2008-2009 Undergraduate Calendar

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

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

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

The University is a full member of:

- The Association of Universities and Colleges of Canada

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Disclaimer

University of Guelph 2008

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

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

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

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

Published by: Undergraduate Program Services

Introduction

Collection, Use and Disclosure of Personal Information

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

Statistics Canada - Notification of Disclosure

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

Address for University Communication

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

Email Address

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

Home Address

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

Name Changes

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

Student Confidentiality and Release of Student Information Policy Excerpt

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

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

Table of Contents

X. Degree Programs

Specializations and Their Degrees

Specializations		Honours			General	Co-op
		Major	Minor	Area of Emphasis		
Adult Development, Families & Well-Being	ADFW	BASC				BASC
Agriculture	AGR		BSAG BAS			
Agricultural Business	AGBU	BCOMM				BCOMM
Agricultural Economics	AGEC	BA BSAG				
Agricultural Science	AGRS	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:C					BSTC:C
Art History	ARTH	BA	BA BAS			
Art Theory and Criticism	ATC		BA BAS			
Biochemistry	BIOC	BSC	BAS BSC			BSC
Biological Chemistry	BCHM	BSC				
Biological Engineering	BIOE	BENG				BENG
Biological Science	BIOS	BSC			BSC	
Biology	BIOL		BAS BSC			
Bio-Medical Science	BIOM	BSC				
Biomedical Toxicology	BTOX	BSC				BSC
Biophysics	BIOP	BSC				BSC
Biotechnology	BIOT		BAS BSC			
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			
Computing		BCOMP				BCOMP
Computing & Information Science	CIS	BA BSC	BA BAS BSC		BA	BA BSC
Criminal Justice & Public Policy	CJPP	BA	BA BAS			
Crop, Horticulture and Turfgrass Sciences	CHAT	BSAG				
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	BENG				BENG
English	ENGL	BA	BA BAS		BA	
Environment & Development	EAD			BAH.ID		
Environmental Biology	ENVB	BSC BSES				BSES
Environmental Economics & Policy	EEP	BSES				BSES
Environmental Engineering	ENVE	BENG	BENG			BENG
Environmental Geography	ENVG	BSES				BSES
Environmental Governance	EGOV	BA				
Environmental Management	EM	BBRM				
Environmental Monitoring & Analysis	EMA	BSES				BSES
Environmental Studies	ENVS		BA BAS			
Environmental Toxicology	ETOX	BSC				BSC
Environmetrics and Modelling	EMM	BSES				BSES
Equine Management	EQM	BBRM				
Ethics in Life Sciences	ELS		BA BAS			
European Culture & Civilization	ECC		BA BAS	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.MEIF		
Food Engineering	FENG		BENG			
Food Science	FOOD	BSC	BAS BSC			BSC
Forest Systems	FSYS		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		
GIS & Environmental Analysis	GIS		BAS BSC			
Geography	GEOG	BA	BA BAS		BA	
Geology	GEOL		BAS BSC			
German	GERM		BA BAS			
Historical Perspectives in Development	HPD			BAH.ID		
History	HIST	BA	BA BAS		BA	
Hotel & Food Administration	HAFA	BCOMM				BCOMM
Human Kinetics	HK	BSC				
Human Resources Management	HRM	BCOMM				
Individual Studies	IS	BA				
Information Systems & Human Behaviour	ISHB	BA				
International Development	ID	BA	BA BAS		BA	
Interpretive Ecology	IE			BSCH.ECOL		

Italian	ITAL		BA BAS			
Landscape Architecture		BLA				
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				BA
Mathematical Science	MSCI		BSC			
Mathematics	MATH	BA BSC	BA BAS BSC		BA	
Microbiology	MICR	BSC	BAS BSC			BSC
Molecular Biology & Genetics	MBG	BSC	BAS BSC			
Museum Studies	MS		BA BAS			
Music	MUSC	BA	BA BAS		BA	
Nanoscience	NANO	BSC				
Natural Resources Management	NRM	BSES				BSES
Neuroscience	NEUR		BAS BSC			
Nutritional Sciences	NSCI		BAS BSC			
Nutritional & Nutraceutical Sciences	NANS	BSC				
Organic Agriculture	OAGR	BSAG				
Philosophy	PHIL	BA	BA BAS		BA	
Physical Science	PSCI	BSC			BSC	
Physics	PHYS	BSC	BAS BSC			BSC
Physics, Computing and Communications	PHCC:C					BSTC
Plant Biology	PBIO	BSC	BAS BSC			
Plant Biotechnology	PBTC	BSC	BAS BSC			
Political Economy & Administrative Change	PEAC			BAH.ID		
Political Science	POLS	BA	BA BAS		BA	
Psychology	PSYC	BA	BA BAS			BA
Psychology: Brain & Cognition	PBC	BSC	BAS BSC			
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				
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				
Urban Landscape Management	ULM	BSAG				
Veterinary Medicine		DVM				
Visual Arts of the Americas	VAA		BA BAS			
Water Resources Engineering	WRE	BENG				BENG
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:

Adult Development, Families and Well-Being

Applied Human Nutrition

Child, Youth and Family

Co-operative Education is available in the following program:

Child, Youth and Family

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 knowledgable 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.

Adult Development, Families and Well-Being (ADFW)

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

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

Graduates of this program are pursuing careers in a variety of settings including family and community service agencies, government departments, services for seniors and their families, health care agencies, employee and family assistance programs, and local social planning councils. This program provides a solid foundation for the pursuit of graduate studies in fields such as social work, family relations, gerontology, occupational therapy, family law and mediation, couple and family therapy, education, sexual health, human resource management (business), and health studies.

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

Program Requirements

All students in the Adult Development, Families and Well-Being major must successfully complete a minimum of 20.00 passed credits, including the core of 11.50 required credits as outlined in the Schedule of Studies.

Some students may wish to select courses that provide a broad background appropriate for teaching, business, public service management or other careers. Students interested in pursuing graduate education are encouraged to complete an undergraduate thesis in their senior year and to participate in faculty research projects.

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

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

Students may take one minor in addition to the Adult Development, Families and Well-Being major. See the B.A. Program information for the list of minors: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c10/c10ba.shtm. The 60.00% requirement applies to each major and minor.

Double Counting of Courses

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

Counselling on Minors

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

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

Major

Semester 1

FRHD*1100	[0.50]	Life: Health and Well-Being
PSYC*1200	[0.50]	Dynamics of Behaviour
One of:		
ENGL*1200	[0.50]	Reading the Contemporary World
FREN*1200	[0.50]	French Language I
One of:		
ANTH*1150	[0.50]	Introduction to Anthropology
SOC*1100	[0.50]	Sociology
0.50 electives		

Semester 2

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

Semester 3

FRHD*2100	[0.50]	Development of Human Sexuality
STAT*2080	[0.50]	Introductory Applied Statistics I
One of:		
BIOM*2000	[0.50]	Concepts in Human Physiology
MBG*1000	[0.50]	Genetics and Society
PSYC*2410	[0.50]	Behavioural Neuroscience I
1.00 electives		

Semester 4

FRHD*2060	[0.50]	Adult Development and Aging
FRHD*2350	[0.50]	Principles of Program Design in the Human Services
STAT*2090	[0.50]	Introductory Applied Statistics II
1.00 electives		

Semester 5

FRHD*3040	[0.50]	Parenting: Research and Applications
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
FRHD*3290	[1.00]	Practicum I: Adult Development and Families
1.00 electives		

Semester 7

FRHD*4310	[0.50]	Professional Issues *
2.00 electives		

Semester 8

FRHD*4250	[0.50]	Aging and Health
One of:		
FRHD*4260	[0.50]	Social Policy and Gerontology
FRHD*4320	[0.50]	Social Policies for Children, Youth and Families
1.50 electives		

Electives - Recommended and Program Options

Students entering into human services after graduation are encouraged to take FRHD*4290. Students who intend to pursue studies or careers in the following areas, Adult Development and Aging, Family and Social Relations, Human Sexualtity and Health or Research may wish to include electives from the following lists:

Adult Development and Aging Interest

FRHD*3060	[0.50]	Principles of Social Gerontology
FRHD*4160	[0.50]	Family Relations in Gerontology
FRHD*4190	[0.50]	Assessment in Gerontology
FRHD*4290	[1.00]	Practicum II: Adult Development and Families

Family and Social Relations Interest

FRHD*4020	[0.50]	Family Theory
FRHD*4100	[0.50]	Dynamics of Group and Family Functioning
FRHD*4290	[1.00]	Practicum II: Adult Development and Families

Human Sexuality and Health Interest

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

Research Interest

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

Graduate and Professional Studies

Students have successfully used the B.A.Sc. degree to gain admission into graduate programs in 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 Adult Development, Families and Well-Being major of the B.A.Sc. degree program you will need to select certain courses as part of your undergraduate program to meet graduate program admission requirements. Sometimes these requirements are quite particular which means that you must plan your course selections early and carefully.

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

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

* Exchange/Study Abroad Opportunities

Students interested in study abroad experience could consider this in either Semester 5 or 7. If it is in Semester 5, then students could defer FRHD*3040 and FRHD*3070 to Semester 7 and FRHD*3400 can be taken in Winter Semester 6 with the Practicum FRHD*3290 (with permission). If the study abroad experience is preferred in Semester 7, the Professional Issues course (FRHD*4310) could be taken in Semester 5 (with permission).

Adult Development, Families and Well-Being (Co-op) (ADFW:C)

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

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

Graduates of this program are pursuing careers in a variety of settings including family and community service agencies, government departments, services for seniors and their families, health care agencies, employee and family assistance programs, and local social planning councils. This program provides a solid foundation for the pursuit of graduate studies in fields such as social work, family relations, gerontology, occupational therapy, family law and mediation, couple and family therapy, education, sexual health, human resource management (business), and health studies.

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

Program Requirements

All students in the Adult Development, Families and Well-Being Co-op major must successfully complete a minimum of 20.00 passed credits, including the core of 11.00 required credits as outlined in the Schedule of Studies. Students in the Co-op program must also complete COOP*1100 in the third semester.

Some students may wish to select courses that provide a broad background appropriate for teaching, business, public service management or other careers. Students interested in pursuing graduate education are encouraged to complete an undergraduate thesis in their senior year and to participate in faculty research projects.

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

Co-operative Education Program

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.A.Sc. Co-operative Education Program

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

Major

Semester 1 - Fall

FRHD*1100	[0.50]	Life: Health and Well-Being
PSYC*1200	[0.50]	Dynamics of Behaviour
One of:		
ENGL*1200	[0.50]	Reading the Contemporary World
FREN*1200	[0.50]	French Language I
One of:		
ANTH*1150	[0.50]	Introduction to Anthropology
SOC*1100	[0.50]	Sociology
0.50 electives		

Semester 2 - Winter

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

Semester 3 - Fall

COOP*1100	[0.00]	Introduction to Co-operative Education
FRHD*2100	[0.50]	Development of Human Sexuality
STAT*2080	[0.50]	Introductory Applied Statistics I
One of:		
BIOM*2000	[0.50]	Concepts in Human Physiology
MBG*1000	[0.50]	Genetics and Society

PSYC*2410 [0.50] Behavioural Neuroscience I
1.00 electives

Semester 4 - Winter

FRHD*2060 [0.50] Adult Development and Aging
FRHD*2350 [0.50] Principles of Program Design in the Human Services
STAT*2090 [0.50] Introductory Applied Statistics II
1.00 electives

Summer Semester

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

Fall Semester

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

Semester 5 - Winter

FRHD*3120 [0.50] Families in Canadian Context
FRHD*3290 [1.00] Practicum I: Adult Development and Families
FRHD*4250 [0.50] Aging and Health
One of:
FRHD*4260 [0.50] Social Policy and Gerontology
FRHD*4320 [0.50] Social Policies for Children, Youth and Families

Semester 6 - Summer

FRHD*3400 [0.50] Communication and Counselling Skills
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

Winter Semester

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

Semester 8 - Summer

2.50 electives

Electives that Complement the Major

Students entering into human services after graduation are encouraged to take FRHD*4290. Students who intend to pursue studies or careers in the following areas, Adult Development and Aging, Family and Social Relations, Human Sexuality and Health or Research may wish to include electives from the following lists:

FRHD*3060 [0.50] Principles of Social Gerontology
FRHD*4160 [0.50] Family Relations in Gerontology
FRHD*4190 [0.50] Assessment in Gerontology
FRHD*4290 [1.00] Practicum II: Adult Development and Families
FRHD*4020 [0.50] Family Theory
PSYC*3690 [0.50] Community Mental Health
FRHD*4810 [0.50] Thesis I
FRHD*4910 [1.00] Thesis II

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 Adult Development, Families and Well-being major of the B.A.Sc. degree program you will need to select certain courses as part of your undergraduate program to meet graduate program admission requirements. Sometimes these requirements are quite particular which means that you must plan your course selections early and carefully.

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

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

Applied Human Nutrition (AHN)

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

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

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

All students in the Applied Human Nutrition major must include the core of 14.00 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
FRHD*1100 [0.50] Life: Health and Well-Being
HTM*2700 [0.50] Introductory Foods
MICR*1020 [0.50] Fundamentals of Applied Microbiology
PSYC*1200 [0.50] Dynamics of Behaviour

Semester 2

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

Semester 3

BIOC*2580 [0.50] Introductory Biochemistry
HTM*2030 [0.50] Control Systems in the Hospitality 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
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
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
NUTR*3110	[0.50]	Food Security

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.

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 15.00 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

FRHD*1100	[0.50]	Life: Health and Well-Being
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

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 in Human 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
One of:		
FRHD*3200	[1.00]	Practicum - Child
FRHD*3250	[1.00]	Practicum in Youth

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
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

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:3b

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
SOAN*2290	[0.50]	Identities and Cultural Diversity
SOC*1500	[0.50]	Crime and Criminal Justice
SOC*3040	[0.50]	Sociology of Social Welfare

Early Childhood Education

Students 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
THST*3030	[0.50]	Theatre for Young Audiences

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 14.00 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

FRHD*1100	[0.50]	Life: Health and Well-Being
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

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 in Human 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

Fall Semester

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

Semester 5 - Winter

FRHD*3150	[0.50]	Strategies for Behaviour Change
FRHD*3180	[0.50]	Observation and Assessment
FRHD*4320	[0.50]	Social Policies for Children, Youth and Families

One of:

FRHD*3200	[1.00]	Practicum - Child
FRHD*3250	[1.00]	Practicum in Youth

Semester 6 - Summer

FRHD*3400	[0.50]	Communication and Counselling Skills

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

Semester 8 - Summer

2.50 electives

Restricted Electives

0.50 restricted electives at the 4000 level.

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 and the College of Management and Economics: 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 humanities:

ARTH Art History
CHIN Mandarin
CLAS Classical Studies
ENGL English
EURO European Studies
FREN French Studies
GERM German Studies
GREK Greek
HIST History
HUMN Humanities
ITAL Italian Studies
LAT Latin
LING Linguistics
MUSC Music
PHIL Philosophy
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 social sciences:

ANTH Anthropology
ECON Economics
GEOG Geography
IDEV International Development
ISS Interdisciplinary Social Science
POLS Political Science
PSYC Psychology
SOAN Sociology and Anthropology
SOC Sociology
WMST Women's Studies

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 4U credit in a specific area):

BIOL*1020	[0.50]	Introduction to Biology
BIOM*2000	[0.50]	Concepts in Human Physiology
BOT*1200	[0.50]	Plants and Human Use
CHEM*1060	[0.50]	Introductory Chemistry
CHEM*1100	[0.50]	Chemistry Today
CIS*1000	[0.50]	Introduction to Computer Applications
CROP*1050	[0.50]	Energy from Agriculture
ENVB*2210	[0.50]	Introductory Apiculture
FOOD*2010	[0.50]	Principles of Food Science
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
GEOG*1350	[0.50]	Earth: Hazards and Global Change
GEOL*1050	[0.50]	Geology and the Environment
GEOL*1100	[0.50]	Principles of Geology
HORT*1120	[0.50]	Grape and Wine Science
HORT*1130	[0.50]	Science of Gardening
MBG*1000	[0.50]	Genetics and Society
MCS*2020	[0.50]	Information Management
MET*1000	[0.50]	The Atmospheric Environment
MUSC*1090	[0.50]	Physics of Music
NUTR*1010	[0.50]	Nutrition and Society
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

Other acceptable courses which require 4U or university preparation:

BIOL*1XXX	[0.00]	Any BIOL course at the 1000 level
CHEM*1XXX	[0.00]	Any CHEM course at the 1000 level
CIS*1XXX	[0.00]	Any CIS course at the 1000 level
CIS*2100	[0.50]	Scientific Computing and Applications Development
HK*2100*(Only available to SART majors)	[0.50]	Anatomy for Artists
MATH*1XXX	[0.00]	Any MATH course at the 1000 level
MET*2030	[0.50]	Meteorology and Climatology
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:

a. 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.

b. 9.00 of the required 15.00 credits must be in courses offered by the College of Arts, the departments of Economics, Geography, Political Science, Psychology, Sociology and Anthropology (in the College of Social and Applied Human Sciences and the College of Management and Economics), the Department of Computing and Information Science, or the Department of Mathematics and Statistics.

c. 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:

a. 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.

b. 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.

c. 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 and the College of Management and Economics.

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

Chinese - CHIN*1200

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 Options

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.

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

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

General Program Areas of Concentration

Anthropology

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
Environmental Governance
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
Computing and Information Science
Criminal Justice and Public Policy
Economics
Educational Psychology
English
Ethics in the Life Sciences
Environmental Studies
European Culture and Civilization
Family and Child Studies
French Studies
Geography
German
History
International Development
Italian
Marketing Management
Mathematics
Museum Studies
Music
Philosophy
Political Science
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 Food, Agricultural and Resource Economics, 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 Food, Agricultural and Resource Economics.

Major (Honours Program)

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

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
BUS*2220	[0.50]	Financial 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*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*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
BUS*2230	[0.50]	Management Accounting
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. **Note:** the following course may be used towards an anthropology specialization: ISS*2990.

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

Area of Concentration (General Program)

A minimum of 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 and Cross-Cultural Perspectives; 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 majoring in other programs who are also interested in the study of Art History are encouraged to consider 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 [1.50 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

Major (Honours Program)

A minimum of 9.00 credits is required, including:

a. the Art History core
   1. ARTH*1220, ARTH*1510, ARTH*1520,

b. 3.00 credits from the Western Art and Cross-Cultural Perspectives including:
   1. ARTH*2150 or ARTH*3150
   2. ARTH*2540
   3. ARTH*2550 or ARTH*2950
   4. One of ARTH*2280, ARTH*2290, ARTH*2580, ARTH*2600
   5. At least 1.00 credits of the 3000-level thematic courses: ARTH*3100, ARTH*3200, ARTH*3310, ARTH*3320, ARTH*3330, ARTH*3340, ARTH*3520

c. 1.50 credits from the Arts of the Americas area of focus: ARTH*2050, ARTH*2060, ARTH*2070, ARTH*2490, ARTH*3010, ARTH*3050, ARTH*3060

d. 1.00 credits from the Art Theory, Critical Methodology and Museology area of focus: ARTH*2120, ARTH*2480, ARTH*3210, ARTH*3220, ARTH*3780

e. At least 2.00 credits from 4000-level seminar courses: ARTH*4310, ARTH*4320, ARTH*4330, ARTH*4340, ARTH*4350, ARTH*4620

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

a. The Art History core (ARTH*1220, ARTH*1510, ARTH*1520)

b. 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 & Space in Western Art
ARTH*3150	[0.50]	Space: Roman Art and Urbanism
ARTH*3200	[0.50]	Colour: Practice & Meanings in Western Art
ARTH*3310	[0.50]	Image: Pictures & Their Power
ARTH*3320	[0.50]	Lives: Aspects of Western Art
ARTH*3330	[0.50]	Display: Visual Culture in Western Europe
ARTH*3340	[0.50]	The Art Object & Material Culture
ARTH*3520	[0.50]	Idea: Art Since 1950
ARTH*4330	[1.00]	Topics in Art & Visual Culture III
ARTH*4340	[1.00]	Topics in Art & Visual Culture IV

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*4310	[1.00]	Topics in Art & Visual Culture I
ARTH*4320	[1.00]	Topics in Art & Visual Culture 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 & Identity in Art
ARTH*3780	[0.50]	Gender and Art
ARTH*4350	[1.00]	Topics in Art & Visual Culture V
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 specializations, 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

b. 3.50 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 & Identity in Art
ARTH*3520	[0.50]	Idea: Art Since 1950
ARTH*3780	[0.50]	Gender and Art
ARTH*4350	[1.00]	Topics in Art & Visual Culture V

Business Administration (BADM)

Department of Economics, College of Management and Economics

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 Economics (ECON) or Mathematical Economics (MAEC) in the B.A. degree and the heading Management Economics (MEIF) in the B.Comm. degree.

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

BUS*2220	[0.50]	Financial Accounting
BUS*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*1000	[0.50]	Introductory Marketing
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]	Food & Agri 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:

a. the Classical Languages core

b. any 5.00 credits from CLAS*3050, CLAS*3060, CLAS*3070, CLAS*3080, CLAS*3090, CLAS*3120, CLAS*4010

c. LAT*4100, LAT*4150

Minor (Honours Program)

A minimum of 6.00 credits is required, including:

a. the Classical Languages core

b. 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

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

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

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

d. one of CLAS*3030, CLAS*3040

e. one of CLAS*3150, CLAS*3200, HIST*2850, PHIL*2140

Major (Honours Program)

A minimum of 8.00 credits is required, including:

a. the Classical Studies Core

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

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

d.

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

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

a. the Classical Studies Core

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

Computing and Information Science (CIS)

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 CIS 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 CIS 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 CIS 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 CIS electives at 3000 level or above
1.00 electives

Semester 7

1.00 CIS. credits at the 4000 level

1.50 electives

Semester 8

1.00 CIS 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 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. A five year option with four work terms is also available. Please see the department's co-op academic advisor for details.

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.

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.

Students are advised to plan their schedule of studies well in advance so that they can take all required prerequisites for later (especially 4000 level) courses. Students should note that some 4000 level courses are only given in alternate years. Failure to plan may result in the inability to take a particular senior CIS course. 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 CIS 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 CIS electives at 3000 level or above
1.00 electives

Semester 7(Fall)

1.00 CIS credits at the 4000 level

1.50 electives

Semester 8(Winter)

1.00 CIS 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 CIS electives at the 3000 level or above
1.25 credits in the Area of Application or electives
OR Alternative 2
1.50 CIS 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 CIS at 3000 level or above

1.00 credits in CIS at the 4000 level

Semester 8(Winter)

CIS*4000 [0.50] Applications of Computing Seminar
1.00 CIS credits at the 4000 level
1.50 credits in the Area of Application or electives
0.50 credits in the CIS 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 and Governance
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 and Governance
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] Research Methods II: Quantitative Methods
- 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*4050 [0.50] Advanced Topics in Law and Politics
- POLS*4100 [0.50] Women, Justice and Public Policy
- POLS*4160 [0.50] Multi-Level Governance in Canada
- POLS*4250 [0.50] Topics in Public Management
- POLS*4260 [0.50] Topics in Public Policy
- POLS*4740 [0.50] Advanced Topics in Rights and Liberties
- 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 and Governance
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

Economics (ECON)

Department of Economics, **College of Management and Economics**

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:

a. the Economics core

b. 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:

a. the Economics core

b. 2.50 other credits in economics at the 3000 or 4000 level

Notes:

1. ECON*3740 is recommended.
2. Students wishing to pursue a more structured Economics minor should take ECON*3710 as well as ECON*3740.
3. 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 Management and Economics**

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

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

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

Major (Honours Program)

Semester 1

ECON*1050	[0.50]	Introductory Microeconomics

One of:

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

1.50 electives

Semester 2 (Winter)

ECON*1100	[0.50]	Introductory Macroeconomics

One computer science course
1.50 electives

Summer Semester

Optional -- at the discretion of the student.

Semester 3 (Fall)

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

0.50 electives

Semester 4 (Winter)

ECON*3740	[0.50]	Introduction to Econometrics

One economic history course*
1.50 electives

Summer Semester

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

Fall Semester

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

Semester 5 (Winter)

ECON*3100	[0.50]	Game Theory
ECON*3600	[0.50]	Macroeconomics in an Open Economy

One 3000 level economics course
1.00 electives

Summer Semester

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

Semester 6 (Fall)

ECON*3710	[0.50]	Advanced Microeconomics

One 4000 level Economics course (ECON*4640 is recommended)
1.50 electives

Winter Semester

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

Summer Semester

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

Semester 7 (Fall)

ECON*4710	[0.50]	Advanced Topics in Microeconomics

One 4000 level Economics course
1.00 electives
0.50 restricted electives

Semester 8 (Winter)

ECON*4810	[0.50]	Advanced Macroeconomic Theory

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 B.A. Program in English that focus on the study of literature and related texts across a broad range of theoretical, historical, and geographical sites. The School also welcomes non-majors into its courses,

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.

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

Area of Concentration (General Program)

A minimum of 5.50 English credits is required in the English core and the English electives. English elective courses must be chosen to fulfill the Distribution Requirements for the Area of Concentration.

English core - 2.00 credits as follows:

a. ENGL*1080, ENGL*2080, ENGL*2120

b. one of ENGL*2130, ENGL*3940, ENGL*3960

English electives - 3.50 credits to include:

1. 3.00 credits from 3000 level lecture courses
2. 0.50 credits from any other lecture or seminar course
3. Distribution requirements as listed below.

Distribution Requirements for the Area of Concentration:

The electives must be chosen to ensure that 0.50 credits are completed in each of the following four fields:

- Medieval and Early Modern Literature
- 18th and 19th Century Literature
- Colonialisms/Postcolonialisms
- Canadian Literature/American Literature

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

Major (Honours Program)

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

English core - 3.00 credits as follows:

a. ENGL*1080, ENGL*2080

b. ENGL*2120, ENGL*2130, ENGL*3940, ENGL*3960

English electives - 5.50 credits to include:

- 3.50 credits from 3000 level lecture courses
- 1.00 credits from 4000 level courses
- 1.00 credits from any other lecture or seminar courses
- Distribution requirements as listed below

Distribution Requirements for the Major:

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

- Medieval and Early Modern Literature
- 18th and 19th Century Literature

and that 0.50 credits are completed in each of the following three fields:

- American Literature
- Canadian Literature
- Colonialisms/Postcolonialisms

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

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 Governance (EGOV)

Interdisciplinary Program

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

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

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

Major (Honours Program)

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

AGEC*3170*	[0.50]	Cost-Benefit Analysis
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*1350	[0.50]	Earth: Hazards and Global Change
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*3020	[0.50]	Global Environmental Change
GEOG*3210	[0.50]	Management of the Biophysical Environment
GEOG*4210	[0.50]	Environmental Governance
GEOG*4220	[0.50]	Local Environmental Management
GEOG*4230	[0.50]	Environmental Impact Assessment
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250	[0.50]	Public Administration and Governance
POLS*2300	[0.50]	Canadian Government
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3370	[0.50]	Environmental Politics and Governance
One of:		
GEOG*2030	[0.50]	Political Ecology & Geography
GEOG*2230	[0.50]	Economic Geography
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
One of:		
HIST*2250	[0.50]	Environment and History
PHIL*2070*	[0.50]	Philosophy of the Environment
SOC*3380*	[0.50]	Society and Nature
One of:		
ECON*2740*	[0.50]	Economic Statistics
GEOG*2460	[0.50]	Analysis in Geography
STAT*2040	[0.50]	Statistics I
One of:		
AGEC*3190	[0.50]	Markets, Firms & Natural Amenities
POLS*3250	[0.50]	Public Policy: Challenges and Prospects
POLS*3270	[0.50]	Local Government in Ontario
POLS*3470	[0.50]	Business-Government Relations in Canada
POLS*3790*	[0.50]	The Political Economy of International Relations
One of:		
AGEC*4290	[0.50]	Land Economics
AGEC*4310	[0.50]	Resource Economics

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

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

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 Politics and Governance

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

Ethics in Life Sciences (ELS)

Department of Philosophy, College of Arts

This program draws together critical and foundational analysis of the sciences (scientific method and concepts) with the philosophical disciplines of pure and applied ethics. The program will be of particular interest to students seeking to become skilled at interpreting and discussing concrete scientific developments and at analyzing and evaluating ethical issues in the life sciences.

Minor (Honours Program)

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

a. PHIL*2120, PHIL*2180, PHIL*3450

b. At least 2 of the following courses (minimum 1.00 credits): PHIL*2070, PHIL*2030, PHIL*3170, PHIL*3240, PHIL*4040

c. At least 2 of the following courses in Ethics (minimum 1.00 credits): PHIL*2060, PHIL*2600, PHIL*3040, PHIL*3230, PHIL*4060, PHIL*4230, PHIL*4310, PHIL*4340

d. At least 2 of the following courses in Metaphysics/Epistemology (minimum 1.00 credits): PHIL*2160, PHIL*2170, PHIL*2250, PHIL*2370, PHIL*3130, PHIL*3180, PHIL*3190, PHIL*4360, PHIL*4370, PSYC*3280

e. 0.50 additional credits in Philosophy

Students must have at least 2.00 credits in Philosophy at the 3000 level or above.

NOTE: PSYC*3280 counts as a Philosophy credit.

European Culture and Civilization (ECC)

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

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

Minor (Honours Program)

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

A minimum of 5.50 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*2100	[0.50]	Renaissance Lovers and Fools
ITAL*3060	[0.50]	Advanced Italian
ITAL*3150	[0.50]	Medieval Italian Literature
ITAL*3200	[0.50]	Novels of Resistance
ITAL*3950	[0.50]	Topics in 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 (taught in French)
FREN*3010	[0.50]	Twentieth-Century French Novel (taught in French)
FREN*3020*	[0.50]	Twentieth-Century French Theatre (taught in French)
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 (taught in English)
HUMN*3450	[0.50]	20th Century German Literature and Film
HUMN*4170	[0.50]	Don Quixote and the Picaresque Novel (taught 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 & Space in Western Art
ARTH*3320	[0.50]	Lives: Aspects of Western Art
ARTH*3330	[0.50]	Display: Visual Culture in Western Europe
ARTH*3340	[0.50]	The Art Object & Material Culture
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]	Russia and Eastern Europe

European Studies (EURS)

Interdisciplinary Program

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

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

Major (Honours Program)

A minimum of 13.00 credits is required, including:

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

b. 5.00 credits in either the European Culture and Civilization or the European Business Studies area of emphasis

Core Requirements

1. 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, a course taken in that year involving a major academic paper of exam in the core language will, upon approval of the Co-ordinator for European Studies, EURO*4740.
2. 3.00 credits in one language:

FREN*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*2100	[0.50]	Renaissance Lovers and Fools
ITAL*3060	[0.50]	Advanced Italian
ITAL*3150	[0.50]	Medieval Italian Literature
ITAL*3200	[0.50]	Novels of Resistance
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. 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
   POLS*3450 [0.50] European Governments and Politics

Areas of Emphasis

European Business

Required courses:

BUS*2220	[0.50]	Financial Accounting
BUS*2230	[0.50]	Management Accounting
BUS*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]	Food & Agri Marketing Management

2.00 credits (4 courses) chosen from:

One of:		
AGEC*3310	[0.50]	Operations Management
AGEC*4370	[0.50]	Food & Agri Marketing Management

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

BUS*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 (taught in French)
FREN*3010	[0.50]	Twentieth-Century French Novel (taught in French)
FREN*3020*	[0.50]	Twentieth-Century French Theatre (taught in French)
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 (taught in English)
HUMN*3450	[0.50]	20th Century German Literature and Film
HUMN*4170	[0.50]	Don Quixote and the Picaresque Novel (taught 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 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 & Space in Western Art
ARTH*3320	[0.50]	Lives: Aspects of Western Art
ARTH*3330	[0.50]	Display: Visual Culture in Western Europe
ARTH*3340	[0.50]	The Art Object & Material Culture
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]	Russia and Eastern Europe

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*1150. 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.

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:

a. FREN*1200, FREN*2020, FREN*2030, FREN*2060, FREN*2520, FREN*3230

b. at least 0.50 credits from FREN*2500, FREN*2540

c. at least 2.00 additional credits from FREN*3000, FREN*3010, FREN*3070, FREN*3120, FREN*3150, FREN*3200, FREN*3240, FREN*3560

d. at least 1.00 credits from FREN*3500, FREN*3520, FREN*3530

e. 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:

a. FREN*1200, FREN*2020, FREN*2030, FREN*2060, FREN*2520, FREN*3520

b. 1.00 credits in French literature from FREN*3000, FREN*3010, FREN*3070, FREN*3120, FREN*3200 , FREN*3240, FREN*3560, FREN*4300, FREN*4050, FREN*4220, FREN*4290,

c. 1.00 additional credits from French

Notes:

1. Students are strongly urged to take 0.50 language credits each semester.
2. Students in the general program may take 4000 level courses, but must previously have taken FREN*3520.
3. 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.
4. FREN*1000 , FREN*1090, FREN*1100, FREN*1150, FREN*1120 are not counted toward a specialization in French.
5. 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.

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.

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

Area of Concentration (General Program)

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

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

Two of:

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

One of:

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

2.00 credits at the 3000 level or above

Major (Honours Program)

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

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

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

Minor (Honours Program)

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

Two of:

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

Two of:

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

One of:

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

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

German (GERM)

School of Languages and Literatures, College of Arts

All language courses carry 0.50 credits. Students with 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*3450, GERM*3460, GERM*3470, 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

a. HIST*1010, HIST*2100, HIST*2450, HIST*2600

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

Area of Concentration (General Program)

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

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

b. students should take the History Core Requirements

Note: With the permission of the department, students may select as part of their program 0.50 credits outside the History Department such as ECON*2420, ECON*3730, EURO*4600, WMST*4010.

Major (Honours Program)

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

a. the History Core Requirements

b. 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:

a. the History Core Requirements

b. 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:

a. minimum of 9.00 credits
b. minimum of 4.00 credits at the 3000 level and above, including at least 1.00 credits at the 4000 level
c. minimum of 1.00 credits in methods and/or theory
d. maximum of 1.50 credits at the 1000 level
e. a senior level Directed Readings or Special Project course must be completed. When appropriate, the Committee will identify a faculty member as the supervisor for a student's course of study.

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

a. a clear statement of theme or areas of study
b. a clear statement of the contribution of the major to a post-graduation field of work or study
c. a clearly set out rationale for inclusion of the specific courses and how they relate to or develop the theme or areas of study
d. a list of required "core" courses and "restricted electives" following the above criteria. When proposing core and restricted elective credits, students should keep in mind the prerequisites for their desired 3000 and 4000 level courses

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

Information Systems and Human Behaviour (ISHB)

Interdisciplinary Program

As computers and communications play progressively more subtle and significant roles in society, this program of study brings together the elements of 3 disciplines to provide students with an understanding of technical, behavioural and social aspects of information technology. This program of study is a co-operative effort of the 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 Computing and Information Science.

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
SOAN*3070	[0.50]	Qualitative and Observational Methods

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

Statistics Courses

STAT*2040	[0.50]	Statistics I

International Development (ID)

Interdisciplinary Program

Faculty Advisor: Room 045 MacKinnon Building, ext 56175.

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

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

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

Area of Concentration (General Program)

A minimum of 5.00 credits is required, including:

ANTH*1150	[0.50]	Introduction to Anthropology
ECON*1050	[0.50]	Introductory Microeconomics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2650	[0.50]	Introductory Development Economics
GEOG*2030	[0.50]	Political Ecology & 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, 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]	Political Ecology & 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

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:
AGEC*1300 [0.50] Poverty, Food & Hunger
AGEC*3250 [0.50] Food, Nutrition & International Development
EDRD*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

Areas of Emphasis

Environment and Development

GEOG*1220 [0.50] Human Impact on the Environment
GEOG*1300 [0.50] Introduction to the Biophysical Environment
GEOG*2210 [0.50] Environment and Resources
GEOG*3210 [0.50] Management of the Biophysical Environment
One of:
AGEC*2700 [0.50] Survey of Natural Resource Economics
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 Politics and Governance
SOC*2280 [0.50] Society and Environment
SOC*3380 [0.50] Society and Nature

Choose Option A or B

Option A - Biophysical Environment
GEOG*2460 [0.50] Analysis in Geography
Two of:
GEOG*2110 [0.50] Climate and the Biophysical Environment
GEOG*2480 [0.50] Mapping and GIS
GEOG*3020 [0.50] Global Environmental Change
GEOG*3110 [0.50] Biotic and Natural Resources
GEOG*3610 [0.50] Environmental Hydrology
GEOG*3620 [0.50] Desert Environments
Two of:
GEOG*3480 [0.50] GIS and Spatial Analysis
GEOG*4110 [0.50] Environmental Systems Analysis
GEOG*4210 [0.50] Environmental Governance
GEOG*4220 [0.50] Local Environmental Management
GEOG*4230 [0.50] Environmental Impact Assessment
GEOG*4250 [0.50] Coastal Processes
GEOG*4480 [0.50] Applied Geographic Information Systems

Option B - Human Environment
GEOG*2260 [0.50] Applied Human Geography
Two of:
GEOG*2480 [0.50] Mapping and GIS
GEOG*3020 [0.50] Global Environmental Change
GEOG*3090 [0.50] Gender and Environment
GEOG*3320 [0.50] Agriculture and Society
GEOG*3490 [0.50] Tourism and Environment
GEOG*3600 [0.50] Geography of a Selected Region
Two of:
GEOG*3480 [0.50] GIS and Spatial Analysis
GEOG*4200 [0.50] Seminar in Urban Geography
GEOG*4210 [0.50] Environmental Governance
GEOG*4220 [0.50] Local Environmental Management
GEOG*4230 [0.50] Environmental Impact Assessment
GEOG*4390 [0.50] Seminar in Rural Geography
GEOG*4480 [0.50] Applied Geographic Information Systems

Economic and Business Development

BUS*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 AGEC 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*2160 [0.50] Social Anthropology
SOAN*2120 [0.50] Introductory Methods
SOAN*3240 [0.50] Gender & Global Inequality I
SOAN*4230 [0.50] Gender & Global Inequality II
One of the following not taken as part of the core:
ANTH*2230 [0.50] Regional Ethnography
SOC*2080 [0.50] Rural Sociology
One of:
SOAN*3070 [0.50] Qualitative and Observational Methods
SOAN*3120 [0.50] Quantitative Methods
One of:
ANTH*3400 [0.50] The Anthropology of Gender
ANTH*3670 [0.50] Indigenous Peoples: Global Context
ANTH*3690 [0.50] History of Anthropological Thought
ANTH*3770 [0.50] Kinship and Social Organization
SOAN*3100 [0.50] Gender Perspectives on Families and Households
Two of the following not taken as part of the core, at least 0.50 credits being at the 3000 level:
ENGL*2880 [0.50] Women in Literature
GEOG*3090 [0.50] Gender and Environment
HIST*2800 [0.50] The History of the Modern Family
HIST*2930 [0.50] Women and Cultural Change
HIST*3020 [0.50] Sexuality and Gender in History
HIST*3580 [0.50] Women's History in Asia
PHIL*2060 [0.50] Philosophy of Feminism I
POLS*2150 [0.50] Gender and Politics
POLS*3160 [0.50] Women and Politics in the Third World
POLS*3710 [0.50] Politics and Sexuality
WMST*2000 [0.50] Women and Representation
WMST*3000 [0.50] Feminist Theory and Methods
WMST*3010 [0.50] Gender and Diversity
0.50 additional credits at the 4000 level in ANTH, SOAN, SOC or WMST

Historical Perspectives in Development

HIST*1010 [0.50] Europe and the Early Modern World
HIST*2450 [0.50] The Practising Historian
Two of:
HIST*1150 [0.50] 20th-Century Global History
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] Ancient & Medieval South Asia
HIST*3910 [0.50] Africa Since 1800
1.00 additional credits at the 4000-level in HIST.

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

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

Three of:

HIST*2920	[0.50]	Republican Latin America
HIST*3150	[0.50]	History and Culture of Mexico
HIST*3420	[0.50]	Colonial Latin America
HUMN*3300	[0.50]	Latin American Studies in the Humanities
ISS*3300	[0.50]	Latin American Studies in the Social Sciences
POLS*3080	[0.50]	Politics of Latin America
POLS*3730	[0.50]	The Americas
SOAN*3250	[0.50]	Social Change in Latin America
SPAN*3080	[0.50]	Spanish American Culture

0.50 additional credits in SPAN at the 3000 level*

0.50 additional credits at the 4000 level in SPAN or in ANTH, HIST, IDEV, POLS, SOAN, SOC with a focus on Latin America or the Caribbean. Please consult with the International Development advisor for a list of appropriate courses.

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

Political Economy and Administrative Change

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

Two of:

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

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

AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGEC*3170	[0.50]	Cost-Benefit Analysis
AGEC*3250	[0.50]	Food, Nutrition & International Development
AGEC*4210	[0.50]	World Agriculture and Economic Development
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 3000-level, not taken as part of the core.
1.00 additional credits in POLS at the 4000 level
0.50 additional credits with a regional focus at the 2000 or 3000 level in HIST or POLS. The faculty advisor for International Development maintains a list of appropriate courses.

Rural and Agricultural Development

SOAN*2120	[0.50]	Introductory Methods

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

AGEC*1300	[0.50]	Poverty, Food & Hunger
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ANTH*2160	[0.50]	Social Anthropology
SOC*2080	[0.50]	Rural Sociology

One of:

AGEC*3170	[0.50]	Cost-Benefit Analysis
SOAN*3070	[0.50]	Qualitative and Observational Methods
SOAN*3120	[0.50]	Quantitative Methods

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

AGEC*3250	[0.50]	Food, Nutrition & International Development
ANTH*3670	[0.50]	Indigenous Peoples: Global Context
ANTH*3690	[0.50]	History of Anthropological Thought
SOAN*3240	[0.50]	Gender & Global Inequality I
SOAN*3250	[0.50]	Social Change in Latin America
SOAN*3680	[0.50]	Perspectives on Development
SOC*3380	[0.50]	Society and Nature

Any EDRD courses at the 3000 level or above.

Two of:

AGR*1250	[0.50]	Agrifood System Trends & Issues
AGR*2500	[0.50]	Field Trip in International Agriculture
BIOL*1030	[0.50]	Biology I
BIOL*1040	[0.50]	Biology II
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
NRS*2120	[0.50]	Introduction to Environmental Stewardship
OAGR*2050	[0.50]	Gateway to Organic Agriculture
SOIL*2010	[0.50]	Soil Science

0.50 additional credits at the 3000 or 4000 levels in AGR, ENVB, GEOL, HORT, NRS, OAGR, SOIL or any biophysical course in GEOG.
1.00 additional credits in AGEC, ANTH, SOAN or SOC at the 4000 level.

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]	Political Ecology & 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]	Perspectives on Development

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:

a. ITAL*2060, ITAL*2070, ITAL*3060

b. two of the following courses ITAL*2100, ITAL*3150, ITAL*3200

c. 1.50 additional credits from List A

d. 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 & Space in Western Art
ARTH*3150	[0.50]	Space: Roman Art and Urbanism
ARTH*3310	[0.50]	Image: Pictures & Their Power
ARTH*3320	[0.50]	Lives: Aspects of Western Art

One of:

ARTH*3340	[0.50]	The Art Object & Material Culture
ANTH*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 Management and Economics

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:

BUS*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]	Food & Agri 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*3030	[0.50]	Research Methods
MCS*3040	[0.50]	Business and Consumer Law
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 Management and Economics

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

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

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

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

Department of Economics, College of Management and Economics

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

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 - Fall

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

1.00 electives

Semester 2 - Winter

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

1.50 electives

Semester 3 - Fall

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

1.00 electives

Semester 4 - Winter

ECON*3740	[0.50]	Introduction to Econometrics

2.00 electives or restricted electives*

Spring/Summer

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

Fall

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

Semester 5 - Winter

ECON*3100	[0.50]	Game Theory
ECON*3600	[0.50]	Macroeconomics in an Open Economy

1.50 electives or restricted electives*

Spring/Summer

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

Semester 6 - Fall

ECON*3710	[0.50]	Advanced Microeconomics

2.00 electives or restricted electives*

Winter

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

Spring/Summer

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

Semester 7 - Fall

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

1.00 electives or restricted electives*

Semester 8 - Winter

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

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

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:

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

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

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:

a. the Mathematics core requirements

b. MATH*2210

c. MATH*3200

d. STAT*2040

e. 0.50 credits in Statistics

f. 0.50 credits in Computing Science (from CIS*1500 or higher)

g. 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 & Identity in Art
ARTH*3330	[0.50]	Display: Visual Culture in Western 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 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 more than one semester, students may be required to reapply (re-audition) before registering to continue in Applied Music. Students must achieve a minimum grade 70% in Applied Music courses in order to proceed to the next level.

Applied Composition

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

Core Requirements

The Music core is designed to provide the concepts and skills students need for successful study in higher level courses. All students in 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*2180	[0.50]	Musicianship II
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

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

Area of Concentration (General Program)

A minimum of 6.00 Music credits is required, including:

a. the Music core (4.50 credits)

b. at least 1.00 Music credits at the 3000 level or above

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

Major (Honours Program)

A minimum of 9.00 Music credits is required, including:

a. the Music core (4.50 credits)
b. two of MUSC*2530, MUSC*2540, MUSC*2550, MUSC*2560.
c. one of MUSC*2110, MUSC*2140, MUSC*2150, MUSC*2200
d. one of MUSC*2100, MUSC*2220
e. MUSC*4401/2
f. 2.00 additional Music credits at the 3000 or 4000 level

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

Minor (Honours Program)

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

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

Philosophy (PHIL)

Department of Philosophy, College of Arts

The Department of Philosophy offers programs emphasizing the history of philosophy and the study of metaphysics, epistemology, ethics and logic. The requirements for the various Philosophy programs are designed to ensure a basic competence in the discipline while permitting varying degrees of flexibility. It is important that students discuss their programs with a 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:

a. 1 of PHIL*2140, PHIL*2160, PHIL*2170, PHIL*3060, PHIL*3080, PHIL*3130, PHIL*3200, PHIL*3280
b. 1 of PHIL*2110, PHIL*2130, PHIL*2180, PHIL*2250, PHIL*3180, PHIL*3190, PHIL*3240, PHIL*3250, PHIL*3420, PHIL*3450, PHIL*3910, PHIL*3920, PHIL*3930, PHIL*4360, PHIL*4370, PSYC*3280
c. 1 of PHIL*2030, PHIL*2060, PHIL*2070, PHIL*2120, PHIL*2600, PHIL*3040, PHIL*3050, PHIL*3230, PHIL*4040, PHIL*4060, PHIL*4310, PHIL*4340
d. 3.50 additional credits in Philosophy

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

The Department of Philosophy also offers a Minor in Ethics in the Life Sciences (Honours Program)

This program draws together critical and foundational analysis of the sciences (scientific method and concepts) with the philosophical disciplines of pure and applied ethics.

For more information, please see the program listing for Ethics in the Life Sciences (ELS).

Major (Honours Program)

A minimum of 8.50 credits is required, including:

a. PHIL*2110, PHIL*2120, PHIL*2140, PHIL*2160, PHIL*3080
b. 2 of PHIL*2170, PHIL*2180, PHIL*2250, PHIL*3180, PHIL*3190, PHIL*3240, PHIL*3250, PHIL*3450, PHIL*4360, PHIL*4370, PSYC*3280
c. 2 of PHIL*2060, PHIL*3050, PHIL*3230, PHIL*4310, PHIL*4340
d. 2 of PHIL*2030, PHIL*2070, PHIL*2130, PHIL*2600, PHIL*3130, PHIL*3200, PHIL*3280, PHIL*3420, PHIL*3910, PHIL*3920, PHIL*3930, PHIL*4040, PHIL*4060
e. 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*4500 and/or PHIL*4550), PHIL*4800.

Minor (Honours Program)

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

a. 1 of PHIL*2140, PHIL*2160, PHIL*2170, PHIL*3060, PHIL*3080
b. 1 of PHIL*2110, PHIL*2180, PHIL*2250, PHIL*3180, PHIL*3190, PHIL*3240, PHIL*3250, PHIL*3450, PHIL*4360, PHIL*4370, PSYC*3280
c. 1 of PHIL*2060, PHIL*2120, PHIL*3050, PHIL*3230, PHIL*4310, PHIL*4340
d. 1 of PHIL*2030, PHIL*2070, PHIL*2130, PHIL*2600, PHIL*3130, PHIL*3200, PHIL*3280, PHIL*3420, PHIL*3910, PHIL*3920, PHIL*3930, PHIL*4040, PHIL*4060
e. 3.00 additional credits in Philosophy

Note: Students must have at least 2.00 credits in Philosophy at the 3000 level or above.

The Department of Philosophy also offers a Minor in Ethics in the Life Sciences (Honours Program).

This program draws together critical and foundational analysis of the sciences (scientific method and concepts) with the philosophical disciplines of pure and applied ethics.

For more information, please see the program listing for Ethics in the Life Sciences (ELS).

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*3180 and POLS*3650. Students in the honours program minor are required to take POLS*3180.

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

Core Requirements

a. POLS*1150, POLS*2000, POLS*2300
b. POLS*2080 or POLS*2100
c. POLS*2200 or POLS*2250

Area of Concentration (General Program)

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

a. the Political Science core
b. 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:

a. the Political Science core
b. POLS*3180 and POLS*3650
c. at least 0.50 credits at the 3000 level in three of the four fields in the department
d. 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:

a. the Political Science core
b. POLS*3180
c. 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*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*3130	[0.50]	Law, Politics and Judicial Process
POLS*3210	[0.50]	The Constitution and Canadian Federalism
POLS*3250	[0.50]	Public Policy: Challenges and Prospects
POLS*3300	[0.50]	Governing Criminal Justice
POLS*3370	[0.50]	Environmental Politics and Governance
POLS*3440	[0.50]	Corruption, Scandal and Political Ethics
POLS*3470	[0.50]	Business-Government Relations in Canada
POLS*3670	[0.50]	Comparative Public Policy and Administration
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*3320	[0.50]	Politics of Aid & Development
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]	Russia and Eastern Europe
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 Studies 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 Psychology and Educational Psychology. The department does not offer Psychology as an Area of Concentration in the General BA Program.

Note on Honours Courses

Courses marked (H) are designed for students in a psychology major or minor, the Information Systems and Human Behaviour major or the Educational Psychology minor. Students in other programs wishing to take these courses must obtain the permission of the instructors concerned. **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 the ISHB Major.**

Core Courses

Students must complete at least 3.00 credits (2.00 credits for the PSYC minor) of the following 2000-level Psychology courses. 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.

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

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*2040	[0.50]	Research Statistics
PSYC*2360	[0.50]	Introductory Research Methods
PSYC*3250	[0.50]	Psychological Measurement

1.50 additional Psychology credits at the 3000 level or above (see Graduate Studies Advisory Note).

1.50 additional psychology credits at the 4000 level (See Graduate Studies 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*2040 SHOULD NORMALLY BE COMPLETED BY THE END OF SEMESTER 4.

Note: The regulations of the B.A. program state that 7.00 credits 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 Studies 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 electives credits at the 3000 level or above and 0.50 elective credits at the 4000 level beyond PSYC*4870 and PSYC*4880 (the Honours Thesis courses) 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*2040
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 the Honours Thesis courses are normally taken in a Fall-Winter sequence worth the equivalent of 1.50 credits toward the 20.00 credits Honours B.A. degree requirements.

Minor (Honours Program)

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

A 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*2360	[0.50]	Introductory Research Methods

2.00 credits in the 2000 level Psychology core courses listed above

2.00 credits in Psychology at the 3000/4000 level

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.

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.

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 some 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*2040 [0.50] Research Statistics
1.50 Psychology core***
0.50 electives*

Winter Semester

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

Semester 4 - Summer

1.00 Psychology core
1.50 electives****

Fall Semester

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

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*2040 [0.50] Research Statistics
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:

a. 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

b. 4 of SOAN*4220, SOAN*4240 , SOC*2010, SOC*2280, SOC*2390, SOC*4880, SOC*4890, SOC*4900, SOC*4910

c. at least 1.00 credits at the 4000 level

Sociology (SOC)

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

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

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

FRHD*3060	[0.50]	Principles of Social Gerontology
ISS*2990	[0.50]	Introduction to Marx
PHIL*2180	[0.50]	Philosophy of Science

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

SOAN courses will be used towards the Sociology specializations.

Area of Concentration (General Program)

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

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

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

Major (Honours Program)

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

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

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

The following courses may be used toward a sociology specialization:

FRHD*3060	[0.50]	Principles of Social Gerontology
ISS*2990	[0.50]	Introduction to Marx
PHIL*2180	[0.50]	Philosophy of Science

Minor (Honours Program)

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

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

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

The following courses may be used toward a sociology specialization:

FRHD*3060	[0.50]	Principles of Social Gerontology
ISS*2990	[0.50]	Introduction to Marx
PHIL*2180	[0.50]	Philosophy of Science

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:

a. 3.00 credits from SPAN*1100, SPAN*1110, SPAN*2000, SPAN*2010, SPAN*3500, SPAN*3530, SPAN*4500, SPAN*4520

b. SPAN*2040, SPAN*2990, SPAN*3080

c. 0.50 credits in literature

Major (Honours Program)

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

a. SPAN*2000, SPAN*2010, SPAN*2040, SPAN*2990, SPAN*3080, SPAN*3500, SPAN*3530, SPAN*4500, SPAN*4520

b. 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:

a. 3.00 credits from SPAN*1100, SPAN*1110, SPAN*2000, SPAN*2010, SPAN*3500, SPAN*3530, SPAN*4500, SPAN*4520

b. SPAN*2040, SPAN*2990, SPAN*3080

c. 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:

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

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

Recommended Courses

MATH*1200	[0.50]	Calculus I

MATH*1210	[0.50]	Calculus II
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 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 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 Western Art and Cross-Cultural Perspectives: (ARTH*2150, ARTH*2280, ARTH*2290, ARTH*2540, ARTH*2550, ARTH*2580, ARTH*2600, ARTH*2950, ARTH*3150).

ii. 0.50 credits in Art History from 3000-level thematic courses: (ARTH*3100, ARTH*3200, ARTH*3320, ARTH*3330, ARTH*3340, ARTH*3520).

iii. 0.50 credits in Visual Arts of the Americas: (ARTH*2050, ARTH*2060, ARTH*2070, ARTH*2490, ARTH*3010, ARTH*3050, ARTH*3060).

iv. 0.50 credits in Art Theory, Critical Methodology and Museology (ARTH*2120, ARTH*2480, ARTH*3210, ARTH*3220, ARTH*3780, ARTH*4310, ARTH*4350, ARTH*4620).

d. 3.00 additional credits in Studio Art including 1.50 credits 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 Western Art and Cross-Cultural Perspectives: (ARTH*2150, ARTH*2280, ARTH*2290, ARTH*2540, ARTH*2550, ARTH*2580, ARTH*2600, ARTH*2950, ARTH*3150).

ii. 0.50 credits in Art History from 3000-level thematic courses: (ARTH*3100, ARTH*3200, ARTH*3320, ARTH*3330, ARTH*3340, ARTH*3520).

iii. 0.50 credits in Visual Arts of the Americas: (ARTH*2050, ARTH*2060, ARTH*2070, ARTH*2490, ARTH*3010, ARTH*3050, ARTH*3060).

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*3600	[0.50]	Digital & Non-Silver Photography
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 Practices I
SART*3300	[0.50]	Sculpture II
SART*3770	[0.50]	Extended Practices II
SART*4300	[0.50]	Sculpture III
SART*4310	[0.50]	Sculpture IV
SART*4660	[0.50]	Topics in Extended Practices
SART*4670	[0.50]	Topics in Extended Practices
SART*4800	[0.50]	Special Topics in Sculpture
SART*4810	[0.50]	Extended Practices III
SART*4820	[0.50]	Extended Practices 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.
5. Students in SART can fulfill one of the natural and mathematical sciences B.A. distribution requirements with HK*2100. This credit cannot be used towards the SART major.

Theatre Studies (THST)

School of English and Theatre Studies, College of Arts

The Theatre Studies program is a component of a liberal education, and is dedicated to integrating academic study and theatre practice. The program offers introductory and advanced courses 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)

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
   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*4310 [1.00] Topics in Art & Visual Culture I
   - ARTH*4320 [1.00] Topics in Art & Visual Culture II

Women's Studies (WMST)

Interdisciplinary Program

Women's Studies Office, College of Arts

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
SOC*4410	[0.50]	Women, Work and Public Policy

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
GERM*3460	[0.50]	Women in 18th & 19th Century German Lit.
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
PHIL*4060	[0.50]	Philosophy of Feminism II
SOAN*3100	[0.50]	Gender Perspectives on Families and Households
SOAN*3240	[0.50]	Gender & Global Inequality I
SOAN*4220	[0.50]	Gender and Change in Rural Canada
SOAN*4230	[0.50]	Gender & Global Inequality II
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 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 - minimum 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 - minimum 4.00 credits

Science Core - minimum 2.00 credits as identified by minor below:

If you choose this BAS Science Minor, then	The BAS Science Core Requirements would be:
Agriculture	BIOL*1030, BIOL*1040, [(CHEM*1040, CHEM*1050) or (MATH*1080, STAT*2040)]
Biochemistry	BIOL*1030, BIOL*1040, CHEM*1040, CHEM*1050
Biology	BIOL*1030, BIOL*1040, [(CHEM*1040, CHEM*1050) or (MATH*1080, STAT*2040)]
Biotechnology	BIOL*1030, BIOL*1040, CHEM*1040, CHEM*1050
Chemistry	CHEM*1040, CHEM*1050, MATH*1200, MATH*1210
Computing & Information Science	CIS*1500, CIS*1910, STAT*2040, STAT*2050
Ecology	BIOL*1030, BIOL*1040, STAT*2040, (MATH*1080, MATH*1200)
Food Science	BIOL*1030, BIOL*1040, CHEM*1040, CHEM*1050
Forest Systems	BIOL*1030, BIOL*1040, STAT*2040, (MATH*1080, MATH*1200)
Functional Foods & Nutraceuticals	BIOL*1030, BIOL*1040, CHEM*1040, CHEM*1050
Geology	BIOL*1030, BIOL*1040, GEOL*1050, GEOG*1300
GIS & Environmental Analysis	GEOG*1300, GEOL*1050, STAT*2040, (MATH*1080, MATH*1200)
Mathematics	MATH*1200, MATH*1210, STAT*2040, STAT*2050
Microbiology	BIOL*1030, BIOL*1040, [(CHEM*1040, CHEM*1050) or [STAT*2040, (MATH*1080 or MATH*1200)]]
Molecular Biology and Genetics	BIOL*1030, BIOL*1040, [(CHEM*1040, CHEM*1050) or [STAT*2040, (MATH*1080 or MATH*1200)]]
Neuroscience	BIOL*1030, BIOL*1040, CHEM*1040, CHEM*1050
Nutritional Sciences	BIOL*1030, BIOL*1040, CHEM*1040, CHEM*1050
Plant Biology	BIOL*1030, BIOL*1040, CHEM*1040, CHEM*1050
Physics	PHYS*1000, PHYS*1010, MATH*1200, MATH*1210
Psychology: Brain and Cognition	MATH*1080, STAT*2040, [(CHEM*1040, CHEM*1050) or (BIOL*1030, BIOL*1040)]
Statistics	MATH*1200, MATH*1210, STAT*2040, STAT*2050

Zoology	BIOL*1030, BIOL*1040, [(CHEM*1040, CHEM*1050) or [STAT*2040, (MATH*1080 or MATH*1200)]]	

Arts and Social Science Core - 2.00 credits including:

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

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

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
Criminal Justice & Public Policy
Economics
Educational Psychology
English
Environmental Studies
Ethics in the Life Sciences
European Culture and Civilization
Family & Child Studies
French Studies
Geography
German
History
International Development
Italian
Marketing Management
Museum Studies
Music
Philosophy
Political Science
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):

Agriculture (see B.Sc.(Agr.) program description)
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: Brain and Cognition
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 3.00 credits may be double-counted:

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

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

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

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

The University of Guelph, in collaboration with the regional campuses at Ridgetown and Kemptville, 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. At the present time, two majors, Environmental Management and Equine Management, are available in the program through University of Guelph's Ridgetown campus and Kemptville campus respectively with Semester 5 to 8 offered at the Guelph campus.

Program Information

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

The first 10.00 credits of the Environmental Management Major are available through the Ridgetown campus and the first 10.00 credits of the Equine Management Major are available through the Kemptville campus. The additional 10.00 credits for both majors are available through the Guelph Campus.

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

Academic Advising and Counselling

Program Counselling

Program Counsellors are available at both the Ridgetown, Kemptville and Guelph campuses to assist in-course students who require information or advice about their program or other academic regulations and who seek information about resources available to students. For information about how to contact a program counsellor, and for more information about program counselling, see Section VII -- Academic Counselling of the current Undergraduate Calendar.

Departmental Advising

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

Continuation of Study

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

Conditions for Graduation

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

Schedule of Studies

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

Special Expenses

Expenses for field trips and labs can range from $20 to $100 per semester. In certain courses modest expenses will be incurred for supplies. Equine Management students are welcome to board horses at local facilities. Please contact the Kemptville Registrar, Heather Buck at Heather Buck <hbuck@kemptvillec.uoguelph.ca> for a listing of boarding facilities.

B.B.R.M. Program Regulations

Recommendations

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

Environmental Management Major (EM)

Dean's Office OAC

This major will require the completion of 20.00 credits.

Semesters 1 to 4 offered at the Ridgetown campus

Semester 1 - Fall

CIS*1000	[0.50]	Introduction to Computer Applications
ENVM*1000	[0.50]	Introductory Environmental Science
ENVM*1050	[0.50]	Surveying and GIS
ENVM*2020	[0.50]	Environmental Law
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*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVM*1090	[0.50]	Occupational Health and Safety
ENVM*1100	[0.50]	Ecology

0.50 restricted electives

Semester 4 - Winter

AGR*2100	[0.50]	Human Resource Management
BIOL*1040	[0.50]	Biology II
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

AGEC*2700	[0.50]	Survey of Natural Resource Economics
AGR*3500	[0.50]	Experiential Education
SOIL*3080	[0.50]	Soil and Water Conservation

1.00 electives or restricted electives

Semester 6 - Winter

GEOL*3130	[0.50]	Agrogeology
MET*2020	[0.50]	Agrometeorology
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives or restricted electives

Semester 7 - Fall

AGEC*4290 [0.50] Land Economics

One of:

ENVB*4420	[0.50]	Problems in Environmental Biology
NRS*4110	[0.50]	Natural Resources Management Field Camp *
SOIL*4250	[0.50]	Soils in the Landscape

1.50 electives or restricted electives

* Students choosing NRS*4110 must choose electives in 3rd year to obtain the required prerequisites.

Semester 8 - Winter

AGR*4050	[0.50]	Professionalism and Agrology
AGEC*4310	[0.50]	Resource Economics
GEOL*3060	[0.50]	Groundwater
NRS*3600	[0.50]	Remote Sensing

0.50 electives or restricted electives

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

Restricted Electives

Students would be required to take a minimum of 2.00 credits from one or more of the following groups and should 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*3200	[0.50]	Environmental Soil Biology
SOIL*4090	[0.50]	Soil Management
SOIL*4130	[0.50]	Soil and Nutrient 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
NRS*2120	[0.50]	Introduction to Environmental Stewardship
NRS*3100	[0.50]	Resource Planning Techniques
SOIL*3050	[0.50]	Land Utilization

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

Equine Management Major (EQM)

Dean's Office OAC

This major will require the completion of 20.00 credits.

Students enrolling in the Equine Management major will be required to submit an equine background information form.

Semesters 1 to 4 offered at the Kemptville campus

Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
ENVM*1090	[0.50]	Occupational Health and Safety
EQN*1020	[0.00]	Horse Care Practicum I
EQN*1060	[0.50]	Equine Event Management I
EQN*1100	[0.50]	Introduction to Equine Industry
SOIL*2010	[0.50]	Soil Science

Semester 2 - Winter

AGR*1050	[0.50]	Communication Skills
BIOL*1040	[0.50]	Biology II
CIS*1000	[0.50]	Introduction to Computer Applications
EQN*1030	[0.00]	Horse Care Practicum II
EQN*1040	[0.50]	Equine Facility Management and Design
EQN*1070	[0.50]	Equine Event Management II

Semester 3 - Fall

AGR*2030	[0.50]	Pasture Management
CHEM*1040	[0.50]	General Chemistry I
ECON*1050	[0.50]	Introductory Microeconomics
EQN*2020	[0.50]	Equine Management
EQN*2040	[0.50]	Equine Anatomy and Physiology

Semester 4 - Winter

AGEC*1100	[0.50]	Introduction to Business
AGR*2100	[0.50]	Human Resource Management
BUS*2220	[0.50]	Financial Accounting
EQN*2050	[0.50]	Introduction to Equine Nutrition
EQN*2200	[0.50]	Equine Industry Trends and Issues I

Semesters 5 to 8 offered at the Guelph campus

Semester 5 - Fall

AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*3500	[0.50]	Experiential Education
MCS*1000	[0.50]	Introductory Marketing

One of:

SOIL*3080	[0.50]	Soil and Water Conservation
SOIL*4090	[0.50]	Soil Management
SOIL*4130	[0.50]	Soil and Nutrient Management

0.50 electives

Semester 6 - Winter

ANSC*3210	[0.50]	Principles of Animal Care and Welfare
EQN*3050	[0.50]	Equine Exercise Physiology
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

Semester 7 - Fall

AGEC*3310	[0.50]	Operations Management
EQN*4020	[0.50]	Feeding the Performance Horse

1.50 electives

Semester 8 - Winter

AGR*4050	[0.50]	Professionalism and Agrology
AGR*4500	[0.50]	Agrifood Industry Problem-Solving
EQN*4400	[0.50]	Equine Industry Trends and Issues II

1.00 electives

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

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 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
EDRD Environmental Design and Rural Development
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
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 Food, Agricultural and Resource Economics, 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 Food, Agricultural and Resource Economics 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

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

0.50 from List A or List B

Semester 4

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

One of:
- Students choosing List A take 0.50 electives from List A
- Students choosing List B take 0.50 electives

Semester 5

AGEC*3400	[0.50]	Agribusiness Financial Management
ECON*3740	[0.50]	Introduction to Econometrics
MCS*3040	[0.50]	Business and Consumer Law

One of:
- Students choosing List A take 0.50 electives
- Students choosing List B take 0.50 electives from 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

One of:
- Students choosing List A take 1.00 electives
- Students choosing List B take 0.50 electives from List B and 0.50 electives

Semester 7

AGEC*3030	[0.50]	The Firm and Markets
AGEC*4370	[0.50]	Food & Agri Marketing Management
BUS*4250	[0.50]	Business Policy

1.00 electives

Semester 8

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

One of:
- Students choosing List A take 0.50 electives from List A and 0.50 electives
- Students choosing List B take 1.00 electives

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		
AGEC*4220	[0.50]	Advanced Farm Management

List B*

BIOL*1020 in Semester 3
(2 of AGR*2350, ANSC*2340, ANSC*3210, 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 Food, Agricultural and Resource Economics, Ontario Agricultural College

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

The Co-op program in Agricultural Business is a five year program, including 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter and Summer work term. Please refer to the Co-operative Education program policy with respect to adjusting the schedule listed below.

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

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

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

AGR*2400 [0.50] Economics of the Canadian Food System
BUS*2220 [0.50] Financial Accounting
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*2410 [0.50] Agrifood Markets and Policy
BUS*2230 [0.50] Management Accounting
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*2770 [0.50] Introductory Mathematical Economics
0.50 electives 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
ECON*3740 [0.50] Introduction to Econometrics
MCS*3040 [0.50] Business and Consumer Law
1.00 electives

Summer Semester

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

Semester 6 - Fall

AGEC*3400 [0.50] Agribusiness Financial Management
ECON*3560 [0.50] Theory of Finance
HTM*4390 [0.50] Individuals and Groups in Organizations
1.00 electives

Winter Semester

COOP*4000 [0.00] Co-op Work Term IV
(Eight month work term Winter/Summer)

Summer Semester

COOP*5000 [0.00] Co-op Work Term V
(Eight month work term Winter/Summer)

Semester 7 - Fall

AGEC*3030 [0.50] The Firm and Markets
AGEC*4370 [0.50] Food & Agri Marketing Management
BUS*4250 [0.50] Business Policy
One of:
Students choosing List A take 1.00 electives
Students choosing List B take 0.50 electives from List B and 0.50 electives

Semester 8 - Winter

AGEC*4000 [0.50] Agricultural and Food Policy
AGEC*4240 [0.50] Futures and Options Markets
AGR*4500 [0.50] Agrifood Industry Problem-Solving
One of:
Students choosing List A take 0.50 electives from List A and 0.50 electives
Students choosing List B take 1.00 electives

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
AGEC*4220 [0.50] Advanced Farm Management

List B*

BIOL*1020 in Semester 3
(2 of AGR*2350, ANSC*2340, ANSC*3210, AGR*2470, and CROP*2110)
* students with OAC Biology may elect to take BIOL*1030 in Semester 3

Hotel and Food Administration (HAFA)

School of Hospitality and Tourism Management, College of Management and Economics

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 4U Chemistry. If CHEM*1100 is not required, then a total of 3.00 restricted electives are required.

Semester 2

ECON*1100 [0.50] Introductory Macroeconomics
HTM*2000 [0.50] Hospitality 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

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

Semester 4 or 5

HTM*3070 [0.50] Hospitality and Tourism Management Accounting

Semester 5 or 6

BUS*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 15.00 required credits listed above, students must take a minimum of 2.50 restricted electives throughout the program. Students may choose to explore a variety of subjects or may choose to study 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

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

Courses dealing with market forces and consumer behaviour:

AGEC*4360 [0.50] Marketing Research
MCS*1000 [0.50] Introductory Marketing
MCS*2600 [0.50] Fundamentals of Consumer Behaviour
MCS*3000 [0.50] Advanced Marketing
MCS*3600 [0.50] Consumer Information Processes
MCS*3620 [0.50] Marketing Communications

Courses related to the study of tourism:

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] Tourism Policy, Planning and Development

Courses relating to institutional foodservice management:

AGR*1250 [0.50] Agrifood 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*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*3310 [0.50] Operations Management
BUS*2230 [0.50] Management Accounting
BUS*3230 [0.50] Intermediate Management Accounting
BUS*3330 [0.50] Intermediate Accounting
BUS*3340 [0.50] Intermediate Financial Accounting II
BUS*4250 [0.50] Business Policy
BUS*4260 [0.50] International Business
MCS*2100 [0.50] Personal Financial Management

Other restricted electives:

CIS*1000 [0.50] Introduction to Computer Applications
EDRD*3140 [0.50] Organizational Communication
EDRD*3160 [0.50] International Communication
ENGL*1200 [0.50] Reading the Contemporary World
ENGL*1410 [0.50] Major Writers
MCS*3010 [0.50] Quality Management
PHIL*2100 [0.50] Critical Thinking

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) (HAFA:C)

School of Hospitality and Tourism Management, College of Management and Economics

The principal aim of the Hotel and Food Administration Co-op program is to facilitate the transition of students from academic studies to a professional work life by enhancing the integration of theory and practice. 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 4U 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 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
2.50 from List A or List B or electives

Semester 4 - Winter

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

Summer Semester

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

Fall Semester

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

Winter Semester

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

Semester 5 - Fall

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
2.00 from List A or List B or electives

Semester 7 - Fall

HTM*4300 [0.50] Co-operative Education Seminar

2.00 from List A or List B or electives

Semester 8 - Winter

2.50 from List A or List B or electives

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

Human Resources Management (HRM)

Department of Business, College of Management and Economics

The HRM program provides an academic foundation to prepare students for careers as Human Resources practitioners, and for potential certification by the Human Resources Professionals Association of Ontario (HRPAO) as a Certified Human Resources Professional (CHRP). The HRM program 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 the academic requirements for seven out of nine Compulsory Subjects as set out by the Human Resources Professionals Association of Ontario. Students who are interested in completing the two remaining Compulsory Subjects should speak to the HRM Faculty Advisor or B.Comm. Program Counsellors for additional information and guidance on the options available.

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

BUS*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

BUS*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

BUS*3030	[0.50]	Occupational Health and Safety
BUS*3090	[0.50]	Training and Development
BUS*3320	[0.50]	Financial Management
MCS*3040	[0.50]	Business and Consumer Law

0.50 electives

Semester 6

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

0.50 electives

Semester 7

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

1.00 electives

Semester 8

BUS*3070	[0.50]	Recruitment and Selection
BUS*4250	[0.50]	Business Policy
HTM*4160	[0.50]	Human Resources Planning

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]	Food & Agri 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 Management & Economics**

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 in Finance. Students that identify the Finance 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 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; 3.50 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
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

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

1.00 electives

Semester 3

BUS*2230	[0.50]	Management Accounting
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2720	[0.50]	Business History
One of:		
ECON*2770	[0.50]	Introductory Mathematical Economics

MCS*3040 [0.50] Business and Consumer Law
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
ECON*3740 [0.50] Introduction to Econometrics
1.50 electives or restricted electives

Semester 6

BUS*3320 [0.50] Financial Management
ECON*3560 [0.50] Theory of Finance
ECON*3600 [0.50] Macroeconomics in an Open Economy
1.00 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
2.00 electives or restricted electives

Semester 8

ECON*4800 [0.50] Theory of Strategic Management
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 most 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*4360 [0.50] Marketing Research
BUS*3230 [0.50] Intermediate Management Accounting
BUS*3330 [0.50] Intermediate Accounting
BUS*3340 [0.50] Intermediate Financial Accounting II
BUS*4250 [0.50] Business Policy
BUS*4260 [0.50] International Business
MCS*3000 [0.50] Advanced Marketing
One of:
AGEC*4240 [0.50] Futures and Options Markets
ECON*3760 [0.50] Fundamentals of Derivatives

Finance Area of Emphasis Restricted Electives:

Students must take the following:

ECON*3100 [0.50] Game Theory
ECON*3510 [0.50] Money, Credit and the Financial System
ECON*3660 [0.50] Economics of Equity Markets
ECON*3710 [0.50] Advanced Microeconomics
ECON*4560 [0.50] Advanced Topics in Finance
One of:
AGEC*4240 [0.50] Futures and Options Markets
ECON*3760 [0.50] Fundamentals of Derivatives
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.

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

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

The Co-op program in Management Economics in Industry and Finance is a five year program including, 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter, and Summer work term. Please refer to the Co-operative Education program policy with respect to adjusting the schedule listed below.

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

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

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

BUS*2220 [0.50] Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics
MCS*1000 [0.50] Introductory Marketing
1.00 electives

Semester 3 - Fall

BUS*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

Fall Semester

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

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

Summer Semester

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

Semester 6 - Fall

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

Note: If in the Finance Area of Emphasis take ECON*3710.

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

Winter Semester

COOP*4000 [0.00] Co-op Work Term IV
(Eight month work term Winter/Summer)

Summer Semester

COOP*5000 [0.00] Co-op Work Term V
(Eight month work term Winter/Summer)

Semester 7 - Fall

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

Semester 8 - Winter

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

Restricted Electives

4.00 additional credits in economics, of which

- at most 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*4360 [0.50] Marketing Research
BUS*3230 [0.50] Intermediate Management Accounting
BUS*3330 [0.50] Intermediate Accounting
BUS*3340 [0.50] Intermediate Financial Accounting II
BUS*4250 [0.50] Business Policy
BUS*4260 [0.50] International Business
MCS*3000 [0.50] Advanced Marketing

One of:

AGEC*4240 [0.50] Futures and Options Markets
ECON*3760 [0.50] Fundamentals of Derivatives

Finance Area of Emphasis Restricted Electives:

Students must take the following:

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

One of:

AGEC*4240 [0.50] Futures and Options Markets
ECON*3760 [0.50] Fundamentals of Derivatives

2.00 additional credits in economics, of which

- at most 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.

Marketing Management (MKMN)

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

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 10 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. Students will gain education and skill in 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 Management and Economics. 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

For this major, 20.00 credits are required, of which 12.50 are specified, 3.50 are restricted electives (from lists), 1.50 are Liberal Education electives, and 2.50 are free electives. A possible program sequence is outlined below.

Semester 1- Fall

ECON*1050 [0.50] Introductory Microeconomics
MCS*1000 [0.50] Introductory Marketing

Semester 2 - Winter

BUS*2220 [0.50] Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics

Semesters 1 or 2 - Fall or Winter

MATH*1000 [0.50] Introductory Calculus
PSYC*1200 [0.50] Dynamics of Behaviour
0.50 Communication electives see List E1
0.50 Marketing Environment electives see List E2
0.50 Liberal Education electives
0.50 electives

Note: Marketing students who are exceptionally strong in mathematics may consult with the Faculty advisor to substitute an alternative mathematics course for MATH*1000 (MATH*1080 or MATH*1200).

Semester 3 - Fall

BUS*2230 [0.50] Management Accounting
MCS*2000 [0.50] Business in a Changing World

Semester 4 - Winter

STAT*2060 [0.50] Statistics for Business Decisions

Semesters 3 or 4 - Fall or Winter

ECON*2310 [0.50] Intermediate Microeconomics
HTM*3000 [0.50] Human Resources Management
MCS*2020 [0.50] Information Management
MCS*2600 [0.50] Fundamentals of Consumer Behaviour
MCS*3040 [0.50] Business and Consumer Law
0.50 History electives see List E3
0.50 Global Perspective electives see List E4

Semester 5 - Fall

BUS*3320 [0.50] Financial Management

Semester 6 - Winter

AGEC*3310 [0.50] Operations Management

Semesters 5 or 6 - Fall or Winter

HTM*4390 [0.50] Individuals and Groups in Organizations
MCS*3030 [0.50] Research Methods
MCS*3500 [0.50] Market Analysis and Planning
MCS*3620 [0.50] Marketing Communications
0.50 Leadership/Professionalism electives see List E5
0.50 Liberal Education electives
1.00 electives

Semester 7 - Fall

ECON*3560 [0.50] Theory of Finance

Semester 8 - Winter

BUS*4250 [0.50] Business Policy

Semesters 7 or 8 - Fall or Winter

MCS*3600 [0.50] Consumer Information Processes
MCS*4370 [0.50] Marketing Strategy
MCS*4600 [0.50] International Marketing
0.50 Advanced Marketing electives see List E6
0.50 Capstone electives see List E6
0.50 Liberal Education electives
1.00 electives

Restricted Electives for the Marketing Management Major

The electives in the B.Comm. Marketing Management program are designed to supplement the major's required courses to ensure achievement of the University's 10 Learning Objectives. They supplement the major's required courses with regard to all of the Learning Objectives except "Numeracy". The Marketing Management program delivers substantial "Numeracy" through its required math, statistics, and economics courses as well as through emphasis on data analysis in courses such as Research Methods (MCS*3030) and Market Analysis and Planning (MCS*3500).

Please note that substitutions for restricted electives will be allowed if the Faculty Advisor agrees that a proposed alternative achieves the Learning Objective(s) of the course it will replace and has an equivalent level of rigour.

Also be advised that the following lists allow interested students to earn the Certificate in Leadership offered through the Office of Open Learning, by the College of Management and Economics concurrently with their B.Comm. degree. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements. Please note that successful completion of the Certificate in Leadership is not reflected on University of Guelph transcripts.

Communication Elective - List EI

Consistent with the University Learning Objective of "Literacy" and to provide a foundation in the first year for oral and written communication in subsequent marketing courses, marketing management majors must take one [0.50 credits] of:

ENGL*1200 [0.50] Reading the Contemporary World

LING*1000	[0.50]	Introduction to Linguistics
PHIL*1050	[0.50]	Introductory Philosophy: Basic Problems

0.50 credits from FREN, GERM, GREK, ITAL, LAT, SPAN

Marketing Environment Elective - List E2

Consistent with the University Learning Objective of "Depth and Breadth of Understanding" and to supplement the knowledge students gain in MCS*1000 about the socio-cultural, economic, political/legal, and technological "environmental" factors that must be taken into consideration in marketing decision-making, marketing management majors must take one [0.50 credits] of:

AGR*1250	[0.50]	Agrifood System Trends & Issues
ANTH*1150	[0.50]	Introduction to Anthropology
ARTH*1220	[0.50]	The Visual Arts Today
EDRD*1400	[0.50]	Introduction to Design
ENVB*2010	[0.50]	Food Production and the Environment
FREN*1000	[0.50]	Understanding the French Speaking World
FRHD*1010	[0.50]	Human Development
GEOG*1200	[0.50]	Society and Space
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*2510	[0.50]	Canada: A Regional Synthesis
HIST*2610	[0.50]	Contemporary Canadian Issues
NUTR*1010	[0.50]	Nutrition and Society
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250	[0.50]	Public Administration and Governance
SOC*1100	[0.50]	Sociology

History Elective - List E3

Consistent with the University Learning Objective of "Sense of Historical Development" and to help marketing majors develop a sense of the fundamental relativity of knowledge and understanding over time, marketing management majors must take one [0.50 credits] of:

ARTH*2490	[0.50]	History of Canadian Art
EURO*1050	[0.50]	The Emergence of a United Europe
HIST*1010	[0.50]	Europe and the Early Modern World
HIST*1250	[0.50]	Science and Society Since 1500
HIST*2070	[0.50]	World Religions in Historical Perspective
HIST*2250	[0.50]	Environment and History
HIST*2390	[0.50]	Imperial and Soviet Russia Since 1800
HIST*2510	[0.50]	The Emergence of Modern European Society 1789-1945
HIST*2800	[0.50]	The History of the Modern Family
HIST*2910	[0.50]	History of Modern Asia
MUSC*2280	[0.50]	Masterworks of Music

Global Perspective Elective - List E4

Consistent with the University Learning Objective of "Global Understanding" and to help marketing management majors gain the global perspective needed in senior marketing courses such as International Marketing (MCS*4600), marketing management majors must take one [0.50 credits] of:

ECON*2410	[0.50]	Intermediate Macroeconomics
GEOG*2030	[0.50]	Political Ecology & Geography
HIST*1150	[0.50]	20th-Century Global History
POLS*1500	[0.50]	World Politics
POLS*2080	[0.50]	Development and Underdevelopment
POLS*2200	[0.50]	International Relations
ZOO*1500	[0.50]	Humans in the Natural World - a Zoological Perspective

Leadership/Professionalism Elective - List E5

To address the University Learning Objective of "Independence of Thought" as it is achieved through "Moral Maturity" or "Aesthetic Maturity" or "Understanding of Forms of Inquiry", and to help prepare senior marketing management majors for leadership positions in organizations, they must take one [0.50 credits] of:

EDRD*3160	[0.50]	International Communication
EDRD*4120	[0.50]	Leadership Development in Small Organizations
MCS*2850	[0.50]	Service Learning in Housing
PHIL*2600	[0.50]	Business and Professional Ethics
POLS*3180	[0.50]	Research Methods I: Political Inquiry and Methods
POLS*3940	[0.50]	Accountability and Canadian Government
UNIV*2000	[0.50]	Foundations of Leadership

Advanced Marketing Elective - List E6

To address the University Learning Objective of "Depth and Breadth of Learning" and to enhance the knowledge of product development, placement strategies, and the integration of societal influences on thinking, senior marketing management majors must take one [0.50 credits] of:

MCS*3010	[0.50]	Quality Management
MCS*4040	[0.50]	Management in Product Development
MCS*4050	[0.50]	The Evolution of Capitalism: A Canadian Perspective
MCS*4300	[0.50]	Marketing and Society
MCS*4400	[0.50]	Pricing Management

Capstone Elective - List E7

To address the University Learning Objective of "Love of Learning" as it is achieved through "Independence of Thought" and "Depth and Breadth of Learning", senior marketing management majors must take one [0.50 credits] of:

MCS*4100	[0.50]	Entrepreneurship
MCS*4910	[0.50]	Topics in Consumer Studies
MCS*4920	[0.50]	Topics in Consumer Studies
MCS*4950	[0.50]	Consumer Studies Practicum
UNIV*4000	[0.50]	Leadership Capstone

Marketing Management (Co-op) (MKMN:C)

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

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

The Co-op in Marketing Management is a five year program including 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter, and Summer work term. Please refer to the Co-operative Education program policy with respect to adjusting the schedule listed below.

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

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

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
MCS*1000	[0.50]	Introductory Marketing

Semester 2 - Winter

BUS*2220	[0.50]	Financial Accounting
ECON*1100	[0.50]	Introductory Macroeconomics
STAT*2060	[0.50]	Statistics for Business Decisions

Semesters 1 or 2 - Fall or Winter

MATH*1000	[0.50]	Introductory Calculus
PSYC*1200	[0.50]	Dynamics of Behaviour

0.50 Communication electives see List E1
0.50 Marketing Environment electives see List E2
0.50 Liberal Education electives

Note: Marketing students who are exceptionally strong in mathematics may consult with the Faculty advisor to substitute an alternative mathematics course for MATH*1000 (MATH*1080 or MATH*1200).

Semester 3 - Fall

BUS*2230	[0.50]	Management Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
MCS*2000	[0.50]	Business in a Changing World

Semesters 3 or 4 - Fall or Winter

ECON*2310	[0.50]	Intermediate Microeconomics
HTM*3000	[0.50]	Human Resources Management
MCS*2020	[0.50]	Information Management
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3030	[0.50]	Research Methods

0.50 History electives see List E3
0.50 Global Perspective electives see List E4
0.50 electives

Summer Semester

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

Fall Semester

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

Semester 5 - Winter

AGEC*3310	[0.50]	Operations Management

Summer Semester

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

Semester 6 - Fall

BUS*3320	[0.50]	Financial Management

Semesters 5 or 6 - Winter or Fall

HTM*4390	[0.50]	Individuals and Groups in Organizations
MCS*3040	[0.50]	Business and Consumer Law
MCS*3500	[0.50]	Market Analysis and Planning
MCS*3620	[0.50]	Marketing Communications

0.50 Leadership/Professionalism electives see List E5
0.50 Liberal Education electives
1.00 electives

Winter Semester

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

(Eight month work term Winter/Summer)

Summer Semester

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

(Eight month work term Winter/Summer)

Semester 7 - Fall

ECON*3560	[0.50]	Theory of Finance

Semester 8 - Winter

BUS*4250	[0.50]	Business Policy

Semesters 7 or 8 - Fall or Winter

MCS*3600	[0.50]	Consumer Information Processes
MCS*4370	[0.50]	Marketing Strategy
MCS*4600	[0.50]	International Marketing

0.50 Advanced Marketing electives see List E6
0.50 Capstone electives see List E6
0.50 Liberal Education electives
1.00 electives

Restricted Electives for the Marketing Management Major

The electives in the B.Comm. Marketing Management program are designed to supplement the major's required courses to ensure achievement of the University's 10 Learning Objectives. They supplement the major's required courses with regard to all of the Learning Objectives except "Numeracy". The Marketing Management program delivers substantial "Numeracy" through its required math, statistics, and economics courses as well as through emphasis on data analysis in courses such as Research Methods (MCS*3030) and Market Analysis and Planning (MCS*3500).

Please note that substitutions for restricted electives will be allowed if the faculty advisor agrees that a proposed alternative achieves the Learning Objective(s) of the course it will replace and has an equivalent level of rigour.

Also be advised that the following lists allow interested students to earn the Certificate in Leadership offered through the Office of Open Learning, by the College of Management and Economics concurrently with their B.Comm. degree. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements. Please note that successful completion of the Certificate in Leadership is not reflected on University of Guelph transcripts.

Communication Elective - List EI

Consistent with the University Learning Objective of "Literacy" and to provide a foundation in the first year for oral and written communication in subsequent marketing courses, marketing management majors must take one [0.50 credits] of:

ENGL*1200	[0.50]	Reading the Contemporary World
LING*1000	[0.50]	Introduction to Linguistics
PHIL*1050	[0.50]	Introductory Philosophy: Basic Problems

0.50 credits from FREN, GERM, GREK, ITAL, LAT, SPAN

Marketing Environment Elective - List E2

Consistent with the University Learning Objective of "Depth and Breadth of Understanding" and to supplement the knowledge students gain in MCS*1000 about the socio-cultural, economic, political/legal, and technological "environmental" factors that must be taken into consideration in marketing decision-making, marketing management majors must take one [0.50 credits] of:

AGR*1250	[0.50]	Agrifood System Trends & Issues
ANTH*1150	[0.50]	Introduction to Anthropology
ARTH*1220	[0.50]	The Visual Arts Today
EDRD*1400	[0.50]	Introduction to Design
ENVB*2010	[0.50]	Food Production and the Environment
FREN*1000	[0.50]	Understanding the French Speaking World
FRHD*1010	[0.50]	Human Development
GEOG*1200	[0.50]	Society and Space
GEOG*1220	[0.50]	Human Impact on the Environment
GEOG*2510	[0.50]	Canada: A Regional Synthesis
HIST*2610	[0.50]	Contemporary Canadian Issues
NUTR*1010	[0.50]	Nutrition and Society
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*1400	[0.50]	Issues in Canadian Politics
POLS*2250	[0.50]	Public Administration and Governance
SOC*1100	[0.50]	Sociology

History Elective - List E3

Consistent with the University Learning Objective of "Sense of Historical Development" and to help marketing majors develop a sense of the fundamental relativity of knowledge and understanding over time, marketing management majors must take one [0.50 credits] of:

ARTH*2490	[0.50]	History of Canadian Art
EURO*1050	[0.50]	The Emergence of a United Europe
HIST*1010	[0.50]	Europe and the Early Modern World
HIST*1250	[0.50]	Science and Society Since 1500
HIST*2070	[0.50]	World Religions in Historical Perspective
HIST*2250	[0.50]	Environment and History
HIST*2390	[0.50]	Imperial and Soviet Russia Since 1800
HIST*2510	[0.50]	The Emergence of Modern European Society 1789-1945
HIST*2800	[0.50]	The History of the Modern Family
HIST*2910	[0.50]	History of Modern Asia
MUSC*2280	[0.50]	Masterworks of Music

Global Perspective Elective - List E4

Consistent with the University Learning Objective of "Global Understanding" and to help marketing management majors gain the global perspective needed in senior marketing courses such as International Marketing (MCS*4600), marketing management majors must take one [0.50 credits] of:

ECON*2410	[0.50]	Intermediate Macroeconomics
GEOG*2030	[0.50]	Political Ecology & Geography
HIST*1150	[0.50]	20th-Century Global History
POLS*1500	[0.50]	World Politics
POLS*2080	[0.50]	Development and Underdevelopment
POLS*2200	[0.50]	International Relations
ZOO*1500	[0.50]	Humans in the Natural World - a Zoological Perspective

Leadership/Professionalism Elective - List E5

To address the University Learning Objective of "Independence of Thought" as it is achieved through "Moral Maturity" or "Aesthetic Maturity" or "Understanding of Forms of Inquiry", and to help prepare senior marketing management majors for leadership positions in organizations, they must take one [0.50 credits] of:

EDRD*3160	[0.50]	International Communication
EDRD*4120	[0.50]	Leadership Development in Small Organizations
MCS*2850	[0.50]	Service Learning in Housing
PHIL*2600	[0.50]	Business and Professional Ethics
POLS*3180	[0.50]	Research Methods I: Political Inquiry and Methods
POLS*3940	[0.50]	Accountability and Canadian Government
UNIV*2000	[0.50]	Foundations of Leadership

Advanced Marketing Elective - List E6

To address the University Learning Objective of "Depth and Breadth of Learning" and to enhance the knowledge of product development, placement strategies, and the integration of societal influences on thinking, senior marketing management majors must take one [0.50 credits] of:

MCS*3010	[0.50]	Quality Management
MCS*4040	[0.50]	Management in Product Development
MCS*4050	[0.50]	The Evolution of Capitalism: A Canadian Perspective
MCS*4300	[0.50]	Marketing and Society
MCS*4400	[0.50]	Pricing Management

Capstone Elective - List E7

To address the University Learning Objective of "Love of Learning" as it is achieved through "Independence of Thought" and "Depth and Breadth of Learning", senior marketing management majors must take one [0.50 credits] of:

MCS*4100	[0.50]	Entrepreneurship
MCS*4910	[0.50]	Topics in Consumer Studies
MCS*4920	[0.50]	Topics in Consumer Studies
MCS*4950	[0.50]	Consumer Studies Practicum
UNIV*4000	[0.50]	Leadership Capstone

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

ECON*1050	[0.50]	Introductory Microeconomics
MCS*1000	[0.50]	Introductory Marketing
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 and Governance
POLS*2300	[0.50]	Canadian Government
1.00 electives		

Semester 3

BUS*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

BUS*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
BUS*3320	[0.50]	Financial Management
MCS*3040	[0.50]	Business and Consumer Law
One of:		
POLS*3110	[0.50]	Politics of Ontario *
0.50 electives		
One of:		
ECON*3610	[0.50]	Public Economics *
0.50 electives		

* ECON*3610 and POLS*3110 will only be offered once per year. Therefore, students should register for these courses when they are offered (either Semester 5 or 6).

Semester 6

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
One of:		
POLS*3110	[0.50]	Politics of Ontario *
0.50 electives		
One of:		
ECON*3610	[0.50]	Public Economics *
0.50 electives		

* ECON*3610 and POLS*3110 will only be offered once per year. Therefore, students should register for these courses when they are offered (either Semester 5 or 6).

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

BUS*4250	[0.50]	Business Policy
HTM*4390	[0.50]	Individuals and Groups in Organizations
POLS*4250	[0.50]	Topics in Public Management
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 Politics and Governance
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 a professional career by enhancing the integration of theory and practice.

The Co-op program in Public Management is a five year program, including 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter and Summer work term. Please refer to the Co-operative Education programs policy with respect to adjusting the schedule listed below.

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

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

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
MCS*1000	[0.50]	Introductory Marketing
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 and Governance
POLS*2300	[0.50]	Canadian Government
1.00 electives		

Semester 3 - Fall

BUS*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

BUS*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		

Summer Semester

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

Fall Semester

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

Semester 5 - Winter

ECON*3560	[0.50]	Theory of Finance
MCS*2020	[0.50]	Information Management
PHIL*2600	[0.50]	Business and Professional Ethics
POLS*3210	[0.50]	The Constitution and Canadian Federalism
One of:		
POLS*3110	[0.50]	Politics of Ontario *
0.50 electives		

* POLS*3110 will only be offered once per year. Therefore, students should register for the course when it is offered (either Semester 5 or 6).

Summer Semester

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

Semester 6 - Fall

AGEC*3310	[0.50]	Operations Management
HTM*3000	[0.50]	Human Resources Management
MCS*3040	[0.50]	Business and Consumer Law
POLS*3110	[0.50]	Politics of Ontario
POLS*3470	[0.50]	Business-Government Relations in Canada

One of:

POLS*3110	[0.50]	Politics of Ontario *

0.50 electives

* POLS*3110 will only be offered once per year. Therefore, students should register for the course when it is offered (either Semester 5 or 6).

Winter Semester

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

(Eight month work term Winter/Summer)

Summer Semester

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

(Eight month work term Winter/Summer)

Semester 7 - Fall

BUS*3320	[0.50]	Financial Management
HTM*4390	[0.50]	Individuals and Groups in Organizations

0.50 electives

One of:

POLS*4970	[0.50]	Honours Political Science Research I

0.50 credits at the 4000 level in Political Science

One of:

ECON*3610	[0.50]	Public Economics *

0.50 electives

* ECON*3610 will only be offered once per year. Therefore, students should register for the course when it is offered (either Semester 7 or 8).

Semester 8 - Winter

BUS*4250	[0.50]	Business Policy
POLS*3670	[0.50]	Comparative Public Policy and Administration
POLS*4250	[0.50]	Topics in Public Management

One of:

POLS*4980	[0.50]	Honours Political Science Research II

0.50 credits at the 4000 level in Political Science

One of:

ECON*3610	[0.50]	Public Economics *

0.50 electives

* ECON*3610 will only be offered once per year. Therefore, students should register for the course when it is offered (either Semester 7 or 8).

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 Politics and Governance
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 Management and Economics

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 interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking the additional 4 required courses through University of British Columbia distance education by letter of permission to count as electives in their degree.

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

ECON*1050	[0.50]	Introductory Microeconomics
MATH*1000	[0.50]	Introductory Calculus
MCS*1000	[0.50]	Introductory Marketing
MCS*1820	[0.50]	Real Estate and Housing

0.50 electives

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

Semester 2

ECON*1100	[0.50]	Introductory Macroeconomics
EDRD*1400	[0.50]	Introduction to Design
POLS*2300	[0.50]	Canadian Government

1.00 electives

Semester 3

BUS*2220	[0.50]	Financial Accounting
MCS*2850	[0.50]	Service Learning in Housing
ECON*2310	[0.50]	Intermediate Microeconomics

1.00 electives

Semester 4

BUS*2230	[0.50]	Management Accounting
MCS*2020	[0.50]	Information Management
MCS*2820	[0.50]	Real Estate Finance
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

Semester 5

ECON*3560	[0.50]	Theory of Finance
ECON*2410	[0.50]	Intermediate Macroeconomics
MCS*3810	[0.50]	Real Estate Market Analysis
MCS*4840	[0.50]	Housing and Real Estate Law

0.50 electives

Semester 6

ECON*3510	[0.50]	Money, Credit and the Financial System
LARC*2820	[0.50]	Urban and Regional Planning
MCS*3030	[0.50]	Research Methods
MCS*3820	[0.50]	Real Estate Development

0.50 electives

Semester 7

BUS*3320	[0.50]	Financial Management
ECON*3500	[0.50]	Urban Economics
HTM*4390	[0.50]	Individuals and Groups in Organizations
MCS*4820	[0.50]	Real Estate Appraisal

0.50 electives

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 Management and Economics

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.

The purpose of this major is to develop the conceptual, analytical and management skills required for careers in real estate and housing. Students graduate with a degree that can lead to a variety of professional positions in the private or public sectors of the Canadian real estate industry or they can continue on to graduate work in business, planning or the social sciences.

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

The Co-op program in Real Estate and Housing is a five year program, including 5 work terms. Although the schedule includes 5 work terms, students have the option to complete only 4 of the 5 work terms, but must graduate with a Fall, Winter and Summer work term. Please refer to the Co-operative Education programs policy with respect to adjusting the schedule listed below.

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

Students interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking the additional 4 required courses through the University of British Columbia distance education by letter of permission to count as electives in your degree. See your departmental Faculty Advisor for more details.

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

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
MATH*1000	[0.50]	Introductory Calculus
MCS*1000	[0.50]	Introductory Marketing
MCS*1820	[0.50]	Real Estate and Housing

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

ECON*1100	[0.50]	Introductory Macroeconomics
EDRD*1400	[0.50]	Introduction to Design
POLS*2300	[0.50]	Canadian Government

1.00 electives

Semester 3 - Fall

BUS*2220	[0.50]	Financial Accounting
COOP*1100	[0.00]	Introduction to Co-operative Education
ECON*2310	[0.50]	Intermediate Microeconomics
MCS*2850	[0.50]	Service Learning in Housing

1.00 electives

Semester 4 - Winter

BUS*2230	[0.50]	Management Accounting
ECON*2410	[0.50]	Intermediate Macroeconomics
MCS*2820	[0.50]	Real Estate Finance
STAT*2060	[0.50]	Statistics for Business Decisions

0.50 electives

Summer Semester

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

Fall Semester

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

Semester 5 - Winter

ECON*3510	[0.50]	Money, Credit and the Financial System
MCS*2020	[0.50]	Information Management
MCS*3820	[0.50]	Real Estate Development
MCS*3890	[0.50]	Property Management

0.50 electives

Summer Semester

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

Semester 6 - Fall

ECON*3560	[0.50]	Theory of Finance
MCS*3030	[0.50]	Research Methods
MCS*3810	[0.50]	Real Estate Market Analysis
MCS*4840	[0.50]	Housing and Real Estate Law

0.50 electives

Winter Semester

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

(Eight month work term Winter/Summer)

Summer Semester

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

(Eight month work term Winter/Summer)

Semester 7 - Fall

BUS*3320	[0.50]	Financial Management
ECON*3500	[0.50]	Urban Economics
MCS*4820	[0.50]	Real Estate Appraisal
HTM*4390	[0.50]	Individuals and Groups in Organizations

0.50 electives

Semester 8 - Winter

LARC*2820	[0.50]	Urban and Regional Planning
MCS*4810	[0.50]	Real Estate and Housing Project
POLS*3270	[0.50]	Local Government in Ontario

1.00 electives

Tourism Management (TMGT)

School of Hospitality and Tourism Management, College of Management and Economics

As the world's largest industry, tourism encompasses a wide range of public and private enterprises that require knowledgeable and talented management professionals. The program in Tourism Management 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, 14.50 of the 20.00 credits are specified as core requirements, 3.00 as restricted electives (List A), and the remaining 2.50 as electives (including the Liberal Education Requirement of 1.50 credits).

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*2010	[0.50]	Hospitality and Tourism Business Communications
HTM*2100	[0.50]	Lodging Operations
HTM*2120	[0.50]	Hospitality and Tourism Marketing I

0.50 from List A or electives

Semester 3

BUS*2220	[0.50]	Financial Accounting
HTM*2050	[0.50]	Dimensions of Tourism
MCS*2020	[0.50]	Information Management

1.00 from List A or electives

Semester 4

HTM*2170	[0.50]	Tourism Policy, Planning and Development
HTM*2200	[0.50]	Organizational Behaviour I
STAT*2060	[0.50]	Statistics for Business Decisions

1.00 from List A or electives

Semester 5

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
MCS*3040	[0.50]	Business and Consumer Law

0.50 from List A or electives

Semester 6

AGEC*4360	[0.50]	Marketing Research
BUS*3320	[0.50]	Financial Management
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

One of:

EDRD*3550	[0.50]	Economic Development for Rural and Smaller Communities
EDRD*4010	[0.50]	Tourism Planning in the Less Developed World

1.00 from List A or electives

List A - Restricted Electives

In addition to the 14.50 required credits, students must also take a minimum of 3.00 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
EDRD*3400	[0.50]	Sustainable Communities
EDRD*3550	[0.50]	Economic Development for Rural and Smaller Communities
GEOG*2210	[0.50]	Environment and Resources
GEOG*3490	[0.50]	Tourism and Environment
PHIL*2070	[0.50]	Philosophy of the Environment
POLS*3370	[0.50]	Environmental Politics and Governance

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*3160	[0.50]	International Communication
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

Courses for those interested in developing tourism related real estate:

GEOG*3490	[0.50]	Tourism and Environment
LARC*2820	[0.50]	Urban and Regional Planning
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 the social and economic environment of business:

ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
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

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
SOAN*2040	[0.50]	Globalization of Work and Organizations
SOC*1100	[0.50]	Sociology

Courses dealing with marketing and consumer behaviour:

MCS*1000	[0.50]	Introductory Marketing
MCS*2600	[0.50]	Fundamentals of Consumer Behaviour
MCS*3000	[0.50]	Advanced Marketing
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*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*3310	[0.50]	Operations Management
BUS*2230	[0.50]	Management Accounting
BUS*3230	[0.50]	Intermediate Management Accounting
BUS*3330	[0.50]	Intermediate Accounting
BUS*3340	[0.50]	Intermediate Financial Accounting II
BUS*4250	[0.50]	Business Policy
BUS*4260	[0.50]	International Business
MCS*2100	[0.50]	Personal Financial Management

Other restricted electives:

CHEM*1100	[0.50]	Chemistry Today
CIS*1000	[0.50]	Introduction to Computer Applications
EDRD*3140	[0.50]	Organizational Communication
ENGL*1200	[0.50]	Reading the Contemporary World
ENGL*1410	[0.50]	Major Writers
MCS*3010	[0.50]	Quality Management
PHIL*2100	[0.50]	Critical Thinking

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 a focus on the application of computing science.. 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 (area of application) 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:

a. earn 15.00 credits. These must include courses that fulfill the distribution requirements of the General Degree (see below). At least 4.00 credits must be at the 3000 level or above. Not more than 6.00 credits at the introductory (1000) level may be counted towards the 15.00 credit requirement.

b. no more than 11.00 credits in any one subject or discipline, as indicated by the course prefix code, can be counted towards a general degree.

c. successfully complete the following credits:

CIS*1500	[0.50]	Introduction to Programming
CIS*1910	[0.50]	Discrete Structures in Computing I
CIS*2430	[0.50]	Object Oriented Programming
CIS*2500	[0.50]	Intermediate Programming
CIS*2520	[0.50]	Data Structures
CIS*2750	[0.75]	Software Systems Development and Integration
CIS*2910	[0.50]	Discrete Structures in Computing II
CIS*3530	[0.50]	Data Base Systems and Concepts

0.5 additional CIS or STAT credits at the 2000 level or higher
1.0 additional CIS credits at 3000 level or higher

d. Earn 2.00 science credits (list of courses available in the Program Counsellor's office) and 2.00 credits in the College of Arts or College of Social and Applied Human Sciences in addition to the courses listed in c.

2. Requirements for an Honours Degree

To graduate from an honours program a student must:

a. 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.

b. 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 CIS credits at the 3000 level or above
1.50 additional CIS credits at the 4000 level or above

c. 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.

d. 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 by 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)

Department 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 CIS at 3000 level or above
1.00 credits in CIS 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 CIS 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.

Students are advised to plan their schedule of studies well in advance so that they can take all required prerequisites for later (especially 4000 level) courses. Students should note that some 4000 level courses are only given in alternate years. Failure to plan may result in the inability to take a particular senior CIS course.

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 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 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 CIS at 3000 level or above
1.00 credits in CIS 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 CIS 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 CIS at 3000 level or above
1.00 credits in CIS 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 CIS at the 4000 level

Bachelor of Engineering [B.Eng.]

Program Information

Objectives of the Program

Students in this program obtain a liberal engineering education, which includes a comprehensive core of science, mathematics and engineering science that provides a strong foundation for engineering design and analysis. This enables students to undertake the solution of engineering problems in the areas of 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 Engineers Canada. Graduates from accredited engineering programs have the educational requirements to apply for membership in the Professional Engineers Ontario (PEO) and other provinces after a number of years of acceptable engineering experience and successful completion of a PEO examination in engineering law and ethics.

Requirements of the Program

Students combine their required courses in mathematics, physical sciences and engineering with additional credits providing the opportunity for specialization in: one of the programs; complementary studies courses; and elective subjects. A minimum of 23.50 credits must be obtained. 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.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.Eng..

Continuation of Study

Students are advised to consult the regulations for continuation of study within the program which are outlined in detail in Section VIII, Undergraduate Degree Regulation & Procedures. Students will be ineligible to continue in the B.Eng. program and will not be readmitted to the degree program if the same course is failed three times.

Normally, students in the B.Eng. program will be permitted only one supplemental privilege during their studies. It will usually be granted for 3000 or 4000 level courses only.

Conditions for Graduation

To qualify for the degree the student must complete the courses required for a B.Eng. program, obtaining a minimum of 23.50 credits and must achieve an overall minimum cumulative average of at least 60% and a minimum cumulative average of at least 60% in all ENGG courses.

Co-operative Education

Students studying for the B.Eng. degree may participate in a Co-operative Education program following the completion of the first 4 semesters of study. The Co-operative Education program consists of a minimum of 4 semesters of experience in industry with employers who participate in the program. Reports and assignments are graded by a faculty supervisor with assistance from the employer. Evaluations of Co-op semesters are recorded on the student's academic record. The Co-operative Education program provides an excellent opportunity for students to obtain work experience in industry directly related to their field of study. Interested students should consult their program counsellor.

Students wishing to participate in the Co-operative Education program should indicate their intention to do so by applying for admission to the Co-op program on entrance. Following the completion of semester 2, in-course applicants will be considered for admission to the Co-op program.

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

One of:

BIOL*1030	[0.50]	Biology I

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] Electric Circuits
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
One of:
BIOL*1040 [0.50] Biology II
0.50 restricted electives

Note: Students select 0.50 restricted electives in Semester 5 if MICR*1020 was selected in Semester 3. If BIOL*1030 was selected in Semester 3, then students must select BIOL*1040 in Semester 5 in place of the 0.50 restricted elective.

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
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 (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary studies sub-list.)
- 0.75 credits in required Design electives
- 1.00 credits in Biological Engineering electives
- 1.50 credits in Free electives

Food Engineering (FENG)

School of Engineering, College of Physical and Engineering Science

Minor (Honours Program)

Students must be registered in the B.Eng. degree program to apply for a Minor in Food Engineering.

The minor can be satisfied by taking the following additional courses:

BIOC*2580 [0.50] Introductory Biochemistry
BUS*2220 [0.50] Financial Accounting
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
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.

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*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*1010 [0.50] Introductory Electricity and Magnetism
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] Electric Circuits
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 125 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 (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 1.50 credits in ES&C Engineering electives
- 0.75 credits in ES&C Engineering Design electives

Environmental Engineering Program Regular and Co-op (ENVE/ENVE:C)

School of Engineering, College of Physical and Engineering Science

The degradation of the environment is a concern shared by citizens, government agencies, non governmental agencies and businesses. The Environmental Engineering program offered by the School of Engineering provides graduates with design and engineering skills to minimize and prevent the impact of human activities on water, soil and air systems. Both simple and innovative solutions are part of the tool box. Graduates will also creatively integrate humanistic and social perspectives in their solutions.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
ENGG*1100	[0.75]	Engineering and Design I
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]	Electric Circuits
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

0.50 restricted electives

Note: Students select 0.50 restricted electives in Semester 4 if MICR*1020 was selected in Semester 3. If BIOL*1030 was selected in Semester 3, then students must select BIOL*1040 in Semester 4 in place of the 0.50 restricted elective.

Semester 5 - Regular or Co-op

ENGG*3180	[0.50]	Air Quality
ENGG*3240	[0.50]	Engineering Economics
ENGG*3260	[0.50]	Thermodynamics
ENGG*3590	[0.50]	Water Quality
ENGG*3650	[0.50]	Hydrology

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). A maximum of three 1000 level electives is allowed. Restricted electives must include:

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 1.50 credits in Environmental Engineering electives (if BIOL*1030 is selected in Semester 3, then BIOL*1040 must be selected from the list in the Program Guide).

Minor (Honours Program)

Students must be registered in the B.Eng. degree program to apply for a Minor in Environmental Engineering.

The minor can be satisfied by taking the following additional courses:

BIOC*2580	[0.50]	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 ecological principles in the design of water management systems and strategies. Water management includes flood prevention, warning and control; drainage; design of natural channels; irrigation; and erosion prevention and control. The supply of water for municipal, industrial and agricultural purposes is considered in the context of resource conservation. Identification of potential point and diffused sources of pollutants is used to develop efficient, environmentally sustainable and economical methods to preserve high-quality water to sustain human life and water-dependent ecosystems.

Major (Honours Program)

Semester 1 - Regular or Co-op

CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
ENGG*1100	[0.75]	Engineering and Design I
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]	Electric Circuits
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*4360	[0.75]	Soil-Water Conservation Systems Design
ENGG*4370	[0.75]	Urban Water Systems Design

1.00 restricted electives

Semester 8 (Winter) Regular or Co-op

ENGG*4150	[1.00]	Water Resources Engineering Design IV
ENGG*4250	[0.75]	Watershed Systems Design

1.00 restricted electives

Note: ENGG*4250 can be taken in Semester 6

Restricted Electives (see Program Guide for more information)

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 1.00 credits in Water Resources Engineering electives
- 0.50 credits in Environmental Resources electives
- 0.50 credits in Water Resources electives

Bachelor of Landscape Architecture (B.L.A.)

Landscape Architecture is the art and science of designing and conserving land and water for human use and enjoyment. As a profession, Landscape Architecture is concerned with two scales of planning and design.

The first scale is with the development of specific sites for residential, recreational, institutional, commercial and industrial projects. The second scale pertains to the regional landscape where the issues include management plans for forest, park and recreation areas, agricultural lands protection, gravel pit mining and restoration, hazard land studies, and visual resource analysis.

Program Information

Objectives of the Program

Landscape Architecture is a diverse and rewarding design profession. Landscape architects play an important role in shaping our environment, working in collaboration with other design professionals, specialists and the public.

Students in the B.L.A. program attain professional knowledge and skill that prepares them to deal with problems that concern the interface between people and the environment. Program emphasis is on core professional knowledge domains that include landscape analysis, design, implementation, communication, history and professional practice. Additional required and elective courses in the arts and sciences provide a well-rounded education.

Graduates of the program have exciting careers in the public and private sector. As landscape architects, they design memorable places that are attractive, functional and sustainable and that affect the way our cities, suburbs, rural and wilderness areas are planned, designed and managed.

Accreditation

The Bachelor of Landscape Architecture program is accredited by the Canadian Society of Landscape Architects (CSLA) accreditation is recongized by the American Society of Landscape Architects. C.S.L.A. accreditation is recognized by the American Society of Landscape Architects (ASLA). Graduates of accredited landscape architecture programs have the educational qualifications to apply for membership in provincial and state professional associates in Canada and the United States after completion of the required number of years of professional practice and successful completion of required examinations.

Admission to the Landscape Architecture Program

Students wishing to enter the program of study leading to the Bachelor of Landscape Architecture degree should consult Section IV--Admission Information.

Degree

The degree granted for the successful completion of the program is the Bachelor of Landscape Architecture (B.L.A.).

Selection of Electives

All electives may be chosen independently although counselling with the 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

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
ZOO*1500	[0.50]	Humans in the Natural World - a Zoological Perspective

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*2230	[0.50]	Planting Design
LARC*2420	[0.50]	Materials and Techniques
PHIL*2070	[0.50]	Philosophy of the Environment

0.50 electives

Semester 3

LARC*2100	[0.50]	Landscape Analysis
LARC*2240	[0.50]	Plants in the Landscape
LARC*2410	[0.50]	Site Engineering
LARC*3040	[0.75]	Site Planning and Design Studio

0.50 electives

Semester 4

LARC*2820	[0.50]	Urban and Regional Planning
LARC*3050	[0.75]	Landscape Architecture I
LARC*3430	[0.50]	Landscape Construction I

0.50 Social Science elective

***Note:** A "Social Science" elective can be any course in the following areas: Anthropology, Economics, Geography, Women's Studies, International Development, Political Science, Psychology or Sociology.

Semester 5

LARC*3060	[0.75]	Landscape Architecture II
LARC*3440	[0.75]	Landscape Construction II
LARC*4610	[0.50]	Professional Practice

0.50 electives

Semester 6

Choose one of the following three options:

Option 1

2.00 electives

Option 2

LARC*4620	[1.00]	Internship in Landscape Architecture

1.00 electives

Option 3

Exchange Program (2.00 credits)

Semester 7

LARC*3070	[1.00]	Landscape Architecture III
LARC*3320	[0.50]	Principles of Landscape Ecology
LARC*4510	[0.50]	Honours Thesis

0.50 electives

Semester 8

LARC*4090	[0.50]	Seminar
LARC*4710	[1.00]	Integrative Design Studio

0.50 electives

0.50 electives

Bachelor of Science (B.Sc.)

The University of Guelph offers general and honours programs leading to the B.Sc. degree. The general program consists of a minimum of 15.00 credits (usually 30 semester courses) involving normally 6 semesters of study. The requirements for the honours program is a minimum of 20.00 credits (usually 40 semester courses) which may be obtained over 8 semesters of study. Some majors may require more than 20.00 credits.

The Three Semester System

Most of the B.Sc. programs operate on the three semester system. In this system each of the Fall, Winter and Summer semesters is of 12 weeks duration. Two semesters are equivalent to 1 academic year at a university on the traditional system. In the three semester system, students may vary their rate of progress towards graduation. However, since many science courses must be taken in a certain sequence and not all courses are offered each semester, most science students are required to proceed from semester to semester in restricted patterns. Furthermore, the advanced courses of the honours programs are offered only in the regular fall and winter semesters.

Additional information may be obtained from Admissions Services, Office of Registrarial Services. The three-semester system and the pass-by-course method of advancement allow considerable flexibility of program arrangement. In addition, a variety of program contents is available which the student may modify to meet individual requirements.

Transfer from One B.Sc. Program to Another

On entrance to the B.Sc. program, the student may elect to follow an intended area of specialization or to postpone this decision until a later semester. The choice of a particular program of study may be most effectively made at the end of Semester 3 or 4. Judicious selection of courses in each and every semester will allow the easiest transfer between programs without incurring the need for additional semesters of study. The program counsellor of the particular college from which it is anticipated that the majority of science courses will be taken should be consulted for advice.

Program Information

General Program Requirements

The general B.Sc. degree requires the successful completion of 15.00 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 1.00 credits in each of the above areas and an additional 0.50 credits in three of the four above areas. The courses to be taken in semesters 4 to 6 may be selected to allow a broad study of the sciences from the list of approved electives for B.Sc. students.

Honours Program Requirements

In order to graduate 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 or a second major

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
If more than one of the above courses is taken, students are required to complete additional credits beyond the minimum total required for the degree.

2. 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

If more than 7.00 credits at the 1000 level are completed, students are required to complete additional credits beyond the minimum total required for the degree.

4. 3000 and 4000 Level Credits

There is a requirement for a minimum of 6.00 science credits at the 3000- and 4000-levels with a minimum of 2.00 credits at the 4000 level.

5. Science Credits

A minimum of 16.00 science credits (usually 32 courses) is required for the honours major program. The inclusion of a minor in a non-science area involves the reduction to 14.00 science credits (usually 28 courses) with the approval of the program counsellors. Acceptable science courses in the following programs means "acceptable to the B.Sc. Program Committee". Lists of acceptable courses are available in the offices of the faculty advisors and the program counsellors and on the world wide web at the following address: http://www.bsc.uoguelph.ca/Approved_electives.shtml.

6. Double-Counting of Credits

A maximum of 2.00 credits required in a major program may be applied to meet the requirements of a minor or an additional major.

For a completed minor in a non B.Sc. area, students can apply up to 1.00 credits, from their minor, at the 3000/4000 level towards the 6.00 credits a t the 3000/4000 level required for the degree.

7. Continuation of Study

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

Doctor of Veterinary Medicine

Students in the B.Sc. program who intend to apply for admission to the Doctor of Veterinary Medicine program should register for the Major Biological Science or Major Physical Science program, or the major of their choice. Prospective candidates for the D.V.M. program should consult the admission requirements for the program. Students may obtain assistance in selecting a program that will meet the requirements for the Doctor of Veterinary Program and for continuation in biological or physical science programs by consulting the appropriate Program Counsellor.

General Program (BSCG)

Continuation of Study

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

Conditions for Graduation

In order to qualify for graduation from the general program the student is required to attain a passing grade in a minimum of 15.00 required credits as outlined in the Total Course Requirements for all students in the General Science Program.

Total Course Requirements for all Students in the General Science Program

Total of 15.00 credits as follows:

1. 4.00 credits from the first year science core - 1.00 credits beyond the 4U or OAC level in each of biological science, chemistry, mathematical science, physics. Note: A maximum of 7.00 credits at the 1000 level may be used towards the degree requirements.
2. An additional 0.50 credits from at least 3 of the following subject areas: biological science, biochemistry/chemistry, mathematical science, physics.
3. 6.50 additional credits selected from the list of approved sciences electives for the B.Sc. degree program of which 2.50 credits must be at the 3000 or 4000 level. Note: One of: BIOL*1020, CHEM*1060, PHYS*1020 may be counted towards the degree requirements, counting as 0.50 credits in science.

4. 2.00 credits - arts and/or social science electives approved for the B.Sc. degree program.
5. 1.00 credits in electives.

Recommended Schedule for Students in Biological Science Areas

Semester 1

BIOL*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
STAT*2040	[0.50]	Statistics I
MATH*2080	[0.50]	Elements of Calculus II

0.50 Arts or Social Science electives

Semester 3 to 6

A minimum of 2.50 credits in each semester, including at least 2.00 acceptable science credits per semester. For details consult 'Total Course Requirements'.

Recommended Schedule for Students in Physical Science Areas

Semester 1

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 to 6

A minimum of 2.50 credits in each semester, including 2.00 acceptable science courses per semester. For details consult 'Total Course Requirements'.

Honours Programs (BSCH)

Honours Program Majors

The following honours majors are available:

Biological Sciences:

20.00 credits - Animal Biology
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
5.25 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 electives or restricted electives

Semester 5

ANSC*3080	[0.50]	Agricultural Animal Physiology
ANSC*3120	[0.50]	Introduction to Animal Nutrition

1.50 electives or restricted electives

Semester 6

ANSC*3210	[0.50]	Principles of 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. ANSC*3210 is an Arts and Social Science 0.50 credit. 1.50 additional credits from Arts or Social Science are required.

0.50 credits is required from each of the following: Animal Nutrition, Animal Breeding & Genetics, and Animal Physiology & Behaviour. Students are encouraged to consult with the Faculty Advisor for help in tailoring their selection to meet personal and career interests.

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.

Animal Breeding & Genetics [0.50] Required

ANSC*4020	[0.50]	Genetics of Companion Animals
ANSC*4050	[0.50]	Biotechnology in Animal Science
MBG*3090	[0.50]	Applied Animal Genetics
MBG*4030	[0.50]	Animal Breeding Methods

Animal Nutrition [0.50] Required

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

Animal Physiology & Behaviour [0.50] Required

ANSC*4090	[0.50]	Applied Animal Behaviour
ANSC*4100	[0.50]	Applied Environmental Physiology and Animal Housing
ANSC*4130	[0.50]	Reproductive Management and Technology
ANSC*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:

ANSC*3050	[0.50]	Aquaculture: Advanced Issues
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
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

Note: Suggested course sequences are available in the departmental brochure. Please consult with the departmental advisor.

Semester 4 - Summer

MATH*2170 [0.50] Differential Equations I
STAT*2050 [0.50] Statistics II
0.50 Arts or Social Science electives
1.00 electives

Fall Semester

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

Semester 5 - Winter

MATH*2130 [0.50] Numerical Methods
1.00 credits in Mathematics or Statistics at the 3000 level or above
1.00 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 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. The major will require the completion of at least 20.25 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
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

BIOC*2580 [0.50] Introductory Biochemistry
CHEM*2060 [0.50] Structure and Bonding
CHEM*2880 [0.50] Physical Chemistry
MBG*2000 [0.50] Introductory Genetics
MICR*2030 [0.50] Microbial Growth

Semester 4

BIOC*3560 [0.50] Structure and Function in Biochemistry
BIOL*2210 [0.50] Introductory Cell Biology
CHEM*2480 [0.50] Analytical Chemistry I
CHEM*2700 [0.50] Organic Chemistry I
MBG*2020 [0.50] Introductory Molecular Biology

Semester 5

BIOC*3570 [0.50] Analytical Biochemistry
CHEM*3750 [0.50] Organic Chemistry II
STAT*2040 [0.50] Statistics I
1.00 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*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:

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*3330, 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
CIS*1500 [0.50] Introduction to Programming
MATH*1200 [0.50] Calculus I
PHYS*1000 [0.50] An Introduction to Mechanics

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 Arts or Social Science electives

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

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

Summer Semester

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

Semester 6 - Fall

MICR*3230	[0.50]	Immunology I

One of:

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

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*3330, MICR*4230, PBIO*3110, PBIO*4750.

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

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 Arts or Social Science electives

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

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

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

Semester 6 - Fall

CHEM*3750	[0.50]	Organic Chemistry II
MICR*3230	[0.50]	Immunology I

One of:

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

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*3330, 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
STAT*2040	[0.50]	Statistics I

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
CHEM*4740	[0.50]	Topics in Bio-Organic Chemistry

0.50 Chemistry, Biochemistry or Molecular Biology and Genetics courses at the 3000 or 4000 level ***

0.75 electives or restricted electives *

Semester 8

One of:

CHEM*4630	[0.50]	Bioinorganic Chemistry
CHEM*4720	[0.50]	Organic Reactivity

1.00 Chemistry, Biochemistry or Molecular Biology and Genetics course at the 3000 or 4000 level ***

1.00 electives or restricted electives *

Selection of restricted electives are subject to the following:

1. * BIOL*2210 must be taken.
2. * MICR*2020 or MICR*2030 must be taken.
3. ** Note: CHEM*4630 and CHEM*4720 are offered in alternating winter semesters and both courses are required.
4. *** 1.50 credits are to be selected from the following list of allowable courses at the 3000 and 4000 level:

BIOC*4520	[0.50]	Metabolic Processes
BIOC*4540	[0.50]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
CHEM*4900	[0.75]	Chemistry Research Project I
CHEM*4910	[0.75]	Chemistry Research Project II
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MBG*4080	[0.50]	Molecular Genetics
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MCB*4080	[0.50]	Applied Microbiology and Biochemistry
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:

Schedule of Studies

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 the end of 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

0.50 Arts or Social Science electives

0.50 Mathematical science from:

CIS*1000	[0.50]	Introduction to Computer Applications
CIS*1200	[0.50]	Introduction to Computing
MATH*2080	[0.50]	Elements of Calculus II

Semester 3

MBG*2000	[0.50]	Introductory Genetics

One of:

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology

1.00 electives*

0.50 Arts or Social Science elective

Semester 4

STAT*2040	[0.50]	Statistics I

One of:

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology

1.00 electives*

0.50 Arts or Social Science elective

Semester 5 to 8

2.50 in each semester*

*** Required Biological Science electives**

1. At least one of:

BIOL*2060	[0.50]	Ecology
BIOL*3110	[0.50]	Population Ecology
BOT*2050	[0.50]	Plant Ecology

2. At least one of:

BIOM*3100	[0.50]	Mammalian Physiology I
BOT*3310	[0.50]	Plant Growth and Development
ENVB*4290	[0.50]	Applied Insect Physiology **
HK*3940	[1.25]	Human Physiology
ZOO*3200	[0.50]	Comparative Animal Physiology I

   ** additional prerequisite required, not specified in semesters 1 to 4.

3. 6.00 additional Biological Science credits of which 4.00 must be at the 3000 or 4000 level. The list of approved science electives is posted at www.bsc.uoguelph.ca.

Credit Summary (20.00 credits)

4.00 - First year science core

3.00 - Required science courses semesters 3 - 8

6.00 - Approved Biological Science electives of which 4.00 must be 3000/4000 level

3.00 - Approved science electives of which 2.00 must be 3000/4000 level

2.00 - Approved Arts or Social Science electives

2.00 - Electives

Biology (BIOL)

College of Biological Science

Minor (Honours Program)

A minor in Biology consists of a minimum of 5.00 credits including the following courses:

BIOL*1030	[0.50]	Biology I
BIOL*1040	[0.50]	Biology II
BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2000	[0.50]	Introductory Genetics

1 of:

BIOL*2060	[0.50]	Ecology
BIOL*3110	[0.50]	Population Ecology

Of the additional 2.50 credits, students must complete a minimum of 1.50 credits at the 3000 or 4000 level, from courses offered by the following departments: Human Health and Nutritional Science, Integrative Biology and Molecular and Cellular Biology. This minor is restricted to students registered in B.Sc. majors in the Physical Sciences, B.A.S., and the B.A. degree programs.

Bio-Medical Science (BIOM)

Department of Biomedical Sciences and Department of Human Health and Nutritional Sciences

This joint program of the Department of Human Health and Nutritional Sciences and the Department of Biomedical Sciences 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 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.

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.

Students who are admitted into the Biomedical Science major from high school must meet additional requirements to continue in the major. Continuation after first year 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 average of 75% average will be guaranteed continuation in this major. For students with a 70-74.9% average, continuation will be competitive based on available spaces. Students with an average below 70% will be changed to the Biological Science major. Students may subsequently change to another B.Sc. major of their choice.

B.Sc. students who were not admitted into the Biomedical Science major from high school and wish to declare the specialization at the end of 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.

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

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 in this semester.

Semester 6

BIOM*3040	[0.50]	Medical Embryology
BIOM*3090	[0.50]	Principles of Pharmacology

Electives or restricted electives to a maximum of 2.75 total credits in this semester.

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:

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

2.00 electives or restricted electives*

Restricted Electives

1. One anatomy course from BIOM*3010, HK*3401/2, ZOO*2090 must be completed.
2. One of:

MICR*3230	[0.50]	Immunology I
NUTR*4200	[0.50]	Nutrition and Immune Function

3. A minimum of 1.00 to a maximum of 2.00 credits in research experience may be met either by:
   i. completing both HK*4410 and BIOM*4420
   ii. completing HK*4410 and either HK*4230 or BIOM*4500
   iii. 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)
   iv. completing an equivalent course from another department with the permission of the Faculty Advisor
4. A total of 2.00 credits in Arts and Social Science courses must be completed including:
   i. 0.50 credits in philosophy and ethics from PHIL*2030, PHIL*2070, PHIL*2100, PHIL*2120, PHIL*2180
   ii. 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 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
CHEM*2480	[0.50]	Analytical Chemistry I
MBG*2000	[0.50]	Introductory Genetics
TOX*2000	[0.50]	Principles of Toxicology

0.50 Arts or Social Science electives

Semester 4

BIOL*2210	[0.50]	Introductory Cell Biology
CHEM*2700	[0.50]	Organic Chemistry I
MBG*2020	[0.50]	Introductory Molecular Biology
NUTR*3210	[0.50]	Fundamentals of Nutrition
STAT*2050	[0.50]	Statistics II

Semester 5

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOM*3100	[0.50]	Mammalian Physiology I
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
TOX*3300	[0.50]	Analytical Toxicology

0.25 electives

Semester 6

BIOM*3090	[0.50]	Principles of Pharmacology
BIOM*3110	[0.50]	Mammalian Physiology II
BIOM*3120	[0.25]	Laboratory Exercises in Mammalian Physiology
PATH*3610	[0.50]	Principles of Disease

0.75 electives

Semester 7

BIOM*3030	[0.75]	Biomedical Histology
BIOM*4090	[0.50]	Pharmacology
NUTR*4510	[0.50]	Toxicology, Nutrition and Food
TOX*4000	[0.50]	Medical Toxicology

TOX*4590 [0.50] Biochemical Toxicology

Semester 8

STAT*3510 [0.50] Environmental Risk Assessment
TOX*4100 [0.50] Toxicological Pathology
TOX*4200 [0.50] Topics in Toxicology
0.75 electives

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 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
PHYS*1080 [0.50] Physics for Life Sciences
STAT*2040 [0.50] Statistics I
0.50 Arts or Social Science 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 Arts or Social Science electives

Winter

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

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

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

Semester 6 - Fall

BIOM*3100 [0.50] Mammalian Physiology I
MBG*3350 [0.75] Laboratory Methods in Molecular Biology I
NUTR*4510 [0.50] Toxicology, Nutrition and Food
TOX*3300 [0.50] Analytical Toxicology
0.25 electives

Semester 7 - Winter

BIOM*3090 [0.50] Principles of Pharmacology
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
0.25 electives

Semester 8 - Fall

BIOM*3030 [0.75] Biomedical Histology
BIOM*4090 [0.50] Pharmacology
TOX*4000 [0.50] Medical Toxicology
TOX*4590 [0.50] Biochemical Toxicology
0.25 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. At least 1.00 credits must be from 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
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] 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] 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*2620 [0.50] Food Engineering Principles
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*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 Management and Economics

Minor (Honours Program)

A minimum of 5.00 credits is required.

BUS*2220 [0.50] Financial Accounting
BUS*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*1000 [0.50] Introductory Marketing
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

Students wishing to acquire further depth in Business Administration should consider taking electives from the schedules of study listed under Economics in the B.A. degree, Economics and Mathematical Economics in the B.A.H. degree and Management Economics Industry and Finance in the B.Comm. 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. At least 1.00 credits must be from Arts and/or Social Science courses.

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*2700	[0.50]	Organic Chemistry I

0.50 Arts or Social Science electives

One of:

CHEM*3870	[0.50]	Molecular Spectroscopy
CHEM*4880	[0.50]	Topics in Advanced Physical Chemistry

Semester 7

CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
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

One of:

CHEM*3870	[0.50]	Molecular Spectroscopy
CHEM*4880	[0.50]	Topics in Advanced Physical Chemistry

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. At least 1.00 credits must be from Arts and/or Social Science courses.

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

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

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

One of:

CHEM*2700	[0.50]	Organic Chemistry I

0.50 Arts or Social Science electives

Fall Semester

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

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]	Molecular Spectroscopy

0.50 electives

Summer Semester

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

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
CHEM*3750	[0.50]	Organic Chemistry II

0.50 electives

Semester 7 - Winter**

PHYS*4040	[0.50]	Quantum Mechanics II

One of:

CHEM*3760	[0.50]	Organic Chemistry III

0.50 electives

One of:

CHEM*3870	[0.50]	Molecular Spectroscopy
CHEM*4880	[0.50]	Topics in Advanced Physical Chemistry

0.50 Arts or Social Science 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*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
MATH*2150	[0.50]	Applied Matrix Algebra

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

3.00 Chemistry or Biochemistry**
1.50 electives*

*selection of electives is subject to the following:

1. At least 1.00 credits must be in the Arts & Social Sciences.
2. PHYS*2040 or PHYS*2260
3. Approval of the Faculty Advisor must be obtained for the selection of courses not listed as restrictive electives.
4. Options for an "Area of Focus" or a minor are available. Subject areas include Biochemistry, Computing and Information Science, Earth Sciences, Environmental Sciences, Mathematical Sciences, and Physics. Please consult with your Faculty Advisor for more detail.

**3.00 credits from the 3000/4000 level as follows:

1. 1.50 comprising of (CHEM*3870 or CHEM*4880), (CHEM*4620 or CHEM*4630), (CHEM*4720 or CHEM*4730)
2. 1.50 chosen from CHEM*3870, CHEM*4010, CHEM*4400, BIOC*4520, BIOC*4540,BIOC*4580, CHEM*4620, CHEM*4630, CHEM*4720, CHEM*4730, CHEM*4740, CHEM*4880, CHEM*4900, CHEM*4910, MCB*4050, MCB*4080, TOX*4590

Note:

1. Some of these courses may have to be taken in Semester 6.
2. Some of these courses are offered only in alternate years, and some have additional prerequisites for which the student must plan ahead, with the assistance of the faculty advisor.

Minor (Honours Program)

A minor in Chemistry consists of at least 5.00 credits in Chemistry courses (CHEM) at the 2000 level or above including a minimum of 2.50 credits at the 3000 or 4000 level. Exclusions: CHEM*2300 and CHEM*3360 cannot be counted toward this specialization

Chemistry (Co-op) (CHEM:C)

Department of Chemistry, College of Physical and Engineering Science

Major (Honours Program)

The major will require the completion of 20.25 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
MATH*2150	[0.50]	Applied Matrix Algebra

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*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]	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:

1. At least 1.00 credits must be in the Arts & Social Sciences.
2. PHYS*2040 or PHYS*2260
3. Approval of the Faculty Advisor must be obtained for the selection of courses not listed as restrictive electives.
4. Options for an "Area of Focus" or a minor are available. Subject areas include Biochemistry, Computing and Information Science, Earth Sciences, Environmental Sciences, Mathematical Sciences, and Physics. Please consult with your Faculty Advisor for more detail.

** 3.00 credits from the 3000/4000 level as follows:

1. 1.50 comprising of (CHEM*3870 or CHEM*4880), (CHEM*4620 or CHEM*4630), (CHEM*4720 or CHEM*4730)
2. 1.50 chosen from CHEM*3870, CHEM*4010, CHEM*4400, BIOC*4520, BIOC*4540, BIOC*4580, CHEM*4620, CHEM*4630, CHEM*4720, CHEM*4730, CHEM*4740, CHEM*4880, CHEM*4900, CHEM*4910, MCB*4050, MCB*4080, TOX*4590

Note:

Some of these courses are offered only in alternate years, and some have additional prerequisites for which the student must plan ahead, with the assistance of the faculty advisor.

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
MATH*2150 [0.50] Applied Matrix Algebra
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] 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:

1. At least 1.00 credits must be in the Arts & Social Sciences.
2. PHYS*2040 or PHYS*2260
3. Approval of the Faculty Advisor must be obtained for the selection of courses not listed as restrictive electives.
4. Options for an "Area of Focus" or a minor are available. Subject areas include Biochemistry, Computing and Information Science, Earth Sciences, Environmental Sciences, Mathematical Sciences, and Physics. Please consult with your Faculty Advisor for more detail.

** 3.00 credits from the 3000/4000 level as follows:

1. 1.50 comprising of (CHEM*3870 or CHEM*4880), (CHEM*4620 or CHEM*4630), (CHEM*4720 or CHEM*4730)
2. 1.50 chosen from CHEM*3870, CHEM*4010, CHEM*4400, BIOC*4520, BIOC*4540, BIOC*4580, CHEM*4620, CHEM*4630, CHEM*4720, CHEM*4730, CHEM*4740, CHEM*4880, CHEM*4900, CHEM*4910, MCB*4050, MCB*4080, TOX*4590

Note:

Some of these courses are offered only in alternate years, and some have additional prerequisites for which the student must plan ahead, with the assistance of the faculty advisor.

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. A five year option with four work terms is also available. Please see the department's co-op faculty advisor for details.

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.

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*3760 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*3760 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 and evolutionary biology. 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 the end of 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
One of:
- BOT*2100 [0.50] Life Strategies of Plants
- ZOO*3200 [0.50] Comparative Animal Physiology I

One of:
- MBG*3000 [0.50] Population Genetics
- ZOO*3300 [0.50] Evolution

1.00 electives

Semester 6

BIOL*3120	[0.50]	Community Ecology

2.00 electives

Semester 7

BIOL*4110	[0.75]	Ecological Methods

1.75 electives

Semester 8

BIOL*4120	[0.50]	Evolutionary Ecology

2.00 electives

* Restricted Electives

One of:

IBIO*2300	[0.50]	Invertebrate Morphology and Evolution
ZOO*2090	[0.50]	Vertebrate Structure and Function

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*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
IBIO*4200	[0.50]	Integrative Vertebrate Biology
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
BOT*3710	[0.50]	Classification and Morphology of Seed Plants

One of:

IBIO*4210	[0.25]	Lab Studies in Ornithology
IBIO*4220	[0.25]	Lab Studies in Ichthyology
IBIO*4230	[0.25]	Lab Studies in Herpetology
IBIO*4240	[0.25]	Lab Studies in Mammalogy

One of:

BIOL*3450	[0.50]	Introduction to Aquatic Environments
ENVB*3090	[0.50]	Insect Diversity and Biology

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
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
PBIO*4750	[0.50]	Genetic Engineering of Plants **

List B - Impacts of Pollution on Living Organisms

Minimum of 1.00 credits from the following list:

BIOL*3450	[0.50]	Introduction to Aquatic Environments
ENVB*3010	[0.50]	Climate Change Biology
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3280	[0.50]	Waterborne Disease Ecology
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*3230	[0.50]	Agroforestry Systems **
ENVB*3250	[0.50]	Forest Health and Disease
ENVB*3270	[0.50]	Forest Biodiversity **
ENVB*3300	[0.50]	Applied Ecology and Environment **
ENVB*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**
NRS*2120	[0.50]	Introduction to Environmental Stewardship
NRS*3100	[0.50]	Resource Planning Techniques
SOIL*3050	[0.50]	Land Utilization **
SOIL*3080	[0.50]	Soil and Water Conservation **
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

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*

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*

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 Semester

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

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

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
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

Fall Semester

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

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

0.75 electives*

* a minimum of 1.50 credits must be from the College of Arts and/or the College of Social and Applied Human Sciences

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*3030	[0.50]	Food Chemistry I
FOOD*3160	[0.75]	Food Processing I
FOOD*3230	[0.75]	Food Microbiology

0.50 electives

Semester 6 - Winter

FOOD*3040	[0.50]	Food Chemistry II
FOOD*3170	[0.50]	Food Processing II

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
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*3030	[0.50]	Food Chemistry I
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*3040	[0.50]	Food Chemistry II
FOOD*3170	[0.50]	Food Processing II
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*3700	[0.50]	Sensory Evaluation of Foods
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
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

Semester 5 - Fall

FOOD*3030	[0.50]	Food Chemistry I
FOOD*3160	[0.75]	Food Processing I
FOOD*3230	[0.75]	Food Microbiology

0.50 electives

Semester 6 - Winter

FOOD*3040	[0.50]	Food Chemistry II
FOOD*3170	[0.50]	Food Processing II

1.50 electives

Summer Semester

Optional

Fall Semester

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

Winter Semester

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

Semester 7 - Fall

FOOD*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 Systems (FSYS)

Department of Environmental Biology, Ontario Agricultural College

Minor (Honours Program)

A minor in Forest Systems consists of 5.00 credits from the following courses:

ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*4400	[0.50]	Forest Systems Field Camp
ENVB*4780	[0.50]	Forest Ecology

Two of:

ENVB*3230	[0.50]	Agroforestry Systems
ENVB*3250	[0.50]	Forest Health and Disease
ENVB*3270	[0.50]	Forest Biodiversity

One of:

ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*3330	[0.50]	Ecosystem Processes and Applications

Four of:

BIOL*3130	[0.50]	Conservation Biology
BOT*2030	[0.50]	Plants in the Ontario Landscape
ENVB*3010	[0.50]	Climate Change Biology
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3610	[0.50]	Environmental Hydrology
GEOG*4110	[0.50]	Environmental Systems Analysis
HORT*3350	[0.50]	Woody Plant Production and Culture
SOIL*2010	[0.50]	Soil Science
ZOO*2050	[0.50]	Natural History of Ontario
ZOO*4050	[0.50]	Natural Resources Policy

* ENVB*4400 is preferred, but may be substituted by ENVB*4420, NRS*4110 or ZOO*4410 with the approval of the faculty advisor.

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 Governance

[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*2200	[0.50]	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 the end of 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*2090	[0.50]	Vertebrate Structure and Function
ZOO*2100	[0.50]	Developmental Biology

1.50 electives**

Semester 4

BIOL*2210	[0.50]	Introductory Cell Biology
BIOC*2580	[0.50]	Introductory Biochemistry
IBIO*2300	[0.50]	Invertebrate Morphology and Evolution
MBG*2000	[0.50]	Introductory Genetics

0.50 electives**

Semester 5

BIOL*3110	[0.50]	Population Ecology
BIOL*3450	[0.50]	Introduction to Aquatic Environments
IBIO*3300	[0.50]	Integrative Biology of Invertebrates
ZOO*3200	[0.50]	Comparative Animal Physiology I
ZOO*3300	[0.50]	Evolution

Semester 6

BIOL*3120	[0.50]	Community Ecology
ZOO*3210	[0.50]	Comparative Animal Physiology II

1.50 electives**, ***

Semester 7

IBIO*4200	[0.50]	Integrative Vertebrate Biology
IBIO*4220	[0.25]	Lab Studies in Ichthyology
ZOO*4350	[0.50]	Biology of Polluted Waters
ZOO*4570	[0.50]	Marine Ecological Processes

0.75 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
IBIO*4521/2	[2.00]	Thesis in Integrative Biology
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. This major must include at least 6.00 credits at the 3000 or 4000 level from the approved list of science electives of which at least 2.00 credits must be at the 4000 level (and may include STAT*4340). 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

One of:

MATH*3160	[0.50]	Linear Algebra II
0.50 electives		

0.50 electives

Semester 5

MATH*3100	[0.50]	Differential Equations II
MATH*3200	[0.50]	Real Analysis

One of:

MATH*3130	[0.50]	Abstract Algebra
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

Note: Students who wish to take STAT*4340 in semester 8 should take STAT*3100 in semester 5, STAT*3110 in semester 6 and STAT*3240 in semester 5 or 7.

Semester 6

MATH*3260	[0.50]	Complex Analysis

One of:

MATH*3160	[0.50]	Linear Algebra II (if not taken in Sem. 4)
0.50 electives		

1.50 electives

Semester 7

0.50 credits from a 4000 level mathematics

1.50 electives**

One of:

MATH*3130	[0.50]	Abstract Algebra
MATH*3240	[0.50]	Operations Research

Semester 8

1.00 credits from a 4000 level mathematics **

1.50 electives

*A student selecting STAT*3100 should take STAT*3110 in semester 6.

**Students are reminded that the major requires 2.00 credits (four courses) at the 4000 level in Mathematics.

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
MBG*3080	[0.50]	Bacterial Genetics
MICR*3120	[0.50]	Systematic Bacteriology
MICR*3230	[0.50]	Immunology I
MICR*3330	[0.50]	World of Viruses

Semester 6

BIOL*3050	[0.50]	Mycology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*3260	[0.50]	Microbial Adaptation and Development

0.75 electives

Semester 7

2.50 electives or restricted electives which can include MICR*4310

Semester 8

2.50 electives or restricted electives which can include MICR*4320

Elective and Restricted Elective Credits

2.00 elective credits must be from the Arts and Social Sciences.

2.50 restricted elective credits of which 1.00 credit must be at the 4000 level.

A minimum of 6.00 science credits must be at the 3000/4000 level of which at least 2.00 credits must be at the 4000 level (including the 1.00 restricted elective credit).

Restricted Electives

BIOC*4540	[0.50]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
BIOL*4050	[0.50]	Advanced Eukaryotic Microbiology
FOOD*3230	[0.75]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*4400	[0.50]	Dairy Processing
MCB*4080	[0.50]	Applied Microbiology and Biochemistry
MICR*3220	[0.50]	Plant Microbiology
MICR*3270	[0.50]	Microbial Cell Biology
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4230	[0.50]	Immunology II
MICR*4240	[0.50]	Topics in Microbiology
MICR*4280	[0.50]	Microbial Ecology
MICR*4310	[1.00]	Research Project I
MICR*4320	[1.00]	Research Project II
MICR*4330	[0.50]	Molecular Virology
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 5.25 credits:

2.25 credits including:

BIOC*3560	[0.50]	Structure and Function in Biochemistry
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*2020	[0.50]	Microbial Interactions and Associations
MICR*2030	[0.50]	Microbial Growth

2.00 credits from:

BIOL*3050	[0.50]	Mycology
FOOD*3230	[0.75]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
MBG*2020	[0.50]	Introductory Molecular Biology
MBG*3080	[0.50]	Bacterial Genetics
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*3270	[0.50]	Microbial Cell Biology
MICR*3330	[0.50]	World of Viruses
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management

1.00 credits from:

BIOL*4050	[0.50]	Advanced Eukaryotic Microbiology
MCB*4080	[0.50]	Applied Microbiology and Biochemistry
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4230	[0.50]	Immunology II
MICR*4280	[0.50]	Microbial Ecology
MICR*4330	[0.50]	Molecular Virology
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
COOP*1100	[0.00]	Introduction to Co-operative Education
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

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

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
MBG*3080	[0.50]	Bacterial Genetics
MICR*3120	[0.50]	Systematic Bacteriology
MICR*3230	[0.50]	Immunology I
MICR*3330	[0.50]	World of Viruses

Semester 6 - Winter

BIOL*3050	[0.50]	Mycology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*3260	[0.50]	Microbial Adaptation and Development

0.75 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 which can include MICR*4310

Summer Semester

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

Semester 8 - Fall

2.50 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
COOP*1100	[0.00]	Introduction to Co-operative Education
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

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

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

Semester 5 - Winter

BIOC*3560	[0.50]	Structure and Function in Biochemistry
BIOL*3050	[0.50]	Mycology
MBG*3350	[0.75]	Laboratory Methods in Molecular Biology I
MICR*3330	[0.50]	World of Viruses

0.25 electives

Summer Semester

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

Semester 6 - Fall

MICR*3120	[0.50]	Systematic Bacteriology
MICR*3230	[0.50]	Immunology I
MBG*3080	[0.50]	Bacterial Genetics

1.00 electives

Semester 7 - Winter

MICR*3260	[0.50]	Microbial Adaptation and Development

2.00 electives or restricted electives which can include MICR*4310

Summer Semester

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

Semester 8 - Fall

2.50 electives or restricted electives which can include MICR*4320

Elective and Restricted Elective Credits

2.00 elective credits must be from the Arts and Social Sciences.

2.50 restricted elective credits of which 1.00 credit must be at the 4000 level.

A minimum of 6.00 science credits must be at the 3000/4000 level of which at least 2.00 credits must be at the 4000 level (including the 1.00 restricted elective credit).

Restricted Electives

BIOC*4540	[0.50]	Enzymology
BIOC*4580	[0.50]	Membrane Biochemistry
BIOL*4050	[0.50]	Advanced Eukaryotic Microbiology
FOOD*3230	[0.75]	Food Microbiology
FOOD*3260	[0.50]	Industrial Microbiology
FOOD*4400	[0.50]	Dairy Processing
MCB*4080	[0.50]	Applied Microbiology and Biochemistry
MICR*3220	[0.50]	Plant Microbiology
MICR*3270	[0.50]	Microbial Cell Biology
MICR*4010	[0.50]	Pathogenic Bacteriology
MICR*4230	[0.50]	Immunology II
MICR*4240	[0.50]	Topics in Microbiology
MICR*4280	[0.50]	Microbial Ecology
MICR*4310	[1.00]	Research Project I
MICR*4320	[1.00]	Research Project II
MICR*4330	[0.50]	Molecular Virology
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 Faculty Advisor, students can choose a general program or can focus their courses in areas such as molecular biology, cell biology, developmental biology, genetics, or agricultural genetics. The program qualifies students for postgraduate training in cell or molecular biology and genetics including clinical genetics and genetic counselling, and provides an excellent background for careers in biotechnology, toxicology, agriculture and medical research. Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor.

Major (Honours Program)

A total of 20.00 credits is required to complete the major.

Semester 1

BIOL*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

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

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

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

1.50 electives or restricted electives

Semester 8*

MBG*4510	[1.00]	Research Project in Molecular Biology and Genetics II

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.

Arts and Social Science Electives - 2.00 credits

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*4280	[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*3080	[0.50]	Bacterial 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*4110	[0.50]	Advanced Concepts in Genetics
MBG*4160	[0.50]	Plant Breeding
MBG*4240	[0.50]	Applied Molecular Genetics
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MBG*4300	[0.50]	Plant Molecular Genetics
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*3330	[0.50]	World of Viruses
MICR*4330	[0.50]	Molecular Virology

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*3080	[0.50]	Bacterial 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*4110	[0.50]	Advanced Concepts in Genetics
MBG*4160	[0.50]	Plant Breeding
MBG*4240	[0.50]	Applied Molecular Genetics
MBG*4270	[0.50]	DNA Replication, Recombination and Repair
MBG*4300	[0.50]	Plant Molecular Genetics
MCB*4010	[0.50]	Advanced Cell Biology
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MICR*3330	[0.50]	World of Viruses
MICR*4330	[0.50]	Molecular Virology

One of:

MBG*4040	[0.50]	Genetics and Molecular Biology of Development
MBG*4070	[0.50]	Genetics and Molecular Biology of Development

Nanoscience (NANO)

Administered jointly by the Department of Chemistry and the Department of Physics, College of Physical and Engineering Science.

Major (Honours Program)

The major will require the completion of 20.00 credits as indicated below.

Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
NANO*1000	[0.50]	Introduction to Nanoscience
PHYS*1000	[0.50]	An Introduction to Mechanics

Students who are admitted deficient in one 4U course in Chemistry or Physics must take the equivalent introductory course in first semester. It is in the students best interest if the first-year science core in that subject is completed by the end of 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

CHEM*2060	[0.50]	Structure and Bonding
MATH*2160	[0.50]	Linear Algebra I
NANO*2000	[0.50]	Synthesis of Nanomaterials
PHYS*2310	[0.50]	Mechanics I
PHYS*2330	[0.50]	Electricity and Magnetism I

Semester 4

CHEM*2070	[0.50]	Structure and Spectroscopy
MATH*2170	[0.50]	Differential Equations I
NANO*2100	[0.50]	Analysis of Nanomaterials

1.00 electives*

Semester 5

One of:

CHEM*3860	[0.50]	Quantum Chemistry
PHYS*3230	[0.50]	Quantum Mechanics I

NANO*3500	[0.50]	Thin Film Science
NANO*3600	[0.50]	Computational Methods

1.00 electives

Semester 6

NANO*3200	[0.50]	Nanolithographic Techniques
NANO*3300	[0.50]	Spectroscopy of Nanomaterials
NANO*3700	[0.50]	Introduction to Quantum Computing

1.00 electives

Semester 7

NANO*4100	[0.50]	Biological Nanomaterials

2.00 electives

Semester 8

NANO*4200	[0.50]	Quantum Materials

2.00 electives

* If a student wants to take PHYS*3230 in semester 5, then they must select PHYS*2320 and PHYS*2340 as electives in semester 4.

Selection of electives is subject to the following rules:

1. The student must select at least 1.00 credits in Arts or Social Science.
2. The program must include at least 6.00 science credits at the 3000 and 4000 level of which at least 2.00 must be at the 4000 level.
3. In semesters 7 and 8, the student must select to do either NANO*4900 or NANO*4910.

In completing the science requirements for the degree, some suggested complementary areas of focus are:

Chemistry: Inorganic

Semester 4: CHEM*2480
Semester 5: CHEM*3640
Semester 6: CHEM*3650
Semester 7: CHEM*2820, CHEM*4620
Semester 8: CHEM*2700

Chemistry: Organic

Semester 4: CHEM*2700
Semester 5: CHEM*3750
Semester 6: CHEM*3760
Semester 7: CHEM*2820, CHEM*4730
Semester 8: CHEM*2480, CHEM*4720

Chemistry: Physical/Analytical

Semester 4: CHEM*2480
Semester 5: CHEM*2820
Semester 6: CHEM*3430 or CHEM*3870
Semester 7: CHEM*3440, CHEM*3860
Semester 8: CHEM*3870, CHEM*3430

Engineering

Semester 2: CIS*1500
Semester 4: ENGG*2450*
Semester 5: ENGG*2410*, ENGG*3450*
Semester 6: ENGG*4550*
Semester 7: ENGG*4080*

Mathematics and Statistics

Semester 4: STAT*2040
Semester 5: STAT*3100
Semester 6: MATH*2130
Semester 7: NANO*4500, MATH*3240
Semester 8: NANO*4510, MATH*3160

Physics

Semester 4: PHYS*2320, PHYS*2340
Semester 5: PHYS*3240, MATH*2200
Semester 6: PHYS*3220
Semester 7: PHYS*4240, PHYS*4180
Semester 8: PHYS*4040

***Note**: Courses makred with an asterick may require additional prerequistes. Students should consult the relevant course descriptions for further informaiton.

Neuroscience (NEUR)

Office of the Associate Dean, B.Sc. Program

Minor (Honours Program)

A minor in Neuroscience shall include a minimum of 5.00 credits including:

BIOM*3000	[0.50]	Functional Mammalian Neuroanatomy
NEUR*4000	[0.50]	Current Issues in Neuroscience
PSYC*2410	[0.50]	Behavioural Neuroscience I

1 of:

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

and 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

1.00 credits from an independent research project in the neurosciences, approved by the faculty advisor, selected from a combination of:

BIOM*4420	[0.50]	Research Modules
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
IBIO*4510	[0.75]	Research in Integrative Biology II
NEUR*4401/2	[1.00]	Research in Neurosciences
NEUR*4450	[1.00]	Research in Neurosciences
PSYC*4500	[0.50]	Current Theoretical Issues in Psychology
PSYC*4510	[0.50]	Current Issues in Psychology
PSYC*4870	[0.50]	Honours Thesis I
PSYC*4880	[1.00]	Honours Thesis II

and 1.50 from the following:

BIOM*3090	[0.50]	Principles of Pharmacology
BIOM*4030	[0.50]	Endocrine Physiology
HK*3100	[0.50]	Neuromuscular Physiology
PHYS*2030	[0.50]	Biophysics of Excitable Cells
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
PSYC*4600	[0.50]	Cognitive Neuroscience
ZOO*4470	[0.50]	Comparative Endocrinology

In fullfillment of the 1.50 additional credits, students may take 1 of:

BIOM*3040	[0.50]	Medical Embryology
ZOO*2100	[0.50]	Developmental Biology

and non-B.Sc. students may also select:

BIOL*2210	[0.50]	Introductory Cell Biology
MBG*2020	[0.50]	Introductory Molecular Biology

Please note that some of the restricted electives require prerequisites that are not included in the minor.

Nutritional and Nutraceutical Sciences (NANS)

Department of Human Health and Nutritional Sciences, College of Biological Science

The Nutritional and Nutraceutical Sciences major is concerned with understanding the contribution of food, beverage and nutritional supplement consumption to growth, development of optimal biological function, maintenance of health, and treatment of disease.

If lacking the fundamentals of word processing, spread sheet use and data management, the student should select CIS*1200 as early in the program as possible.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A total of 20.00 credits is required, including 2.00 credits from Arts and Social Sciences courses.

Semester 1

BIOL*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

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
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:

BIOM*4420	[0.50]	Research Modules
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
HK*4410	[0.50]	Research Concepts
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*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
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

Semester 4

1.50 science electives from the approved list of B.Sc. science electives*
0.50 electives
One of:

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

(if a statistics course is chosen in Semester 3)
OR

STAT*2040	[0.50]	Statistics I

(if a computing course is chosen in Semester 3)

Semester 5 to 8

Total of 2.50 credits per semester including at least 2.00 science electives.

Sufficient courses at the 3000 or 4000 level must be selected in Semesters 5 through 8 to total 6.00 credits in science at the 3000 or 4000 level with at least 2.00 physical science at the 4000 level.

*approved course lists are available in the 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

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 credits must be from 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]	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

EDRD*3120	[0.50]	Educational Communication
GEOL*3060	[0.50]	Groundwater
NRS*3600	[0.50]	Remote Sensing
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 Politics and Governance
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]	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 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
MATH*2080	[0.50]	Elements of Calculus II

0.50 Arts or Social Science electives*

Semester 3

AGR*2470	[0.50]	Introduction to Plant Agriculture
BIOC*2580	[0.50]	Introductory Biochemistry
BOT*2100	[0.50]	Life Strategies of Plants
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*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
CROP*3300	[0.50]	Grain Crops
CROP*3310	[0.50]	Protein and Oilseed Crops
CROP*4240	[0.50]	Weed Science
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*3210	[0.50]	Plant Pathology
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
IBIO*4521/2	[2.00]	Thesis in Integrative Biology
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

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2210	[0.50]	Introductory Cell Biology
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
PBIO*4750	[0.50]	Genetic Engineering of Plants

0.75 electives or restricted electives

Semester 7

MBG*4500	[1.00]	Research Project in Molecular Biology and Genetics I
PBIO*4000	[0.50]	Molecular and Cellular Aspects of Plant-Microbe Interactions

1.00 electives or restricted electives

Semester 8

BOT*4380	[0.50]	Metabolism in the Whole Life of Plants

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
MBG*4510	[1.00]	Research Project in Molecular Biology and Genetics II
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*3330	[0.50]	World of Viruses
MICR*4230	[0.50]	Immunology II
PBIO*3110	[0.50]	Crop Physiology
PBIO*4600	[0.50]	Plant Environment Interaction and Stress

Note: Students are strongly recommended to take MBG*4510.

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

Psychology: Brain & Cognition (PBC)

Department of Psychology, College of Social and Applied Human Sciences

The B.Sc. Major in Psychology: Brain and Cognition offers an opportunity for students to develop interests within learning, perception, cognition, and biopsychology from a sound base in physical and biological sciences. Students primarily interested in other areas within psychology should consult the schedule of studies for the Bachelor of Arts program. Psychology courses in the above focuses may also be studied via the B.A. program.

Note on Honours Courses

Courses marked (H) are designed for students in a psychology major or minor or the Information Systems and Human Behaviour program and the Educational Psychology Minor 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 the 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

One of:

PSYC*2330	[0.50]	Principles of Learning
PSYC*2410	[0.50]	Behavioural Neuroscience I

One of:

PSYC*2390	[0.50]	Principles of Sensation and Perception
PSYC*2650	[0.50]	Cognitive Psychology

One of:

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

1.00 electives *

Semester 4

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

0.50 Psychology core (PSYC*2330, PSYC*2390, PSYC*2410, PSYC*2650)
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

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**

* Electives in semester 3-8 must satisfy the following requirements:

i. 1.00 arts and/or non-psychology social science credits

ii. 2.50 credits at the 3000 level

iii. 2.00 credits at the 4000 level

iv. 3.50 credits from List A

v. 3.50 credits from List B

Note: of these electives, 2.50 credits must be at the 3000/4000 level and 2.00 additional credits must be at the 4000 level.

Graduate Studies Advisory Note

** 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

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*3260	[0.50]	Laboratory in Animal Learning
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*4470	[0.50]	Behavioural Neuroscience Seminar
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

All courses on the List of Approved Science Electives for B.Sc. students, excluding psychology.

Minor (Honours Program)

A minor in Psychology: Brain and Cognition 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]	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

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

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

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 the end of 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*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
IBIO*2300	[0.50]	Invertebrate Morphology and Evolution
MBG*2000	[0.50]	Introductory Genetics
NUTR*3210	[0.50]	Fundamentals of Nutrition

0.50 electives **

Semester 5

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology
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
IBIO*4200	[0.50]	Integrative Vertebrate Biology
ZOO*4070	[0.50]	Animal Behaviour

0.75 electives **

Semester 8

BIOL*4150	[0.50]	Wildlife Conservation and Management

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
IBIO*4521/2	[2.00]	Thesis in Integrative Biology
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 0.50 credits from:

IBIO*4210	[0.25]	Lab Studies in Ornithology
IBIO*4220	[0.25]	Lab Studies in Ichthyology
IBIO*4230	[0.25]	Lab Studies in Herpetology
IBIO*4240	[0.25]	Lab Studies in Mammalogy

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 the end of 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*2090	[0.50]	Vertebrate Structure and Function
ZOO*2100	[0.50]	Developmental Biology

1.50 electives **

Semester 4

BIOL*2210	[0.50]	Introductory Cell Biology
BIOC*2580	[0.50]	Introductory Biochemistry
IBIO*2300	[0.50]	Invertebrate Morphology and Evolution
MBG*2000	[0.50]	Introductory Genetics

0.50 electives **

Semester 5

BIOL*3110	[0.50]	Population Ecology
IBIO*3300	[0.50]	Integrative Biology of Invertebrates
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

IBIO*4200	[0.50]	Integrative Vertebrate Biology
ZOO*3000	[0.50]	Comparative Histology
ZOO*4070	[0.50]	Animal Behaviour

1.00 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 0.25 credits from:

IBIO*4220	[0.25]	Lab Studies in Ichthyology
IBIO*4210	[0.25]	Lab Studies in Ornithology
IBIO*4230	[0.25]	Lab Studies in Herpetology
IBIO*4240	[0.25]	Lab Studies in Mammalogy

2. 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
IBIO*4521/2	[2.00]	Thesis in Integrative Biology
ZOO*4170	[0.50]	Experimental Comparative Animal Physiology
ZOO*4300	[0.75]	Marine Biology and Oceanography
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.

3. At least 1.00 Arts or Social Science electives.
4. 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, 4.00 of which must be from the following list:

BIOL*3110	[0.50]	Population Ecology
BIOL*3120	[0.50]	Community Ecology
IBIO*2300	[0.50]	Invertebrate Morphology and Evolution
IBIO*3300	[0.50]	Integrative Biology of Invertebrates
IBIO*4200	[0.50]	Integrative Vertebrate Biology
IBIO*4220	[0.25]	Lab Studies in Ichthyology
IBIO*4210	[0.25]	Lab Studies in Ornithology
IBIO*4230	[0.25]	Lab Studies in Herpetology
IBIO*4240	[0.25]	Lab Studies in Mammalogy
ZOO*2090	[0.50]	Vertebrate Structure and Function
ZOO*2100	[0.50]	Developmental Biology
ZOO*3000	[0.50]	Comparative Histology
ZOO*3200	[0.50]	Comparative Animal Physiology I
ZOO*3210	[0.50]	Comparative Animal Physiology II
ZOO*3300	[0.50]	Evolution
ZOO*4070	[0.50]	Animal Behaviour
ZOO*4330	[0.50]	Environmental Biology of Fishes

The remaining 1.00 credit may also come from this list or from outside this list, in consultation with a faculty advisor.

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

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

Program Information

Agricultural scientists must be effective communicators and problem solvers, self-directed in their learning, and have a global perspective of the agrifood systems. Students will be involved in co-operative group learning activities and will experience courses that are multidisciplinary and integrate the teaching activities of many faculty and departments.

Students will have the option of completing a broad agricultural program (honours agricultural science) or another major in which they take a minimum of 6.00 credits. The curriculum provides opportunities for students to select courses that will help them prepare for professional careers as entrepreneurs, scientists, marketing specialists, financial managers, technical advisors, or communication specialists. Students will have a comprehensive understanding of the food system when they graduate. They will be able to integrate their knowledge of production agriculture, environmental management, resource allocation and business management as it applies to the food system nationally and globally.

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

Graduates meet the educational requirements for membership in the Ontario Institute of Agrologists. The Ontario Institute of Agrologists is the professional organization in agriculture in the Province of Ontario. Professional institutes in the various provinces in Canada and the scientific societies in agriculture collectively comprise the Agricultural Institute of Canada. The program received full accreditation from the Agricultural Institute of Canada in April 2007.

B.Sc.(Agr.) Majors:

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

Declaration of a Major

All students are admitted into an undeclared major upon entry. Students will be required to select a major by semester 3 through consultation with the Program Counsellor and Faculty Advisors. The course requirements are listed for each major in the following section.

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

Study Abroad

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

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

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

Doctor of Veterinary Medicine

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

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

Continuation of Study

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

Conditions of Graduation

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

Honours Agriculture (AGRS)

Semester 1

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

Semester 2

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

0.50 electives

Semester 3

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

0.50 restricted electives

Semester 4

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

One of:

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

One of:

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

0.50 restricted electives

Semester 5

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

1.50 electives or restricted electives

Semester 6

EDRD*3400	[0.50]	Sustainable Communities

2.00 electives

Semester 7 & 8

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

Option A:

AGR*4500	[0.50]	Agrifood Industry Problem-Solving

4.50 electives

Option B

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

3.00 electives

Restricted Electives

1. 2 of the following Restricted Electives are required:

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

2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
3. A humanities or social science course (0.50 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Suggested Electives in Agricultural Sciences and Related Disciplines

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

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

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

Agricultural Land Resources

General Recommendations:

EDRD*3450	[0.50]	Watershed Planning Practice

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

Climate & Agroecosystems Management:

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

Nutrient Management:

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

Source Water Protection:

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

Agroforestry

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

Communication, Organizations and Development

General Recommendations:

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

Communication: Process and Products:

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

Rural Organizations and Community Development:

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

International Agriculture

General Recommendations:

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

Tropical Agroecosystems:

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

International Agribusiness and Policy:

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

Plant Protection

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

Agriculture (AGR)

OAC Dean's Office

Minor (Honours Program)

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

Minor

A minimum of 5.00 credits is required including:

One of:

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

Three of:

AGR*2320	[0.50]	Soils in Agroecosystems
AGR*2350	[0.50]	Animal Production Systems and Industry
AGR*2400	[0.50]	Economics of the Canadian Food System
AGR*2470	[0.50]	Introduction to Plant Agriculture
AGR*2500	[0.50]	Field Trip in International Agriculture
EDRD*3400	[0.50]	Sustainable Communities
FOOD*3090	[0.50]	Food Science and Human Nutrition

3.00 credits from the following Elective List:

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

Agronomy:

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

Animal Science:

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

Environmental Biology:

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

Horticultural Science:

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

Organic Agriculture:

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

Resource Management:

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

Agricultural Economics (AGEC)

Department of Food, Agricultural and Resource Economics

Semester 1

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

Semester 2

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

Semester 3

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

Two of:

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

0.50 electives or restricted electives

Semester 4

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

0.50 electives or restricted electives

Semester 5

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

One of:

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

1.00 electives or restricted electives

Semester 6

EDRD*3400	[0.50]	Sustainable Communities

2.00 electives or restricted electives

Semester 7 & 8

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

Option A:

Semester 7

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

1.50 electives or restricted electives

Semester 8

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

1.50 electives or restricted electives

Option B

Semester 7

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

0.50 electives or restricted electives

Semester 8

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

1.00 electives or restricted electives

Restricted Electives

1. Students are required to take at least 1.50 additional credits at the 3000 or 4000 level in the following subject areas: AGEC, MCS, ECON, or in an area otherwise approved by the faculty advisor. At least 1.00 of these additional credits must be at the 4000 level.
2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.

Animal Science (ANSC)

Department of Animal and Poultry Science

Semester 1

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

Semester 2

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

0.50 electives

Semester 3

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

Semester 4

ANSC*2340	[0.50]	Structure of Farm Animals
BIOC*2580	[0.50]	Introductory Biochemistry
MICR*2020	[0.50]	Microbial Interactions and Associations
STAT*2040	[0.50]	Statistics I

0.50 electives

Semester 5

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

0.50 electives

Semester 6

2.50 electives or restricted electives

Semester 7 & 8

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

Option A:

Semester 7

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

1.50 electives or restricted electives

Semester 8

AGR*4500	[0.50]	Agrifood Industry Problem-Solving

2.00 electives or restricted electives

Option B

Semester 7

AGR*4450	[1.00]	Research Project I
POPM*4230	[0.50]	Animal Health

1.00 electives or restricted electives

Semester 8

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

Restricted Electives

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

   Animal Breeding.

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

   Animal Nutrition:

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

   Animal Physiology and Behaviour:

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

2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
3. A humanities or social science course (0.50 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

Crop, Horticulture and Turfgrass Sciences (CHAT)

Department of Plant Agriculture

Semester 1

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

Semester 2

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

0.50 electives

Semester 3

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

0.50 electives or restricted electives

Semester 4

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

One of:

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

0.50 to 1.00 electives or restricted electives

Semester 5

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

One of:

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

1.00 to 2.00 electives or restricted electives

Semester 6

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

1.50 to 2.00 electives or restricted electives

Semester 7 & 8

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

Option A:

Semester 7

One of:

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

2.00 to 2.50 electives or restricted electives

Semester 8

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

1.50 to 2.00 electives or restricted electives

Option B

Semester 7

AGR*4450	[1.00]	Research Project I

One of:

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

1.00 to 1.50 electives or restricted electives

Semester 8

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

1.00 to 1.50 electives or restricted electives

Restricted Electives

1. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Those credits at the 3000 level or above selected to satisfy Item # 3 below will be applied to satisfy this minimum 7.00 credit requirement. Refer to the Program Counsellor for the list of agricultural science courses.
2. A humanities or social science course (0.50 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.
3. Six courses (3.00 credits) from the courses listed below without regard to group.

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

Crop Science

Choose three courses (1.50 credits) among the following:

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

Choose three courses (1.50 credits) among the following:

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

Horticultural Science

Choose two courses (1.00 credits) among the following:

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

Choose two courses (1.00 credits) among the following:

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

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

Choose two courses (1.00 credits) among the following:

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

Turfgrass Science

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

Choose one of:

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

Organic Agriculture(OAGR)

Department of Plant Agriculture and Department of Land Resource Science

Semester 1

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

Semester 2

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

0.50 electives

Semester 3

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

Semester 4

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

1.50 electives or restricted electives

Semester 5

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

0.50 electives or restricted electives

Semester 6

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

1.50 electives or restricted electives

Semester 7

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

1.50 electives or restricted electives

Semester 8

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

1.50 electives or restricted electives

Restricted Electives

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

ANSC*3210	[0.50]	Principles of Animal Care and Welfare
CROP*2110	[0.50]	Crop Ecology
CROP*4240	[0.50]	Weed Science
EDRD*2000	[0.50]	Introduction to Rural Extension
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3210	[0.50]	Plant Pathology
ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*4100	[0.50]	Applied Entomology
GEOG*3320	[0.50]	Agriculture and Society
HORT*3260	[0.50]	Woody Plants
NRS*3000	[0.50]	Environmental Issues in Agriculture and Landscape Management
PBIO*4100	[0.50]	Soil Plant Relationships
PHIL*2070	[0.50]	Philosophy of the Environment
SOAN*4220	[0.50]	Gender and Change in Rural Canada
SOC*3380	[0.50]	Society and Nature
SOC*4210	[0.50]	Advanced Topics in Rural Sociology

2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
3. A humanities or social science course (0.50 credits) at the 2000 level or above from the College of Arts or College of Social and Applied Human Sciences.

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

Urban Landscape Management (ULM)

The School of Environmental Design and Rural Development

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

Field Trips

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

Semester 1

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

Semester 2

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

One of:

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

Semester 3

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

0.50 electives

Semester 4

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

1.00 electives or restricted electives

Semester 5

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

1.50 electives or restricted electives

Semester 6

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

0.50 electives or restricted electives

Semester 7

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

1.00 electives or restricted electives

Semester 8

AGR*4460	[1.00]	Research Project II

1.50 electives or restricted electives

A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level.

Restricted Electives

1.50 credits from:

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

1.00 credits from:

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

Bachelor of Science in Environmental Sciences [B.Sc.(Env.)]

Program Information

Objectives of the Program

The Environmental Sciences program is designed to provide a strong interdisciplinary grounding in specific environmental sciences including the socioeconomic context in which environmental issues are resolved.

There is an emphasis on management and decision-making skills for the application of scientific knowledge to environmental problems, and the evaluation of appropriate environmental policies. A practical perspective based on defining and resolving problems is central to the program, and this is often done in the context of group work.

Substantial emphasis is placed on communication skills, including the development of competence in both written and oral presentations. These skills will be progressively developed in core courses from the first to the fourth year. Students in the final 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 graduate from the B.Sc.(Env.) program, students must successfully complete a minimum of 20.00 credits including all the stated course requirements for the program. As well, students must achieve a cumulative average of 60% or higher over all course attempts.

Environmental Sciences (Co-op)

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 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 or major) are not offered each semester, careful planning and program consultation with the Faculty Co-op Advisor is essential. In particular, students are encouraged to seek advice when choosing for their Summer academic semester.

The Environmental Sciences Program

The degree in Environmental Sciences consists of a minimum of 20.00 credits, as follows:

1. 5.00 First Year Curriculum
2. 5.00 Environmental Sciences Core
3. 7.00 Environmental Sciences Major
4. free electives*

Within these courses, students must include at least 6.00 credits at the 3000 or 4000 level, and no program may include more than 7.00 credits at the 1000 level.

* There are not specific subject requirements for the elective courses, however, you may NOT select the following: BOT*1200, CHEM*1100, CIS*1000, GEOL*1100, MATH*1050, MET*1000, MICR*1010 , MICR*1020, MBG*1000, PHYS*1600, ZOO*1500.

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General Chemistry II
ECON*1050	[0.50]	Introductory Microeconomics
GEOG*1300	[0.50]	Introduction to the Biophysical Environment
PHYS*1130	[0.50]	Physics with Applications

Note: Co-op students must select COOP*1100 Introduction to Co-operative Education

Environmental Sciences Core

In addition to the common first year curriculum, students are required to take the following core Environmental Sciences courses in the semesters recommended in the schedule of studies:

BIOL*2060	[0.50]	Ecology
ENVS*2150	[0.50]	Terrestrial Systems
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
ENVS*4011/2	[0.50]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation
PHIL*2070	[0.50]	Philosophy of the Environment
One of:		
AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
One of:		
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance
ZOO*4050	[0.50]	Natural Resources Policy
One of:		
ECON*2740	[0.50]	Economic Statistics
GEOG*2460	[0.50]	Analysis in Geography
STAT*2040	[0.50]	Statistics I

Note: the statistics course required is prescribed by the student's choice of major.

Environmental Sciences Majors

Earth and Atmospheric Science

Ecology

Environmental Biology

Environmental Economics and Policy

Environmental Geography

Environmental Monitoring and Analysis

Environmetrics and Modelling

Natural Resources Management

Requirements for each of these majors are described in the detailed schedules of studies below.

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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

ENVS*2150	[0.50]	Terrestrial Systems
GEOL*1050	[0.50]	Geology and the Environment
MET*2030	[0.50]	Meteorology and Climatology
STAT*2040	[0.50]	Statistics I

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

Semester 4

BIOL*2060	[0.50]	Ecology
GEOL*3060	[0.50]	Groundwater
SOIL*2010	[0.50]	Soil Science

One of:

MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II
STAT*2050	[0.50]	Statistics II

0.50 electives or restricted electives

Semester 5

GEOL*2110	[0.50]	Earth Material Science

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

1.50 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.

Semester 6

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
NRS*3600	[0.50]	Remote Sensing
PHIL*2070	[0.50]	Philosophy of the Environment

0.50 electives or restricted electives

Semester 7

ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation

2.00 electives or restricted electives

Semester 8

ENVS*4012	[0.50]	Project in Environmental Sciences

2.00 electives or restricted electives

Restricted Electives

Students must choose one of the following:

GEOL*3250	[0.50]	Field Methods in Geosciences
MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
SOIL*4250	[0.50]	Soils in the Landscape

Additionally students in the Earth and Atmospheric Science major are required to choose 2.50 credits from the following lists. 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. With prior approval, students may be able to use courses not on this list towards their Earth and Atmospheric Science restricted electives.

List A - Environmental Geology

GEOL*2020	[0.50]	Stratigraphy
GEOL*2200	[0.50]	Glacial Geology
GEOL*3130	[0.50]	Agrogeology
GEOL*3190	[0.50]	Environmental Water Chemistry
GEOL*4090	[0.50]	Sedimentology
GEOL*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

One of:

SOIL*4090	[0.50]	Soil Management
SOIL*4130	[0.50]	Soil and Nutrient Management

List C - Water

ENGG*2550	[0.50]	Water Management
ENGG*3650	[0.50]	Hydrology
GEOG*4150	[0.50]	Sedimentary Processes
GEOL*3190	[0.50]	Environmental Water Chemistry
SOIL*3080	[0.50]	Soil and Water Conservation

List D - Atmosphere

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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

ENVS*2150	[0.50]	Terrestrial Systems
GEOL*1050	[0.50]	Geology and the Environment
MET*2030	[0.50]	Meteorology and Climatology
STAT*2040	[0.50]	Statistics I

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

Winter Semester

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

Semester 4 - Summer

BIOL*2060	[0.50]	Ecology
PHIL*2070	[0.50]	Philosophy of the Environment
SOIL*2010	[0.50]	Soil Science

1.00 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
GEOL*3060	[0.50]	Groundwater
NRS*3600	[0.50]	Remote Sensing

One of:

MATH*1210	[0.50]	Calculus II
MATH*2080	[0.50]	Elements of Calculus II
STAT*2050	[0.50]	Statistics II

Summer Semester

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

Semester 6 - Fall

ENVS*4011	[0.00]	Project in Environmental Sciences
GEOL*2110	[0.50]	Earth Material Science

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

1.50 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Semester 7 - Winter

ENVS*4012	[0.50]	Project in Environmental Sciences

2.00 electives or restricted electives

Summer Semester (Optional)

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

Semester 8 - Fall

ENVS*4300	[0.50]	Environmental Law & Regulation
SOIL*4250	[0.50]	Soils in the Landscape

1.50 electives or restricted 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 seek advice on their choices and are reminded that 6.00 credits of the B.Sc.(Env.) degree must be at the 3000-4000 level. With prior approval, students may be able to use courses not on this list towards their Earth and Atmospheric Science restricted electives.

List A - Environmental Geology

GEOL*2020	[0.50]	Stratigraphy
GEOL*2200	[0.50]	Glacial Geology
GEOL*3130	[0.50]	Agrogeology
GEOL*3190	[0.50]	Environmental Water Chemistry
GEOL*4090	[0.50]	Sedimentology
GEOL*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*4150	[0.50]	Sedimentary Processes
GEOL*3190	[0.50]	Environmental Water Chemistry
SOIL*3080	[0.50]	Soil and Water Conservation

List D - Atmosphere

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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
ENVS*2150	[0.50]	Terrestrial Systems
STAT*2040	[0.50]	Statistics I

One of:

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

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

0.50 electives or restricted electives

Semester 5

BIOL*3010	[0.50]	Laboratory and Field Work in Ecology

One of:

BOT*2100	[0.50]	Life Strategies of Plants
ZOO*3200	[0.50]	Comparative Animal Physiology I

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

1.00 electives or restricted electives

Semester 6

BIOL*3120	[0.50]	Community Ecology
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
PHIL*2070	[0.50]	Philosophy of the Environment

0.50 electives or restricted electives

Semester 7

BIOL*4110	[0.75]	Ecological Methods
ENVS*4011	[0.00]	Project in Environmental Sciences

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

1.25 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.

Semester 8

BIOL*4120	[0.50]	Evolutionary Ecology
ENVS*4012	[0.50]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation

1.00 electives

Note: Ecology majors are not required to complete BIOL*2060 as a core course.

Restricted Electives

One of:

MBG*3000	[0.50]	Population Genetics
ZOO*3300	[0.50]	Evolution

One of:

BOT*3410	[0.50]	Plant Anatomy
ZOO*2090	[0.50]	Vertebrate Structure and Function

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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
ENVS*2150	[0.50]	Terrestrial Systems
STAT*2040	[0.50]	Statistics I

One of:

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

Winter Semester

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

Semester 4 - Summer

BIOC*2580	[0.50]	Introductory Biochemistry
MBG*2000	[0.50]	Introductory Genetics
PHIL*2070	[0.50]	Philosophy of the Environment

1.00 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

BIOL*3110	[0.50]	Population Ecology
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems

STAT*2050 [0.50] Statistics II
0.50 electives or restricted electives

Summer Semester

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

Semester 6 - Fall

BIOL*3010 [0.50] Laboratory and Field Work in Ecology
ENVS*4011 [0.00] Project in Environmental Sciences
One of:
AGEC*2700 [0.50] Survey of Natural Resource Economics
ECON*2100 [0.50] Economic Growth and Environmental Quality
1.50 electives or restricted electives

Semester 7 - Winter

BIOL*3120 [0.50] Community Ecology
BIOL*4120 [0.50] Evolutionary Ecology
ENVS*4012 [0.50] Project in Environmental Sciences
1.00 electives or restricted electives

Summer Semester (Optional)

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

Semester 8- Fall

BIOL*4110 [0.75] Ecological Methods
ENVS*4300 [0.50] Environmental Law & Regulation
One of:
GEOG*3210 [0.50] Management of the Biophysical Environment
POLS*3370 [0.50] Environmental Politics and Governance
0.75 electives or restricted electives
Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.
Note: Ecology majors are not required to complete as a core course.

Restricted Electives

One of:
MBG*3000 [0.50] Population Genetics
ZOO*3300 [0.50] Evolution
One of:
BOT*2100 [0.50] Life Strategies of Plants
ZOO*3200 [0.50] Comparative Animal Physiology I
One of:
BOT*3410 [0.50] Plant Anatomy
ZOO*2090 [0.50] Vertebrate Structure and Function

Environmental Biology (ENVB)

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*1040 [0.50] General Chemistry I
ENVS*1020 [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*1050 [0.50] General 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
ENVS*2150 [0.50] Terrestrial Systems
TOX*2000 [0.50] Principles of Toxicology
One of:
AGEC*2700 [0.50] Survey of Natural Resource Economics
ECON*2100 [0.50] Economic Growth and Environmental Quality
0.50 electives or restricted electives

Semester 4

BIOC*2580 [0.50] Introductory Biochemistry
BIOL*2060 [0.50] Ecology
MBG*2000 [0.50] Introductory Genetics
STAT*2040 [0.50] Statistics I
0.50 electives or restricted electives

Semester 5

One of:
GEOG*3210 [0.50] Management of the Biophysical Environment
POLS*3370 [0.50] Environmental Politics and Governance
2.00 electives or restricted electives
Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.

Semester 6

ENVS*3150 [0.50] Aquatic Systems
ENVS*3160 [0.50] Atmospheric Systems
PHIL*2070 [0.50] Philosophy of the Environment
1.00 electives or restricted electives

Semester 7

ENVS*4011 [0.00] Project in Environmental Sciences
ENVS*4300 [0.50] Environmental Law & Regulation
2.00 electives or restricted electives

Semester 8

ENVS*4012 [0.50] Project in Environmental Sciences
2.00 electives or restricted electives

Restricted Electives

Students in the Environmental Biology major are required to choose 5.00 credits from the following list. Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of the B.Sc.(Env.) degree must be at the 3000-4000 level.

BIOL*3130 [0.50] Conservation Biology *
BIOL*3450 [0.50] Introduction to Aquatic Environments
BIOL*4060 [0.50] Restoration Ecology *
BIOL*4150 [0.50] Wildlife Conservation and Management
ENVB*2010 [0.50] Food Production and the Environment
ENVB*2030 [0.50] Current Issues in Forest Science
ENVB*2040 [0.50] Plant Health and the Environment
ENVB*3010 [0.50] Climate Change Biology
ENVB*3030 [0.50] Pesticides and the Environment
ENVB*3040 [0.50] Natural Chemicals in the Environment
ENVB*3230 [0.50] Agroforestry Systems
ENVB*3250 [0.50] Forest Health and Disease
ENVB*3270 [0.50] Forest Biodiversity
ENVB*3300 [0.50] Applied Ecology and Environment
ENVB*4020 [0.50] Water Quality and Environmental Management *
ENVB*4130 [0.50] Chemical Ecology: Principles & Practice *
ENVB*4240 [0.50] Biological Activity of Pesticides
ENVB*4550 [0.50] Ecotoxicological Risk Characterization *
ENVB*4780 [0.50] Forest Ecology *
ENVS*4220 [0.50] Environmental Impact Assessment
GEOG*3020 [0.50] Global Environmental Change
GEOL*3190 [0.50] Environmental Water Chemistry
MICR*4140 [0.50] Soil Microbiology and Biotechnology
MICR*4180 [0.50] Microbial Processes in Environmental Management
NRS*2120 [0.50] Introduction to Environmental Stewardship
PBIO*4530 [0.50] Environmental Pollution Stresses on Plants *
SOIL*3080 [0.50] Soil and Water Conservation *
TOX*3360 [0.50] Environmental Chemistry and Toxicology
ZOO*4350 [0.50] Biology of Polluted Waters *

* **Note:** 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.

Environmental Biology (ENVB: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*1040 [0.50] General Chemistry I
ENVS*1020 [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*1050 [0.50] General 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
ENVS*2150	[0.50]	Terrestrial Systems
TOX*2000	[0.50]	Principles of Toxicology

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

0.50 electives or restricted electives

Winter Semester

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

Semester 4 - Summer

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2060	[0.50]	Ecology
MBG*2000	[0.50]	Introductory Genetics
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
PHIL*2070	[0.50]	Philosophy of the Environment

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

0.50 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Summer Semester

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

Semester 6 - Fall

ENVS*4011	[0.00]	Project in Environmental Sciences

2.50 electives or restricted electives

Semester 7 - Winter

ENVS*4012	[0.50]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation

1.50 electives or restricted electives

Summer Semester - (Optional)

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

Semester 8 - Fall

2.50 electives or restricted electives

Restricted Electives

Students in the Environmental Biology major are required to choose 5.00 credits from the following list. Students are encouraged to seek advice on their choices and are reminded that 6.00 credits of the B.Sc.(Env.) degree must be at the 3000-4000 level.

BIOL*3130	[0.50]	Conservation Biology *
BIOL*3450	[0.50]	Introduction to Aquatic Environments
BIOL*4060	[0.50]	Restoration Ecology *
BIOL*4150	[0.50]	Wildlife Conservation and Management
ENVB*2010	[0.50]	Food Production and the Environment
ENVB*2030	[0.50]	Current Issues in Forest Science
ENVB*2040	[0.50]	Plant Health and the Environment
ENVB*3010	[0.50]	Climate Change Biology
ENVB*3030	[0.50]	Pesticides and the Environment
ENVB*3040	[0.50]	Natural Chemicals in the Environment
ENVB*3230	[0.50]	Agroforestry Systems
ENVB*3250	[0.50]	Forest Health and Disease
ENVB*3270	[0.50]	Forest Biodiversity
ENVB*3300	[0.50]	Applied Ecology and Environment
ENVB*4020	[0.50]	Water Quality and Environmental Management *
ENVB*4130	[0.50]	Chemical Ecology: Principles & Practice *
ENVB*4240	[0.50]	Biological Activity of Pesticides
ENVB*4550	[0.50]	Ecotoxicological Risk Characterization *
ENVB*4780	[0.50]	Forest Ecology *
ENVS*4220	[0.50]	Environmental Impact Assessment
GEOG*3020	[0.50]	Global Environmental Change
GEOL*3190	[0.50]	Environmental Water Chemistry
MICR*4140	[0.50]	Soil Microbiology and Biotechnology
MICR*4180	[0.50]	Microbial Processes in Environmental Management
NRS*2120	[0.50]	Introduction to Environmental Stewardship
PBIO*4530	[0.50]	Environmental Pollution Stresses on Plants *
SOIL*3080	[0.50]	Soil and Water Conservation *
TOX*3360	[0.50]	Environmental Chemistry and Toxicology
ZOO*4350	[0.50]	Biology of Polluted Waters *

* **Note:** 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.

Environmental Economics and Policy (EEP)

Department of Economics, College of Management and Economics

Department of Food, Agricultural and Resource Economics, 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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
ENVS*2150	[0.50]	Terrestrial Systems

0.50 electives or restricted electives

Semester 4

BIOL*2060	[0.50]	Ecology
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2740	[0.50]	Economic Statistics
PHIL*2070	[0.50]	Philosophy of the Environment

0.50 electives or restricted electives

Note: STAT*2040 may be substituted for ECON*2740.

Semester 5

AGEC*3190	[0.50]	Markets, Firms & Natural Amenities
AGEC*4290	[0.50]	Land Economics
ECON*2410	[0.50]	Intermediate Macroeconomics
ECON*2770	[0.50]	Introductory Mathematical Economics

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

Note: AGEC*4290 is taught in even-numbered years.

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.

Semester 6

AGEC*3170	[0.50]	Cost-Benefit Analysis
ECON*3740	[0.50]	Introduction to Econometrics
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems

0.50 electives or restricted electives

Semester 7

ECON*3710	[0.50]	Advanced Microeconomics
ECON*4930	[0.50]	Environmental Economics
ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation

1.00 electives or restricted electives

Note: Students must obtain permission from instructor to take ECON*4930 and ECON*3710 at the same time.

Semester 8

AGEC*4310	[0.50]	Resource Economics
ENVS*4012	[0.50]	Project in Environmental Sciences

1.50 restricted electives or electives

Restricted Electives

Students in the Environmental Economics and Policy major are required to choose 2.00 credits additional Food, Agricultural and Resource Economics (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 level or higher.

Environmental Economics and Policy (EEP:C)

Department of Economics, College of Management and Economics

Department of Food, Agricultural and Resource Economics, 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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*1100	[0.50]	Introductory Macroeconomics
ECON*2100	[0.50]	Economic Growth and Environmental Quality
ENVS*2150	[0.50]	Terrestrial Systems

0.50 electives or restricted electives

Winter Semester

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

Semester 4 - Summer

BIOL*2060	[0.50]	Ecology
ECON*2310	[0.50]	Intermediate Microeconomics
ECON*2410	[0.50]	Intermediate Macroeconomics
PHIL*2070	[0.50]	Philosophy of the Environment
STAT*2040	[0.50]	Statistics I

Note: STAT*2040 may be substituted for ECON*2740.

Fall Semester

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

Semester 5 - Winter

AGEC*3170	[0.50]	Cost-Benefit Analysis
ECON*2770	[0.50]	Introductory Mathematical Economics
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Summer Semester

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

Semester 6 - Fall

AGEC*3190	[0.50]	Markets, Firms & Natural Amenities
AGEC*4290	[0.50]	Land Economics
ECON*3710	[0.50]	Advanced Microeconomics
ENVS*4011	[0.00]	Project in Environmental Sciences

1.00 electives or restricted electives

Note: AGEC*4290 is taught in even-numbered years.

Semester 7 - Winter

AGEC*4310	[0.50]	Resource Economics
ECON*3740	[0.50]	Introduction to Econometrics
ENVS*4012	[0.50]	Project in Environmental Sciences

1.00 electives or restricted electives

Summer Semester (Optional)

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

Semester 8 - Fall

ECON*4930	[0.50]	Environmental Economics
ENVS*4300	[0.50]	Environmental Law & Regulation

1.50 electives or restricted electives

Restricted Electives

Students in the Environmental Economics and Policy major are required to choose 2.00 credits additional Food, Agricultural and Resource Economics (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 level or higher.

Environmental Geography (ENVG)

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 encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

Semester 1

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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

ENVS*2150	[0.50]	Terrestrial Systems
GEOG*2000	[0.50]	Geomorphology
GEOG*2460	[0.50]	Analysis in Geography

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

0.50 electives

Semester 4

BIOL*2060	[0.50]	Ecology
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2210	[0.50]	Environment and Resources
GEOG*2480	[0.50]	Mapping and GIS

0.50 electives

Semester 5

GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

1.00 electives or restricted electives*

Note: Environmental Geography majors are required to complete GEOG*3210 and (POLS*3370 or ZOO*4050). ZOO*4050 may be substituted for POLS*3370 and would be taken in Semester 8.

Semester 6

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
GEOG*3480	[0.50]	GIS and Spatial Analysis
PHIL*2070	[0.50]	Philosophy of the Environment

0.50 electives or restricted electives*

Semester 7

ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation
GEOG*4690	[1.00]	Geography Field Research

1.00 electives or restricted electives*

OR

ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation

0.50 credits in Geography at the 3000 level or higher

1.50 electives or restricted electives*

Semester 8

ENVS*4012	[0.50]	Project in Environmental Sciences
GEOG*4880	[0.50]	Contemporary Geographic Thought

1.50 electives or restricted electives*

* students in the Environmental Geography major must take at least 4 additional geography courses at the 3000 level or higher 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:

GEOG*3020	[0.50]	Global Environmental Change
GEOG*4110	[0.50]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Governance
GEOG*4230	[0.50]	Environmental Impact Assessment

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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

ENVS*2150	[0.50]	Terrestrial Systems
GEOG*2000	[0.50]	Geomorphology
GEOG*2460	[0.50]	Analysis in Geography

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

0.50 electives

Winter Semester

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

Semester 4 - Summer

BIOL*2060	[0.50]	Ecology
GEOG*2210	[0.50]	Environment and Resources
PHIL*2070	[0.50]	Philosophy of the Environment

1.00 electives

Fall Semester

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

Semester 5 - Winter

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
GEOG*2110	[0.50]	Climate and the Biophysical Environment
GEOG*2480	[0.50]	Mapping and GIS

0.50 electives or restricted electives*

Summer Semester

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

Semester 6 - Fall

ENVS*4011	[0.00]	Project in Environmental Sciences
GEOG*3110	[0.50]	Biotic and Natural Resources
GEOG*3210	[0.50]	Management of the Biophysical Environment
GEOG*3480	[0.50]	GIS and Spatial Analysis
POLS*3370	[0.50]	Environmental Politics and Governance

0.50 electives or restricted electives*

Note: Environmental Geography majors are required to complete GEOG*3210 and (POLS*3370 or ZOO*4050). ZOO*4050 may be substituted for POLS*3370 and would be taken in Semester 8.

Semester 7 - Winter

ENVS*4012	[0.50]	Project in Environmental Sciences
GEOG*4880	[0.50]	Contemporary Geographic Thought

1.50 electives or restricted electives*

Summer Semester

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

Semester 8 - Fall

ENVS*4300	[0.50]	Environmental Law & Regulation
GEOG*4690	[1.00]	Geography Field Research

1.00 electives or restricted electives*

OR

ENVS*4300	[0.50]	Environmental Law & Regulation

0.50 credits in Geography at the 3000 level or higher

1.50 electives or restricted electives*

* students in the Environmental Geography major must take at least 4 additional geography courses at the 3000 level or higher 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:

GEOG*3020	[0.50]	Global Environmental Change
GEOG*4110	[0.50]	Environmental Systems Analysis
GEOG*4210	[0.50]	Environmental Governance
GEOG*4230	[0.50]	Environmental Impact Assessment

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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
ENVS*2150	[0.50]	Terrestrial Systems
MATH*2080	[0.50]	Elements of Calculus II
MET*2030	[0.50]	Meteorology and Climatology

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

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

BIOL*2060	[0.50]	Ecology
PHYS*2550	[0.50]	Radiation and the Environment
STAT*2050	[0.50]	Statistics II
TOX*2000	[0.50]	Principles of Toxicology

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

Note: PHYS*2550 is offered in even numbered years.

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8 - Winter.

Semester 6

CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
PHIL*2070	[0.50]	Philosophy of the Environment
STAT*3510	[0.50]	Environmental Risk Assessment

Semester 7

ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation
TOX*3300	[0.50]	Analytical Toxicology

1.50 core requirement or electives

Semester 8

CHEM*4010	[0.50]	Chemistry and Industry
ENVS*4012	[0.50]	Project in Environmental Sciences
PHYS*3080	[0.50]	Energy

One of:

MET*4210	[0.50]	Atmospheric Experimentation and Instrumentation
MET*4300	[0.50]	Atmospheric Transport and Chemistry

0.50 electives

Note: MET*4300 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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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
ENVS*2150	[0.50]	Terrestrial Systems
MATH*2080	[0.50]	Elements of Calculus II
MET*2030	[0.50]	Meteorology and Climatology

One of:

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

Winter Semester

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

Semester 4 - Summer

BIOC*2580	[0.50]	Introductory Biochemistry
BIOL*2060	[0.50]	Ecology
CHEM*2480	[0.50]	Analytical Chemistry I
PHIL*2070	[0.50]	Philosophy of the Environment
STAT*2040	[0.50]	Statistics I

Fall Semester

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

Semester 5 - Winter

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
PHYS*2040	[0.50]	Fundamental Electronics and Sensors
STAT*2050	[0.50]	Statistics II

Summer Semester

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

Semester 6 - Fall

ENVS*4011	[0.00]	Project in Environmental Sciences
PHYS*2040	[0.50]	Fundamental Electronics and Sensors
PHYS*2550	[0.50]	Radiation and the Environment
TOX*2000	[0.50]	Principles of Toxicology

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

0.50 electives

Note: PHYS*2550 is offered in even numbered years.

Semester 7 - Winter

CHEM*4010	[0.50]	Chemistry and Industry
ENVS*4012	[0.50]	Project in Environmental Sciences
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

Note: MET*4300 is offered in even numbered years.

Summer Semester (Optional)

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

Semester 8

ENVS*4300	[0.50]	Environmental Law & Regulation
TOX*3300	[0.50]	Analytical Toxicology

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

1.00 electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7 - Winter.

Environmetrics and Modelling (EMM)

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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
ENVS*2150	[0.50]	Terrestrial Systems
STAT*2040	[0.50]	Statistics I

One of:

MATH*2080	[0.50]	Elements of Calculus II
MATH*2160	[0.50]	Linear Algebra I

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

Note: Only one of MATH*1210/MATH*2080 and only one of MATH*2150/MATH*2160 will count towards the degree (see Semester 4). MATH*1210 and MATH*2160 are preferred for mathematics emphasis.

Note: Students in the Environmetrics and Modelling major must consult the Environmetrics and Modelling Faculty Advisor for course scheduling in semester 4 through 8.

Semester 4

BIOL*2060	[0.50]	Ecology
MATH*2130	[0.50]	Numerical Methods
MATH*2170	[0.50]	Differential Equations I
STAT*2050	[0.50]	Statistics II

One of:

MATH*1210	[0.50]	Calculus II
MATH*2150	[0.50]	Applied Matrix Algebra

Semester 5

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

2.00 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.

Semester 6

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
MATH*3510	[0.50]	Biomathematics
PHIL*2070	[0.50]	Philosophy of the Environment
STAT*3510	[0.50]	Environmental Risk Assessment

Semester 7

ENVS*4011	[0.00]	Project in Environmental Sciences
ENVS*4300	[0.50]	Environmental Law & Regulation

2.00 electives or restricted electives

Semester 8

ENVS*4012	[0.50]	Project in Environmental Sciences

2.00 electives or restricted 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 level or higher and a minimum of 1.00 must be at the 4000 level.

List

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*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts
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*4070	[0.50]	Case Studies in Modeling
MATH*4430	[0.50]	Advanced Numerical Methods
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*4340	[0.50]	Statistical Inference
STAT*4350	[0.50]	Applied Multivariate Statistical Methods
STAT*4360	[0.50]	Applied Time Series Analysis

Environmetrics and Modelling (EMM: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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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
ENVS*2150	[0.50]	Terrestrial Systems
MATH*2080	[0.50]	Elements of Calculus II
STAT*2040	[0.50]	Statistics I

0.50 electives or restricted electives

Note: Students in the Environmetrics and Modelling major must consult the Environmetrics and Modelling Faculty Advisor for course scheduling in semester 4 through 8.

Winter Semester

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

Semester 4 - Summer

BIOL*2060	[0.50]	Ecology
MATH*2150	[0.50]	Applied Matrix Algebra
MATH*2170	[0.50]	Differential Equations I
PHIL*2070	[0.50]	Philosophy of the Environment

0.50 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

ENVS*3150	[0.50]	Aquatic Systems
ENVS*3160	[0.50]	Atmospheric Systems
MATH*2130	[0.50]	Numerical Methods
STAT*2050	[0.50]	Statistics II

0.50 electives or restricted electives

Summer Semester

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

Semester 6 - Fall

ENVS*4011	[0.00]	Project in Environmental Sciences

One of:

AGEC*2700	[0.50]	Survey of Natural Resource Economics
ECON*2100	[0.50]	Economic Growth and Environmental Quality

One of:

GEOG*3210	[0.50]	Management of the Biophysical Environment
POLS*3370	[0.50]	Environmental Politics and Governance

1.50 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Semester 7 - Winter

ENVS*4012	[0.50]	Project in Environmental Sciences
MATH*3510	[0.50]	Biomathematics
STAT*3510	[0.50]	Environmental Risk Assessment

1.00 electives or restricted electives

Summer Semester (Optional)

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

Semester 8 - Fall

ENVS*4300	[0.50]	Environmental Law & Regulation

2.00 electives or restricted 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 level or higher and of these a minimum of 1.00 must be at the 4000 level.

List

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*3490	[0.50]	The Analysis and Design of Computer Algorithms
CIS*3530	[0.50]	Data Base Systems and Concepts
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*4070	[0.50]	Case Studies in Modeling
MATH*4430	[0.50]	Advanced Numerical Methods
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*4340	[0.50]	Statistical Inference
STAT*4350	[0.50]	Applied Multivariate Statistical Methods
STAT*4360	[0.50]	Applied Time Series Analysis

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*1040	[0.50]	General Chemistry I
ENVS*1020	[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*1050	[0.50]	General 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

ENVS*2150	[0.50]	Terrestrial Systems
MET*2030	[0.50]	Meteorology and Climatology
NRS*2120	[0.50]	Introduction to Environmental Stewardship
STAT*2040	[0.50]	Statistics I

One of:

AGEC*2700 [0.50] Survey of Natural Resource Economics
ECON*2100 [0.50] Economic Growth and Environmental Quality

Note: GEOG*2460 may be substituted for STAT*2040.

Semester 4

BIOL*2060 [0.50] Ecology
PHIL*2070 [0.50] Philosophy of the Environment
SOIL*2010 [0.50] Soil Science
1.00 electives or restricted 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
One of:
GEOG*3210 [0.50] Management of the Biophysical Environment
POLS*3370 [0.50] Environmental Politics and Governance
0.50 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.

Semester 6

ENVS*3150 [0.50] Aquatic Systems
ENVS*3160 [0.50] Atmospheric Systems
NRS*3100 [0.50] Resource Planning Techniques
One of:
ENGG*2550 [0.50] Water Management
GEOG*3610 [0.50] Environmental Hydrology
GEOL*3060 [0.50] Groundwater
0.50 electives or restricted electives

Semester 7

ENVS*4011 [0.00] Project in Environmental Sciences
ENVS*4300 [0.50] Environmental Law & Regulation
NRS*4110 [0.50] Natural Resources Management Field Camp
ZOO*4110 [0.50] Principles of Fish and Wild Life Management
1.00 electives or restricted electives

Note: BIOL*4150 may be substituted for ZOO*4110.

Semester 8

ENVS*4012 [0.50] Project in Environmental Sciences
2.00 electives or restricted electives

Restricted Electives

Students in the Natural Resources Management major are required to choose 1.50 restricted elective credits from the following list. 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 level or higher.

CROP*2280 [0.50] Crops in Land Reclamation
ENVB*3000 [0.50] Nature Interpretation
ENVB*3230 [0.50] Agroforestry Systems
ENVB*3270 [0.50] Forest Biodiversity
ENVB*4780 [0.50] Forest Ecology
GEOG*2420 [0.50] Aerial-photo Interpretation
GEOG*3210 [0.50] Management of the Biophysical Environment
GEOG*3480 [0.50] GIS and Spatial Analysis
GEOG*4230 [0.50] Environmental Impact Assessment
GEOL*3130 [0.50] Agrogeology
LARC*3320 [0.50] Principles of Landscape Ecology
LARC*4520 [0.50] Park and Recreation Administration
MET*3050 [0.50] Microclimatology
NRS*3600 [0.50] Remote Sensing
SOIL*3060 [0.50] Environmental Soil Chemistry
SOIL*3070 [0.50] Environmental Soil Physics
SOIL*3200 [0.50] Environmental Soil Biology

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*1040 [0.50] General Chemistry I
ENVS*1020 [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*1050 [0.50] General 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
ENVS*2150 [0.50] Terrestrial Systems
MET*2030 [0.50] Meteorology and Climatology
NRS*2120 [0.50] Introduction to Environmental Stewardship
STAT*2040 [0.50] Statistics I

Note: GEOG*2460 may be substituted for STAT*2040.

Winter Semester

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

Semester 4 - Summer

BIOL*2060 [0.50] Ecology
PHIL*2070 [0.50] Philosophy of the Environment
1.50 electives or restricted electives

Fall Semester

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

Semester 5 - Winter

ENVS*3150 [0.50] Aquatic Systems
ENVS*3160 [0.50] Atmospheric Systems
SOIL*2010 [0.50] Soil Science
One of:
ENGG*2550 [0.50] Water Management
GEOG*3610 [0.50] Environmental Hydrology
GEOL*3060 [0.50] Groundwater
0.50 electives or restricted electives

Summer Semester

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

Semester 6 - Fall

ENVS*4011 [0.00] Project in Environmental Sciences
SOIL*3050 [0.50] Land Utilization
SOIL*3080 [0.50] Soil and Water Conservation
One of:
AGEC*2700 [0.50] Survey of Natural Resource Economics
ECON*2100 [0.50] Economic Growth and Environmental Quality
One of:
GEOG*3210 [0.50] Management of the Biophysical Environment
POLS*3370 [0.50] Environmental Politics and Governance
0.50 electives or restricted electives

Note: ZOO*4050 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Semester 7 - Winter

ENVS*4012 [0.50] Project in Environmental Sciences
NRS*3100 [0.50] Resource Planning Techniques
1.50 electives or restricted electives

Summer Semester (Optional)

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

Semester 8 - Fall

ENVS*4300 [0.50] Environmental Law & Regulation
NRS*4110 [0.50] Natural Resources Management Field Camp
ZOO*4110 [0.50] Principles of Fish and Wild Life Management
1.00 electives or restricted 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. 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 level or higher.

CROP*2280 [0.50] Crops in Land Reclamation
ENVB*3000 [0.50] Nature Interpretation
ENVB*3230 [0.50] Agroforestry Systems
ENVB*3270 [0.50] Forest Biodiversity
ENVB*4780 [0.50] Forest Ecology
GEOG*2420 [0.50] Aerial-photo Interpretation
GEOG*3210 [0.50] Management of the Biophysical Environment
GEOG*3480 [0.50] GIS and Spatial Analysis
GEOG*4230 [0.50] Environmental Impact Assessment

GEOL*3130	[0.50]	Agrogeology
LARC*3320	[0.50]	Principles of Landscape Ecology
LARC*4520	[0.50]	Park and Recreation Administration
MET*3050	[0.50]	Microclimatology
NRS*3600	[0.50]	Remote Sensing
SOIL*3060	[0.50]	Environmental Soil Chemistry
SOIL*3070	[0.50]	Environmental Soil Physics
SOIL*3200	[0.50]	Environmental Soil Biology

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, Computing and Communicaitons) 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, Computing and Communications 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

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

Winter Semester

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

Semester 5 - 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

Semester 6 - Fall

XSEN*3020	[0.50]	Pharmaceutical Analysis
XSEN*4020	[0.50]	Pharmaceutical Organic Chemistry
XSEN*4030	[0.50]	Pharmaceutical Product Formulations
XSEN*4040	[0.50]	Pharmaceutical Manufacturing
XSEN*4050	[0.50]	Biopharmaceuticals

Note: All courses in Semester 6 are taught at Seneca @ York campus College in Toronto (For more information go to: http://www.bsctech.uoguelph.ca. Seneca may change the ordering of the courses offered within semesters 6 and 7.

Semester 7 - Winter

XSEN*2020	[0.50]	Management Studies: EQ and the New Workplace
XSEN*3030	[0.50]	Pharmacology and Applied Toxicology
XSEN*3040	[0.50]	Occupational Health and Chemistry
XSEN*3060	[0.50]	Pharmaceutical Analysis - Advanced
XSEN*4010	[0.50]	Pharmaceutical Calculations

Note: All courses in Semester 7 are taught at Seneca @ York campus College in Toronto (For more information go to: http://www.bsctech.uoguelph.ca.. Seneca may change the ordering of the courses offered within semesters 6 and 7.

Summer Semester

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

Semester 8 - Fall

CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation

On e of:

CHEM*4730	[0.50]	Synthetic Organic Chemistry
CHEM*4740	[0.50]	Topics in Bio-Organic Chemistry

On e of:

BIOC*4520	[0.50]	Metabolic Processes
CHEM*3640	[0.50]	Chemistry of the Elements I
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MCB*4080	[0.50]	Applied Microbiology and Biochemistry

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, Computing and Communications (PHCC: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] 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 Newnham Campus in Toronto (For more information go to: http://www.bsctech.uoguelph.ca.

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

Note: All courses in Semester 6 are taught at Seneca College Newnham Campus in Toronto (For more information go to: http://www.bsctech.uoguelph.ca.

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] 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 Newnham Campus in Toronto (For more information go to: http://www.bsctech.uoguelph.ca.

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 Newnham Campus in Toronto (For more information go to: http://www.bsctech.uoguelph.ca.

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 four years to complete. The college is accredited jointly by the Canadian and American Veterinary Medical Association, and the Royal College of Veterinary Surgeons of Britain. The D.V.M. degree from Guelph is respected by veterinarians throughout the world.

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.
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.

Conditions for Continuation of Study

For supplemental and deferred privileges, all students in the D.V.M. Program are subject to Deferred Privilege Procedures and Supplemental Privilege Procedures outlined in Chapter VIII--Undergraduate Degree Regulations and Procedures.

For continuation of study, a student must satisfy the conditions presented below. In order to graduate, students must fulfill the course requirements for the program and have achieved at least a 60% Program Average (PA). The Academic Review Sub-Committee will assess all cases where a student's academic progress does not meet the Continuation of Study requirements and will interpret the academic regulations. The requirements will be applied with due consideration to the credit weights of the course, the role of the course in the Phase and the degree of integration of the course with concurrently required courses, and in light of the student's particular circumstances (see VIII--Undergraduate Degree Regulations and Procedures).

Full-time Study

The D.V.M. program is offered as a full-time program and normally requires four years (over the equivalent of eight academic semesters at the University of Guelph) to complete. In exceptional extenuating circumstances, the Academic Review Sub-Committee may allow a student to take courses on a part-time basis. In these instances, the Academic Review Sub-Committee has the discretion to select the courses that the student will register in on a part-time basis. Students permitted to take courses on a part-time basis are cautioned that there is an enrolment limitation for the program and that access to certain courses or resumption of the program on a full-time basis will be conditional on the availability of space.

Failed Courses

1. Continuation of study from one phase of the D.V.M. Program to the next is dependent on the successful completion of all courses, or approved equivalents, in the published schedule of studies for the D.V.M. Program.
2. A student who fails one course in a Phase may be required to repeat all courses in the Phase. The consequences of failure of any particular course in the D.V.M. Program are as follows:
   a. Failure in any of the following courses result in the **Repeat of the Course:** VETM*3000, VETM*3210, VETM*3390, VETM*3430, VETM*3220, VETM*3440, VETM*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 reult 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 will be allowed to fail a particular course only once. Any student who fails the same course twice will be required to withdraw and will be ineligible for readmission to the D.V.M. Program.
4. Grades obtained by D.V.M. students who repeat one or more VETM course(s) will be reported on the transcript in addition to the original course grade. In the instance where all courses in a Phase are repeated, the grades from the repeated VETM courses will constitute the new Phase Average (PHA). The new D.V.M. Program Average will include the grades obtained in both the original and repeated VETM course attempts.

Supplemental Privileges

1. In the circumstances of a failed course, the Academic Review Sub-Committee may, if appropriate and under special circumstances only, allow a student the opportunity to gain credit standing in a failed course by granting a supplemental privilege (see Failed Courses and Supplemental Privilege in Section VIII). Students must request a supplemental privilege by submitting the request to the Academic Review Sub-Committee, and the fee for the privilege, within 7 days of the release of grades for the phase in which the failure occurred. The Academic Review Sub-Committee, upon receiving a request from a student, and after consulting with the instructor and reviewing the student's course performance, will determine whether a supplemental privilege should be granted.
2. Students will be permitted supplemental privileges in a maximum of two courses over the entire D.V.M. Program. A supplemental privilege will not be granted for a second failure in a course. Any student granted a supplemental privilege must meet with the 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 D.V.M. program, the student must have completed successfully all of the courses approved for the program. Students will not be allowed to graduate with a PA of < 60% or PHA of < 60% in Phase 4.

Voluntary Withdrawal from the Program

Students who have voluntarily withdrawn from the D.V.M. program and who wish to return must give notice to the 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.

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)

Students admitted to the DVM Program in Fall 2007 or earlier follow Schedule 4 and should consult the appropriate calendar http://www.uoguelph.ca/registrar/calendars/index.cfm?undergraduate.

Schedule 5 (D.V.M. Continuation of Study)

Students admitted to the DVM in Fall 2008 or beyond follow Schedule 5.

Continuation of Study is assessed on the student's D.V.M. Program Average (not the University Cumulative Average) and according to the policy on failures as stated above.

In Phase 2 and beyond, eligibility to continue is also assessed at the end of each Phase using the Phase Average (PHA). Courses that are given a grade of Pass or Fail do not affect either the PA or PHA because they are not attached to any numerical grade.

Students required to repeat a Phase must achieve the required PA of > 60% by the end of the repeated Phase. If a student does not achieve the required standing by the end of the repeated Phase, he or she will normally be required to withdraw from the program.

The required averages are as follows:

For Course Attempts in Phase I

Program Average (PA)	Status of Student
PA < 50%	Required to Withdraw
PA ≥ 50% but < 60%	Required to Repeat Phase
PA ≥ 60%	Eligible to Continue

If Repeating Phase 1:

Program Average (PA)	Status of Student
PA < 60%	Required to Withdraw
PA ≥ 60%	Eligible to Continue

For Course Attempts in Phase 2

Program Average (PA) and Phase Average (PHA)	Status of Student
PHA < 50%	Required to Withdraw
PA or PHA ≥ 50% but < 60%	Required to Repeat Phase
PA and PHA ≥ 60%	Eligible to Continue

If Repeating Phase 2:

Program Average (PA)	Status of Student
PA < 60%	Required to Withdraw
PA ≥ 60%	Eligible to Continue

For Course Attempts in Phase 3

Program Average (PA) and Phase Average (PHA)	Status of Student
PHA < 50%	Required to Withdraw
PA or PHA ≥ 50% but < 60%	Required to Repeat Phase*
PA and PHA ≥ 60%	Eligible to Continue

* Students finishing Phase 3 with a PA or PHA > 50% but < 60%, will not be permitted to proceed to the Externship course or into Phase 4.

If Repeating Phase 3:

Program Average (PA)	Status of Student
PA < 60%	Required to Withdraw
PA ≥ 60%	Eligible to Continue

For Course Attempts in Phase 4

Program Average (PA) and Phase Average (PHA)	Status of Student
PHA < 50%	Required to Withdraw
PA or PHA ≥ 50% but < 60%	Required to Remediate*
PA and PHA ≥ 60%	Eligible to Continue**

* Students finishing Phase 4 with a PA or PHA > 50% but < 60%, will not be permitted to graduate. The Academic Review Sub-Committee will establish the appropriate remediation requirements that must be fulfilled in order for the student to obtain the standing of Eligible to Graduate. These may include repeating a component of a course, one or more entire courses, or one or more clinical rotations.

** Students finishing Phase 4 with a PA and PHA ≥ 60% and having satisfied all course requirements for the program are Eligible to Graduate.

Schedule of Studies

Phase 1

VETM*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 and Pharmacology
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*4420	[0.25]	Clinical Pharmacology
VETM*4450	[0.50]	Equine Medicine and Surgery
VETM*4460	[1.00]	Food Animal Medicine and Surgery
VETM*4470	[1.00]	Medicine and Surgery of Dog and Cat
VETM*4480	[0.75]	Comparative Medicine
VETM*4490	[1.00]	Systems Pathology
VETM*4530	[0.50]	Health Management III
VETM*4540	[1.75]	Surgical Exercises
VETM*4870	[0.25]	Clinical Medicine III

Phase 4

Students entering into the Phase 4 of the DVM Program will select an area of emphasis from either: Small Animal Stream, Mixed Stream, Equine Stream or the Food Animal Stream.

Small Animal Stream:

VETM*4610	[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 work experience. Students will participate in a competitive employment process to be engaged in work terms developed and/or approved by Co-operative Education and Career Services as suitable learning experiences relevant to the students' area of academic study. A graded work report and performance evaluation will be required for each work term and will appear on the student's official transcript. The academic and work schedules will vary with degree program and major.

The first work term is scheduled after the third or fourth academic semester, providing an academic foundation on which to build the work experience. In addition, COOP*1100 – Introduction to Co-operative Education, a mandatory, non-credit course, is a prerequisite for the first work term.

COOP*1100 is designed to introduce students to the theory and practice of co-operative education at the University of Guelph. Students will acquire practice in the skills required to succeed in the competitive process of securing suitable work terms. Specifically, the course will cover; characteristics and expectations of the "new" world of work, interview skills, resume and cover letter writing.

Students will learn to take full advantage of the co-op option and will obtain practice in the co-op 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*1100before 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.

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.

University of Guelph-Humber

For University of Guelph-Humber programs please refer to http://www.guelphhumber.ca.

Associate Diploma Programs

For Associate Diploma Programs please refer to the Associate Diploma Program Calendar, available on the world wide web at http://www.uoguelph.ca/diploma_calendar/.