*3470	[0.50]	Mass Transfer Operations

1.00 restricted electives

#### Semester 7 Regular / Semester 6 Co-op

ENGG*3670	[0.50]	Soil Mechanics
ENGG*4330	[0.75]	Air Pollution Control
ENGG*4340	[0.50]	Solid and Hazardous Waste Management
ENGG*4370	[0.75]	Urban Water Systems Design

0.50 restricted electives

#### Semester 8 - Regular or Co-op

ENGG*4130	[1.00]	Environmental Engineering Design IV
ENGG*4260	[0.75]	Water and Wastewater Treatment Design
GEOL*3060	[0.50]	Groundwater

0.50 restricted electives

#### Restricted Electives

Environmental engineering students must complete the following restricted electives (see Program Guide for more information). You can take these courses where Restricted Electives are indicated in the schedule of courses. A maximum of three 1000 level electives is allowed. Restricted electives must include:

2.00 credits in Complementary Studies electives

0.50 credits in Free electives

0.50 credits in Science/Engineering electives

One of:

0.50 credits in Science electives (if MICR\*1020 is selected in Semester 3)

BIOL\*1040 (if BIOL\*1030 is selected in Semester 3)

Note: The following courses should not be used as Free Electives:

CHEM*2820	[0.50]	Thermodynamics and Kinetics
CHEM*2880	[0.50]	Physical Chemistry
GEOG*3620	[0.50]	Desert Environments
GEOL*3190	[0.50]	Environmental Water Chemistry
PHYS*1600	[0.50]	Contemporary Astronomy
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3080	[0.50]	Soil and Water Conservation
TOX*3360	[0.50]	Environmental Chemistry and Toxicology

#### Minor (Honours Program)

Students must be registered in the B.Sc.(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]	Introductory Biochemistry
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
ENGG*3180	[0.50]	Air Quality
ENGG*3590	[0.50]	Water Quality
ENGG*4260	[0.75]	Water and Wastewater Treatment Design
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
MICR*1020	[0.50]	Fundamentals of Applied Microbiology
MICR*4180	[0.50]	Microbial Processes in Environmental Management

One of:

ENGG*2560	[0.50]	Environmental Engineering Systems
ENGG*2660	[0.50]	Biological Engineering Systems I

One of:

ENGG*3470	[0.50]	Mass Transfer Operations
ENGG*4330	[0.75]	Air Pollution Control
ENGG*4340	[0.50]	Solid and Hazardous Waste Management

Students must select an environmental application project for the design course in the student's major program.

#### 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. 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
HIST*1250	[0.50]	Science and Society Since 1500
MATH*1200	[0.50]	Calculus I

##### Semester 2 - Regular or Co-op

CHEM*1050	[0.50]	General Chemistry II
ENGG*1210	[0.50]	Engineering Mechanics I
ENGG*1500	[0.50]	Engineering Analysis
MATH*1210	[0.50]	Calculus II
PHYS*1130	[0.50]	Physics with Applications

##### Semester 3 - Regular or Co-op

COOP*1100	[0.00]	Introduction to Co-operative Education
ENGG*2100	[0.75]	Engineering and Design II
ENGG*2120	[0.50]	Material Science
ENGG*2400	[0.50]	Engineering Systems Analysis
GEOG*2000	[0.50]	Geomorphology
MATH*2270	[0.50]	Applied Differential Equations
MICR*1020	[0.50]	Fundamentals of Applied Microbiology

##### Semester 4 - Regular or Co-op

ENGG*2230	[0.50]	Fluid Mechanics
ENGG*2450	[0.50]	Network Theory
ENGG*2550	[0.50]	Water Management
ENGG*2560	[0.50]	Environmental Engineering Systems
MATH*2130	[0.50]	Numerical Methods
STAT*2120	[0.50]	Probability and Statistics for Engineers

##### 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*3430	[0.50]	Heat and Mass Transfer
GEOL*3060	[0.50]	Groundwater

1.50 restricted electives

##### Semester 7 Regular / Semester 6 Co-op

ENGG*3340	[0.50]	Geographic Information Systems in Environmental Engineering
ENGG*4250	[0.75]	Watershed Systems Design
ENGG*4360	[0.75]	Soil-Water Conservation Systems Design
ENGG*4370	[0.75]	Urban Water Systems Design

0.50 restricted electives

##### Semester 8 (Winter) Regular or Co-op

ENGG*4150	[1.00]	Water Resources Engineering Design IV
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1.50 restricted electives

#### Restricted Electives (see Program Guide for more information)

- 1.00 credits in Water Resources Engineering electives
- 0.50 credits in Environmental electives
- 2.00 credits in Complementary Studies
- 0.50 credits in Water Resources electives

#### Food Engineering (FENG)

##### School of Engineering, College of Physical and Engineering Science

#### Minor (Honours Program)

Students must be registered in the B.Sc.(Eng.) degree program to apply for a Minor in Food Engineering.

The minor can be satisfied by taking the following additional courses:

AGEC*2220	[0.50]	Financial Accounting
BIOC*2580	[0.50]	Introductory 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

0.75 Biological Engineering Design Course\*

One of:

ENGG*4300	[0.75]	Food Processing Engineering Design
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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] Cereal Technology

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 select a food application project for the design course in the student's major program*

**NOTE:** Courses taken for the minors are credited to appropriate elective areas.

## 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 problem solving perspective 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 both good writing ability and oral communication ability. This is emphasized particularly in the Environmental Sciences core courses, starting in first year, and running through to fourth year. Students in the final years 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, Faculty of Environmental Sciences. 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 qualify for graduation from the B.Sc.(Env.) program, the student must have completed successfully the stated course requirements for the program.

#### Environmental Sciences (Co-op)

Office of the Associate Dean, Faculty of Environmental Sciences.

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 program 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 the semester preceding COOP\*1000 (ie. in semester 2).

Year	Fall	Winter	Spring
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		

Since some of the program requirements in the degree program (core, major, area of emphasis) 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 20.00 credits, as follows:

1. 5.00 First Year Curriculum
2. 3.00 Environmental Sciences Core
3. 7.00-8.00 Environmental Sciences Major
4. 2.50 minimum Area of Emphasis
5. 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.

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*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

##### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

\*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 below:

BIOL*2060	[0.50]	Ecology
ENVS*2010	[0.50]	Decision-making and Communication Skills
ENVS*4011/2	[0.50]	Colloquium/Project in Environmental Sciences
PHIL*2070	[0.50]	Philosophy of the Environment

Note: BIOL\*2060 is to be taken in Semester 3 or 4, ENVS\*2010 is to be taken in Semester 3, the series ENVS\*4011, ENVS\*4012 is to be taken consecutively during the last complete academic year (F-W) Semester 7/8 or Semester 6/7 (Co-op), and PHIL\*2070 is to be taken in Semester 4, 5 or 6 (preference is earlier in program).

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

Note: Either AGECE\*2700 or ECON\*2100 is to be taken in Semester 3.

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Policy Formation and Administration
ZOO*4050	[0.50]	Natural Resources Policy

Note: One of GEOG\*3210 and POLS\*3370 are to be taken in Semester 4 or 6 or ZOO\*4050 is to be taken in Semester 7 or 8.

#### Environmental Sciences Majors

Earth and Atmospheric Science

Ecology

Environmental Economics and Policy

Environmental Geography

Environmental Monitoring and Analysis

Environmental Protection

Environmetrics

Natural Resources Management

Requirements for each of these majors are described in the detailed schedules of studies below.

#### Area of Emphasis Requirements

All students must choose an area of emphasis consisting of a minimum of 2.50 credits in a particular topic area. These are listed after "Schedules of Studies". The sequence of courses normally begins in third year. With the approval of the Program Counsellor, students may develop their own area of emphasis. All areas of emphasis must be approved by the Program Counsellor. Students should note that entry to certain areas of emphasis is restricted by the student's choice of major. Thus program approval should be gained before registering in courses to count towards their area of emphasis.

#### Earth and Atmospheric Science (EAAS)

Department of Land Resource Science, Ontario Agricultural College

##### Major

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.

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

##### Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3**

GEOG*1050	[0.50]	Geology and the Environment
MET*2030	[0.50]	Meteorology and Climatology
STAT*2040	[0.50]	Statistics I

1.00 core requirements or electives

**Semester 4**

SOIL*2010	[0.50]	Soil Science
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2.00 core requirements or electives

**Semester 5**

GEOG*2110	[0.50]	Earth Material Science
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1.50 core requirements, restricted electives or electives

One of:

MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II
STAT*2050	[0.50]	Statistics II

**Semester 6**

SOIL*3600	[0.50]	Remote Sensing
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One of:

GEOG*3060	[0.50]	Groundwater
SOIL*3070	[0.50]	Environmental Soil Physics

1.50 core requirements, restricted electives or electives

**Semester 7**

SOIL*4210	[0.50]	Earth and Atmospheric Science Field Camp
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2.00 core requirements, restricted electives or electives

**Semester 8**

2.50 core requirements, restricted electives or electives

**Restricted Electives**

Students in the Earth and Atmospheric Science major are required to choose 2.50 credits from the following lists. Students are encouraged to consult with the faculty advisor for assistance.

**List A - Environmental Geology**

GEOG*2020	[0.50]	Stratigraphy
GEOG*2200	[0.50]	Glacial Geology
GEOG*3100	[0.50]	Non-Renewable Earth Resources
GEOG*3130	[0.50]	Agrogeology
GEOG*4090	[0.50]	Sedimentology
GEOG*4130	[0.50]	Clay and Humic Chemistry

**List B - Soil Science**

PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*3170	[0.50]	Soil Processes in Landscape
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management

**List C - Water**

ENGG*2550	[0.50]	Water Management
ENGG*3650	[0.50]	Hydrology
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*4150	[0.50]	Sedimentary Processes
GEOG*3190	[0.50]	Environmental Water Chemistry
SOIL*3080	[0.50]	Soil and Water Conservation

**List D - Atmosphere**

GEOG*2110	[0.50]	Climate and the Biophysical Environment
MET*3050	[0.50]	Microclimatology
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry

**Earth and Atmospheric Science (EAAS:C)**

Department of Land Resource Science, Ontario Agricultural College

**Major**

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.

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

**Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVV*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3 - Fall**

GEOG*1050	[0.50]	Geology and the Environment
MET*2030	[0.50]	Meteorology and Climatology
STAT*2040	[0.50]	Statistics I

1.00 core requirements or electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

SOIL*2010	[0.50]	Soil Science
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One of:

MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II
STAT*2050	[0.50]	Statistics II

1.50 core requirements, restricted electives or electives

**Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

SOIL*3600	[0.50]	Remote Sensing
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One of:

GEOG*3060	[0.50]	Groundwater
SOIL*3070	[0.50]	Environmental Soil Physics

1.50 core requirements, restricted electives or electives

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6- Fall**

GEOG*2110	[0.50]	Earth Material Science
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2.00 core requirements, restricted electives or electives

**Semester 7- Winter**

2.50 core requirements, restricted electives or electives

**Summer Semester (Optional)**

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 8**

SOIL*4210	[0.50]	Earth and Atmospheric Science Field Camp
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2.00 core requirements, restricted electives or electives

**Restricted Electives**

Students in the Earth and Atmospheric Science major are required to choose 2.50 credits from the following lists. Students are encouraged to consult with the faculty advisor for assistance.

**List A - Environmental Geology**

GEOG*2020	[0.50]	Stratigraphy
GEOG*2200	[0.50]	Glacial Geology
GEOG*3100	[0.50]	Non-Renewable Earth Resources
GEOG*3130	[0.50]	Agrogeology
GEOG*4090	[0.50]	Sedimentology
GEOG*4130	[0.50]	Clay and Humic Chemistry

**List B - Soil Science**

PBIO*4100	[0.50]	Soil Plant Relationships
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*3170	[0.50]	Soil Processes in Landscape
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management

**List C - Water**

ENGG*2550	[0.50]	Water Management
ENGG*3650	[0.50]	Hydrology
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*4150	[0.50]	Sedimentary Processes
GEOG*3190	[0.50]	Environmental Water Chemistry

SOIL*3080	[0.50]	Soil and Water Conservation
<b>List D - Atmosphere</b>		
GEOG*2110	[0.50]	Climate and the Biophysical Environment
MET*3050	[0.50]	Microclimatology
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry

**Ecology (ECOL)****College of Biological Science****Major**

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.

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3**

BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*2300	[0.50]	Chemical Reactivity
STAT*2040	[0.50]	Statistics I

1.00 core requirements or electives

**Semester 4**

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*3110	[0.50]	Population Ecology
MBG*2000	[0.50]	Introductory Genetics
STAT*2050	[0.50]	Statistics II

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

**Semester 5**

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
BIOL*3120	[0.50]	Community Ecology

One of:

BOT*3410	[0.50]	Plant Anatomy
ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I

0.50 core requirements or electives

**Semester 6**

One of:

MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution

2.00 core requirements or electives

**Semester 7**

BIOL*4110	[0.75]	Ecological Methods
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1.75 core requirements or electives

**Semester 8**

BIOL*4120	[0.50]	Evolutionary Ecology
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2.00 core requirements or electives

**Note:** Ecology majors are not required to complete BIOL\*2060 as a core course.

**Ecology (ECOL:C)****College of Biological Science****Major**

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.

**Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I

PHYS*1080	[0.50]	Physics for Life Sciences
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**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3 - Fall**

BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*2300	[0.50]	Chemical Reactivity
STAT*2040	[0.50]	Statistics I

1.00 core requirements or electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4-Summer**

BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
STAT*2050	[0.50]	Statistics II

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

0.50 core requirements or electives

**Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5- Winter**

BIOL*3110	[0.50]	Population Ecology
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One of:

BOT*3410	[0.50]	Plant Anatomy
ZOO*2070	[0.50]	Invertebrate Zoology I
ZOO*2090	[0.50]	Vertebrate Structure and Function

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I

1.00 core requirements or electives

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6- Fall**

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
BIOL*3120	[0.50]	Community Ecology

One of:

MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution

1.50 core requirements or electives

**Semester 7- Winter**

BIOL*4120	[0.50]	Evolutionary Ecology
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2.00 core requirements or electives

**Summer Semester (Optional)**

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 8**

BIOL*4110	[0.75]	Ecological Methods
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1.75 core requirements or electives

**Note:** Ecology majors are not required to complete BIOL\*2060 as a core course.

**Environmental Economics and Policy (EEP)****Department of Economics, College of Social and Applied Human Sciences****Department of Agricultural Economics and Business, Ontario Agricultural College****Major**

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.

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

<b>Semester 3</b>			<b>Summer Semester</b>		
AGEC*2700	[0.50]	Survey of Natural Resource Economics	COOP*3000	[0.00]	Co-op Work Term III
ECON*1100	[0.50]	Introductory Macroeconomics	<b>Semester 6 - Fall</b>		
ECON*2100	[0.50]	Economic Growth and Environmental Quality	AGEC*4290	[0.50]	Land Economics *
1.00 core requirements, restricted electives or electives			ECON*3710	[0.50]	Advanced Microeconomics
<b>Semester 4</b>			1.50 core requirements, restricted electives or electives		
ECON*2310	[0.50]	Intermediate Microeconomics	<b>Semester 7 - Winter</b>		
ECON*2740	[0.50]	Economic Statistics *	AGEC*4310	[0.50]	Resource Economics
1.50 core requirements, restricted electives or electives			ECON*3740	[0.50]	Introduction to Econometrics
<b>Semester 5</b>			2.00 core requirements, restricted electives or electives		
AGEC*4290	[0.50]	Land Economics **	<b>Summer Semester (Optional)</b>		
ECON*2410	[0.50]	Intermediate Macroeconomics	COOP*4000	[0.00]	Co-op Work Term IV
ECON*2770	[0.50]	Introductory Mathematical Economics	<b>Semester 8</b>		
1.00 core requirements, restricted electives or electives			ECON*4930	[0.50]	Environmental Economics
<b>Semester 6</b>			2.00 core requirements, restricted electives or electives		
ECON*3740	[0.50]	Introduction to Econometrics	*AGEC*4290 is taught in even-numbered years		
2.00 core requirements, restricted electives or electives			<b>Restricted Electives</b>		
<b>Semester 7</b>			Students in the Environmental Economics and Policy major are required to choose 2.00 credits additional Agricultural Economics and Business (AGEC*XXXX) or Economics (ECON*XXXX). Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000-4000 level.		
ECON*3710	[0.50]	Advanced Microeconomics ***	<b>Environmental Geography (ENVG)</b>		
ECON*4930	[0.50]	Environmental Economics ***	<b>Department of Geography, College of Social and Applied Human Sciences</b>		
1.50 core requirements, restricted electives or electives			<b>Major</b>		
<b>Semester 8</b>			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.		
AGEC*4310	[0.50]	Resource Economics	<b>Semester 1</b>		
2.00 core requirements, restricted electives or electives			BIOL*1030	[0.50]	Biology I
* Students may select between ECON*2740 and STAT*2040			CHEM*1300	[0.50]	Introductory Environmental Chemistry
**AGEC*4290 is taught in even-numbered years			ENVS*1010	[0.50]	Introduction to Environmental Sciences
*** students must obtain permission from instructor to take ECON*4930 and ECON*3710 at the same time			MATH*1080	[0.50]	Elements of Calculus I
<b>Restricted Electives</b>			PHYS*1080	[0.50]	Physics for Life Sciences
Students in the Environmental Economics and Policy major are required to choose 2.00 credits additional Agricultural Economics and Business (AGEC*XXXX) or Economics (ECON*XXXX). Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000-4000 level.			<b>Semester 2</b>		
<b>Environmental Economics and Policy (EEP:C)</b>			BIOL*1040	[0.50]	Biology II
<b>Department of Economics, College of Social and Applied Human Sciences</b>			CHEM*1310	[0.50]	Introductory Environmental Chemistry II
<b>Department of Agricultural Economics and Business, Ontario Agricultural College</b>			ECON*1050	[0.50]	Introductory Microeconomics
<b>Major</b>			GEOG*1300	[0.50]	Introduction to the Biophysical Environment
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.			PHYS*1130	[0.50]	Physics with Applications
<b>Semester 1 - Fall</b>			<b>Semester 3</b>		
BIOL*1030	[0.50]	Biology I	GEOG*2000	[0.50]	Geomorphology
CHEM*1300	[0.50]	Introductory Environmental Chemistry	GEOG*2460	[0.50]	Analysis in Geography
ENVS*1010	[0.50]	Introduction to Environmental Sciences	1.50 core requirements or electives		
MATH*1080	[0.50]	Elements of Calculus I	<b>Semester 4</b>		
PHYS*1080	[0.50]	Physics for Life Sciences	GEOG*2110	[0.50]	Climate and the Biophysical Environment
<b>Semester 2 - Winter</b>			GEOG*2210	[0.50]	Environment and Resources
BIOL*1040	[0.50]	Biology II	GEOG*2480	[0.50]	Mapping and GIS
CHEM*1310	[0.50]	Introductory Environmental Chemistry II	1.00 core requirements or electives		
COOP*1100	[0.00]	Introduction to Co-operative Education	<b>Semester 5</b>		
ECON*1050	[0.50]	Introductory Microeconomics	GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*1300	[0.50]	Introduction to the Biophysical Environment	GEOG*3210	[0.50]	Management of the Biophysical Environment *
PHYS*1130	[0.50]	Physics with Applications	1.50 core requirements, restricted electives** or electives		
<b>Semester 3 - Fall</b>			<b>Semester 6</b>		
AGEC*2700	[0.50]	Survey of Natural Resource Economics	GEOG*3480	[0.50]	GIS and Spatial Analysis
ECON*1100	[0.50]	Introductory Macroeconomics	2.00 core requirements, restricted electives** or electives		
ECON*2100	[0.50]	Economic Growth and Environmental Quality	<b>Semester 7</b>		
1.00 core requirements, restricted electives or electives			GEOG*4690	[1.00]	Geography Field Research
<b>Winter Semester</b>			1.50 core requirements, restricted electives** or electives		
COOP*1000	[0.00]	Co-op Work Term I	OR		
<b>Semester 4 - Summer</b>			0.50 credits in Geography at the 3000-4000 level		
ECON*2310	[0.50]	Intermediate Microeconomics	2.00 core requirements, restricted electives** or electives		
ECON*2410	[0.50]	Intermediate Macroeconomics	<b>Semester 8</b>		
STAT*2040	[0.50]	Statistics I	GEOG*4880	[0.50]	Contemporary Geographic Thought
1.00 core requirements, restricted electives or electives			2.00 core requirements, restricted electives** or electives		
<b>Fall Semester</b>			* Note: Environmental Geography majors are required to complete GEOG*3210 and (POLS*3370 or ZOO*4050).		
COOP*2000	[0.00]	Co-op Work Term II	** students in the Environmental Geography major must take at least 4 additional geography courses at the 3000-4000 level including:		
<b>Semester 5 - Winter</b>			At least one of:		
ECON*2770	[0.50]	Introductory Mathematical Economics	GEOG*3000	[0.50]	Fluvial Processes
2.00 core requirements, restricted electives or electives			GEOG*3610	[0.50]	Environmental Hydrology

GEOG*3620	[0.50]	Desert Environments
At least two of:		
ENVS*4220	[0.50]	Environmental Impact Assessment
GEOG*3020	[0.50]	Global Environmental Change
GEOG*4110	[0.50]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Resource Analysis

### Environmental Geography (ENVG:C)

Department of Geography, College of Social and Applied Human Sciences

#### Major

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are strongly encouraged to seek advice from the appropriate advisor when selecting and scheduling courses, **before Semester 3**.

#### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

#### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

#### Semester 3 - Fall

GEOG*2000	[0.50]	Geomorphology
GEOG*2460	[0.50]	Analysis in Geography

1.50 core requirements or electives

#### Winter Semester

COOP*1000	[0.00]	Co-op Work Term I
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#### Semester 4 - Summer

GEOG*2210	[0.50]	Environment and Resources
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2.00 core requirements or electives

#### Fall Semester

COOP*2000	[0.00]	Co-op Work Term II
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#### Semester 5 - Winter

GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2480	[0.50]	Mapping and GIS
GEOG*3480	[0.50]	GIS and Spatial Analysis

1.00 core requirements, restricted electives\*\* or electives

#### Summer Semester

COOP*3000	[0.00]	Co-op Work Term III
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#### Semester 6 - Fall

GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment *

1.50 core requirements, restricted electives\*\* or electives

#### Semester 7 - Winter

GEOG*4880	[0.50]	Contemporary Geographic Thought
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One of:

1.50 core requirements, restricted electives \*\* or electives.

0.50 credits in Geography at the 3000-4000 level.

2.00 core requirements, restricted electives\*\* or electives

#### Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV
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#### Semester 8 - Fall

GEOG*4690	[1.00]	Geography Field Research
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2.00 core requirements, restricted electives\*\* or electives.

\* Note: Environmental Geography major are required to complete GEOG\*3210 and (POLS\*3370 or ZOO\*4050).

\*\* students in the Environmental Geography major must take at least 4 additional geography courses at the 3000-4000 level including:

At least one of:

GEOG*3000	[0.50]	Fluvial Processes
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*3620	[0.50]	Desert Environments

At least two of:

ENVS*4220	[0.50]	Environmental Impact Assessment
GEOG*3020	[0.50]	Global Environmental Change
GEOG*4110	[0.50]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Resource Analysis

### Environmental Monitoring and Analysis (EMA)

College of Physical and Engineering Science

#### Major

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.

#### Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

#### Semester 2

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

#### Semester 3

CHEM*2300	[0.50]	Chemical Reactivity
MATH*2080	[0.50]	Elements of Calculus II
MET*2030	[0.50]	Meteorology and Climatology

1.00 core requirements or electives

#### Semester 4

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
PHYS*2040	[0.50]	Fundamental Electronics and Sensors
STAT*2040	[0.50]	Statistics I

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

#### Semester 5

PHYS*2550	[0.50]	Radiation and the Environment *
STAT*2050	[0.50]	Statistics II
TOX*2000	[0.50]	Principles of Toxicology

1.00 core requirements or electives

#### Semester 6

PHYS*3080	[0.50]	Energy
STAT*3510	[0.50]	Environmental Risk Assessment

One of:

MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry

1.00 core requirement or electives

#### Semester 7

ENVS*3360	[0.50]	Waste Management and Utilization
TOX*3300	[0.50]	Analytical Toxicology

1.50 core requirement or electives

#### Semester 8

CHEM*4010	[0.50]	Chemistry and Industry
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2.00 core requirement or electives

\* PHYS\*2550 is offered in even numbered years.

### Environmental Monitoring and Analysis (EMA:C)

College of Physical and Engineering Science

#### Major

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.

#### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

#### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications



**Semester 3 - Fall**

CHEM*2300	[0.50]	Chemical Reactivity
MATH*2080	[0.50]	Elements of Calculus II
MET*2030	[0.50]	Meteorology and Climatology

1.00 core requirements or electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2480	[0.50]	Analytical Chemistry I
STAT*2040	[0.50]	Statistics I

One of:

CIS*1200	[0.50]	Introduction to Computing
CIS*1500	[0.50]	Introduction to Programming

0.50 core requirements or electives

**Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

PHYS*3080	[0.50]	Energy
STAT*2050	[0.50]	Statistics II

One of:

MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry

1.00 core requirements or electives

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6 - Fall**

ENVS*3360	[0.50]	Waste Management and Utilization
PHYS*2040	[0.50]	Fundamental Electronics and Sensors
PHYS*2550	[0.50]	Radiation and the Environment *
TOX*2000	[0.50]	Principles of Toxicology

0.50 core requirements or electives

**Semester 7 - Winter**

CHEM*4010	[0.50]	Chemistry and Industry
STAT*3510	[0.50]	Environmental Risk Assessment

1.50 core requirements or electives

**Summer Semester (Optional)**

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 8**

TOX*3300	[0.50]	Analytical Toxicology
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2.00 core requirements or electives

\* PHYS\*2550 is offered in even numbered years.

**Environmental Protection (ENVP)****Department of Environmental Biology, Ontario Agricultural College****Major**

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.

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3**

CHEM*2300	[0.50]	Chemical Reactivity
ENVB*2030	[0.50]	Current Issues in Forest Science
STAT*2040	[0.50]	Statistics I

1.00 core requirements or electives

**Semester 4**

BIOC*2580	[0.50]	Introductory Biochemistry
ENVB*2010	[0.50]	Food Production and the Environment

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I

1.00 core requirements or electives

Last Revision: August 22, 2006

**Semester 5**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOL*3450	[0.50]	Introduction to Aquatic Environments
MET*2030	[0.50]	Meteorology and Climatology
TOX*2000	[0.50]	Principles of Toxicology

0.50 core requirements or electives

**Semester 6**

ENVB*3030	[0.50]	Pesticides and the Environment
MBG*2000	[0.50]	Introductory Genetics

1.50 core requirements or electives

**Semester 7**

ENVB*3300	[0.50]	Applied Ecology and Environment
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management
ZOO*4350	[0.50]	Biology of Polluted Waters

0.50 core requirements or electives

**Semester 8**

ENVB*4240	[0.50]	Biological Activity of Pesticides
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2.00 core requirements or electives

**Environmental Protection (ENVP:C)****Department of Environmental Biology, Ontario Agricultural College****Major**

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.

**Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3 - Fall**

CHEM*2300	[0.50]	Chemical Reactivity
ENVB*2030	[0.50]	Current Issues in Forest Science
STAT*2040	[0.50]	Statistics I

1.00 core requirements or electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*3450	[0.50]	Introduction to Aquatic Environments
MBG*2000	[0.50]	Introductory Genetics

1.00 core requirements or electives

**Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

ENVB*2010	[0.50]	Food Production and the Environment
ENVB*3030	[0.50]	Pesticides and the Environment

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I

1.00 core requirements or electives

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6 - Fall**

BIOC*3560	[0.50]	Structure and Function in Biochemistry
ENVB*3300	[0.50]	Applied Ecology and Environment
MET*2030	[0.50]	Meteorology and Climatology
TOX*2000	[0.50]	Principles of Toxicology

0.50 core requirements or electives

**Semester 7 - Winter**

ENVB*4240	[0.50]	Biological Activity of Pesticides
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2.00 core requirements or electives

**Summer Semester - (Optional)**

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

**Semester 8 - Fall**

MICR\*4140 [0.50] Soil Microbiology and Biotechnology  
 MICR\*4180 [0.50] Microbial Processes in Environmental Management  
 ZOO\*4350 [0.50] Biology of Polluted Waters  
 1.00 core requirements or electives

**Environmetrics (ENVM)****Department of Mathematics and Statistics, College of Physical and Engineering Science****Department of Computing and Information Science, College of Physical and Engineering Science****Major**

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.

**Semester 1**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1300 [0.50] Introductory Environmental Chemistry  
 ENVS\*1010 [0.50] Introduction to Environmental Sciences  
 MATH\*1080 [0.50] Elements of Calculus I  
 PHYS\*1080 [0.50] Physics for Life Sciences

**Semester 2**

BIOL\*1040 [0.50] Biology II  
 CHEM\*1310 [0.50] Introductory Environmental Chemistry II  
 ECON\*1050 [0.50] Introductory Microeconomics  
 GEOG\*1300 [0.50] Introduction to the Biophysical Environment  
 PHYS\*1130 [0.50] Physics with Applications

**Semester 3**

CIS\*1500 [0.50] Introduction to Programming  
 STAT\*2040 [0.50] Statistics I

One of:

MATH\*1210 [0.50] Calculus II  
 MATH\*2080 [0.50] Elements of Calculus II

1.00 core requirements, restricted electives or electives

Note: Students in the Environmetrics major must consult the Environmetrics Faculty Advisor for course scheduling in semester 4 through 8.

**Semester 4**

MATH\*2130 [0.50] Numerical Methods  
 MATH\*2170 [0.50] Differential Equations I  
 STAT\*2050 [0.50] Statistics II

One of:

MATH\*2150 [0.50] Applied Matrix Algebra  
 MATH\*2160 [0.50] Linear Algebra I

Note: MATH\*2160 is preferred for mathematics emphasis.

0.50 core requirements, restricted electives or electives

**Semester 5**

2.50 core requirements, restricted electives or electives

**Semester 6**

MATH\*3510 [0.50] Biomathematics  
 STAT\*3510 [0.50] Environmental Risk Assessment

1.50 core requirements, restricted electives or electives

**Semester 7**

2.50 core requirements, restricted electives or electives

**Semester 8**

2.50 core requirements, restricted electives or electives

**Restricted Electives**

Students in the Environmetrics major are required to choose 3.50 credits of restricted electives. A minimum of 2.50 credits must be at the 3000/4000 level and of these a minimum of 1.00 must be at the 4000 level.

**List**

MATH\*2200 [0.50] Advanced Calculus I  
 MATH\*2210 [0.50] Advanced Calculus II  
 MATH\*3100 [0.50] Differential Equations II  
 MATH\*3170 [0.50] Partial Differential Equations and Special Functions  
 MATH\*3240 [0.50] Operations Research  
 MATH\*4430 [0.50] Advanced Numerical Methods  
 MATH\*4070 [0.50] Case Studies in Modeling  
 MATH\*4510 [0.50] Environmental Transport and Dynamics  
 STAT\*3100 [0.50] Introductory Mathematical Statistics I  
 STAT\*3110 [0.50] Introductory Mathematical Statistics II  
 STAT\*3240 [0.50] Applied Regression Analysis

STAT\*3320 [0.50] Sampling Theory with Applications  
 STAT\*4350 [0.50] Applied Multivariate Statistical Methods  
 STAT\*4510 [0.50] Advanced Risk Analysis  
 STAT\*4340 [0.50] Statistical Inference  
 STAT\*4360 [0.50] Applied Time Series Analysis  
 CIS\*1900 [0.50] Discrete Structures in Computer Science  
 CIS\*2430 [0.50] Object Oriented Programming  
 CIS\*2460 [0.50] Modelling of Computer Systems  
 CIS\*2500 [0.50] Intermediate Programming  
 CIS\*2520 [0.50] Data Structures  
 CIS\*2750 [0.75] Software Systems Development and Integration  
 CIS\*3460 [0.50] System Simulation  
 CIS\*3490 [0.50] The Analysis and Design of Computer Algorithms  
 CIS\*3530 [0.50] Data Base Systems and Concepts

**Environmetrics (ENVM:C)****Department of Mathematics and Statistics, College of Physical and Engineering Science****Department of Computing and Information Science, College of Physical and Engineering Science****Major**

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.

**Semester 1 - Fall**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1300 [0.50] Introductory Environmental Chemistry  
 ENVS\*1010 [0.50] Introduction to Environmental Sciences  
 MATH\*1080 [0.50] Elements of Calculus I  
 PHYS\*1080 [0.50] Physics for Life Sciences

**Semester 2 - Winter**

BIOL\*1040 [0.50] Biology II  
 CHEM\*1310 [0.50] Introductory Environmental Chemistry II  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 ECON\*1050 [0.50] Introductory Microeconomics  
 GEOG\*1300 [0.50] Introduction to the Biophysical Environment  
 PHYS\*1130 [0.50] Physics with Applications

**Semester 3 - Fall**

CIS\*1500 [0.50] Introduction to Programming  
 STAT\*2040 [0.50] Statistics I

One of:

MATH\*1210 [0.50] Calculus II  
 MATH\*2080 [0.50] Elements of Calculus II

1.00 core requirements, restricted electives or electives

Note: Students in the Environmetrics major must consult the Environmetrics Faculty Advisor for course scheduling in semester 4 through 8.

**Winter Semester**

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

**Semester 4 - Summer**

MATH\*2130 [0.50] Numerical Methods  
 MATH\*2170 [0.50] Differential Equations I  
 STAT\*2050 [0.50] Statistics II

1.00 core requirements, restricted electives or electives

**Fall Semester**

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

**Semester 5 - Winter**

STAT\*3510 [0.50] Environmental Risk Assessment

One of:

MATH\*2150 [0.50] Applied Matrix Algebra  
 MATH\*2160 [0.50] Linear Algebra I

Note: MATH\*2160 is preferred for mathematics emphasis

1.50 core requirements, restricted electives or electives

**Summer Semester**

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

**Semester 6 - Fall**

2.50 core requirements, restricted electives or electives

**Semester 7 - Winter**

MATH\*3510 [0.50] Biomathematics

2.00 core requirements, restricted electives or electives

**Summer Semester (Optional)**

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

**Semester 8**

2.50 core requirements, restricted electives or electives

**Restricted Electives**

Students in the Environmetrics major are required to choose 3.50 credits of restricted electives. A minimum of 2.50 credits must be at the 3000/4000 level and of these a minimum of 1.00 must be at the 4000 level.

**List**

MATH*2200	[0.50]	Advanced Calculus I
MATH*2210	[0.50]	Advanced Calculus II
MATH*3100	[0.50]	Differential Equations II
MATH*3170	[0.50]	Partial Differential Equations and Special Functions
MATH*3240	[0.50]	Operations Research
MATH*4430	[0.50]	Advanced Numerical Methods
MATH*4070	[0.50]	Case Studies in Modeling
MATH*4510	[0.50]	Environmental Transport and Dynamics
STAT*3100	[0.50]	Introductory Mathematical Statistics I
STAT*3110	[0.50]	Introductory Mathematical Statistics II
STAT*3240	[0.50]	Applied Regression Analysis
STAT*3320	[0.50]	Sampling Theory with Applications
STAT*4350	[0.50]	Applied Multivariate Statistical Methods
STAT*4510	[0.50]	Advanced Risk Analysis
STAT*4340	[0.50]	Statistical Inference
STAT*4360	[0.50]	Applied Time Series Analysis
CIS*1900	[0.50]	Discrete Structures in Computer Science
CIS*2430	[0.50]	Object Oriented Programming
CIS*2460	[0.50]	Modelling of Computer Systems
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration
CIS*3460	[0.50]	System Simulation
CIS*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts

**Natural Resources Management (NRM)****Department of Land Resource Science, Ontario Agricultural College****Major**

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.

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

**Semester 1**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3**

MET*2030	[0.50]	Meteorology and Climatology
SOIL*2120	[0.50]	Introduction to Environmental Stewardship
STAT*2040	[0.50]	Statistics I

1.00 core requirements, restricted electives or electives

Note: GEOG\*2460 may be substituted for STAT\*2040.

**Semester 4**

SOIL*2010	[0.50]	Soil Science
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2.00 core requirements, restricted electives or electives

**Semester 5**

ENVB*2030	[0.50]	Current Issues in Forest Science
SOIL*3050	[0.50]	Land Utilization
SOIL*3080	[0.50]	Soil and Water Conservation

1.00 core requirements, restricted electives or electives

**Semester 6**

SOIL*3100	[0.50]	Resource Planning Techniques
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One of:

ENGG*2550	[0.50]	Water Management
GEOG*3610	[0.50]	Environmental Hydrology
GEOL*3060	[0.50]	Groundwater

1.50 core requirements, restricted electives or electives

**Semester 7**

SOIL*4110	[0.50]	Natural Resources Management Field Camp
ZOO*4110	[0.50]	Principles of Fish and Wild Life Management

1.50 core requirements, restricted electives or electives

Note: BIOL\*4150 may be substituted for ZOO\*4110.

**Semester 8**

2.50 core requirements, restricted electives or electives

**Restricted Electives**

Students in the Natural Resources Management major are required to choose 1.50 restricted elective credits from the following list:

CROP*2280	[0.50]	Crops in Land Reclamation
ENVB*3000	[0.50]	Nature Interpretation
ENVB*4780	[0.50]	Forest Ecology
ENVS*3320	[0.50]	Principles of Landscape Ecology
ENVS*4220	[0.50]	Environmental Impact Assessment
GEOG*2420	[0.50]	Aerial-photo Interpretation
GEOG*3210	[0.50]	Management of the Biophysical Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis
GEOL*3130	[0.50]	Agrogeology
LARC*4520	[0.50]	Park and Recreation Administration
MET*3050	[0.50]	Microclimatology
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3170	[0.50]	Soil Processes in Landscape
SOIL*3200	[0.50]	Environmental Soil Biology
SOIL*3600	[0.50]	Remote Sensing

**Natural Resources Management (NRM:C)****Department of Land Resource Science, Ontario Agricultural College****Major**

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.

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

**Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1300	[0.50]	Introductory Environmental Chemistry
ENVS*1010	[0.50]	Introduction to Environmental Sciences
MATH*1080	[0.50]	Elements of Calculus I
PHYS*1080	[0.50]	Physics for Life Sciences

**Semester 2 - Winter**

BIOL*1040	[0.50]	Biology II
CHEM*1310	[0.50]	Introductory Environmental Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

**Semester 3 - Fall**

ENVB*2030	[0.50]	Current Issues in Forest Science
MET*2030	[0.50]	Meteorology and Climatology
SOIL*2120	[0.50]	Introduction to Environmental Stewardship

1.00 core requirements, restricted electives or electives

**Winter Semester**

COOP*1000	[0.00]	Co-op Work Term I
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**Semester 4 - Summer**

SOIL*2010	[0.50]	Soil Science
STAT*2040	[0.50]	Statistics I

1.50 core requirements, restricted electives or electives

Note: GEOG\*2460 may be substituted for STAT\*2040.

**Fall Semester**

COOP*2000	[0.00]	Co-op Work Term II
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**Semester 5 - Winter**

One of:

ENGG*2550	[0.50]	Water Management
GEOG*3610	[0.50]	Environmental Hydrology
GEOL*3060	[0.50]	Groundwater

2.00 core requirements, restricted electives or electives

**Summer Semester**

COOP*3000	[0.00]	Co-op Work Term III
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**Semester 6 - Fall**

SOIL*3050	[0.50]	Land Utilization
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SOIL\*3080 [0.50] Soil and Water Conservation  
1.50 core requirements, restricted electives or electives

### Semester 7 - Winter

2.50 core requirements, restricted electives or electives

### Summer Semester (Optional)

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

### Semester 8 - Fall

SOIL\*4110 [0.50] Natural Resources Management Field Camp  
ZOO\*4110 [0.50] Principles of Fish and Wild Life Management

1.50 core requirements, restricted electives or electives

Note: BIOL\*4150 may be substituted for ZOO\*4110.

### Restricted Electives

Students in the Natural Resources Management major are required to choose 1.50 restricted elective credits from the following list:

CROP\*2280 [0.50] Crops in Land Reclamation  
ENVB\*3000 [0.50] Nature Interpretation  
ENVB\*4780 [0.50] Forest Ecology  
ENVS\*3320 [0.50] Principles of Landscape Ecology  
ENVS\*4220 [0.50] Environmental Impact Assessment  
GEOG\*2420 [0.50] Aerial-photo Interpretation  
GEOG\*3210 [0.50] Management of the Biophysical Environment  
GEOG\*3480 [0.50] GIS and Spatial Analysis  
GEOL\*3130 [0.50] Agrogeology  
LARC\*4520 [0.50] Park and Recreation Administration  
MET\*3050 [0.50] Microclimatology  
SOIL\*3060 [0.50] Environmental Soil Chemistry  
SOIL\*3070 [0.50] Environmental Soil Physics  
SOIL\*3170 [0.50] Soil Processes in Landscape  
SOIL\*3200 [0.50] Environmental Soil Biology  
SOIL\*3600 [0.50] Remote Sensing

### Areas of Emphasis

All students must choose an area of emphasis consisting of a minimum of 2.50 credits in a particular topic area. The sequence of courses normally begins in third year. With the approval of the program counsellor, students may develop their own area of emphasis. All areas of emphasis must be approved by the program counsellor. Students should note that entry to certain areas of emphasis is restricted by the student's choice of major. Thus program approval should be gained before registering in courses to count towards their area of emphasis.

### Atmospheric Resources (AR)

MET\*2030 [0.50] Meteorology and Climatology

Four of:

GEOG\*2110 [0.50] Climate and the Biophysical Environment  
MET\*2020 [0.50] Agrometeorology  
MET\*3050 [0.50] Microclimatology  
MET\*4210 [0.50] Atmospheric Experimentation and Instrumentation  
MET\*4300 [0.50] Atmospheric Transport and Chemistry

### Biotic Systems (BS)

BIOL\*3110 [0.50] Population Ecology  
BIOL\*3120 [0.50] Community Ecology

Three of:

BIOL\*3010 [0.50] Laboratory and Field Work in Ecology  
BIOL\*3130 [0.50] Conservation Biology  
BIOL\*3450 [0.50] Introduction to Aquatic Environments  
BOT\*2050 [0.50] Plant Ecology  
ENVB\*4780 [0.50] Forest Ecology  
MBG\*2000 [0.50] Introductory Genetics  
MICR\*4140 [0.50] Soil Microbiology and Biotechnology  
ZOO\*4350 [0.50] Biology of Polluted Waters

### Crop Ecology (CE)

ENVB\*2010 [0.50] Food Production and the Environment

Four of:

CROP\*2110 [0.50] Crop Ecology  
CROP\*2280 [0.50] Crops in Land Reclamation  
CROP\*4220 [0.50] Cropping Systems  
CROP\*4240 [0.50] Weed Science  
CROP\*4340 [0.50] Seminar: Selected Topics in Crop Science  
ENVB\*2040 [0.50] Plant Health and the Environment  
ENVB\*3030 [0.50] Pesticides and the Environment  
GEOG\*3320 [0.50] Agriculture and Society  
SOIL\*2010 [0.50] Soil Science

### Development and Stewardship (DS)

SOIL\*2120 [0.50] Introduction to Environmental Stewardship  
and 4 courses from List A or List B:

### List A

AGEC\*4210 [0.50] World Agriculture and Economic Development  
IDEV\*2010 [0.50] International Development Studies  
REXT\*4020 [0.50] Rural Extension in Change and Development

### List B

GEOG\*4390 [0.50] Seminar in Rural Geography  
LARC\*2820 [0.50] Urban and Regional Planning  
SOIL\*3050 [0.50] Land Utilization

### Environmental Administration (EA)

GEOG\*3210 [0.50] Management of the Biophysical Environment  
HAFA\*4390 [0.50] Individuals and Groups in Organizations

Three of:

HAFA\*3000 [0.50] Human Resources Management  
LARC\*2820 [0.50] Urban and Regional Planning  
MCS\*2020 [0.50] Information Management  
POLS\*2250 [0.50] Public Administration  
POLS\*3250 [0.50] Public Policy: Challenges and Prospects  
REXT\*3040 [0.50] Communication Process

### Environmental Degradation (ED)

Three of:

ENGG\*2550 [0.50] Water Management  
ENVS\*3360 [0.50] Waste Management and Utilization  
MICR\*4180 [0.50] Microbial Processes in Environmental Management  
SOIL\*3200 [0.50] Environmental Soil Biology  
TOX\*2000 [0.50] Principles of Toxicology  
ZOO\*4350 [0.50] Biology of Polluted Waters

Two of:

BIOL\*3010 [0.50] Laboratory and Field Work in Ecology  
CROP\*2280 [0.50] Crops in Land Reclamation  
GEOG\*3110 [0.50] Biotic and Natural Resources  
SOIL\*3050 [0.50] Land Utilization  
SOIL\*3080 [0.50] Soil and Water Conservation

### Environmental Economics and Policy (EEP)

ECON\*1100 [0.50] Introductory Macroeconomics

One of:

AGEC\*2700 [0.50] Survey of Natural Resource Economics  
ECON\*2100 [0.50] Economic Growth and Environmental Quality

Note: Whichever course of AGECE\*2100 or AGECE\*2700 is not taken for the Environmental Sciences core is required for this area of emphasis.

Three of:

AGEC\*4290 [0.50] Land Economics  
AGEC\*4310 [0.50] Resource Economics  
ECON\*2310 [0.50] Intermediate Microeconomics  
ECON\*2650 [0.50] Introductory Development Economics  
ECON\*3580 [0.50] Economics of Regulation  
ECON\*4930 [0.50] Environmental Economics

Note: Additional prerequisites are needed for ECON\*4930.

### Environmental Impact Assessment (EIA)

ENVS\*4220 [0.50] Environmental Impact Assessment  
STAT\*3510 [0.50] Environmental Risk Assessment

One of:

ENGG\*3340 [0.50] Geographic Information Systems in Environmental Engineering  
GEOG\*3480 [0.50] GIS and Spatial Analysis

Two of:

BIOL\*3450 [0.50] Introduction to Aquatic Environments  
GEOG\*4110 [0.50] Environmental Systems Analysis  
GEOL\*3190 [0.50] Environmental Water Chemistry  
PBIO\*4530 [0.50] Environmental Pollution Stresses on Plants  
PHYS\*3080 [0.50] Energy  
TOX\*2000 [0.50] Principles of Toxicology  
ZOO\*4350 [0.50] Biology of Polluted Waters

Note: Additional prerequisites are needed for GEOG\*3480 and STAT\*3510.

### Environmental Management in the U.S. (EMUS)

This Area of Emphasis is undertaken at Bowling Green State University, Ohio. Students are strongly encouraged to undertake an internship (for University of Guelph credit) at a location/agency in the U.S. to be approved jointly by Bowling Green State University (Center for Environmental Programs) and the University of Guelph (Associate Dean's Office, Faculty of Environmental Sciences). The internship is undertaken upon the completion of the courses at Bowling Green State University.

At least 2 of the following BGSU courses:

ENVS301 - Environmental Problems (3 cr.)  
ENVS401 - Environmental Strategies (2 cr.)  
ENVS402 - Environmental Impact Statements (3 cr.)

At least 2 of the following BGSU courses:

POLS302 - American Domestic Public Policy (3 cr.)

POLS303 - Introduction to Public Administration (3 cr.)

POLS331 - State and Local Government (3 cr.)

POLS336 - Environmental Policy and Politics (3 cr.)

Students must complete at least 15 BGSU credits. Upon completion of the U.S. internship, students will receive credit for ENVS\*3100.

### Land Resources (LR)

GEOG\*2000 [0.50] Geomorphology  
 GEOL\*1050 [0.50] Geology and the Environment  
 SOIL\*2010 [0.50] Soil Science

Two of:

GEOL\*2200 [0.50] Glacial Geology  
 GEOL\*3130 [0.50] Agrogeology  
 MET\*2030 [0.50] Meteorology and Climatology  
 SOIL\*3080 [0.50] Soil and Water Conservation  
 SOIL\*3170 [0.50] Soil Processes in Landscape

### Landscape Ecology (LE)

ENVS\*3320 [0.50] Principles of Landscape Ecology

Four of:

BIOL\*3010 [0.50] Laboratory and Field Work in Ecology  
 BIOL\*4150 [0.50] Wildlife Conservation and Management  
 ENVB\*2030 [0.50] Current Issues in Forest Science  
 ENVB\*4780 [0.50] Forest Ecology  
 GEOG\*2000 [0.50] Geomorphology  
 GEOG\*2110 [0.50] Climate and the Biophysical Environment  
 GEOG\*4110 [0.50] Environmental Systems Analysis  
 LARC\*2100 [0.50] Landscape Analysis  
 SOIL\*2010 [0.50] Soil Science  
 SOIL\*3080 [0.50] Soil and Water Conservation  
 ZOO\*4110 [0.50] Principles of Fish and Wild Life Management

### Mathematical Modelling and Risk Assessment (MMRA)

MATH\*2150 [0.50] Applied Matrix Algebra  
 MATH\*2170 [0.50] Differential Equations I  
 MATH\*3510 [0.50] Biomathematics  
 STAT\*2050 [0.50] Statistics II  
 STAT\*3510 [0.50] Environmental Risk Assessment

One of:

MATH\*2080 [0.50] Elements of Calculus II  
 STAT\*2040 [0.50] Statistics I

If any of the above are included in the student's major, then one of the following must be taken:

CIS\*2650 [0.50] Programming II  
 MATH\*2130 [0.50] Numerical Methods  
 STAT\*3240 [0.50] Applied Regression Analysis

### Water Resources (WR)

GEOL\*3060 [0.50] Groundwater

One of:

ENGG\*3650 [0.50] Hydrology  
 GEOG\*3610 [0.50] Environmental Hydrology

Three of:

BIOL\*3450 [0.50] Introduction to Aquatic Environments  
 ENGG\*2550 [0.50] Water Management  
 GEOG\*3000 [0.50] Fluvial Processes  
 GEOL\*3190 [0.50] Environmental Water Chemistry  
 SOIL\*3070 [0.50] Environmental Soil Physics

## Bachelor of Science in Technology [B.Sc.(Tech.)]

The B.Sc.(Tech.) program was designed for students who do not intend to pursue post-graduate studies and are strongly focused on securing industrial employment that makes use of the knowledge acquired in their bachelors degree. This program provides students with the knowledge and skills deemed to be essential by employers and exemplifies the positive benefits of cooperation between colleges and universities. The program combines rigorous theory with practical applications.

For the B.Sc.(Tech.) degree the University offers an honours program requiring the equivalent of 8 semesters of successful full-time study. Two of the semesters will be located at Seneca College in Toronto. The program requires the completion of four co-op work-terms. Students are encouraged to study full-time and to follow the schedule of studies listed below. In the B.Sc.(Tech.) program, 2.50 credits per semester is the normal load for a regular full-time student.

### Program Information

Students are required to follow the pattern of study for one of the two majors offered (Applied Pharmaceutical Chemistry or Physics and Technology) and complete all of the required courses specified in the Schedule of Studies.

Courses taught by Seneca College are noted in the schedule of studies. The course descriptions are in this calendar however detailed course profiles can be accessed through the Seneca College home page.

### Entry Credits

In general, the 4U or OAC 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
- PHYS\*1020 for students lacking in physics

Not more than one of the above will be allowed for credit toward the B.Sc.(Tech.) degree.

### Continuation of Study

Students are advised to consult the University's regulations for continuation of study which are outlined in detail in Section VIII--Undergraduate Degree Regulations & Procedures. In addition to the University regulations, students will also be required to achieve a 70% cumulative average by the end of semester 2 due to the required co-op component within this program. Students will be evaluated after semester 2 and those students who have a cumulative average less than 70% but meet the Guelph continuation of study requirements will be withdrawn from the B.Sc.(Tech.) program. Under these circumstances, students in the Applied Pharmaceutical Chemistry major will be automatically moved to B.Sc. Biological Chemistry and those students in the Physics and Technology major will be automatically moved to the B.Sc. Physics major. Students should contact their Program Counsellor regarding co-op appeal procedures.

Note: Students who voluntarily withdraw from co-op will be moved to the B.Sc. majors specified above.

### Honours Minors

Students may wish to add a minor to their major. 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. It may also require certain specified courses. Given the intended technical training of this degree, students have very little flexibility in terms of electives. As such, students wishing to add a minor would be required to enrol in additional semesters of study. Students wishing to take a minor should consult with their program counsellor.

### Conditions for Graduation

In order to qualify for graduation from the B.Sc.(Tech.) program, the student must have successfully completed all of the courses approved for the program, achieved a 60%, or higher, cumulative average and received a minimum grade of satisfactory for the co-op work reports and work performance evaluations.

### Applied Pharmaceutical Chemistry (APPC:C)

Department of Chemistry, College of Physical and Engineering Science

#### Major (Honours Program)

This major will require the completion of 20.25 credits as indicated below:

##### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics
XSEN*2010	[0.50]	Effective Business and Technical Writing

##### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II

PHYS*1010	[0.50]	Introductory Electricity and Magnetism
0.50 credits from an Arts/Social Science electives		

##### Semester 3 - Fall

CHEM*2060	[0.50]	Structure and Bonding
CHEM*2400	[0.75]	Analytical Chemistry I
CHEM*2880	[0.50]	Physical Chemistry
CIS*1200	[0.50]	Introduction to Computing
STAT*2040	[0.50]	Statistics I

##### Winter Semester

COOP*1000	[0.00]	Co-op Work Term I
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##### Semester 4 - Summer

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2070	[0.50]	Structure and Spectroscopy
CHEM*2700	[0.50]	Organic Chemistry I
MICR*2030	[0.50]	Microbial Growth

0.50 electives

##### Fall Semester

COOP*2000	[0.00]	Co-op Work Term II
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##### Semester 5 - Winter

XSEN*2020	[0.50]	Management Studies: Business and Human Relations
XSEN*3020	[0.50]	Pharmaceutical Analysis
XSEN*3030	[0.50]	Pharmacology and Applied Toxicology
XSEN*3040	[0.50]	Occupational Health and Chemistry
XSEN*4050	[0.50]	Biopharmaceuticals

Note: All courses in Semester 5 are taught at Seneca College in Toronto.

##### Semester 6 - Summer

BIOC*3570	[0.50]	Analytical Biochemistry
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
CHEM*3430	[0.50]	Analytical Chemistry II: Instrumental Analysis
CHEM*3750	[0.50]	Organic Chemistry II

0.50 electives

##### Fall Semester

COOP*3000	[0.00]	Co-op Work Term III
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##### Semester 7 - Winter

XSEN*3060	[0.50]	Pharmaceutical Analysis - Advanced
XSEN*4010	[0.50]	Pharmaceutical Calculations
XSEN*4020	[0.50]	Pharmaceutical Organic Chemistry
XSEN*4030	[0.50]	Pharmaceutical Product Formulations
XSEN*4040	[0.50]	Pharmaceutical Manufacturing

Note: All courses in Semester 7 are taught at Seneca College in Toronto.

##### Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV
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##### Semester 8 - Fall

CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
CHEM*4730	[0.50]	Synthetic Organic Chemistry

One of:

BIOC*4520	[0.50]	Metabolic Processes
BIOC*4550	[0.50]	Biochemistry and Structure of Macromolecules
BIOC*4570	[0.50]	Applied Biochemistry
CHEM*3640	[0.50]	Chemistry of the Elements I

One of:

BIOM*3100	[0.50]	Mammalian Physiology I
HK*3940	[1.25]	Human Physiology
MBG*2000	[0.50]	Introductory Genetics
PATH*3610	[0.50]	Principles of Disease

0.50 electives

### Physics and Technology (PHTC:C)

Department of Physics, College of Physical and Engineering Science

#### Major (Honours Program)

Two streams are available. Stream A is different from Stream B in that Stream B offers a double work term following academic semester 6. This major will require the completion of 21.00 credits as indicated below:

##### Stream A

##### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

##### Semester 2 - Winter

CIS*2500	[0.50]	Intermediate Programming
COOP*1100	[0.00]	Introduction to Co-operative Education

MATH\*1210 [0.50] Calculus II  
 PHYS\*1010 [0.50] Introductory Electricity and Magnetism  
 PHYS\*2040 [0.50] Fundamental Electronics and Sensors

One of:  
 CIS\*1910 [0.50] Discrete Structures in Computing I \*  
 0.50 electives  
 \* CIS\*1910 is a prerequisite for many upper level C.I.S. courses

**Semester 3 - Fall**

MATH\*2160 [0.50] Linear Algebra I  
 MATH\*2200 [0.50] Advanced Calculus I  
 PHYS\*2440 [0.75] Mechanics I  
 PHYS\*2460 [0.75] Electricity and Magnetism I

One of:  
 CIS\*2030 [0.50] Structure and Application of Microcomputers  
 CIS\*2910 [0.50] Discrete Structures in Computing II  
 0.50 electives

**Winter Semester**

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

**Semester 4 - Summer**

MATH\*2170 [0.50] Differential Equations I  
 PHYS\*2260 [0.50] Experimental Basis of Quantum Physics  
 STAT\*2040 [0.50] Statistics I

One of:  
 CIS\*2030 [0.50] Structure and Application of Microcomputers  
 CIS\*2100 [0.50] Scientific Computing and Applications Development  
 CIS\*2520 [0.50] Data Structures  
 CIS\*3120 [0.50] Digital Systems  
 0.50 electives

**Fall Semester**

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

**Semester 5 - Winter**

XSEN\*3100 [0.50] Analog and Digital Communications  
 XSEN\*3120 [0.50] Microprocessors I  
 XSEN\*3130 [0.50] Object Oriented Programming Using C++  
 XSEN\*3140 [0.50] Operating Systems  
 XSEN\*4130 [0.50] Networking Essentials

Note: All courses in Semester 5 are taught at Seneca College in Toronto.

**Summer Semester**

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

**Semester 6 - Fall**

XSEN\*4100 [0.50] Event Driven Programming and Visual Basic  
 XSEN\*4110 [0.50] Data Acquisition and Control  
 XSEN\*4120 [0.50] Data Communications I  
 XSEN\*4140 [0.50] Technical and Personal Communications

One of:  
 XSEN\*4150 [0.50] Microprocessors II  
 XSEN\*4160 [0.50] Computer Peripheral Systems

**Semester 7 - Winter**

PHYS\*2450 [0.75] Mechanics II  
 PHYS\*2470 [0.75] Electricity and Magnetism II  
 PHYS\*3220 [0.50] Waves and Optics

One of:  
 CIS\*3120 [0.50] Digital Systems  
 0.50 electives  
 0.50 electives

**Summer Semester**

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

**Semester 8 - Fall**

MATH\*3100 [0.50] Differential Equations II  
 PHYS\*3230 [0.50] Quantum Mechanics I  
 PHYS\*3240 [0.50] Statistical Physics I  
 PHYS\*4500 [0.50] Advanced Physics Laboratory

0.50 electives

**Note:** At least 0.50 in electives must be taken from courses in the Arts or Social Sciences.

**Stream B****Semester 1 - Fall**

BIOL\*1030 [0.50] Biology I  
 CHEM\*1040 [0.50] General Chemistry I  
 CIS\*1500 [0.50] Introduction to Programming  
 MATH\*1200 [0.50] Calculus I  
 PHYS\*1000 [0.50] An Introduction to Mechanics

**Semester 2 - Winter**

CIS\*2500 [0.50] Intermediate Programming  
 COOP\*1100 [0.00] Introduction to Co-operative Education  
 MATH\*1210 [0.50] Calculus II

PHYS\*1010 [0.50] Introductory Electricity and Magnetism  
 PHYS\*2040 [0.50] Fundamental Electronics and Sensors

One of:  
 CIS\*1910 [0.50] Discrete Structures in Computing I \*  
 0.50 electives  
 \*CIS\*1910 is a prerequisite for many upper level C.I.S. courses

**Semester 3 - Fall**

MATH\*2160 [0.50] Linear Algebra I  
 MATH\*2200 [0.50] Advanced Calculus I  
 PHYS\*2440 [0.75] Mechanics I  
 PHYS\*2460 [0.75] Electricity and Magnetism I

One of:  
 CIS\*2030 [0.50] Structure and Application of Microcomputers  
 CIS\*2910 [0.50] Discrete Structures in Computing II  
 0.50 electives

**Winter Semester**

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

**Semester 4 - Summer**

MATH\*2170 [0.50] Differential Equations I  
 PHYS\*2260 [0.50] Experimental Basis of Quantum Physics  
 STAT\*2040 [0.50] Statistics I

One of:  
 CIS\*2030 [0.50] Structure and Application of Microcomputers  
 CIS\*2100 [0.50] Scientific Computing and Applications Development  
 CIS\*2520 [0.50] Data Structures  
 CIS\*3120 [0.50] Digital Systems  
 0.50 electives

**Semester 5 - Fall**

XSEN\*3100 [0.50] Analog and Digital Communications  
 XSEN\*3120 [0.50] Microprocessors I  
 XSEN\*3130 [0.50] Object Oriented Programming Using C++  
 XSEN\*3140 [0.50] Operating Systems  
 XSEN\*4130 [0.50] Networking Essentials

Note: All courses in Semester 5 are taught at Seneca College in Toronto.

**Semester 6 - Winter**

XSEN\*4100 [0.50] Event Driven Programming and Visual Basic  
 XSEN\*4110 [0.50] Data Acquisition and Control  
 XSEN\*4120 [0.50] Data Communications I  
 XSEN\*4140 [0.50] Technical and Personal Communications

One of:  
 XSEN\*4150 [0.50] Microprocessors II  
 XSEN\*4160 [0.50] Computer Peripheral Systems

Note: All courses in Semester 6 are taught at Seneca College in Toronto.

**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**

PHYS\*2450 [0.75] Mechanics II  
 PHYS\*2470 [0.75] Electricity and Magnetism II  
 PHYS\*3220 [0.50] Waves and Optics

One of:  
 CIS\*3120 [0.50] Digital Systems  
 0.50 electives  
 0.50 electives

**Summer Semester**

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

**Semester 8 - Fall**

MATH\*3100 [0.50] Differential Equations II  
 PHYS\*3230 [0.50] Quantum Mechanics I  
 PHYS\*3240 [0.50] Statistical Physics I  
 PHYS\*4500 [0.50] Advanced Physics Laboratory

0.50 electives

**Note:** At least 0.50 in electives must be taken from courses in the Arts or Social Sciences.

## 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 8 semesters to complete. The college is accredited by the Canadian Veterinary Medical Association, the 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.

**Students entering the D.V.M. Program prior to Fall 2000 should refer to the undergraduate calendar for their year of program entry for appropriate course listings.**

### 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. The ability to relate to people is an acquired skill that must be encouraged during the program of study.
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.

### Academic Counselling

The Office of the Assistant Dean for Student Affairs 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 Assistant 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.

Students on probation are required to meet regularly with the Assistant Dean so that the student's academic progress is monitored and resource information and assistance is provided to the student. As an aid to improving their academic efficiency all students whose program average (PA) is between 60% and 70% will be sent a letter from the Assistant Dean outlining resources available to them.

### 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.

This Continuation of Study Policy applies to students entering the D.V.M. Program in Fall 2000 and subsequent semesters. For continuation of study, a student must satisfy the conditions as presented below. In order to graduate, students must fulfill the course requirements for the program and have achieved at least a 60% program average. 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).

Students entering the D.V.M. Program prior to Fall 2000 should consult the Undergraduate Program for the year in which they entered the Program.

### Full-time Study

The D.V.M. program is offered as a full-time program and normally requires four phases (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 entire phase. A list denoting the consequences of failure of any particular course in the D.V.M. Program is 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\*3480, 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\*4520.

This information is also available as part of the Phase Handbooks.

3. A student who is required to repeat a course and/or phase will be required to withdraw from the D.V.M. program. A student who is required to withdraw can register in the non-degree D.V.M. program. Non-degree D.V.M. Program status is normally granted for a maximum period of one year. Students must advise the Assistant Dean(s) of the College, in writing by 31 May, of their intention to register the following fall semester in the non-degree program to repeat the failed course and/or phase. Students must normally repeat a failed course and/or phase in the academic year immediately following that in which the failure occurred.
4. A student who successfully completes a repeated course and/or phase in the academic year immediately following that in which the failure occurred may re-apply to the D.V.M. program through Admission Services. Applications for readmission must be received by 31 May of the year in which they wish to be considered for readmission. Readmission is not automatic and will be conditional upon availability of space. Students considering readmission should consult the Assistant Dean(s) of the College regarding procedures and criteria for readmission to the D.V.M. program. A student who is readmitted to the D.V.M. program will be subject to the academic rules and regulations in effect for the readmission year.
5. A student will be allowed to fail a particular course only once. Any student who fails the same course twice will be ineligible for readmission to the D.V.M. Program.
6. Grades obtained by D.V.M. students who repeat one or more VETM course(s) while enrolled in the non-D.V.M. program, 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. The new D.V.M. program average will include the grades obtained in both the original and repeat 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 Assistant 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 8 semester Honours D.V.M. program, the student must have completed successfully the courses approved for the program. Students will not be allowed to graduate while on probation.



## 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 Assistant Dean for Student Affairs, 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 the qualified applicants.

## Protective Clothing

All D.V.M. students will require 3 laboratory coats and 3 pairs of coveralls. Students in Phase 3 must also have 3 surgical suits. Phase 4 students will require an additional 1 of each of the 3 types of protective clothing. Labels with each student's name must be affixed to all items of clothing. All soiled clothing must be laundered through the Veterinary Teaching Hospital's "dirty-in /clean-out" plan. Students must wear steel-capped shoes or boots in the large animal clinic and rubber boots in pathology laboratories. A pair of white shoes and a pair of obstetrical boots must be available in Phase 4. The Veterinary Teaching Hospital will not provide extra protective clothing; however, short white jackets will be provided by the Veterinary Teaching Hospital for Phase 4 students during the small animal medicine rotation.

## 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 4 (D.V.M. Continuation of Study)

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 impact either the PA or PHA Average because they are not attached to any numerical grade.

Students on Probation at the end of Phase 1 or 2 must clear this probationary status by achieving the required PA average by the end of Phase 2 or 3 respectively. If a student does not achieve the required standing by the end of the probationary period he or she will normally be required to withdraw from the program.

Students finishing Phase 3 on probationary status will not be permitted to proceed to the Externship or into Phase 4. 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 Continue. These may include repeating a component of a course, one or more entire courses, an entire Phase, or one or more clinical rotations. The required averages are as follows:

### For Course Attempts in Phase 1

Program Average (PA)	Status of Student
PA < 50%	Required to Withdraw
PA ≥ 50% and PA <60%	Probationary Status
PA ≥ 60%	Eligible to Continue

### For Course Attempts in Phase 2 and Beyond

If Eligible to Continue:

Program Average (PA) and Phase Average (PHA)	Status of Student
PHA < 50%	Required to Withdraw
PA or PHA ≥ 50% but PA <60%	Probationary Status
PA and PHA ≥ 60%	Eligible to Continue

If on Probation:

Program Average (PA)	Status of Student
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PA < 60%	Required to Withdraw
PA ≥ 60%	Eligible to Continue

## Schedule of Studies

### Phase 1

VETM*3000	[0.50]	Veterinary Biochemistry
VETM*3070	[2.00]	Veterinary Anatomy
VETM*3080	[1.50]	Veterinary Physiology
VETM*3120	[0.75]	Veterinary Histology
VETM*3210	[0.50]	Art of Veterinary Medicine I
VETM*3390	[0.50]	Veterinary Medical Genetics
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
VETM*3480	[0.50]	Phase 2: Special Topics
VETM*3510	[0.25]	Principles of Surgery

### Phase 3

VETM*4220	[0.50]	Art of Veterinary Medicine III
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*4520	[2.00]	Surgical Exercises
VETM*4530	[0.50]	Advanced Health Management Modules
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	[3.25]	Small Animal Clinics - Small Animal Stream
VETM*4620	[1.00]	Health Management - Small Animal Stream
VETM*4880	[3.25]	Electives in Veterinary Medicine I
VETM*4900	[2.50]	Veterinary Externship

#### Mixed Stream:

VETM*4660	[2.00]	Small Animal Clinics - Mixed Stream
VETM*4670	[1.50]	Large Animal Clinics - Mixed Stream
VETM*4680	[2.00]	Health Management - Mixed Stream
VETM*4890	[2.00]	Electives in Veterinary Medicine II
VETM*4900	[2.50]	Veterinary Externship

#### Equine Stream:

VETM*4920	[1.50]	Small Animal Clinics - Equine Stream
VETM*4930	[2.50]	Large Animal Clinics - Equine Stream
VETM*4940	[1.50]	Health Management - Equine Stream
VETM*4890	[2.00]	Electives in Veterinary Medicine II
VETM*4900	[2.50]	Veterinary Externship

#### Food Animal Stream:

VETM*4710	[1.00]	Large Animal Clinics - Food Animal Stream
VETM*4720	[3.25]	Health Management - Food Animal Stream
VETM*4880	[3.25]	Electives in Veterinary Medicine I
VETM*4900	[2.50]	Veterinary Externship

## Co-operative Education Programs

Co-operative Education is an experiential learning process that integrates academic study with paid hands-on work experience. Guelph's co-op program is similar to a true job hunting process where you apply and compete for jobs that interest you rather than being placed in a job. Students are engaged in productive work in jobs developed and/or approved by Co-operative Education Services as suitable learning situations. You will submit a work report for each of your work terms and your employer will evaluate your performance.

All co-op students will complete 3 or 4 academic semesters before their first work term, giving them an academic foundation to build work experience upon. The academic and work schedules will vary with degree program and major. In addition, COOP\*1100 – Introduction to Co-operative Education, is a mandatory, non-credit course for all students enrolled in the co-op program and is a prerequisite for your first work term.

COOP\*1000 is designed to introduce you to the theory and practice of co-op at the University of Guelph. The course will help you to identify and market your strengths and transferable skills, enhance your resume and cover letter writing abilities, increase your comfort and skill during interviews, and help you fully understand the employment process.

### Admission Information

Students are admitted to a Co-operative Education program directly from high school in the Fall semester. Some programs may admit a small number of in-course students after first or second semester. Normally, students must apply before their third academic semester in order to be considered. The decision to admit an in-course student is dependant upon space in the program, the grades of the student, the approved Academic and Work Sequence, and any other information relevant to the program. The On-Campus Co-ordinator is responsible for facilitating all admission processes. Please refer to the schedule of dates in the Undergraduate Calendar for in-course application deadlines.

### Eligibility

High school students must have a minimum average of 75% to apply to the co-op program. Once accepted to the University of Guelph, you must maintain a 70% cumulative average in the first 2 semesters (full-time study) in order to remain in the co-op program. For transfer students, you must meet normal admission requirements, as well as complete one academic semester at Guelph in which you achieve a minimum 70% average prior to participating in the co-op process. As well, you must have your academic and work schedule approved. Applicants must be a Canadian citizen or permanent resident/landed immigrant. Applicants holding U.S. citizenship should contact Co-operative Education and Career Services.

### Continuation of Study

Students will be allowed to continue in the co-op program only 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 before their first employment process.

Co-op students must normally be registered as full-time. Co-op students are also required to meet other conditions, (e.g. satisfactory work term reports and work performance evaluations) 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 [www.coop.uoguelph.ca](http://www.coop.uoguelph.ca).

### Release of Academic Information

By applying to the Co-op program, students grant permission to the Registrar's Office to release to Co-operative Education 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 Registrar's Office. Students also grant permission to Co-operative Education Services to release their resumes, cover letters and any transcripts released by the Registrar's Office to prospective employers to whom the students are applying. Employment information, the work performance evaluation, and the work term report evaluation will appear on the academic transcripts.

### Procedures for Work Semester Reports

A Work Report is required for each co-op Work Term in which the student is registered. 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 Work Terms with the same employer should consult with their Co-op Faculty Advisor regarding Work Report requirements for eight-month Work Terms. A grade of Outstanding, Very Good, Good, Satisfactory, or Unsatisfactory will appear on the student's Academic Record.

A student who receives an Unsatisfactory Work Report Evaluation will be given an opportunity to make revisions and resubmit the report. Students who are resubmitting a Work Report will not be eligible to proceed to the next employment process until receiving a grade of Satisfactory or higher. If, upon resubmission, the Work Report Evaluation is still unsatisfactory, the student will be required to withdraw from Co-op and may continue in the regular program if available.

In the case of a confidential Work Report, the student is responsible for ensuring that a confidential report is acceptable to the Co-op Faculty Advisor and making evaluation arrangements with the co-op Faculty Advisor and the employer.

### 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, students must receive evaluations of Good or higher in all but one Work Performance Evaluations and an evaluation of Satisfactory or higher in all Work Report Evaluations.

Students wanting to graduate with less than the required number of Work Terms must contact their Co-op Co-ordinator with the request. The Canadian Association for Co-operative Education (CAFCE) guidelines regarding Work Terms will be followed at all times.

### Co-op Fees

Students in Co-op are required to pay a co-op fee each semester (see Section VI--Schedule of Fees). Students who enter Co-op in-course will have an altered payment schedule to be discussed upon admission. There is no application fee.

### Schedule of Studies

Students entering the Co-op program are advised to review carefully the academic semester/work semester sequence as set out in the schedule of studies for the degree programs and specialization offered under Co-operative Education. Normally students must follow the sequence as scheduled. If, under exceptional circumstances, the schedule cannot be followed, the student must obtain written approval of an alternative work and academic semester sequence from the Co-op Coordinator and Co-op Faculty Advisor. In unusual circumstances the Director of Co-operative Education and Career Services may be involved in the approval process.

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## **University of Guelph-Humber**

For University of Guelph-Humber programs please refer to <http://www.guelphhumber.ca>.

## **Associate Diploma Programs**

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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/](http://www.uoguelph.ca/diploma_calendar/).