2011-2012 Undergraduate Calendar

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2011-2012 academic year, including the Summer Semester 2011, the Fall Semester 2011 and the Winter Semester 2012.

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

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

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• The Association of Universities and Colleges of Canada

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http://www.uoguelph.ca

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Disclaimer
University of Guelph 2011

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2011-2012 academic year, including the Summer Semester 2011, the Fall Semester 2011 and the Winter Semester 2012.

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Published by: Undergraduate Program Services
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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.

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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.

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

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

Program Information

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

Adult Development (ADEV)

Applied Human Nutrition (AHN)

Child, Youth and Family (CYF)

Co-operative Education is available in the following programs:

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

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

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

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

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

Academic Counselling

Program Counselling

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

Academic Advising

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

Continuation of Study

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

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 (ADEV)

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

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

Graduates of this program are pursuing careers in a variety of settings including family and community service agencies, government 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 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.

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 major. See the B.A. Program information for the list of minors: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/10/0/10a.shtml. The 60.00% requirement applies to each major and minor.

Double Counting of Courses

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

Counselling on Minors

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

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

Major

Semester 1

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

NUTR*1010 [0.50] Nutrition and Society

PSYC*1200 [0.50] Dynamics of Behaviour

One of:

ANTH*1150 [0.50] Introduction to Anthropology

SOC*1100 [0.50] Sociology

0.50 electives

Semester 2

FRHD*1010 [0.50] Human Development

FRHD*1020 [0.50] Couple and Family Relationships

One of:

BIOM*2000 [0.50] Concepts in Human Physiology

MBG*1000 [0.50] Genetics and Society

1.00 electives

Semester 3

FRHD*2060 [0.50] Adult Development and Aging
X. Degree Programs, Bachelor of Applied Science (B.A.Sc.)

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

Graduates of this program are pursuing careers in a variety of settings including family and community service agencies, government 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 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**

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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 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 take courses that are 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 can consider this in either Semester 5 or 7. If it is in Semester 5, then students could defer FRHD*3400 to Winter Semester 6 with the Practicum FRHD*3290 (with permission). If the study abroad experience is preferred in Semester 7, the Professional Issues course (FRHD*3410) could be taken in Semester 5 with permission.

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

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

Last Revision: March 15, 2014
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

One of:
- HTM*2700  [0.50]  Introductory Foods
- NUTR*1010  [0.50]  Nutrition and Society

0.50 electives

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

Semester 2

One of:
- HTM*2700  [0.50]  Introductory Foods
- NUTR*1010  [0.50]  Nutrition and Society

One of:
- FRHD*4260  [0.50]  Couple and Family Relationships
- SOC*1100  [0.50]  Sociology

0.50 electives

*See note in Semester 1

Semester 3

Note: BUS*3000 may be taken in Semester 4.

Semester 4

1.00 electives or restricted electives

Semester 5*

1.50 electives or restricted electives

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

Semester 6

Note: BUS*3000 may be taken in Semester 7.

Semester 7

NUTR*4070  [0.75]  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*3030  [0.50]  Food Chemistry I
FOOD*3040  [0.50]  Food Chemistry II

X. Degree Programs, Bachelor of Applied Science (B.A.Sc.)
**Electives**

There are 4.50 electives throughout the major which may be fulfilled by elective 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 graduates for a variety of careers in child and youth services. Graduates are pursuing child and youth-related careers in a variety of settings including child and youth treatment facilities, elementary schools, paediatric wards in hospitals, family and community service agencies, and child care centres. Students interested in working with children ten years of age and younger may apply for membership in the College of Early Childhood Educators; see further details on required courses below. Further academic preparation may be required for certain careers. Many graduates go on to pursue graduate education in fields such as family studies, human development, psychology, counselling psychology, social work, speech pathology, and occupational therapy.

**Articulation Agreements**

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

Students in the Child, Youth and Family major who are interested in proceeding to teacher 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 12.00 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*1100</td>
<td>0.50</td>
</tr>
<tr>
<td>NUTR*1010</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC*1200</td>
<td>0.50</td>
</tr>
<tr>
<td>ANTH*1150</td>
<td>0.50</td>
</tr>
<tr>
<td>SOC*1100</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Semester 2**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOM*2000</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*1020</td>
<td>0.50</td>
</tr>
<tr>
<td>MBG*1000</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*2260</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*2280</td>
<td>0.50</td>
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</tbody>
</table>

**Semester 3**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*2100</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Semester 4**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*2110</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*3150</td>
<td>0.50</td>
</tr>
<tr>
<td>STAT*2090</td>
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</tr>
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</table>

**Semester 5**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*3180</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*3400</td>
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</table>

**Semester 6**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*3290</td>
<td>1.00</td>
</tr>
<tr>
<td>FRHD*3520</td>
<td>1.00</td>
</tr>
</tbody>
</table>

**Semester 7**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*4310</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Semester 8**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*4320</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Restricted Electives**

In addition to the 12.00 required credits, 0.50 must be taken from the Department of Family Relations and Applied Nutrition at the 4000 level. (excluding FRHD*4170).

**Electives - Recommended and Program Options**

**Child and Youth Services**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*2230</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*2270</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*2280</td>
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</tr>
<tr>
<td>FRHD*3250</td>
<td>1.00</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDRD*3120</td>
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</tr>
<tr>
<td>FRHD*3090</td>
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</tr>
<tr>
<td>FRHD*3190</td>
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</tr>
<tr>
<td>FRHD*4020</td>
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</tr>
<tr>
<td>FRHD*4200</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*4810</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*4910</td>
<td>1.00</td>
</tr>
<tr>
<td>NUTR*2050</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC*3440</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC*3450</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC*3710</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC*3720</td>
<td>0.50</td>
</tr>
<tr>
<td>PSYC*3850</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Early Childhood Education**

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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRHD*2040</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*2260</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*2270</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*3190</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*3200</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Last Revision: March 15, 2014
FRHD*4170 [1.00] Practicum - Child, Youth and Family (in a placement site designated as Child)
FRHD*4180 [0.50] Assessment and Intervention
FRHD*4210 [0.50] Senior Seminar in Early Education and Care

Students who intend to pursue a career in early childhood education may wish to choose electives from the following list:
ENGL*2740 [0.50] Children's Literature
FRHD*3090 [0.50] Poverty and Health
FRHD*4810 [0.50] Thesis I
FRHD*4910 [1.00] Thesis II
NUTR*2050 [0.50] 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. In our program you would include FRHD*4810 and FRHD*4910.

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

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

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

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

All students in the Child, Youth and Family Co-op major must include the following core of 12.00 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:

Major

Semester 1
FRHD*1100 [0.50] Life: Health and Well-Being
NUTR*1010 [0.50] Nutrition and Society
PSYC*1200 [0.50] Dynamics of Behaviour
One of:
ANTH*1150 [0.50] Introduction to Anthropology
SOC*1100 [0.50] Sociology
0.50 electives

Semester 2
BIOM*2000 [0.50] Concepts in Human Physiology
FRHD*2100 [0.50] Couple and Family Relationships
MBG*1000 [0.50] Genetics and Society
One of:
FRHD*2260 [0.50] Infant Development
FRHD*2280 [0.50] Adolescent Development
0.50 electives

Semester 3
COOP*1100 [0.00] Introduction to Co-operative Education
FRHD*2100 [0.50] Development of Human Sexuality
FRHD*3070 [0.50] Research Methods: Family Studies
FRHD*3400 [0.50] Communication and Counselling Skills

STAT*2080 [0.50] Introductory Applied Statistics I
One of:
FRHD*2060 [0.50] Adult Development and Aging
FRHD*2270 [0.50] Development in Early and Middle Childhood

Semester 4
FRHD*2110 [0.50] Exceptional Children and Youth
FRHD*3120 [0.50] Families in Canadian Context
FRHD*3150 [0.50] Strategies for Behaviour Change
STAT*2090 [0.50] Introductory Applied Statistics II
One of:
FRHD*2040 [0.50] Principles of Program Design for Children
FRHD*2300 [0.50] Principles of Program Design for Youth

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

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

Semester 5 - Winter
FRHD*3040 [0.50] Parenting and Intergenerational Relationships
FRHD*4320 [0.50] Social Policies for Children, Youth and Families
One of:
FRHD*3200 [1.00] Practicum - Child
FRHD*3250 [1.00] Practicum in Youth
0.50 electives

Semester 6 - Summer
2.50 electives

Semester 7 - Fall
FRHD*3180 [0.50] Observation and Assessment Laboratory
FRHD*4310 [0.50] Professional Issues
1.50 electives or restricted electives

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

Semester 8 - Summer
2.50 electives

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

The last revision was on March 15, 2014.
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.

Students entering with advanced standing courses must take a minimum of 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.

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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
- HISP Hispanic Studies
- HIST History
- HUMN Humanities
- ITAL Italian Studies
- LAT Latin
- LING Linguistics
- MUSC Music
- PHIL Philosophy
- PORT Portuguese
- SART Studio Art
- 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.

- BIOL*1020 [0.50] Introduction to Biology
- BIOL*1500 [0.50] Humans in the Natural World
- BIOM*2000 [0.50] Concepts in Human Physiology
- BOT*1200 [0.50] Plants and Human Use
- CHEM*1060 [0.50] Introductory Chemistry
- CHEM*1100 [0.50] Chemistry Today
- CIS*1000 [0.50] Introduction to Computer Applications
- CROP*1050 [0.50] Green Energy - Fuel from Plants
- 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
- 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

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
- GEOG*2250 [0.50] Geology of Natural Disasters
- HK*2100 [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 (4U Required)
Greek - GREK*1100
Hispanic Studies - HISP*1100, HISP*1110
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
Portuguese - PORT*1100
Studio Art - SART*1050, SART*1060
Theatre Studies - THST*1040, THST*1200
Women's Studies - WMST*1000

PLUS
1.00 credits from the following:
Anthropology - ANTH*1120, 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

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

Last Revision: March 15, 2014
Anthropology (ANTH)

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:

- MUSC*2270 [0.50] World Music
- 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
- SOAN*2120 [0.50] Introductory Methods
- SOAN*3070 [0.50] Qualitative and Observational Methods

Two of:

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

2.00 additional credits in ANTH

2.00 additional credits in SOAN

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

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

Minor (Honours Program)

A minimum of 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:

- MUSC*2270 [0.50] World Music
- 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.
**Applied Mathematics and Statistics (Co-op) (APMS:C)**

**Major (Honours Program)**

Students may enter this major in Semester 1 or any semester thereafter; students entering later than Semester 1 may require more than 8 semesters to complete the program. A student wishing to declare the major must consult the Faculty Advisor. A minimum of 20.00 credits is required to complete this program which includes 5.00 credits in Mathematics, 2.50 credits in Statistics, an additional 2.00 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, 3.00 credits in Arts and Social Sciences courses, and 4.5 credits unrestricted electives.

<table>
<thead>
<tr>
<th>Semester 1 - Fall</th>
<th>1.50 electives from Arts and Social Sciences **</th>
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</thead>
<tbody>
<tr>
<td>CIS*1500</td>
<td>Introduction to Programming</td>
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<tr>
<td>MATH*1200</td>
<td>Calculus I</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester 2 - Winter</td>
<td></td>
</tr>
<tr>
<td>CIS*2500</td>
<td>Intermediate Programming</td>
</tr>
<tr>
<td>COOP*1100</td>
<td>Introduction to Co-operative Education</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>Calculus II</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>Statistics I</td>
</tr>
<tr>
<td></td>
<td>1.00 electives from Arts and Social Sciences **</td>
</tr>
<tr>
<td>Summer Semester</td>
<td></td>
</tr>
<tr>
<td>No study semester or work term.</td>
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<table>
<thead>
<tr>
<th>Semester 3 - Fall</th>
<th>0.50 electives from Arts and Social Sciences **</th>
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</thead>
<tbody>
<tr>
<td>MATH*2000</td>
<td>Set Theory</td>
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<tr>
<td>MATH*2160</td>
<td>Linear Algebra I</td>
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<tr>
<td>MATH*2200</td>
<td>Advanced Calculus I</td>
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<tr>
<td>STAT*2050</td>
<td>Statistics II</td>
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</table>

<table>
<thead>
<tr>
<th>Winter Semester</th>
<th>2.00 electives</th>
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</thead>
<tbody>
<tr>
<td>COOP*1000</td>
<td>Co-op Work Term I</td>
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</table>

<table>
<thead>
<tr>
<th>Semester 4 - Summer</th>
<th>1.00 electives from Arts and Social Sciences **</th>
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</thead>
<tbody>
<tr>
<td>MATH*2170</td>
<td>Differential Equations I</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall Semester</td>
<td>2.00 electives</td>
</tr>
<tr>
<td>---------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>COOP*2000</td>
<td>Co-op Work Term II</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Semester 5 - Winter</th>
<th>0.50 credits in Mathematics or Statistics at the 3000 level or above.</th>
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<tbody>
<tr>
<td>MATH*2210</td>
<td>Advanced Calculus II</td>
</tr>
<tr>
<td>MATH*2130</td>
<td>Numerical Methods</td>
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<table>
<thead>
<tr>
<th>Summer Semester</th>
<th>1.00 electives from Arts and Social Sciences **</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*3000</td>
<td>Co-op Work Term III</td>
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</table>

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<tr>
<th>Semester 6 - Fall</th>
<th>At least 1.00 credits from:</th>
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<tbody>
<tr>
<td>STAT*3100</td>
<td>Introductory Mathematical Statistics I</td>
</tr>
<tr>
<td>STAT*3240</td>
<td>Applied Regression Analysis</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 7 - Winter</th>
<th>0.50 electives</th>
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</thead>
<tbody>
<tr>
<td>STAT*3110</td>
<td>Introductory Mathematical Statistics II</td>
</tr>
<tr>
<td></td>
<td>1.50 credits in Mathematics or Statistics at the 3000 level or above.</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Summer Semester</th>
<th>0.50 electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*4000</td>
<td>Co-op Work Term IV</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Semester 8 - Fall</th>
<th>0.50 electives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.00 credits in Mathematics or Statistics at the 4000 level.</td>
</tr>
</tbody>
</table>

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

Minor (Honours Program)
A minimum of 5.00 credits is required, including:

ACCT*2220 [0.50] Financial Accounting
ACCT*2230 [0.50] Management Accounting
ECON*1050 [0.50] Introductory Microeconomics
ECON*1100 [0.50] Introductory Macroeconomics
ECON*2310 [0.50] Intermediate Microeconomics
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*2560 [0.50] Theory of Finance
MCS*1000 [0.50] Introductory Marketing
MCS*3040 [0.50] Business and Consumer Law

One of:
BUS*2090 [0.50] Individuals and Groups in Organizations
FARE*3310 [0.50] Operations Management

Classical Studies (CLAS)

School of Languages and Literatures, College of Arts
The program in Classical Studies is intended particularly for students interested in Greek and Roman culture, society and history.

Core Requirements
a. CLAS*1000, plus EITHER (GREK*1100, GREK*1110, GREK*2020) OR (LAT*1100, LAT*1110, LAT*2000)
b. one of CLAS*2000, CLAS*2150, CLAS*2350, CLAS*3100
c. one of CLAS*3000, CLAS*3010, CLAS*3020
d. one of CLAS*3030, CLAS*3040
e. one of CLAS*3150, HIST*2850, PHIL*2140

Major (Honours Program)
A minimum of 8.00 credits is required, including:

a. the Classical Studies Core
b. CLAS*4000, CLAS*4150, CLAS*4400
c. 2.50 additional credits in Classics, 1.00 of which may be taken from the following as part of the program:
   d. ENGL*1410 [0.50] Major Writers
   HIST*2200 [0.50] The Medieval World
   LING*1000 [0.50] Introduction to Linguistics

Minor (Honours Program)
A minimum of 5.00 credits is required, including:

a. the Classical Studies Core
b. two of CLAS*4000, CLAS*4150, CLAS*4400

Computing and Information Science (CIS)

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

Minor (Honours Program)
A minimum of 5.25 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

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

**Core Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ECON*1050</td>
<td>Introductory Microeconomics</td>
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<tr>
<td>ECON*1100</td>
<td>Introductory Macroeconomics</td>
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<tr>
<td>ECON*2310</td>
<td>Intermediate Microeconomics</td>
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<tr>
<td>ECON*2410</td>
<td>Intermediate Macroeconomics</td>
<td>0.50</td>
</tr>
<tr>
<td>ECON*2740</td>
<td>Economic Statistics</td>
<td>0.50</td>
</tr>
</tbody>
</table>

One of:

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

**Major (Honours Program)**

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

- The Economics core requirements
- 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.

**Minor (Honours Program)**

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

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

**Economics (Co-op) (ECON:C)**

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 minimum 4000 level credit requirements in the B.A. Honours Economics major. Only one of ECON*4900 or ECON*4910 may count towards the B.A. program towards the minimum 4000 level requirement.

Students should review the Economics section in the schedule of studies for additional program information.
Major (Honours Program)

Semester 1
ECON*1050 [0.50] Introductory Microeconomics

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

1.50 electives

Semester 2 (Winter)

ECON*1100 [0.50] Introductory Macroeconomics

One computer science course

1.50 electives

Summer Semester

Optional -- at the discretion of the student.

Semester 3 (Fall)

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

0.50 electives

Semester 4 (Winter)

ECON*3740 [0.50] Introduction to Econometrics

One economic history course*

1.50 electives

Summer Semester

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

Fall Semester

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

Semester 5 (Winter)

ECON*3810 [0.50] Advanced Macroeconomics

One of:
- ECON*3100 [0.50] Game Theory
- ECON*4700 [0.50] Advanced Mathematical Economics

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 Topics in Macroeconomics

0.50 credits in Economics at the 4000 level

1.50 electives

*the economic history course may be taken in any semester

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:

- **ECON*1050 [0.50]** Introductory Microeconomics
- **EDRD*2650 [0.50]** Introduction to Planning and Environmental Law
- **GEOG*1220 [0.50]** Human Impact on the Environment
- **GEOG*1350 [0.50]** Earth: Hazards and Global Change
- **GEOG*2110 [0.50]** Climate and the Biophysical Environment
- **GEOG*2210 [0.50]** Environment and Resources
- **GEOG*3020 [0.50]** Global Environmental Change
- **GEOG*3210 [0.50]** Management of the Biophysical Environment
- **GEOG*4210 [0.50]** Environmental Governance
- **GEOG*4220 [0.50]** Local Environmental Management
- **GEOG*4230 [0.50]** Environmental Impact Assessment
- **POLS*1400 [0.50]** Issues in Canadian Politics
- **POLS*2250 [0.50]** Public Administration and Governance
- **POLS*2300 [0.50]** Canadian Government and Politics
- **POLS*3210 [0.50]** The Constitution and Canadian Federalism
- **POLS*3370 [0.50]** Environmental Politics and Governance

One of:

- **GEOG*2030 [0.50]** Political Ecology & Geography
- **GEOG*2230 [0.50]** Economic Geography

One of:

- **ECON*2100 [0.50]** Economic Growth and Environmental Quality
- **FARE*2700 [0.50]** Survey of Natural Resource Economics

One of:

- **HIST*2250 [0.50]** Environment and History
- **PHIL*2070 [0.50]** Philosophy of the Environment
- **SOC*3380 [0.50]** Society and Nature

One of:

- **ECON*2740 [0.50]** Economic Statistics
- **GEOG*2460 [0.50]** Analysis in Geography
- **STTP*2040 [0.50]** Statistics I

One of:

- **FARE*3170 [0.50]** Cost-Benefit Analysis
- **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:

- **FARE*4290 [0.50]** Land Economics
- **FARE*4310 [0.50]** Resource Economics

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

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

**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:

- **PHIL*2120,** **PHIL*2180,** **PHIL*3450**

b. At least 2 of the following courses (minimum 1.00 credits): **PHIL*2070,** **PHIL*2030,** **PHIL*2170,** **PHIL*2340,** **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 1920s

**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*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 I

**One of:**

- **GERM*2590 [0.50]** Classics of German Literature

- **GERM*3530 [0.50]** Advanced German

**OR**

- **ITAL*2090 [1.00]** Intermediate Italian
- **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**

- **HISP*2000 [0.50]** Intermediate Spanish I
- **HISP*2010 [0.50]** Intermediate Spanish II
- **HISP*2040 [0.50]** Culture of Spain
- **HISP*2950 [0.50]** Hispanic Literary Studies
- **HISP*3500 [0.50]** Advanced Spanish I
- **HISP*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*3000 [0.50]** Romanticism & Realism in France
- **FREN*3010 [0.50]** Twentieth-Century French Novel (taught in French)
- **FREN*3080 [0.50]** Pre-Revolution French Literature
- **HIST*2850 [0.50]** Ancient Greece and Rome
- **HUMN*2100 [0.50]** Renaissance Lovers and Fools
- **HUMN*3020 [0.50]** Myth and Fairy Tales in Germany
- **HUMN*3470 [0.50]** Holocaust & WWII in German Lit. & Film

**Group B**

- **HIST*1010 [0.50]** The Early Modern World
- **HIST*2200 [0.50]** The Medieval World

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HIST*2510 [0.50] Modern Europe Since 1789
HIST*2820 [0.50] Modern France Since 1750
GERM*3090 [0.50] Nationalism and Internationalism in Europe 1914-1957
HIST*3350 [0.50] Modern Germany
HIST*3540 [0.50] World War II
HIST*3570 [0.50] Women in Modern Europe
HIST*3750 [0.50] The Reformation
HIST*3820 [0.50] Early Modern France
HIST*4090 [1.00] Modern European History
HIST*4470 [0.50] Special History Project Seminar I
HIST*4580 [1.00] The French Revolution

Group C

ARTH*1510 [0.50] Art Historical Studies I
ARTH*1520 [0.50] Art Historical Studies II
ARTH*2550 [0.50] The Italian Renaissance
ARTH*2580 [0.50] Late Modern Art: 1900-1950
ARTH*2600 [0.50] Early Modern Art 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] “Classical” Music: Context and Codes
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 have knowledge of music and are granted waivers by instructor. The substitution(s) must also be approved by the ESP coordinator.

Group D

PHIL*2140 [0.50] History of Greek and Roman Philosophy
PHIL*2160 [0.50] Modern European Philosophy to Hume
PHIL*3060 [0.50] Medieval Philosophy
PHIL*3080 [0.50] History of Modern European Philosophy from Kant
PHIL*3200 [0.50] Contemporary European Philosophy
POLS*2000 [0.50] Political Theory
POLS*2100 [0.50] Comparative Politics
POLS*2200 [0.50] International Relations
POLS*3450 [0.50] European Governments and Politics
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 for European Studies, be substituted for EURO*4740.

Major (Honours Program)

A minimum of 12.50 credits is required, including:

a. the three components of the European Studies core (7.50 credits)
b. 5.00 credits in either the European Culture and Civilization or the European Business Studies area of emphasis

c. 3.00 credits in any other course or group of courses in the major

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*2200 [0.50] European Culture from the Mid 19th Century to the 1920s
EURO*2300 [0.50] European Culture since 1920
EURO*4740 [0.50] Research Project in European Studies

Areas of Emphasis

European Business

Required courses:

ACCT*2220 [0.50] Financial Accounting
ACCT*2230 [0.50] Management Accounting
BUS*3320 [0.50] Financial Management
ECON*1050 [0.50] Introductory Microeconomics
ECON*1100 [0.50] Introductory Macroeconomics
MGMT*4260 [0.50] International Business

2.00 credits chosen from:

BUS*3000 [0.50] Human Resources Management
BUS*4250 [0.50] Business Policy
ECON*2200 [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
FARE*3310 [0.50] Operations Management
FARE*4370 [0.50] Food & Agri Marketing Management
HM*1000 [0.50] Introduction to Hospitality and Tourism Management
HM*2050 [0.50] Dimensions of Tourism
HM*2120 [0.50] Hospitality and Tourism Marketing I
HM*3160 [0.50] Destination Management and Marketing
HM*4170 [0.50] International Tourism
MCS*1000 [0.50] Introductory Marketing
MCS*2100 [0.50] Personal Financial Management
MCS*2600 [0.50] Fundamentals of Consumer Behaviour
MCS*3000 [0.50] Advanced Marketing
MCS*3040 [0.50] Business and Consumer Law
STAT*2060 [0.50] Statistics for Business Decisions

European Culture and Civilization

Students must take 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.

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

GERM*2050 [0.50] Introduction to Literature
GERM*2400 [0.50] Contemporary Germany
GERM*2490 [0.50] Intermediate German I
GERM*2500 [0.50] Intermediate German II
GERM*3500 [0.50] Advanced German I

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

OR

ITAL*2090 [1.00] Intermediate Italian
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

HISP*2000 [0.50] Intermediate Spanish I
HISP*2010 [0.50] Intermediate Spanish II
HISP*2040 [0.50] Culture of Spain
HISP*2990 [0.50] Hispanic Literary Studies
HISP*3500 [0.50] Advanced Spanish I
HISP*3530 [0.50] Business Spanish

OR

HISP*2090 [0.50] Intermediate Spanish II

OR

ITAL*3060 [0.50] Advanced Italian
ITAL*3150 [0.50] Medieval Italian Language
ITAL*3200 [0.50] Novels of Resistance

OR

3. BUS*2090 [0.50] Individuals and Groups in Organizations
CLAS*1000 [0.50] Introduction to Classical Culture
HIST*2510 [0.50] Modern Europe Since 1789
POLS*3450 [0.50] European Governments and Politics

X. Degree Programs, Bachelor of Arts (B.A.)

2011-2012 Undergraduate Calendar

Last Revision: March 15, 2014
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.
Unless taken to satisfy the requirements of another program, no student may receive credit in this program for more than one of the following statistics prerequisites ECON*2740, STAT*2040, STAT*2060, or STAT*2080.

French Studies (FREN)

School of Languages and Literatures, College of Arts
All language courses carry 0.50 credits. Please note that students with Ontario Grade 12 credit or its equivalent in French are not normally admitted into FREN*1090, FREN*1100, FREN*1120 or FREN*1150. Francophone students usually start the program with second-year courses conditional upon approval by the Faculty Advisor. Students majoring in French are advised to take elective courses in another Romance language and in Latin. It is also recommended that students include 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*3500, FREN*3540
- c. at least 2.00 additional credits from FREN*3000, FREN*3010, FREN*3080, FREN*3120, FREN*3200
- 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*3080, FREN*3120, FREN*3200, FREN*4300, FREN*4220, FREN*4290, FREN*4520
- 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*1120, FREN*1150, 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*2520, 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 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.S.C. honours Earth Surface Science program (jointly with Land Resources Science), a B.S.C.(ENV) honours Environmental Geography Major program, and a B.S.C. 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.S.C. 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, GEOG*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
- 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
- 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:

- 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*2500 [0.50] Environmental Analysis

German (GERM)

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

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

Minor (Honours Program)

A minimum of 5.00 credits in German is required.

Upon passing both the German designation and its Humanities co-requisites, students may also count HUMN*3020 and HUMN*3470 toward the German minor.

Students enrolled in the German program must contact the School of Languages and Literatures for an up-to-date sequence of course offerings.

Hispanic Studies (HISP)

School of Languages and Literatures, College of Arts

The Hispanic Studies program enables students to concentrate on the Spanish language and on Spanish and Latin American literature. Language courses provide study of the grammatical construction of reading, 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 HISP*1100. Students with 4U Spanish commonly take HISP*2000. They may be admitted into HISP*1110 only with the approval of the Instructor or the Faculty Advisor. Students with native or near native fluency normally begin language courses with HISP*2000. Such students should consult the Head of Hispanic Studies 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 Hispanic 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 HISP*2010, HISP*2990 and HISP*3040 and HISP*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 Hispanic Studies for more information.

Area of Concentration (General Program)

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

- 2.50 credits from HISP*1110, HISP*2000, HISP*2010, HISP*3500, HISP*3530, HISP*4500, HISP*4520
- b. HISP*2040, HISP*2990, HISP*3080
- c. 0.50 credits in literature
- d. additional 0.50 credits in Hispanic Studies.

Major (Honours Program)

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

- a. HISP*2000, HISP*2010, HISP*2040, HISP*2990, HISP*3080, HISP*3220, HISP*3230, HISP*3240, HISP*3500, HISP*3530, HISP*4410, HISP*4420, HISP*4500, HISP*4520
- b. HISP*2040, HISP*2990, HISP*3080
- c. 1.00 credits in literature

Students wishing to substitute required courses with courses taken abroad, or other options, should consult the faculty advisor.

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. This program 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/](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 5.00 credits in History courses is required, including:

- a. the History Core Requirements
- b. 4.50 additional credits in History including 2.00 at the 4000 level.

Minor (Honours Program)

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

- a. the History Core Requirements
- b. 1.50 additional credits in History, including 1.00 at the 3000 or 4000 level.

Note: Honours students in History may, with the permission of the department, take up to 1.00 credits from outside the department such as ECON*2420, ECON*3730, EURO*4600, WMST*4010. Students considering graduate work are advised to take up to 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 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*2260 [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, political 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 5.25 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*2500 [0.75] International Development Studies
- POLS*2080 [0.50] Development and Underdevelopment

Five of:
- ECON*2650 [0.50] Introductory Development Economics
- ECON*3720 [0.50] History of the World Economy Since 1850
- ECON*3730 [0.50] Europe and the World Economy to 1914
- GEOG*2030 [0.50] Political Ecology & Geography
- GEOG*3050 [0.50] Development and the City
- POLS*3670 [0.50] Comparative Public Policy and Administration
- POLS*3790 [0.50] The Political Economy of International Relations
- SOAN*3680 [0.50] Perspectives on Development

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

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

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

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

Core Requirements
- ANTH*1150 [0.50] Introduction to Anthropology
- ECON*1050 [0.50] Introductory Microeconomics
- ECON*1100 [0.50] Introductory Macroeconomics
- ECON*2650 [0.50] Introductory Development Economics
- GEOG*2030 [0.50] Political Ecology & Geography
- GEOG*3050 [0.50] Development and the City
- IDEV*2500 [0.75] 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:
- EDRD*4020 [0.50] Rural Extension in Change and Development
- FARE*1300 [0.50] Poverty, Food & Hunger
- FARE*3250 [0.50] Food, Nutrition & International Development
- SOC*2080 [0.50] Rural Sociology

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

* students must complete IDEV*2500 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:
- ECON*2100 [0.50] Economic Growth and Environmental Quality
- FARE*2700 [0.50] Survey of Natural Resource Economics
- HIST*2250 [0.50] Environment and History
- PHIL*2070 [0.50] Philosophy of the Environment
- POLS*3370 [0.50] Environmental Politics and Governance
- SOC*2280 [0.50] Society and Environment
- SOC*3350 [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] Global Environmental Change

Two of:
- GEOG*3480 [0.50] GIS and Spatial Analysis
- GEOG*4110 [1.00] Environmental Systems Analysis
- GEOG*4210 [0.50] Environmental Governance
- GEOG*4220 [0.50] Local Environmental Management

Last Revision: March 15, 2014
<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>GEOG*4230</td>
<td>Environmental Impact Assessment</td>
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<tr>
<td>GEOG*4250</td>
<td>Coastal Processes</td>
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<tr>
<td>GEOG*4480</td>
<td>Applied Geographic Information Systems</td>
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**Option B - Human Environment**

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<tr>
<th>Course Code</th>
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<tr>
<td>GEOG*2260</td>
<td>Applied Human Geography</td>
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<tbody>
<tr>
<td>GEOG*2480</td>
<td>Mapping and GIS</td>
</tr>
<tr>
<td>GEOG*3020</td>
<td>Global Environmental Change</td>
</tr>
<tr>
<td>GEOG*3090</td>
<td>Gender and Environment</td>
</tr>
<tr>
<td>GEOG*3320</td>
<td>Agriculture and Society</td>
</tr>
<tr>
<td>GEOG*3480</td>
<td>Tourism and Environmental Trade</td>
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<tr>
<td>GEOG*3600</td>
<td>Geography of a Selected Region</td>
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Two of:

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<tr>
<td>GEOG*3480</td>
<td>GIS and Spatial Analysis</td>
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<tr>
<td>GEOG*4200</td>
<td>Seminar in Urban Geography</td>
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<tr>
<td>GEOG*4210</td>
<td>Environmental Governance</td>
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<tr>
<td>GEOG*4220</td>
<td>Local Environmental Management</td>
</tr>
<tr>
<td>GEOG*4230</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>GEOG*4390</td>
<td>Seminar in Rural Geography</td>
</tr>
<tr>
<td>GEOG*4480</td>
<td>Applied Geographic Information Systems</td>
</tr>
</tbody>
</table>

### Economic and Business Development

**ACCT*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:

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<tbody>
<tr>
<td>ECON*4720</td>
<td>Topics in Economic History</td>
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<tr>
<td>ECON*4830</td>
<td>Economic Development</td>
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<tr>
<td>ECON*4880</td>
<td>Topics in International Economics</td>
</tr>
<tr>
<td>ECON*4890</td>
<td>History of Economic Thought</td>
</tr>
<tr>
<td>ECON*4990</td>
<td>Special Study in Economics</td>
</tr>
<tr>
<td>ECON*4930</td>
<td>Environmental Economics</td>
</tr>
<tr>
<td>FARE*4290</td>
<td>Land Economics</td>
</tr>
<tr>
<td>FARE*4310</td>
<td>Resource Economics</td>
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</tbody>
</table>

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

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

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

### Gender and Development

<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ANTH*2160</td>
<td>Social Anthropology</td>
</tr>
<tr>
<td>SOAN*2120</td>
<td>Introductory Methods</td>
</tr>
<tr>
<td>SOAN*3240</td>
<td>Gender &amp; Global Inequality I</td>
</tr>
<tr>
<td>SOAN*4230</td>
<td>Gender &amp; Global Inequality II</td>
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</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ANTH*2230</td>
<td>Regional Ethnography</td>
</tr>
<tr>
<td>SOC*2080</td>
<td>Rural Sociology</td>
</tr>
</tbody>
</table>

One of:

<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>SOAN*3070</td>
<td>Qualitative and Observational Methods</td>
</tr>
<tr>
<td>SOAN*3120</td>
<td>Quantitative Methods</td>
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One of:

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ANTH*3400</td>
<td>The Anthropology of Gender</td>
</tr>
<tr>
<td>ANTH*3670</td>
<td>Indigenous Peoples: Global Context</td>
</tr>
<tr>
<td>ANTH*3690</td>
<td>History of Anthropological Thought</td>
</tr>
<tr>
<td>ANTH*3770</td>
<td>Kinship and Social Organization</td>
</tr>
<tr>
<td>SOAN*3100</td>
<td>Gender Perspectives on Families and Households</td>
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Two of the following not taken as part of the core, at least 0.50 credits being at the 3000 level:

<table>
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<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>ENGL*2880</td>
<td>Women in Literature</td>
</tr>
<tr>
<td>GEOG*3090</td>
<td>Gender and Environment</td>
</tr>
<tr>
<td>HIST*2800</td>
<td>The History of the Modern Family</td>
</tr>
<tr>
<td>HIST*2930</td>
<td>Women and Cultural Change</td>
</tr>
<tr>
<td>HIST*3020</td>
<td>Sexuality and Gender in History</td>
</tr>
<tr>
<td>HIST*3580</td>
<td>Women's History in Asia</td>
</tr>
<tr>
<td>PHIL*2060</td>
<td>Philosophy of Feminism I</td>
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<tr>
<td>POLS*2150</td>
<td>Gender and Politics</td>
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<td>POLS*3160</td>
<td>Women and Politics in the Third World</td>
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<td>POLS*3710</td>
<td>Politics and Sexuality</td>
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<td>WMST*2000</td>
<td>Women and Representation</td>
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<td>WMST*3000</td>
<td>Feminist Theory and Methods</td>
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<td>WMST*3010</td>
<td>Gender and Diversity</td>
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0.50 additional credits at the 4000 level in ANTH, SOAN, SOC or WMST

### Historical Perspectives in Development

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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>HIST*1010</td>
<td>The Early Modern World</td>
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<tr>
<td>HIST*2450</td>
<td>The Practising Historian</td>
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Two of:

<table>
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<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>HIST*1150</td>
<td>The Modern World</td>
</tr>
<tr>
<td>HIST*2070</td>
<td>World Religions in Historical Perspective</td>
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<tr>
<td>HIST*2250</td>
<td>Environment and History</td>
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<tr>
<td>HIST*2340</td>
<td>Migrations in the Atlantic World, 1500-1850</td>
</tr>
<tr>
<td>HIST*2500</td>
<td>Britain Since 1603</td>
</tr>
<tr>
<td>HIST*2800</td>
<td>The History of the Modern Family</td>
</tr>
<tr>
<td>HIST*2890</td>
<td>Early Islamic World</td>
</tr>
<tr>
<td>HIST*2910</td>
<td>Modern Asia</td>
</tr>
<tr>
<td>HIST*2920</td>
<td>Republican Latin America</td>
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### Latin American Studies

<table>
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<tr>
<td>HIS*2900</td>
<td>Intermediate Spanish I</td>
</tr>
<tr>
<td>HIS*2910</td>
<td>Intermediate Spanish II</td>
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<td>HIS*3500</td>
<td>Advanced Spanish I</td>
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<tr>
<td>POLS*3180</td>
<td>Research Methods I: Political Inquiry and Methods</td>
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<tr>
<td>SOAN*2120</td>
<td>Introductory Methods</td>
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Three of:

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<tbody>
<tr>
<td>HIS*2990</td>
<td>Hispanic Literary Studies</td>
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<tr>
<td>HIS*3080</td>
<td>Spanish American Culture</td>
</tr>
<tr>
<td>HIS*2920</td>
<td>Republican Latin America</td>
</tr>
<tr>
<td>HIS*3150</td>
<td>History and Culture of Mexico</td>
</tr>
<tr>
<td>HIS*3420</td>
<td>Colonial Latin America</td>
</tr>
<tr>
<td>HUM*3300</td>
<td>Latin American Studies in the Humanities</td>
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<tr>
<td>ISS*3300</td>
<td>Latin American Studies in the Social Sciences</td>
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<tr>
<td>POLS*3080</td>
<td>Politics of Latin America</td>
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<tr>
<td>SOAN*3250</td>
<td>Social Change in Latin America</td>
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</tbody>
</table>

0.50 additional credits in HISP at the 3000 level

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.

### Political Economy and Administrative Change

<table>
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<th>Course Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>POLS*3180</td>
<td>Research Methods I: Political Inquiry and Methods</td>
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<table>
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<tr>
<td>POLS*2000</td>
<td>Political Theory</td>
</tr>
<tr>
<td>POLS*2100</td>
<td>Comparative Politics</td>
</tr>
<tr>
<td>POLS*2200</td>
<td>International Relations</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON*2100</td>
<td>Economic Growth and Environmental Quality</td>
</tr>
<tr>
<td>ECON*2310</td>
<td>Intermediate Microeconomics</td>
</tr>
<tr>
<td>ECON*2720</td>
<td>Business History</td>
</tr>
<tr>
<td>ECON*3720</td>
<td>History of the World Economy Since 1850</td>
</tr>
<tr>
<td>ECON*3730</td>
<td>Europe and the World Economy to 1914</td>
</tr>
<tr>
<td>ECON*4720</td>
<td>Topics in Economic History</td>
</tr>
<tr>
<td>ECON*4830</td>
<td>Economic Development</td>
</tr>
<tr>
<td>ECON*4890</td>
<td>History of Economic Thought</td>
</tr>
<tr>
<td>FARE*2700</td>
<td>Survey of Natural Resource Economics</td>
</tr>
<tr>
<td>FARE*3170</td>
<td>Cost-Benefit Analysis</td>
</tr>
<tr>
<td>FARE*3250</td>
<td>Food, Nutrition &amp; International Development</td>
</tr>
<tr>
<td>FARE*4210</td>
<td>World Agriculture and Economic Development</td>
</tr>
<tr>
<td>FARE*4290</td>
<td>Land Economics</td>
</tr>
<tr>
<td>FARE*4310</td>
<td>Resource Economics</td>
</tr>
</tbody>
</table>

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

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

Two of the following not taken as part of the core:
ANTH*3670 [0.50] Indigenous Peoples: Global Context
ANTH*3690 [0.50] History of Anthropological Thought
FARE*3250 [0.50] Food, Nutrition & International Development
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 Course in International Agriculture
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
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 ANTH, FARE, SOAN or SOC at the 4000 level.

Minor (Honours Program)

A minimum of 5.25 credits is required, including:

ANTH*1150 [0.50] Introduction to Anthropology
ECON*1050 [0.50] Introductory Microeconomics
ECON*1100 [0.50] Introductory Macroeconomics
IDEV*2500 [0.75] International Development Studies
POL*2080 [0.50] Development and Underdevelopment

Five of:
ECON*2650 [0.50] Introductory Development Economics
ECON*3720 [0.50] History of the World Economy Since 1850
ECON*3730 [0.50] Europe and the World Economy to 1914
GEOG*2030 [0.50] Political Ecology & Geography
GEOG*3050 [0.50] Development and the City
POLS*3670 [0.50] Comparative Public Policy and Administration
POLS*3790 [0.50] The Political Economy of International Relations
SOAN*3680 [0.50] Perspectives on Development

Italian (ITAL)

School of Languages and Literatures, College of Arts

All language courses carry 0.50 credits. Students with Year 4 or grade 12 Italian or their equivalent may be admitted into ITAL*1060 or ITAL*1070 only with the approval of the department. Students enrolling 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*2090, ITAL*3060

b. two of the following courses ITAL*2100, ITAL*3150, ITAL*3200, ITAL*3950, ITAL*3960, ITAL*3970

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

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:

ACCT*2220 [0.50] Financial Accounting
BUS*2090 [0.50] Individuals and Groups in Organizations
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

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

Restricted Electives

MCS*2020 [0.50] Marketing Information Management
MCS*3000 [0.50] Advanced Marketing
MCS*3030 [0.50] Research Methods
MCS*3040 [0.50] Business and Consumer Law
MCS*3500 [0.50] Market Analysis and Planning
MCS*3600 [0.50] Consumer Information Processes
MCS*3620 [0.50] Marketing Communications

One of:

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

Mathematical Economics (MAEC)

Department of Economics and Finance, 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.
### Major (Honours Program)

**Semester 1**
- **CIS*1500** [0.50] Introduction to Programming
- **ECON*1050** [0.50] Introductory Microeconomics
- **MATH*1200** [0.50] Calculus I
- 1.00 electives

**Semester 2**
- **ECON*1100** [0.50] Introductory Macroeconomics
- **MATH*1210** [0.50] Calculus II
- 1.50 electives

**Semester 3**
- **ECON*2310** [0.50] Intermediate Microeconomics
- **ECON*2410** [0.50] Intermediate Macroeconomics
- **STAT*2040** [0.50] Statistics I
- 1.00 electives

**Semester 4**
- **ECON*3740** [0.50] Introduction to Econometrics
- 2.00 electives or restricted electives*

**Semester 5**
- **ECON*3710** [0.50] Advanced Microeconomics
- 2.00 electives or restricted electives*

**Semester 6**
- **ECON*3100** [0.50] Game Theory
- **ECON*3810** [0.50] Advanced Macroeconomics
- 1.50 electives or restricted electives*

**Semester 7**
- **ECON*4640** [0.50] Applied Econometrics I
- **ECON*4710** [0.50] Advanced Topics in Microeconomics
- **ECON*4700** [0.50] Advanced Mathematical Economics
- 1.00 electives or restricted electives*

**Semester 8**
- **ECON*4810** [0.50] Advanced Topics in Macroeconomics

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

0.50 credits in Economics at the 4000 level
- 1.00 electives

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

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

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

**Department of Economics and Finance, College of 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.

**Major (Honours Program)**

**Semester 1 - Fall**
- **CIS*1500** [0.50] Introduction to Programming
- **ECON*1050** [0.50] Introductory Microeconomics
- **MATH*1200** [0.50] Calculus I
- 1.00 electives

**Semester 2 - Winter**
- **ECON*1100** [0.50] Introductory Macroeconomics
- **MATH*1210** [0.50] Calculus II
- 1.50 electives

**Semester 3 - Fall**
- **COOP*1100** [0.00] Introduction to Co-operative Education
- **ECON*2310** [0.50] Intermediate Microeconomics
- **ECON*2410** [0.50] Intermediate Macroeconomics
- **STAT*2040** [0.50] Statistics I
- 1.00 electives

**Semester 4 - Winter**
- **ECON*3740** [0.50] Introduction to Econometrics
- 2.00 electives or restricted electives*

### Spring/Summer
- **COOP*1000** [0.00] Co-op Work Term I

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

### Semester 5 - Winter
- **ECON*3100** [0.50] Game Theory
- **ECON*3810** [0.50] Advanced Macroeconomics
- 1.50 electives or restricted electives*

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

### Semester 6 - Fall
- **ECON*3710** [0.50] Advanced Microeconomics
- 2.00 electives or restricted electives*

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

### Spring/Summer
- **COOP*5000** [0.00] Co-op Work Term V

### Semester 7 - Fall
- **ECON*4640** [0.50] Applied Econometrics I
- **ECON*4700** [0.50] Advanced Mathematical Economics
- **ECON*4710** [0.50] Advanced Topics in Microeconomics
- 1.00 electives or restricted electives*

### Semester 8 - Winter
- **ECON*4810** [0.50] Advanced Topics in Macroeconomics

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

0.50 credits at the 4000 level Economics
- 1.00 electives

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

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

### 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 MHF4U Advanced Functions and/or MCV4U Calculus and Vectors should consult with the department advisor.

**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. Of the minimum of 20.00 credits required to complete an Honours BA degree, at least the following 9.50 credits must be completed for the Mathematics Major:

- **CIS*1500** [0.50] Introduction to Programming
- **MATH*1200** [0.50] Calculus I
- **MATH*1210** [0.50] Calculus II
- **MATH*2000** [0.50] Set Theory
- **MATH*2130** [0.50] Numerical Methods
- **MATH*2160** [0.50] Linear Algebra I
- **MATH*2170** [0.50] Differential Equations I
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 (PHYS*1810) 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 who are enrolled in a Music program: general program, area of concentration; honors program, major or minor. Students enrolled in a Music program, honors major, may audition for MUSC*1500 beyond the fourth semester.

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

**Applied Composition**

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

**Core Requirements**

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

MUSC*1060 [0.50] “Classical” Music: Context and Codes  
MUSC*1180 [0.50] Musicianship I  
MUSC*2100 [0.50] Creating Music on the Computer  
MUSC*2140 [0.50] History of Jazz  
MUSC*2150 [0.50] Music and Popular Culture  
MUSC*2180 [0.50] Musicianship II  
MUSC*2270 [0.50] World Music  
MUSC*2330 [0.50] Genre and Style in Western Art Music  
MUSC*2660 [0.50] Materials of Music I  
MUSC*2670 [0.50] Materials of Music II  
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. MUSC*1060, MUSC*1180, MUSC*2180, MUSC*2330, MUSC*2660, MUSC*2670 (3.00 credits)

b. 1.50 credits from MUSC*2100, MUSC*2140, MUSC*2150, MUSC*2270, MUSC*3630
c. at least 1.00 Music credits at the 3000 level or above (excluding MUSC*3630)
d. two of MUSC*2530, MUSC*2540, MUSC*2550, MUSC*2560.

**Major (Honours Program)**

A minimum of 9.00 Music credits is required, including:

a. the Music core (5.50 credits)
b. two of MUSC*2530, MUSC*2540, MUSC*2550, MUSC*2560.
c. MUSC*4401/2 or MUSC*4450
d. 2.00 additional credits of upper-level topics courses (MUSC*3730, MUSC*3740, MUSC*3800, MUSC*3820, MUSC*3860, MUSC*3880)

Participation in Applied Music courses is strongly recommended for all honours students.

**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).

**Political Science (POLS)**

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

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

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

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

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

**Core Requirements**

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
c. at least 0.50 credits at the 3000 level in three of the five fields in the department
d. 1.50 credits at the 4000 level, two of which may include the POLS*4970/POLS*4980 Honours Thesis

e. an additional 2.50 credits from courses in Political Science

**Note:** 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
d. 1.50 additional credits from courses in Political Science

Choices for fulfillment of prerequisites for 4000 level courses (see course descriptions for corresponding requirements).
### Political Thought
- **POLS*5320** [0.50] Modern Political Thought
- **POLS*53710** [0.50] Politics and Sexuality

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

### Public Policy, Governance and Law
- **POLS*5130** [0.50] Law, Politics and Judicial Process
- **POLS*5210** [0.50] The Constitution and Canadian Federalism
- **POLS*5120** [0.50] Public Policy: Challenges and Prospects
- **POLS*5330** [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*3940** [0.50] Accountability and Canadian Government

### Comparative Politics
- **POLS*3010** [0.50] Politics of Africa
- **POLS*3060** [0.50] Politics of the Middle East and North Africa
- **POLS*3080** [0.50] Politics of Latin America
- **POLS*3160** [0.50] Women and Politics in the Third World
- **POLS*3320** [0.50] Politics of Aid & Development
- **POLS*3410** [0.50] U.S. Politics and Government
- **POLS*3440** [0.50] Corruption, Scandal and Political Ethics
- **POLS*3450** [0.50] European Governments and Politics
- **POLS*3670** [0.50] Comparative Public Policy and Administration
- **POLS*3890** [0.50] Government and Politics of India
- **POLS*3920** [0.50] Modern China

### International Relations and Global Studies
- **POLS*3070** [0.50] Comparative Politics of Asia Pacific
- **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*3490** [0.50] Conflict and Conflict Resolution
- **POLS*3790** [0.50] The Political Economy of International Relations

### 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.S.C. program (described in the schedule of studies for B.S.C. programs). Through its different undergraduate programs, the Psychology Department attempts to provide:

1. a broad general education emphasizing psychological theory and methodology, with an empirical basis in course work (e.g. experiments and projects);
2. 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);
3. 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. The department does not offer Psychology as an Area of Concentration in the General BA Program.

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### Note on Honours Courses
Courses designated with (H) are designed for students in a psychology honours specialization. This includes B.A. Honours Psychology (PYSC) major or minor, B.A. Information Systems and Human Behaviour (ISHB) major, B.Sc. Psychology: Brain and Cognition (PBC), major or minor, and the Neuroscience (NEUR) minor. (H) courses are Honours level requiring for registration a cumulative average of at least 70% in all course attempts in Psychology or registration in the ISHB major, NEUR minor, or PBC major or minor. Unless otherwise specified, all other courses may be taken by students in a general or honours program, providing the prerequisites are met.

#### 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.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*2300</td>
<td>Introduction to Social Psychology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2330</td>
<td>Principles of Learning</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2390</td>
<td>Principles of Sensation and Perception</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2410</td>
<td>Behavioural Neuroscience I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2450</td>
<td>Introduction to Developmental Psychology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2650</td>
<td>Cognitive Psychology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2740</td>
<td>Personality</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*1100</td>
<td>Principles of Behaviour</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*1200</td>
<td>Dynamics of Behaviour</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

6 of the 2000 level Psychology core courses listed above

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*2010</td>
<td>Quantification in Psychology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2040</td>
<td>Research Statistics</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2360</td>
<td>Introductory Research Methods</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*3250</td>
<td>Psychological Measurement</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

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)
(No may be taken in combination with a Psychology Honours Major)

A minimum of 6.00 credits is required including:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*1100</td>
<td>Principles of Behaviour</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*1200</td>
<td>Dynamics of Behaviour</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2010</td>
<td>Quantification in Psychology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2360</td>
<td>Introductory Research Methods</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>
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.

Dependent 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.

Courses designated with (H) are designed for students in a psychology honours specialization. This includes B.A. Honours Psychology (PSYC) major or minor, B.A. Information Systems and Human Behaviour (ISHB) major, B.Sc. Psychology: Brain and Cognition (PBC), major or minor, and the Neuroscience (NEUR) minor; (H) courses are Honours level requiring for registration a cumulative average of at least 70% in all course attempts in Psychology or registration in the ISHB major, major or minor, NEUR minor or PBC major or minor. Unless otherwise specified, all other courses may be taken by students in a general or honours program, providing the prerequisites are met.

**Major (Honours Program) - 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*1100</td>
<td>0.50</td>
<td>Principles of Behaviour</td>
</tr>
<tr>
<td>PSYC*1200</td>
<td>0.50</td>
<td>Dynamics of Behaviour</td>
</tr>
<tr>
<td>1.50 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Semester 2 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*1100</td>
<td>0.00</td>
<td>Introduction to Co-operative Education</td>
</tr>
<tr>
<td>PSYC*2010</td>
<td>0.50</td>
<td>Quantification in Psychology</td>
</tr>
<tr>
<td>0.50 Psychology core***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.50 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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 Stream B for students intending to apply for graduate programs).

**Semester 3 - Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*2040</td>
<td>0.50</td>
<td>Research Statistics</td>
</tr>
<tr>
<td>1.50 Psychology core***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.50 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Winter Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*1000</td>
<td>0.00</td>
<td>Co-op Work Term I</td>
</tr>
</tbody>
</table>

**Semester 4 - Summer**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 Psychology core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.50 electives****</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fall Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*2000</td>
<td>0.00</td>
<td>Co-op Work Term II</td>
</tr>
</tbody>
</table>

**Semester 5 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*2360</td>
<td>0.50</td>
<td>Introductory Research Methods</td>
</tr>
<tr>
<td>PSYC*3250</td>
<td>0.50</td>
<td>Psychological Measurement</td>
</tr>
</tbody>
</table>

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

**Summer Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*3000</td>
<td>0.00</td>
<td>Co-op Work Term III</td>
</tr>
<tr>
<td>PSYC*4910</td>
<td>0.50</td>
<td>Co-operative Education Project I</td>
</tr>
</tbody>
</table>

**Semester 6 - Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 Psychology electives at the 3000 or 4000 level***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.50 electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Semester 7 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 Psychology electives at the 3000 or 4000 level***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.50 electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Semester 8 - Summer****

2.00 electives
* B.A. distribution requirements should be satisfied within the first 4 semesters
** at least two of the 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*1100</td>
<td>0.50</td>
<td>Principles of Behaviour</td>
</tr>
<tr>
<td>PSYC*1200</td>
<td>0.50</td>
<td>Dynamics of Behaviour</td>
</tr>
<tr>
<td>1.50 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Semester 2 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*1100</td>
<td>0.00</td>
<td>Introduction to Co-operative Education</td>
</tr>
<tr>
<td>PSYC*2010</td>
<td>0.50</td>
<td>Quantification in Psychology</td>
</tr>
<tr>
<td>1.00 Psychology core (other than PSYC<em>2310 or PSYC</em>2740)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Semester 3 - Summer**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*2310</td>
<td>0.50</td>
<td>Introduction to Social Psychology</td>
</tr>
<tr>
<td>PSYC*2740</td>
<td>0.50</td>
<td>Personality</td>
</tr>
<tr>
<td>1.50 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Semester 4 - Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*2360</td>
<td>0.50</td>
<td>Introductory Research Methods</td>
</tr>
<tr>
<td>PSYC*2040</td>
<td>0.50</td>
<td>Research Statistics</td>
</tr>
<tr>
<td>1.00 Psychology core</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.50 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Summer Semester**

Optional

**Fall Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*3000</td>
<td>0.00</td>
<td>Co-op Work Term III</td>
</tr>
</tbody>
</table>

**Semester 7 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*4870</td>
<td>0.50</td>
<td>Honours Thesis I</td>
</tr>
<tr>
<td>2.00 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Semester 8 - Summer**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*4880</td>
<td>1.00</td>
<td>Honours Thesis II</td>
</tr>
<tr>
<td>1.50 electives*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*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

**Sociology (SOC)**

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

2011-2012 Undergraduate Calendar

Last Revision: March 15, 2014
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
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
SOC*1100 [0.50] Sociology
2.50 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
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

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH*1200</td>
<td>0.50</td>
<td>Calculus I</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>0.50</td>
<td>Calculus II</td>
</tr>
<tr>
<td>MATH*2150</td>
<td>0.50</td>
<td>Applied Matrix Algebra</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>0.50</td>
<td>Statistics I</td>
</tr>
<tr>
<td>STAT*2050</td>
<td>0.50</td>
<td>Statistics II</td>
</tr>
<tr>
<td>STAT*3100</td>
<td>0.50</td>
<td>Introductory Mathematical Statistics I</td>
</tr>
<tr>
<td>STAT*3110</td>
<td>0.50</td>
<td>Introductory Mathematical Statistics II</td>
</tr>
<tr>
<td>STAT*3240</td>
<td>0.50</td>
<td>Applied Regression Analysis</td>
</tr>
<tr>
<td>STAT*3320</td>
<td>0.50</td>
<td>Sampling Theory with Applications</td>
</tr>
</tbody>
</table>

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*2100, 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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH*1200</td>
<td>[0.50]</td>
<td>Calculus I</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>[0.50]</td>
<td>Calculus II</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>[0.50]</td>
<td>Statistics I</td>
</tr>
<tr>
<td>STAT*2050</td>
<td>[0.50]</td>
<td>Statistics II</td>
</tr>
<tr>
<td>STAT*3110</td>
<td>[0.50]</td>
<td>Introductory Mathematical Statistics I</td>
</tr>
<tr>
<td>STAT*31110</td>
<td>[0.50]</td>
<td>Introductory Mathematical Statistics II</td>
</tr>
<tr>
<td>STAT*3124</td>
<td>[0.50]</td>
<td>Applied Regression Analysis</td>
</tr>
</tbody>
</table>

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 a combination of the two disciplines.

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

**Cost of Studio Supplies**

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

**Student Counselling**

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

**Core Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH*1120</td>
<td>[0.50]</td>
<td>The Visual Arts Today</td>
</tr>
<tr>
<td>ARTH*1520</td>
<td>[0.50]</td>
<td>Art Historical Studies II</td>
</tr>
<tr>
<td>SART*1050</td>
<td>[0.50]</td>
<td>Foundation Studio</td>
</tr>
<tr>
<td>SART*1060</td>
<td>[0.50]</td>
<td>Core Studio</td>
</tr>
</tbody>
</table>

**Major (Honours Program)**

A minimum of 9.00 credits is required, including:

a. the Studio Art core
b. 2.00 additional credits in Studio Art, including at least 0.50 credits from List A and 0.50 from List B
c. 2.00 additional credits in Art History including at least 0.50 credits at the 3000 level or above
d. 3.00 additional credits in Studio Art including 1.50 credits at the 4000-level

**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 at least 0.50 credits at the 3000 level or above
d. 2.00 additional credits in Studio Art, including 0.50 credits from List A and 0.50 from List B

**List A**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credit</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>SART*2090</td>
<td>[0.50]</td>
<td>Drawing I</td>
</tr>
<tr>
<td>SART*2200</td>
<td>[0.50]</td>
<td>Painting I</td>
</tr>
<tr>
<td>SART*2460</td>
<td>[0.50]</td>
<td>Introductory Printmaking I</td>
</tr>
<tr>
<td>SART*2470</td>
<td>[0.50]</td>
<td>Introductory Printmaking II</td>
</tr>
<tr>
<td>SART*2610</td>
<td>[0.50]</td>
<td>Photography I</td>
</tr>
<tr>
<td>SART*2700</td>
<td>[0.50]</td>
<td>Introduction to Computer Graphics</td>
</tr>
</tbody>
</table>

Notes:

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

**Theatre Studies (THST)**

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

The Theatre Studies program is a component of a liberal education, and is dedicated to integrating academic study and theatre practice. The program offers introductory and advanced courses in dramatic literature, theatre history, criticism and theory, together with directing, acting, 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.
2. Certain approved Dramatic Literature courses from the English Program within the School of English and Theatre Studies or other departments may be counted towards a degree in Theatre Studies. A list of approved courses may be obtained from the School's website: http://www.arts.uoguelph.ca/sets/
3. In connection with THST*1040 and some upper-level courses, students are required as part of the course to attend various specified theatre performances in cities such as Toronto, Stratford, Niagara-on-the-Lake, and London. A special fee is charged for travel to these performances and students will be notified during the first week of classes of the amount of this fee and the dates of the performances.

**Area of Concentration (General Program)**

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

a. THST*1040, THST*2010, THST*2230, THST*3550, THST*3850
b. at least one of THST*2080, THST*2120, THST*2240
c. at least one of ENGL*3420, THST*3650, THST*3660
d. 1.50 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*2230, THST*3550, THST*3850, THST*4280
b. two of THST*2080, THST*2120, THST*2240
c. at least one of ENGL*3420, THST*3650, THST*3660
d. at least one of THST*4320 or THST*4330
e. 2.50 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*2230, THST*3550, THST*3850
b. at least one of THST*2080, THST*2120, THST*2240
c. at least one of ENGL*3420, THST*3650, THST*3660
d. 1.50 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
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.

Core Requirements for BAS Science Minors

If you choose this BAS Science Minor, then

<table>
<thead>
<tr>
<th>Course</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>BIOL<em>1070, BIOL</em>1090, [(CHEM<em>1040, CHEM</em>1050) or (MATH<em>1080, STAT</em>2040)]</td>
</tr>
<tr>
<td>Biochemistry</td>
<td>BIOL<em>1080, BIOL</em>1090, CHEM<em>1040, CHEM</em>1050</td>
</tr>
<tr>
<td>Biology</td>
<td>BIOL<em>1070, BIOL</em>1090, [(CHEM<em>1040, CHEM</em>1050) or (MATH<em>1080, STAT</em>2040)]</td>
</tr>
<tr>
<td>Biotechnology</td>
<td>BIOL<em>1080, BIOL</em>1090, CHEM<em>1040, CHEM</em>1050</td>
</tr>
<tr>
<td>Chemistry</td>
<td>CHEM<em>1040, CHEM</em>1050, MATH<em>1200, MATH</em>1210</td>
</tr>
<tr>
<td>Computing &amp; Information Science</td>
<td>CIS<em>1500, CIS</em>1910, STAT<em>2040, STAT</em>2050</td>
</tr>
<tr>
<td>Ecology</td>
<td>BIOL<em>1070, BIOL</em>1090, STAT<em>2040, (MATH</em>1080 or MATH*1200)</td>
</tr>
<tr>
<td>GIS &amp; Environmental Analysis</td>
<td>ENVS<em>1050, GEOG</em>1300, STAT<em>2040, (MATH</em>1080 or MATH*1200)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>MATH<em>1200, MATH</em>1210, STAT<em>2040, STAT</em>2050</td>
</tr>
<tr>
<td>Mathematical Sciences</td>
<td>MATH<em>1200, MATH</em>1210, STAT<em>2040, STAT</em>2050</td>
</tr>
<tr>
<td>Microbiology</td>
<td>BIOL<em>1080, BIOL</em>1090, CHEM<em>1040, CHEM</em>1050</td>
</tr>
<tr>
<td>Molecular Biology and Genetics</td>
<td>BIOL<em>1080, BIOL</em>1090, (CHEM<em>1040, CHEM</em>1050)</td>
</tr>
<tr>
<td>Neuroscience</td>
<td>BIOL<em>1080, BIOL</em>1090, CHEM<em>1040, CHEM</em>1050</td>
</tr>
<tr>
<td>Nutritional and Nutraceutical Sciences</td>
<td>BIOL<em>1080, BIOL</em>1090, CHEM<em>1040, CHEM</em>1050</td>
</tr>
<tr>
<td>Plant Science</td>
<td>BIOL<em>1070, BIOL</em>1090, CHEM<em>1040, CHEM</em>1050</td>
</tr>
<tr>
<td>Physics</td>
<td>PHYS<em>1000, PHYS</em>1010, MATH<em>1200, MATH</em>1210</td>
</tr>
<tr>
<td>Psychology: Brain and Cognition</td>
<td>MATH<em>1080, STAT</em>2040, [(CHEM<em>1040, CHEM</em>1050) or (2 of BIOL<em>1070, BIOL</em>1090)]</td>
</tr>
<tr>
<td>Statistics</td>
<td>MATH<em>1200, MATH</em>1210, STAT<em>2040, STAT</em>2050</td>
</tr>
<tr>
<td>Zoology</td>
<td>BIOL<em>1070, BIOL</em>1090, [(CHEM<em>1040, CHEM</em>1050) or [STAT<em>2040, (MATH</em>1080 or MATH*1200)])</td>
</tr>
</tbody>
</table>

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

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

3. Subject Area Core (ASCI) - 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

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. Science Core - 2.00 credits
2. Arts/Social Science core - 2.00 credits
3. Subject Area Core - (ASCI) - 3.00 credits
4. Arts/Social Science Minor - 5.00 credits minimum
5. Science Minor - 5.00 credits minimum
6. Free Electives - 3.00 credits
X. Degree Programs, Bachelor of Arts and Sciences (B.A.S.)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCI*2000</td>
<td>0.50</td>
<td>Modes of Inquiry and Communication Across Disciplines</td>
</tr>
<tr>
<td>ASCI*3000</td>
<td>0.50</td>
<td>Arts and Sciences Community Project</td>
</tr>
<tr>
<td>ASCI*3100</td>
<td>0.50</td>
<td>Case Studies in Arts and Sciences Research</td>
</tr>
<tr>
<td>ASCI*3700</td>
<td>0.50</td>
<td>Independent Studies in Arts/Sciences</td>
</tr>
<tr>
<td>ASCI*4000</td>
<td>0.50</td>
<td>Arts and Sciences Honours Seminar</td>
</tr>
<tr>
<td>ASCI*4010</td>
<td>0.50</td>
<td>Arts and Sciences Honours Research Seminar</td>
</tr>
<tr>
<td>ASCI*4020</td>
<td>0.50</td>
<td>Topics in Arts and Sciences Research</td>
</tr>
<tr>
<td>ASCI*4030</td>
<td>0.50</td>
<td>Topics in Arts and Sciences Research</td>
</tr>
<tr>
<td>ASCI*4700</td>
<td>0.50</td>
<td>Independent Studies in Arts/Sciences</td>
</tr>
<tr>
<td>ASCI*4710</td>
<td>0.50</td>
<td>Independent Studies in Arts/Sciences</td>
</tr>
</tbody>
</table>

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

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

Minor available in the Arts/Social Sciences core (see B.A. program descriptions):
- Anthropology
- Art History
- Art Theory and Criticism
- Business Administration
- Classical Studies
- Criminal Justice & Public Policy
- Economics
- English
- Ethics in the Life Sciences
- European Culture and Civilization
- Family & Child Studies
- French Studies
- Geography
- German
- Hispanic Studies
- History
- International Development
- Italian
- Marketing Management
- Museum Studies
- Music
- Philosophy
- Political Science
- Psychology
- Sociology
- Studio Art
- Theater Studies
- Visual Art of the Americas

5. Science Minor - 5.00 credits (Minimum)

Minor 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 Systems
- Functional Foods & Nutraceuticals
- Geology
- GIS* & Environmental Analysis
- Mathematics
- Mathematical Science
- Microbiology
- Molecular Biology and Genetics
- Neuroscience
- Nutritional and Nutraceutical Sciences
- Physics
- Plant Science
- Psychology: Brain and Cognition
- Statistics
- Zoology
- Geographic Information Systems

6. Free Electives - 3.00 credits

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

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

Double Counting Rule

A maximum of 3.00 credits may be double-counted:
- a. 1.00 credits may be double-counted between minors.
- b. 2.00 credits may be double-counted between a core and one minor.

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

Last Revision: March 15, 2014

2011-2012 Undergraduate Calendar
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 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
Equine Management students may have the opportunity to board their horse on campus or at a local facilities. Please contact BBRM program counsellor Karina Merkies at <kmekies@kemptville.uoguelph.ca> for more information.

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
BIOL*1030 [0.50] Biology I
CTS*1000 [0.50] Introduction to Computer Applications

Semester 2
AGR*1050 [0.50] Communication Skills
BIOL*1040 [0.50] Biology II
ENVM*1020 [0.50] Introduction to Environmental Microbiology
ENVM*1150 [0.50] Water Resource Management

Semester 3
CHEM*1040 [0.50] General Chemistry I
ENVM*1090 [0.50] Occupational Health and Safety
ENVM*1050 [0.50] Surveying and GIS
ENVM*1100 [0.50] Ecology

Semester 4
AGR*2100 [0.50] Human Resource Management
ECON*1050 [0.50] Introductory Microeconomics
ENVM*2500 [0.50] Integrated Project (Environmental)
FARE*1100 [0.50] Introduction to Business

Electives Available at Ridgetown:

Semester 5
ENVM*1070 [0.50] Nutrient Management
ENVM*1120 [0.50] Environmental Monitoring
ENVM*1130 [0.50] Introduction to Renewable Energy
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
AGR*3500 [0.50] Experiential Education I
FARE*2700 [0.50] Survey of Natural Resource Economics
ENVM*3080 [0.50] Soil and Water Conservation

1.00 electives or restricted electives

Semester 6
MET*2020 [0.50] Agronomoteorogy
NRS*3000 [0.50] Environmental Issues in Agriculture and Landscape Management
STAT*2060 [0.50] Statistics for Business Decisions
1.00 electives or restricted electives

Semester 7
FARE*4290 [0.50] Land Economics
One of:
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
FARE*4310 [0.50] Resource Economics
GEOG*3250 [0.50] Groundwater
GEOG*3420 [0.50] Remote Sensing of the Environment
1.00 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

ENVS*3410 [0.50] Independent Research I
ENVS*3420 [0.50] Independent Research II
ENVS*3430 [1.00] Independent Research

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.
### Natural Resource Management

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVB*2030</td>
<td>Current Issues in Forest Science</td>
</tr>
<tr>
<td>ENVB*3330</td>
<td>Ecosystem Processes and Applications</td>
</tr>
<tr>
<td>ENVB*4020</td>
<td>Water Quality and Environmental Management</td>
</tr>
<tr>
<td>ENVB*4780</td>
<td>Forest Ecology</td>
</tr>
<tr>
<td>GEOG*3610</td>
<td>Environmental Hydrology</td>
</tr>
<tr>
<td>NRS*2120</td>
<td>Introduction to Environmental Stewardship</td>
</tr>
<tr>
<td>NRS*3100</td>
<td>Resource Planning Techniques</td>
</tr>
<tr>
<td>SOIL*3050</td>
<td>Land Utilization</td>
</tr>
</tbody>
</table>

### Environmental Protection

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC*2580</td>
<td>Introduction to Biochemistry</td>
</tr>
<tr>
<td>ENVB*2040</td>
<td>Plant Health and the Environment</td>
</tr>
<tr>
<td>ENVB*3030</td>
<td>Pesticides and the Environment</td>
</tr>
<tr>
<td>ENVB*3330</td>
<td>Ecosystem Processes and Applications</td>
</tr>
<tr>
<td>ENVB*4240</td>
<td>Biological Activity of Pesticides</td>
</tr>
<tr>
<td>MICR*4140</td>
<td>Soil Microbiology and Biotechnology</td>
</tr>
<tr>
<td>MICR*4180</td>
<td>Microbial Processes in Environmental Management</td>
</tr>
<tr>
<td>PBIOL*4530</td>
<td>Environmental Pollution Stresses on Plants</td>
</tr>
</tbody>
</table>

### 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1030</td>
<td>Biology I</td>
</tr>
<tr>
<td>ENVM*1090</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>EQN*1020</td>
<td>Equine Management I</td>
</tr>
<tr>
<td>EQN*1060</td>
<td>Equine Event Management I</td>
</tr>
<tr>
<td>EQN*1100</td>
<td>Introduction to Equine Industry Trends and Issues</td>
</tr>
<tr>
<td>SOIL*2010</td>
<td>Soil Science</td>
</tr>
</tbody>
</table>

**Semester 2 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR*1050</td>
<td>Communication Skills</td>
</tr>
<tr>
<td>BIOL*1040</td>
<td>Biology II</td>
</tr>
<tr>
<td>CIS*1000</td>
<td>Introduction to Computer Applications</td>
</tr>
<tr>
<td>EQN*1030</td>
<td>Equine Management II</td>
</tr>
<tr>
<td>EQN*1050</td>
<td>Equine Facility Management and Design</td>
</tr>
<tr>
<td>EQN*1070</td>
<td>Equine Event Management II</td>
</tr>
</tbody>
</table>

**Semester 3 - Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR*2030</td>
<td>Pasture Management</td>
</tr>
<tr>
<td>ECON*1050</td>
<td>Introductory Microeconomics</td>
</tr>
<tr>
<td>EQN*2020</td>
<td>Stable Management</td>
</tr>
<tr>
<td>EQN*2040</td>
<td>Equine Anatomy and Physiology</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CHEM*1100</td>
<td>Chemistry Today</td>
</tr>
</tbody>
</table>

**Semester 4 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT*2220</td>
<td>Financial Accounting</td>
</tr>
<tr>
<td>AGR*2100</td>
<td>Human Resource Management</td>
</tr>
<tr>
<td>EQN*2050</td>
<td>Introduction to Equine Nutrition</td>
</tr>
<tr>
<td>EQN*2200</td>
<td>Equine Industry Trends and Issues I</td>
</tr>
<tr>
<td>FARE*1100</td>
<td>Introduction to Business</td>
</tr>
</tbody>
</table>

#### Semesters 5 to 8 offered at the Guelph campus

**Semester 5 - Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR*2350</td>
<td>Animal Production Systems, Health and Industry</td>
</tr>
<tr>
<td>AGR*3500</td>
<td>Experiential Education I</td>
</tr>
<tr>
<td>MCS*1000</td>
<td>Introductory Marketing</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>SOIL*3080</td>
<td>Soil and Water Conservation</td>
</tr>
<tr>
<td>SOIL*4090</td>
<td>Soil Management</td>
</tr>
<tr>
<td>SOIL*4130</td>
<td>Soil and Nutrient Management</td>
</tr>
<tr>
<td>0.50 electives</td>
<td></td>
</tr>
</tbody>
</table>

**Semester 6 - Winter**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC*3210</td>
<td>Principles of Animal Care and Welfare</td>
</tr>
<tr>
<td>EQN*3050</td>
<td>Equine Exercise Physiology</td>
</tr>
<tr>
<td>NRS*3000</td>
<td>Environmental Issues in Agriculture and Landscape</td>
</tr>
<tr>
<td>STAT*2060</td>
<td>Statistics for Business Decisions</td>
</tr>
<tr>
<td>0.50 electives</td>
<td></td>
</tr>
</tbody>
</table>

**Semester 7 - Fall**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FARE*3310</td>
<td>Operations Management</td>
</tr>
<tr>
<td>2.00 electives</td>
<td></td>
</tr>
</tbody>
</table>
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.

In their first semester, students may be admitted to either one of nine specialized majors or the undeclared (unspecialized) major. Students in the unspecialized first year, must declare a specialized major in semester two in order to gain access to required courses in semester three.

Bachelor of Commerce Majors

Undeclared (only available in semesters one and two)

Accounting
Hotel and Food Administration*
Human Resources Management
Management Economics and Finance*
Marketing Management*
Public Management*
Real Estate and Housing*
Tourism Management

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

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

The B.Comm. Core includes:

Year 1
- ECON*1050 [0.50] Introductory Microeconomics
- ECON*1100 [0.50] Introductory Macroeconomics
- MATH*1030 [0.50] Business Mathematics
- MCS*1000 [0.50] Introductory Marketing
- MGMT*1000 [1.00] Introduction to Business

Year 2
- ACCT*2220 [0.50] Financial Accounting (maybe taken in Year 1)
- ACCT*2230 [0.50] Management Accounting
- ECON*2560 [0.50] Theory of Finance
- HROB*2100 [1.00] Managing People in Organizations

Year 3
- BUS*3320 [0.50] Financial Management

Year 4
- MGMT*4000 [1.00] Strategic Management

Liberal Education Requirement

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

The following core areas are covered through a choice of courses:

- Consumer Behaviour
  - ECON*2310 or HTM*3080, MCS*2600
- Information Management
  - CIS*1200 or MCS*2020
- Law
  - HROB*3050, MCS*3040, REAL*4840
- Operations
  - FARE*3310, FARE*4500, HTM*3120, REAL*3890
- Statistics
  - ECON*2740 or STAT*2060

Program Information

Academic Counselling

Program Counselling

Students are urged to seek the assistance of the counsellors in the B.Comm. Counselling Office regarding their program and academic regulations, course selection issues, services and resources, and when they are experiencing difficulties that affect their academic progress.

Departmental Advising

On entering the program, all students are assigned to a departmental Faculty Advisor by major. Students should seek the advice of the Faculty Advisor when they have questions or concerns about courses and academic requirements for their program/major. The Faculty Advisor is also knowledgeable about career opportunities which relate to a student’s specific major. The list of Faculty Advisors is available on the Undergraduate Academic Information Centre website: http://www.uoguelph.ca/uaic/students_advisors.shtml or contact the B.Comm. Counselling Office for further information.

Special Expenses

Expenses may include cost of field trips and supplies and, for some majors, laboratory coats and other protective clothing.

Study at Other Universities

Students contemplating study at another university for credit towards a Bachelor of Commerce degree at the University of Guelph should refer to the general regulations governing Letters of Permission in Section 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 Biochemistry
- BIOC Biotechnology
- BIOL Biology
- BMED Biomedical Sciences
- BOT Botany
- CHEM Chemistry
- CHIN Chinese
- 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

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
GEOG Geography
GEOL Geology
GERM German Studies
GREK Greek
HISP Hispanic Studies
HIST History
HORT Horticultural Science
HUMN Humanities
IDEV International Development
ISS Interdisciplinary Social Science
ITAL Italian Studies
LARC Landscape Architecture
LAT Latin
LING Linguistics
MATH Mathematics
MBG Molecular Biology and Genetics
MET Meteorology
MICR Microbiology
MUSC Music
NUTR Nutrition
PHIL Philosophy
PHYS Physics
POLS Political Science
PORT Portuguese
PSYC Psychology
SART Studio Art
SOAN Sociology and Anthropology
SOIL Soil Science
SOC Sociology
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 cannot 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.

**Undeclared (UND)**

**College of Management and Economics**

Applicants to the B.Comm. program who want a flexible introduction to business studies should consider entering as an unspecialized student. Prior to winter course selection in first year undeclared students must declare one of the 9 majors in order to gain access to 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
MATH*1030 [0.50] Business Mathematics
MGMT*1000 [1.00] Introduction to Business
One of:

- AGR*1100 [0.50] Introduction to the Agrifood Systems *
- HTM*1000 [0.50] Introduction to Hospitality and Tourism Management *
- MATH*1200 [0.50] Calculus I *
- POLS*1400 [0.50] Issues in Canadian Politics *
- PSYC*1200 [0.50] Dynamics of Behaviour

**Semester 2**

ECON*2220 [0.50] Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics
HROB*2100 [1.00] Managing People in Organizations
MGCS*1000 [0.50] Introductory Marketing

Students leaning towards a certain major may use their electives to take courses in that area. Undeclared students are encouraged to meet with a B.Comm. program counsellor for advice on elective selection. Further information on selecting electives for the Undeclared first year can be found on the B.Comm. Program Counselling Office website: http://www.bcomm.uoguelph.ca/undeclared.shtml

**Accounting (ACCT)**

**College of Management & Economics, Department of Business**

By combining the conceptual and quantitative elements of accounting while promoting the integration of theory and practice, the accounting major provides graduates with the academic requirements for the postgraduate pursuit of a Professional Accounting designation. Students will develop the technical, analytical, evaluative and communication skills needed for a successful career in accounting and related management areas.

The program provides a strong foundation of accounting and general business knowledge while allowing significant opportunity to develop breadth and depth of knowledge in related areas of study. Course requirements for the postgraduate professional accounting designations vary.

For this major, 15.00 of the 20.00 credits are specified as core requirements and 5.00 electives (including the Liberal Education Requirements of 1.50 credits.) Students pursuing a professional accounting designation should visit the Department of Business website for links to the requirements for each designation.

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.

**Liberal Education Requirement**

As part of the graduation requirement all students within the B.Comm. Program are required to complete 1.50 credits from at least two different subject prefixes as listed under the B.Comm. Program Information section of the undergraduate calendar.

**Major**

**Semester 1**

ECON*1050 [0.50] Introductory Microeconomics
MATH*1030 [0.50] Business Mathematics
MGMT*1000 [1.00] Introduction to Business
One of:

- AGR*1100 [0.50] Introduction to the Agrifood Systems *
- HTM*1000 [0.50] Introduction to Hospitality and Tourism Management *
- MATH*1200 [0.50] Calculus I *
- POLS*1400 [0.50] Issues in Canadian Politics *
- PSYC*1200 [0.50] Dynamics of Behaviour

**Semester 2**

ACCT*2220 [0.50] Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics
HROB*2100 [1.00] Managing People in Organizations
MGCS*1000 [0.50] Introductory Marketing

**Semester 3**

ACCT*2230 [0.50] Management Accounting
ACCT*2240 [0.50] Applied Financial Accounting
STAT*2060 [0.50] Statistics for Business Decisions
One of:

- CIS*1200 [0.50] Introduction to Computing
- MCS*2020 [0.50] Marketing Information Management *

*Note: Students taking courses in the CA stream may take MCS*2020 in semester 3 or 4.

**Semester 4**

ACCT*3330 [0.50] Intermediate Financial Accounting I
BUS*3320 [0.50] Financial Management
ECON*2560 [0.50] Theory of Finance
MGCS*3040 [0.50] Business and Consumer Law

0.50 electives

**Semester 5**

ACCT*3320 [0.50] Auditing I
ACCT*3340 [0.50] Intermediate Financial Accounting II
One of:

- ECON*2310 [0.50] Intermediate Microeconomics
- MCS*2600 [0.50] Fundamentals of Consumer Behaviour

1.00 electives

**Semester 6**

ACCT*3230 [0.50] Intermediate Management Accounting
FAS*3310 [0.50] Operations Management
Semester 7

ACCT*3350 [0.50] Taxation
ACCT*4220 [0.50] Advanced Financial Accounting
MGMT*4000 [1.00] Strategic Management
One of:
ACCT*4270 [0.50] Auditing II

Semester 8

One of:
ACCT*4230 and MGMT*4260
ACCT*4240 [1.00] Accounting Theory and Integrated Cases

One of:
ACCT*4290 and ACCT*4350

0.50 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.

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 interested in earning the Certificate in Leadership can use a combination of restricted, Liberal Education, and free electives.

Major

Semester 1

AGR*1100 [0.50] Introduction to the Agrifood Systems
ECON*1050 [0.50] Introductory Microeconomics
MATH*1030 [0.50] Business Mathematics
MGMT*1000 [1.00] Introduction to Business

Semester 2

AGR*1250 [0.50] Agrifood System Trends & Issues
ECON*1100 [0.50] Introductory Macroeconomics
HROB*2100 [1.00] Managing People in Organizations
MCS*1000 [0.50] Introductory Marketing

Semester 3

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

One of:
CIS*1200 [0.50] Introduction to Computing
MCS*2020 [0.50] Marketing Information Management

Semester 4

ACCT*2230 [0.50] Management Accounting
ECON*2410 [0.50] Intermediate Microeconomics
ECON*2770 [0.50] Introductory Mathematical Economics
FARE*2410 [0.50] Agrifood Markets and Policy

0.50 electives or restricted electives

Semester 5

BUS*3320 [0.50] Financial Management
ECON*2560 [0.50] Theory of Finance
ECON*3740 [0.50] Introduction to Econometrics
FARE*2700 [0.50] Survey of Natural Resource Economics
FARE*3310 [0.50] Operations Management

Semester 6

FARE*4240 [0.50] Futures and Options Markets

Exchange is encouraged

Semester 7

FARE*3030 [0.50] The Firm and Markets
FARE*4370 [0.50] Food & Agri Marketing Management
MGMT*4000 [1.00] Strategic Management

One of:
ENVS*4300 [0.50] Environmental Law & Regulation
HROB*3050 [0.50] Employment Law
MCS*3040 [0.50] Business and Consumer Law
REAL*4840 [0.50] Housing and Real Estate Law

Semester 8

AGR*4500 [0.50] Agrifood Industry Problem-Solving
FARE*4000 [0.50] Agricultural and Food Policy
FARE*4220 [0.50] Advanced Agribusiness Management

1.00 electives or restricted electives

Restricted Electives

1.50 credits must come from one of the following streams:

Agribusiness Stream

Three of:
FARE*1300 [0.50] Poverty, Food & Hunger
FARE*2050 [0.50] Markets for Molecules
FARE*3170 [0.50] Cost-Benefit Analysis
FARE*3400 [0.50] Agribusiness Financial Management
FARE*4210 [0.50] World Agriculture and Economic Development
FARE*4290 [0.50] Land Economics
FARE*4310 [0.50] Resource Economics
FARE*4360 [0.50] Marketing Research
FARE*4500 [0.50] Decision Science

Agricultural Science Stream

BIOL*1020 [0.50] Introduction to Biology

Two of:
AGR*2320 [0.50] Soils in Agroecosystems
AGR*2350 [0.50] Animal Production Systems, Health and Industry
AGR*2470 [0.50] Introduction to Plant Agriculture
FOOD*3090 [0.50] Food Science and Human Nutrition

Food and Agricultural Business (Co-op) (FAB:C)

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

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

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

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.

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, 16.50 of the 20.00 credits are specified as core requirements, 1.50 are restricted electives, 1.50 are Liberal Education electives, and 0.50 are 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.

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 interested in earning the Certificate in Leadership can use a combination of restricted, Liberal Education, and free electives to do so. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements.
Major

Semester 1 - Fall
AGR*1100 [0.50] Introduction to the Agrifood Systems
ECON*1050 [0.50] Introductory Microeconomics
MATH*1030 [0.50] Business Mathematics
MGMT*1000 [1.00] Introduction to Business

Semester 2 - Winter
AGR*1250 [0.50] Agrifood System Trends & Issues
ECON*1100 [0.50] Introductory Macroeconomics
HROB*2100 [1.00] Managing People in Organizations
MCS*1000 [0.50] Introductory Marketing

Semester 3 - Fall
ACCT*2220 [0.50] Financial Accounting
AGR*2400 [0.50] Economics of the Canadian Food System
COOP*1100 [0.00] Introduction to Co-operative Education
ECON*2310 [0.50] Intermediate Microeconomics
ECON*2740 [0.50] Economic Statistics
One of:
CIS*1200 [0.50] Introduction to Computing
MCS*2020 [0.50] Marketing Information Management

Semester 4 - Winter
ACCT*2230 [0.50] Management Accounting
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*2770 [0.50] Introductory Mathematical Economics
FARE*2410 [0.50] Agrifood Markets and Policy

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

Fall Semester
COOP*2000 [0.00] Co-op Work Term II
(Eight month work term Summer/Fall)

Semester 5 - Winter
BUS*3320 [0.50] Financial Management
ECON*3740 [0.50] Introduction to Econometrics
FARE*3310 [0.50] Operations Management
FARE*4240 [0.50] Futures and Options Markets

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

Semester 6 - Fall
ECON*2560 [0.50] Theory of Finance
FAPE*2700 [0.50] Survey of Natural Resource Economics
One of:
ENVS*4300 [0.50] Environmental Law & Regulation
HROB*3050 [0.50] Employment Law
MCS*3040 [0.50] Business and Consumer Law
REAL*4840 [0.50] Housing and Real Estate Law

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

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

Semester 7 - Fall
FAPE*3030 [0.50] The Firm and Markets
FAPE*4370 [0.50] Food & Agri Marketing Management
MGMT*4000 [1.00] Strategic Management

Semester 8 - Winter
AGR*4500 [0.50] Agrifood Industry Problem-Solving
FAPE*4000 [0.50] Agricultural and Food Policy
FAPE*4220 [0.50] Advanced Agribusiness Management

Restricted Electives
1.00 electives or restricted electives

1.50 credits must come from one of the two following streams:

Agribusiness Stream

Three of:
FARE*1300 [0.50] Poverty, Food & Hunger
FARE*2050 [0.50] Markets for Molecules
FARE*3170 [0.50] Cost-Benefit Analysis
FARE*3400 [0.50] Agricultural Finance Management
FARE*4210 [0.50] World Agriculture and Economic Development
FARE*4290 [0.50] Land Economics
FARE*4310 [0.50] Resource Economics
FARE*4360 [0.50] Marketing Research
FARE*4500 [0.50] Decision Science

Agricultural Science Stream

BIOL*1020 [0.50] Introduction to Biology

Two of:
AGR*2320 [0.50] Soils in Agroecosystems
AGR*2350 [0.50] Animal Production Systems, Health and Industry
AGR*2470 [0.50] Introduction to Plant Agriculture
FOOD*3090 [0.50] Food Science and Human Nutrition

Hotel and Food Administration (HJAVA)

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. Students may consult the Faculty Advisor or the B.Comm. Program Counsellor for additional information.

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

For this major, 16.00 of the 20.00 credits are specified as core requirements, 2.00 are restricted electives (from List B), 1.50 are the Liberal Education Requirement and 0.50 are free electives.

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 interested in earning the Certificate in Leadership can use a combination of restricted, Liberal Education and free electives to do so. See http://www.leadershipcertificate.com/ for information about this certificate and its course requirements.

Semester 1
ECON*1050 [0.50] Introductory Microeconomics
HTM*1000 [0.50] Introduction to Hospitality and Tourism Management
MGMT*1000 [1.00] Introduction to Business

Semester 2
ECON*1100 [0.50] Introductory Macroeconomics
HTM*2100 [0.50] Lodging Operations
MATH*1030 [0.50] Business Mathematics
One of:
CHEM*1100 [0.50] Chemistry Today
HTM*2700 [0.50] Introductory Foods

2.00 from List A or List B or electives

*CHEM*1100 must be taken by students without Grade 12 4U Chemistry (SCH4U). If CHEM*1100 is not required, then a total of 2.50 restricted electives are required.

Semester 3
One of:
ECON*2740 [0.50] Economic Statistics
STAT*2060 [0.50] Statistics for Business Decisions

2.00 from List A or List B or electives

Semester 4
2.50 from List A or List B or electives

Semester 5
HTM*3030 [0.50] Beverage Management
2.00 from List A or List B or electives
Semester 6
2.50 from List A or List B or electives

Semester 7
HTM*3060 [0.50] Lodging Management
2.00 from List A or List B or electives

Semester 8
2.50 from List A or List B or electives

List A - Further Required Courses
The following 10.00 credits are also required. Further details on the scheduling of courses will be provided in writing prior to each course selection period by the School’s faculty advisor.

Semester 2 or 3
HTM*2700 [0.50] Introductory Foods

Semester 3 or 4
ACCT*2220 [0.50] Financial Accounting
HROB*2100 [1.00] Managing People in Organizations
HTM*2010 [0.50] Hospitality and Tourism Business Communications
HTM*2030 [0.50] Control Systems in the Hospitality Industry
MCS*2020 [0.50] Marketing Information Management
MCS*3040 [0.50] Business and Consumer Law

Semester 4 or 5
ACCT*2230 [0.50] Management Accounting

Semester 5 or 6
BUS*3320 [0.50] Financial Management
ECON*2560 [0.50] Theory of Finance
HTM*3080 [0.50] Hospitality and Tourism Marketing
HTM*3090 [1.00] Restaurant Operations Management

Semester 6 or 7
HTM*3120 [0.50] Operations Analysis in the Hospitality and Tourism Industry

Semester 7 or 8
HROB*3100 [0.50] Managerial Skills
HTM*4090 [0.50] Hospitality and Tourism Facilities Management and Design
HTM*4190 [0.50] Hospitality and Tourism Operations Planning
MGMT*4000 [1.00] Strategic Management

List B - Restricted Electives
In addition to the 16.00 required credits listed above, students must take a minimum of 2.00 restricted electives throughout the program. Students may choose to explore a variety of subjects or may choose to study an area allied to their major in some depth. Restricted electives are listed below and have been grouped in major topical areas which are related to, or are an extension of, the professional interests of the major. Students may, however, choose restricted electives from any of those listed without regard to the categories, which are intended to be suggestive.

Students may select credits in any second language as restricted electives. Students without a second language are encouraged to take language courses.

Courses dealing with the social and economic environment of business:
ECON*2310 [0.50] Intermediate Microeconomics
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*3520 [0.50] Labour Economics
ECON*3660 [0.50] Economics of Equity Markets
ECON*3760 [0.50] Fundamentals of Derivatives
ECON*3860 [0.50] International Finance
ECON*3960 [0.50] Money, Credit and the Financial System
PHIL*1010 [0.50] Introductory Philosophy: Social and Political Issues
PHIL*2600 [0.50] Business and Professional Ethics
POLS*1400 [0.50] Issues in Canadian Politics

Courses for those interested in developing hospitality related real estate:
REAL*1820 [0.50] Real Estate and Housing
REAL*2820 [0.50] Real Estate Finance
REAL*3810 [0.50] Real Estate Market Analysis
REAL*3890 [0.50] Property Management
REAL*4820 [0.50] Real Estate Appraisal
REAL*4840 [0.50] Housing and Real Estate Law

Courses dealing with human behaviour particularly as related to work and work groups:
ANTH*1150 [0.50] Introduction to Anthropology
HROB*2010 [0.50] Foundations of Leadership
HROB*3050 [0.50] Employment Law
HROB*4010 [0.50] Leadership Capstone
ECON*2200 [0.50] Industrial Relations
PSYC*1200 [0.50] Dynamics of Behaviour
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:
FARE*4360 [0.50] Marketing Research
MCS*2600 [0.50] Fundamentals of Consumer Behaviour
MCS*3000 [0.50] Advanced Marketing
MCS*3010 [0.50] Quality Management
MCS*3620 [0.50] Marketing Communications
MCS*4400 [0.50] Pricing Management
PSYC*1200 [0.50] Dynamics of Behaviour

Courses related to the study of tourism:
EDRD*3580 [0.50] Recreation and Tourism Planning
GEOG*1220 [0.50] Human Impact on the Environment
GEOG*3490 [0.50] Tourism and Environment
HTM*2170 [0.50] Tourism Policy, Planning and Development
HTM*3160 [0.50] Destination Management and Marketing
HTM*4170 [0.50] International Tourism

Courses related to institutional food service 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*2740 [0.50] Cultural Aspects of Food
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] Advanced Restaurant Operations
HTM*4130 [0.50] Current Management Topics
HTM*4250 [0.50] Hospitality Revenue Management
HTM*4500 [0.50] Special Study in Hospitality and Tourism

Courses related to accounting and administration:
ACCT*2240 [0.50] Applied Financial Accounting
ACCT*3230 [0.50] Intermediate Management Accounting
ACCT*3320 [0.50] Auditing I
ACCT*3330 [0.50] Intermediate Financial Accounting I
ACCT*3340 [0.50] Intermediate Financial Accounting II
ACCT*3350 [0.50] Taxation
ACCT*4220 [0.50] Advanced Financial Accounting
ACCT*4230 [0.50] Advanced Management Accounting
MGMT*4200 [0.50] International Business
FARE*3310 [0.50] Operations Management
MC4180 [0.50] Personal Financial Management

Courses to prepare for The Certified Human Resource Professional (CHRP) designation:
ECON*2310 [0.50] Compensation Systems
HROB*3030 [0.50] Occupational Health and Safety
HROB*3070 [0.50] Recruitment and Selection
HROB*3090 [0.50] Training and Development
HROB*4060 [0.50] Human Resources Planning

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
MGMT*4050 [0.50] Applied Community Project I
MGMT*4060 [0.50] Applied Community Project II
PHIL*2100 [0.50] Critical Thinking

Electives and Liberal Education Requirement
In addition to the 16.00 required credits and the 2.00 restricted electives, the student has 2.00 electives throughout the program. These electives must include 1.50 credits toward the B.Comm. Liberal Education Requirement.

Hotel and Food Administration (Co-op) (HAFAC: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. 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.

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
The academic program consists of 20.00 credits, 16.50 of which are specified as core requirements, 2.00 as restricted electives, and 1.50 as the Liberal Education Requirement. 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 interested in earning the Certificate in Leadership can use a combination of restricted, Liberal Education and free electives to do so. See http://www.leadershipcertificate.com/ for information about this certificate and its course requirements.

Semester 1 - Fall
ECON*1050 [0.50] Introductory Microeconomics
HTM*1000 [0.50] Introduction to Hospitality and Tourism Management
MCS*1000 [0.50] Introductory Marketing
MGMT*1000 [1.00] Introduction to Business

Semester 2 - Winter
ECON*1100 [0.50] Introductory Macroeconomics
HTM*2100 [0.50] Lodging Operations
MATH*1030 [0.50] Business Mathematics
One of:*
CHEM*1100 [0.50] Chemistry Today
HTM*2700 [0.50] Introductory Foods
0.50 from List B or electives

Semester 3 - Fall
COOP*1100 [0.00] Introduction to Co-operative Education
One of:
ECON*2740 [0.50] Economic Statistics
STAT*2060 [0.50] Statistics for Business Decisions
2.00 from List A or List B or electives

Semester 4 - Winter
2.50 from List A or List B or electives

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

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

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

Semester 5 - Fall
HTM*3030 [0.50] Beverage Management
2.00 from List A or List B or electives

Semester 6 - Winter
2.50 from List A or List B or electives

Semester 7 - Fall
HTM*3060 [0.50] Lodging Management
HTM*4300 [0.50] Co-operative Education Seminar
1.50 from List A or List B or electives

Semester 8 - Winter
2.50 from List A or List B or electives

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

Human Resources Management (HRM)
Department of Business, College of Management and Economics

The Human Resource Management (HRM) major provides an academic foundation to prepare students for careers as Human Resources practitioners, and for potential certification by the Human Resources Professionals Association (HRPA). The HRM major meets the academic requirements for all of the nine Compulsory Subjects as set out by the HRPA. In addition, students will also have the opportunity to complete the Leadership Certificate.

The HRM major provides students with a traditional business degree with a special emphasis on people within the workplace. HRM related classes extend beyond the traditional lecture based format to include community based group projects, guest lecturers, in-class simulations and case-based learning to help you link academic expertise and theory with industry practice. Experiential learning is an integral part of the major, and occurs through the integration of industry examples in the classroom, and a required applied research course, where students conduct group projects in workplace settings under the direction of a faculty member. Our faculty are highly skilled and committed educators who encourage students to become actively involved in their own education, both within and outside the classroom. In addition, the Human Resources Management Student Association (HRMSA) is active in providing access to HRPA Information, networking events, leadership conferences, Excalibur Human Resource Case Competition, careers night, guest speakers and social events to help students build relationships with other students, faculty, and the business community.

Graduates of this major will leave the University of Guelph equipped with an undergraduate degree as a prepared individual ready to meet the human resources needs of the future. Recent alumni can be found in a variety of HRM positions – both general (e.g., HR manager) and specialist (e.g., recruitment, compensation and benefits, training and development). Some students also choose to pursue further education such as MBA and Law degrees.

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, 16.00 of the 20.00 credits are specified as core requirements and the remaining 4.00 as electives (including 1.50 in the Liberal Education Requirement). 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 interested in earning the Certificate in Leadership can use a combination of restricted, Liberal Education and free electives to do so. See http://www.leadershipcertificate.com/ for information about this certificate and its course requirements.

Semester 1
ECON*1050 [0.50] Introductory Microeconomics
MCS*1000 [0.50] Introductory Marketing
MGMT*1000 [1.00] Introduction to Business
0.50 electives

Semester 2
ECON*1100 [0.50] Introductory Macroeconomics
HTM*2100 [0.50] Lodging Operations
MATH*1030 [0.50] Business Mathematics
One of:*
CHEM*1100 [0.50] Chemistry Today
HTM*2700 [0.50] Introductory Foods
0.50 from List B or electives

Semester 3
ACCT*2220 [0.50] Financial Accounting
ECON*2200 [0.50] Industrial Relations
0.50 electives

Semester 4
ACCT*2230 [0.50] Management Accounting
CIS*1200 [0.50] Introduction to Computing
HROB*2100 [1.00] Managing People in Organizations
MATH*1030 [0.50] Business Mathematics
0.50 electives

Semester 5
ACCT*2230 [0.50] Management Accounting
CIS*1200 [0.50] Introduction to Computing
HROB*2100 [1.00] Managing People in Organizations
MATH*1030 [0.50] Business Mathematics
0.50 electives

Semester 6
ACCT*2230 [0.50] Management Accounting
CIS*1200 [0.50] Introduction to Computing
HROB*2100 [1.00] Managing People in Organizations
MATH*1030 [0.50] Business Mathematics
0.50 electives

Semester 7
HROB*4100 [1.00] Applied Research in Human Resources Management
MGMT*4000 [1.00] Strategic Management

X. Degree Programs, Bachelor of Commerce (B.Comm.)

Last Revision: March 15, 2014

2011-2012 Undergraduate Calendar
Management Economics and Finance (MEF)

Department of Economics and Finance, College of Management & Economics

The Management Economics and Finance major is designed to offer students an appreciation of business and economic problems particularly in the area of finance. The major provides a suitable education for a career in the business world or in the public service. It also constitutes a useful preparation for more advanced studies, including graduate studies in Economics, Business Administration, Accounting, Industrial Relations, Law, and Public Policy. The major is administered by the Department of Economics and Finance and students are urged to consult the faculty advisor. For this major, 11.00 credits are specified, 5.50 are restricted electives in a required area of emphasis and 3.50 are electives. (1.50 Liberal Education Requirement; 2.00 free electives).

Liberal Education Requirement

As part of the graduation requirement all students within the B.Comm. Program are required to complete 1.50 credits from at least two different subject prefixes as listed under the B.Comm. Program Information section of the undergraduate calendar. 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 may use their restricted and free electives towards a professional designation through one of the areas of emphasis.

Major

Semester 1
ECON*1050 [0.50] Introductory Microeconomics
MATH*1030 [0.50] Business Mathematics
MGMT*1000 [1.00] Introduction to Business
One of:
- MATH*1200 [0.50] Calculus I
- MCS*1000 [0.50] Introductory Marketing
0.50 electives

Note: MATH*1200 is required for the Finance Area of Emphasis. MCS*1000 is a required course that should be completed by semester 4.

Semester 2
ACCT*2220 [0.50] Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics
HROB*2100 [1.00] Managing People in Organizations
One of:
- MATH*1210 [0.50] Calculus II
- MCS*1000 [0.50] Introductory Marketing
0.50 electives

Semester 3
ACCT*2230 [0.50] Management Accounting
ECON*2310 [0.50] Intermediate Microeconomics
ECON*2740 [0.50] Economic Statistics
ECON*2770 [0.50] Introductory Mathematical Economics
One of:
- CIS*1200 [0.50] Introduction to Computing
- CIS*1500 [0.50] Introduction to Programming
- MCS*2020 [0.50] Marketing Information Management
Note: Students who wish to take the Statistics courses listed under the Finance Area of Emphasis may select STAT*2040 in place of ECON*2740.

Semester 4
BUS*3320 [0.50] Financial Management
ECON*2410 [0.50] Intermediate Macroeconomics
ECON*2560 [0.50] Theory of Finance
MCS*3040 [0.50] Business and Consumer Law *
One of:
- MCS*1000 [0.50] Introductory Marketing (if not already taken)
0.50 electives or restricted electives in an area of emphasis

* Note: Students may select HROB*3050 or REAL*4840 in place of MCS*3040. Both are Fall semester courses and can be completed in any Fall semester, provided the prerequisites are completed.

Semester 5
ECON*3740 [0.50] Introduction to Econometrics
2.00 electives or restricted electives

Note: ECON*3710 is required for the Finance Area of Emphasis.

Semester 6
One of:

FARE*3310 [0.50] Operations Management
REAL*3890 [0.50] Property Management

2.00 electives or restricted electives

Note: Students may select FARE*4500 in place of FARE*3310 or REAL*3890. It is a Fall semester course available in Semester 7.

Semester 7
MGMT*4000 [1.00] Strategic Management
1.50 electives or restricted electives

Areas of Emphasis

Students choose either Finance or Management as an area of emphasis in the Management and Economics major. This choice should be made by semester 4. See the Economics departmental advisor to declare an area of emphasis.

FINANCE Area of Emphasis

ECON*3710 [0.50] Advanced Microeconomics
ECON*4560 [0.50] Advanced Topics in Finance
1.50 credits from the following Finance courses:
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives **
- ECON*3860 [0.50] International Finance
- ECON*3960 [0.50] Money, Credit and the Financial System
** Note that FARE*4240 may be substituted for this course.
One of:
- ECON*3100 [0.50] Game Theory
- ECON*3810 [0.50] Advanced Macroeconomics
- ECON*4700 [0.50] Advanced Mathematical Economics

1.00 Economics credits at the 3000 or 4000 level

In addition to the required credits listed above, students must take a minimum of 1.5 credits in restricted electives. Restricted electives are listed below and have been grouped in major topical areas which are related to, or are an extension of, the professional interests of the major. Students may, however, choose restricted electives from any of those listed without regard to the categories, which are intended to be suggestive.

Courses toward a professional designation as a Certified Financial Analyst (CFA)

ACCT*3330 [0.50] Intermediate Financial Accounting I
ECON*4400 [0.50] Economics of Organizations and Corporate Governance
ECON*4660 [0.50] Financial Markets Risk Management
ECON*4750 [0.50] Topics in Public Economics
ECON*4760 [0.50] Topics in Monetary Economics
ECON*4780 [0.50] Topics in Industrial Organization
ECON*4800 [0.50] Competitiveness and Strategic Advantage
ECON*4880 [0.50] Topics in International Economics

Courses in Quantitative Finance

ECON*4640 [0.50] Applied Econometrics I
ECON*4840 [0.50] Applied Econometrics II
MATH*2160 [0.50] Linear Algebra I
STAT*3100 [0.50] Introductory Mathematical Statistics I
STAT*3110 [0.50] Introductory Mathematical Statistics II

Courses in preparation for post-graduate work in Economics (MA)

ECON*4640 [0.50] Applied Econometrics I
ECON*4710 [0.50] Advanced Topics in Microeconomics
ECON*4810 [0.50] Advanced Topics in Macroeconomics

MANAGEMENT Area of Emphasis

1.50 credits from the following Finance courses:
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives **
- ECON*3860 [0.50] International Finance
- ECON*3960 [0.50] Money, Credit and the Financial System
** Note that FARE*4240 may be substituted for this course.

2.50 additional credits in economics of which at least 0.50 must be at the 4000 level and at most 0.50*** may be at the 2000 level.

*** May be replaced with a 4000 level 0.50 credits in Accounting.

In addition to the economics credits listed above, students must take a minimum of 1.50 credits in restricted electives. Restricted electives have been grouped in major topical areas which are related to various professional interests. Students may, however, choose restricted electives from any of those listed without regard to the categories.

Courses toward a professional accounting designation such as Certified Management Accounting (CMA), Certified Accounting (CA) Courses, Certified General Accounting (CGA) Courses

Please note, course requirements for the postgraduate professional accounting designations vary. Students may consult their Faculty Advisor, the B.Com Program counsellor or the department website: http://www.business.queensu.ca/accounting.shtml for additional information.

ACCT*2240 [0.50] Applied Financial Accounting
ACCT*3230 [0.50] Intermediate Management Accounting
Courses to prepare for the Certified Human Resource Professional (CHRP) designation:
(see http://www.uoguelph.ca/business/academic-advisor-careers-chrp.shtml for more information)

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<td>Occupational Health and Safety</td>
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<td>HROB*3070</td>
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<td>Recruitment and Selection</td>
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<td>HROB*3090</td>
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<tr>
<td>HROB*4060</td>
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Courses to prepare for a post-graduate program in Industrial Relations:

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<td>ECON*3620</td>
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</table>

Courses toward the Leadership Certificate:
(see http://www.certificateleadership.com/ for more information)

<table>
<thead>
<tr>
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<th>Credit</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>HROB*2010</td>
<td>0.50</td>
<td>Foundations of Leadership</td>
</tr>
<tr>
<td>HROB*4010</td>
<td>0.50</td>
<td>Leadership Capstone</td>
</tr>
<tr>
<td>HROB*4030</td>
<td>0.50</td>
<td>Advanced Topics in Human Resource Management</td>
</tr>
<tr>
<td>HROB*4100</td>
<td>1.00</td>
<td>Applied Research in Human Resources Management</td>
</tr>
<tr>
<td>POLS*2250</td>
<td>0.50</td>
<td>Public Administration and Governance</td>
</tr>
<tr>
<td>POLS*3440</td>
<td>0.50</td>
<td>Corruption, Scandal and Political Ethics</td>
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Courses in Public Administration:

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<th>Credit</th>
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<tr>
<td>ECON*3610</td>
<td>0.50</td>
<td>Public Economics</td>
</tr>
<tr>
<td>POLS*2250</td>
<td>0.50</td>
<td>Public Administration and Governance</td>
</tr>
<tr>
<td>POLS*3200</td>
<td>0.50</td>
<td>Canadian Government and Politics</td>
</tr>
<tr>
<td>POLS*3210</td>
<td>0.50</td>
<td>The Constitution and Canadian Federalism</td>
</tr>
<tr>
<td>POLS*3250</td>
<td>0.50</td>
<td>Public Policy: Challenges and Prospects</td>
</tr>
<tr>
<td>POLS*3270</td>
<td>0.50</td>
<td>Local Government in Ontario</td>
</tr>
<tr>
<td>POLS*3470</td>
<td>0.50</td>
<td>Business-Government Relations in Canada</td>
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Courses in Real Estate and Housing:

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<th>Credit</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ECON*3500</td>
<td>0.50</td>
<td>Urban Economics **</td>
</tr>
<tr>
<td>REAL*1820</td>
<td>0.50</td>
<td>Real Estate and Housing</td>
</tr>
<tr>
<td>REAL*2820</td>
<td>0.50</td>
<td>Real Estate Finance</td>
</tr>
<tr>
<td>REAL*3890</td>
<td>0.50</td>
<td>Property Management</td>
</tr>
<tr>
<td>REAL*4820</td>
<td>0.50</td>
<td>Real Estate Appraisal **</td>
</tr>
</tbody>
</table>

** These courses count towards the Post Graduate Valuation Certificate offered by UBC, part of the requirements to obtain an Accredited Appraiser Canadian Institute designation.

Courses in Corporate Social Responsibility:

<table>
<thead>
<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
<td>BUS*4550</td>
<td>0.50</td>
<td>Applied Business Project I</td>
</tr>
<tr>
<td>BUS*4560</td>
<td>0.50</td>
<td>Applied Business Project II</td>
</tr>
<tr>
<td>ECON*2650</td>
<td>0.50</td>
<td>Introductory Development Economics</td>
</tr>
<tr>
<td>ECON*3300</td>
<td>0.50</td>
<td>Economics of Health and the Workplace</td>
</tr>
<tr>
<td>ECON*4930</td>
<td>0.50</td>
<td>Environmental Economics</td>
</tr>
<tr>
<td>HROB*3030</td>
<td>0.50</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>REAL*2850</td>
<td>0.50</td>
<td>Service Learning in Housing</td>
</tr>
<tr>
<td>MGMT*3020</td>
<td>0.50</td>
<td>Corporate Social Responsibility</td>
</tr>
<tr>
<td>MGMT*4050</td>
<td>0.50</td>
<td>Applied Community Project I</td>
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<tr>
<td>MGMT*4060</td>
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Courses in Marketing:

<table>
<thead>
<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>MCS*2600</td>
<td>0.50</td>
<td>Fundamentals of Consumer Behaviour</td>
</tr>
<tr>
<td>MCS*3000</td>
<td>0.50</td>
<td>Advanced Marketing</td>
</tr>
<tr>
<td>MCS*3010</td>
<td>0.50</td>
<td>Quality Management</td>
</tr>
<tr>
<td>MCS*3620</td>
<td>0.50</td>
<td>Marketing Communications</td>
</tr>
<tr>
<td>MCS*4400</td>
<td>0.50</td>
<td>Pricing Management</td>
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Courses in Food and Agribusiness:

<table>
<thead>
<tr>
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<th>Credit</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>FARE*2050</td>
<td>0.50</td>
<td>Markets for Molecules</td>
</tr>
<tr>
<td>FARE*2410</td>
<td>0.50</td>
<td>Agrifood Markets and Policy</td>
</tr>
<tr>
<td>FARE*3030</td>
<td>0.50</td>
<td>The Firm and Markets</td>
</tr>
</tbody>
</table>
Summer Semester

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

Fall Semester

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

Semester 5 - Winter

ECON*3740 [0.50] Introduction to Econometrics

One of:
- FARE*3310 [0.50] Operations Management
- FARE*4500 [0.50] Decision Science
- REAL*3890 [0.50] Property Management

1.50 electives or restricted electives

Note: Students may select FARE*4500 in place of FARE*3310 or REAL*3890. It is a Fall semester course.

Summer Semester

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

Semester 6 - Fall

2.50 electives or restricted electives

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

Winter Semester

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

Summer Semester

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

Semester 7 - Fall

2.50 electives or restricted electives

Semester 8 - Winter

MGMT*4000 [1.00] Strategic Management

1.50 electives or restricted electives

Areas of Emphasis

Students choose either Finance or Management as an area of emphasis in the Management and Economics major. This choice should be made by semester 4. See the Economics departmental advisor to declare an area of emphasis.

FINANCE Area of Emphasis

ECON*3710 [0.50] Advanced Microeconomics
ECON*4560 [0.50] Advanced Topics in Finance

1.50 credits from the following Finance courses:
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives **
- ECON*3860 [0.50] International Finance
- ECON*3960 [0.50] Money, Credit and the Financial System

** Note that FARE*4240 may be substituted for this course.

One of:
- ECON*3100 [0.50] Game Theory
- ECON*3810 [0.50] Advanced Macroeconomics
- ECON*4700 [0.50] Advanced Mathematical Economics

1.00 Economics credits at the 3000 or 4000 level
In addition to the required credits listed above, students must take a minimum of 1.5 credits in restricted electives. Restricted electives are listed below and have been grouped in major topical areas which are related to, or are an extension of, the professional interests of the major. Students may, however, choose restricted electives from any of those listed without regard to the categories, which are intended to be suggestive.

Courses toward a professional designation as a Certified Financial Analyst (CFA):
- ACCT*3330 [0.50] Intermediate Financial Accounting I
- ECON*4400 [0.50] Economics of Organizations and Corporate Governance
- ECON*4660 [0.50] Financial Markets Risk Management
- ECON*4750 [0.50] Topics in Public Economics
- ECON*4760 [0.50] Topics in Monetary Economics
- ECON*4780 [0.50] Topics in Industrial Organization
- ECON*4800 [0.50] Competitiveness and Strategic Advantage
- ECON*4880 [0.50] Topics in International Economics

Courses in Quantitative Finance:
- ECON*4640 [0.50] Applied Econometrics I
- ECON*4840 [0.50] Applied Econometrics II
- MATH*2160 [0.50] Linear Algebra I
- STAT*3100 [0.50] Introductory Mathematical Statistics I
- STAT*3110 [0.50] Introductory Mathematical Statistics II

Courses in preparation for post-graduate work in Economics (MA):
- ECON*4640 [0.50] Applied Econometrics I
- ECON*4710 [0.50] Advanced Topics in Microeconomics
- ECON*4810 [0.50] Advanced Topics in Macroeconomics

MANAGEMENT Area of Emphasis

1.50 credits from the following Finance courses:
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3760 [0.50] Fundamentals of Derivatives **
- ECON*3860 [0.50] International Finance
- ECON*3960 [0.50] Money, Credit and the Financial System

** Note that FARE*4240 may be substituted for this course.

2.50 additional credits in economics of which at least 0.50 must be at the 4000 level and at most 0.50** may be at the 2000 level.

** May be replaced with a 4000 level 0.50 credits in Accounting.

In addition to the economics credits listed above, students must take a minimum of 1.50 credits in restricted electives listed below. These courses have been grouped in major topical areas which are related to various professional interests. Students may, however, choose restricted electives from any of those listed without regard to the categories.

Courses toward a professional accounting designation such as Certified Management Accounting (CMA), Certified Accounting (CA) Courses, Certified General Accounting (CGA) Courses

Please note, course requirements for the postgraduate professional accounting designations vary. Students may consult their Faculty Advisor, the B.Com Program counsellor or the department website: http://www.business.uoguelph.ca/accounting.shtml for additional information.

ACCT*2240 [0.50] Applied Financial Accounting
ACCT*3230 [0.50] Intermediate Management Accounting
ACCT*3280 [0.50] Auditing I
ACCT*3330 [0.50] Intermediate Financial Accounting I
ACCT*3340 [0.50] Intermediate Financial Accounting II
ACCT*3550 [0.50] Taxation
ACCT*4220 [0.50] Advanced Financial Accounting
ACCT*4230 [0.50] Advanced Management Accounting
ACCT*4240 [1.00] Accounting Theory and Integrated Cases
ACCT*4270 [0.50] Auditing II
ACCT*4290 [0.50] Auditing III
ACCT*4350 [0.50] Income Taxation II
ACCT*4420 [0.50] Advanced Management Accounting

Courses to prepare for the Certified Human Resource Professional (CHR) designation:

(see http://www.uoguelph.ca/business/academic-advisor-careers-chrp.shtml for more information)

ECON*2200 [0.50] Industrial Relations
HROB*3010 [0.50] Compensation Systems
HROB*3030 [0.50] Occupational Health and Safety
HROB*3070 [0.50] Recruitment and Selection
HROB*3090 [0.50] Training and Development
HROB*4060 [0.50] Human Resources Planning

Courses to prepare for a post-graduate program in Industrial Relations:

ECON*2200 [0.50] Industrial Relations
ECON*3520 [0.50] Labour Economics
ECON*3620 [0.50] International Trade
ECON*4790 [0.50] Topics in Labour Market Theory
HROB*3010 [0.50] Compensation Systems
HROB*3030 [0.50] Occupational Health and Safety
HROB*3070 [0.50] Recruitment and Selection
HROB*3090 [0.50] Training and Development
HROB*4060 [0.50] Human Resources Planning

Courses toward the Leadership Certificate:

(see http://www.leadershipcertificate.com/ for more information)

HROB*2010 [0.50] Foundations of Leadership
HROB*4010 [0.50] Leadership Capstone
HROB*4030 [0.50] Advanced Topics in Human Resource Management
HROB*4100 [1.00] Applied Research in Human Resources Management
POLS*2250 [0.50] Public Administration and Governance
POLS*3440 [0.50] Corruption, Scandal and Political Ethics

Courses in Public Administration:

ECON*3610 [0.50] Public Economics
POLS*2250 [0.50] Public Administration and Governance
POLS*2300 [0.50] Canadian Government and Politics
POLS*3210 [0.50] The Constitution and Canadian Federalism
POLS*3250 [0.50] Public Policy: Challenges and Prospects
POLS*3270 [0.50] Local Government in Ontario
POLS*3470 [0.50] Business-Government Relations in Canada

Courses in Real Estate and Housing:

ECON*3500 [0.50] Urban Economics **
REAL*1820 [0.50] Real Estate and Housing
REAL*2820 [0.50] Real Estate Finance
REAL*3890 [0.50] Property Management
REAL*4820 [0.50] Real Estate Appraisal **

** These courses count towards the Post Graduate Valuation Certificate offered by UCIB, part of the requirements to obtain an Accredited Appraiser Canadian Institute designation
Courses in Corporate Social Responsibility:

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<td>BUS*4550</td>
<td>Applied Business Project I</td>
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<tr>
<td>ECON*4930</td>
<td>Environmental Economics</td>
<td>0.50</td>
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<td>Occupational Health and Safety</td>
<td>0.50</td>
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<td>REAL*2850</td>
<td>Service Learning in Housing</td>
<td>0.50</td>
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<tr>
<td>MGMT*3020</td>
<td>Corporate Social Responsibility</td>
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</tr>
<tr>
<td>MGMT*4050</td>
<td>Applied Community Project I</td>
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Courses in Marketing:

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<tr>
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<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MCS*2600</td>
<td>Fundamentals of Consumer Behaviour</td>
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<td>MCS*3000</td>
<td>Advanced Marketing</td>
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<td>MCS*3010</td>
<td>Quality Management</td>
<td>0.50</td>
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<td>MCS*3620</td>
<td>Marketing Communications</td>
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<tr>
<td>MCS*4400</td>
<td>Pricing Management</td>
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Courses in Food and Agribusiness:

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<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>FARE*2050</td>
<td>Markets for Molecules</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*2410</td>
<td>Agrifood Markets and Policy</td>
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<tr>
<td>FARE*4000</td>
<td>Agricultural and Food Policy</td>
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</tr>
<tr>
<td>FARE*4220</td>
<td>Advanced Agribusiness Management</td>
<td>0.50</td>
</tr>
</tbody>
</table>

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 based 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 a Marketing and Consumer Studies Faculty Advisor 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 14.00 are specified, 2.00 are restricted electives (from lists), 1.50 are Liberal Education electives, and 2.50 are free electives. A possible program sequence is outlined below.

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. Examples: (1) students can use a combination of restricted, Liberal Education, and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information about this certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. Note: students also can take courses of interest as electives without concern for clustering.

Semester 1 - Fall

<table>
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<td>MGMT*1000</td>
<td>Introduction to Business</td>
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Semester 2 - Winter

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<td>ECON*1100</td>
<td>Introductory Macroeconomics</td>
<td>0.50</td>
</tr>
<tr>
<td>MCS*1000</td>
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Semesters 1 or 2 - Fall or Winter

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<tr>
<td>MATH*1030</td>
<td>Business Mathematics</td>
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<td>PSYC*1200</td>
<td>Dynamics of Behaviour</td>
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</tr>
<tr>
<td>0.50 Marketing Environment electives (see List E1)</td>
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<tr>
<td>0.50 electives</td>
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Semester 3 - Fall

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<tr>
<td>ACCT*2230</td>
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<td>HROB*2100</td>
<td>Managing People in Organizations</td>
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<td>MCS*2000</td>
<td>Business in a Changing World</td>
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Semester 4 - Winter

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<td>STAT*2060</td>
<td>Statistics for Business Decisions</td>
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Semesters 3 or 4 - Fall or Winter

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<tr>
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<td>Fundamentals of Consumer Behaviour</td>
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<tr>
<td>MCS*3040</td>
<td>Business and Consumer Law</td>
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<tr>
<td>0.50 History/Global Perspective electives (see List E2)</td>
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Semester 5 - Fall

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<td>MCS*3030</td>
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Semester 6 - Winter

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<tbody>
<tr>
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Semesters 5 or 6 - Fall or Winter

<table>
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<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
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<td>Financial Management</td>
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</tr>
<tr>
<td>ECON*2560</td>
<td>Theory of Finance</td>
<td>0.50</td>
</tr>
<tr>
<td>FARE*3310</td>
<td>Operations Management</td>
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<tr>
<td>HROB*3100</td>
<td>Managerial Skills</td>
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</tr>
<tr>
<td>MCS*3620</td>
<td>Marketing Communications</td>
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</tr>
<tr>
<td>0.50 Leadership/Professionalism electives (see List E3)</td>
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</tr>
<tr>
<td>1.00 electives</td>
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Restricted Electives for the Marketing Management Major

The electives in the B.Comm. Marketing Management program help ensure achievement of all of the University's 10 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).

Substitutions for restricted electives will be allowed if a Marketing and Consumer Studies Faculty Advisor agrees that a proposed alternative is relevant to marketing in today's world and has an appropriate level of rigour.

Marketing Environment Elective - List E1

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGR*1250</td>
<td>Agrifood System Trends &amp; Issues</td>
<td>0.50</td>
</tr>
<tr>
<td>ANTH*1150</td>
<td>Introduction to Anthropology</td>
<td>0.50</td>
</tr>
<tr>
<td>ARTH*1220</td>
<td>The Visual Arts Today</td>
<td>0.50</td>
</tr>
<tr>
<td>EDRD*1400</td>
<td>Introduction to Design</td>
<td>0.50</td>
</tr>
<tr>
<td>FRHD*1010</td>
<td>Human Development</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*1200</td>
<td>Society and Space</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*1220</td>
<td>Human Impact on the Environment</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*2510</td>
<td>Canada: A Regional Synthesis</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*2610</td>
<td>Contemporary Canadian Issues</td>
<td>0.50</td>
</tr>
<tr>
<td>NUTR*1010</td>
<td>Nutrition and Society</td>
<td>0.50</td>
</tr>
<tr>
<td>PHIL*2070</td>
<td>Philosophy of the Environment</td>
<td>0.50</td>
</tr>
<tr>
<td>POLS*1400</td>
<td>Issues in Canadian Politics</td>
<td>0.50</td>
</tr>
<tr>
<td>POLS*2250</td>
<td>Public Administration and Governance</td>
<td>0.50</td>
</tr>
<tr>
<td>POLS*2300</td>
<td>Canadian Government and Politics</td>
<td>0.50</td>
</tr>
<tr>
<td>SOC*1100</td>
<td>Sociology</td>
<td>0.50</td>
</tr>
</tbody>
</table>

History/Global Elective - List E2

To help marketing majors develop a sense of the fundamental relativity of knowledge and understanding over time and/or to help them gain the global perspective needed in senior marketing courses, marketing management majors must take one [0.50 credits] of:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTH*2490</td>
<td>History of Canadian Art</td>
<td>0.50</td>
</tr>
<tr>
<td>BIOL*1500</td>
<td>Humans in the Natural World</td>
<td>0.50</td>
</tr>
<tr>
<td>EURO*1050</td>
<td>The Emergence of a United Europe</td>
<td>0.50</td>
</tr>
<tr>
<td>GEOG*2030</td>
<td>Political Ecology &amp; Geography</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1150</td>
<td>The Modern World</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1250</td>
<td>Science and Society Since 1500</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*2070</td>
<td>World Religions in Historical Perspective</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*2250</td>
<td>Environment and History</td>
<td>0.50</td>
</tr>
</tbody>
</table>
### Leadership/Professionalism Elective - List E3
To help prepare senior marketing management majors for leadership positions in organizations, they must take one (0.50 credits) of:
- ECON*2310 [0.50] Intermediate Microeconomics
- ECON*2410 [0.50] Intermediate Macroeconomics
- EDRI*3160 [0.50] International Communication
- EDRI*4120 [0.50] Leadership Development in Small Organizations
- HROB*2010 [0.50] Foundations of Leadership
- MCS*3080 [0.50] The Corporation and Society
- MGMT*3020 [0.50] Corporate Social Responsibility
- MGMT*4260 [0.50] International Business
- PHIL*2100 [0.50] Critical Thinking
- PHIL*2120 [0.50] Ethics
- PHIL*2600 [0.50] Business and Professional Ethics

### Advanced Marketing Capstone Elective - List E4
To enhance their understanding of marketing in terms of theory and/or application, senior marketing management majors must take one (0.50 credits) of:
- HROB*4010 [0.50] Leadership Capstone
- 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*4100 [0.50] Entrepreneurship
- MCS*4020 [0.50] Research in Consumer Studies
- MCS*4300 [0.50] Marketing and Society
- MCS*4400 [0.50] Pricing Management
- MCS*4910 [0.50] Topics in Consumer Studies
- MCS*4920 [0.50] Topics in Consumer Studies
- MCS*4950 [0.50] Consumer Studies Practicum
- MCS*4960 [0.50] Applied Community Project I
- MCS*4960 [0.50] Applied Community Project II

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

#### Department of Marketing and Consumer Studies, College of Management and Economics
The Co-op program in Marketing Management is designed to facilitate the transition of students from academic studies to a professional career by enhancing the integration of theory and practice.

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

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

For additional program information, students should consult with the B.Comm. Program Counsellors or the MKMN Co-op Faculty Advisor.

#### 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 14.00 are specified, 2.00 are restricted electives (from lists), 1.50 are Liberal Education electives, and 2.50 are free electives. A possible program sequence is outlined below.

<table>
<thead>
<tr>
<th>Semester 1 - Fall</th>
<th>Semester 2 - Winter</th>
<th>Semester 3 or 4 - Fall or Winter</th>
<th>Semester 5 - Winter</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECON*1050 [0.50] Introductory Microeconomics</td>
<td>MGMT*1000 [1.00] Introduction to Business</td>
<td>ACCT*2220 [0.50] Financial Accounting</td>
<td>MCS*1000 [0.50] Introductory Marketing</td>
</tr>
<tr>
<td>ECON*1050 [0.50] Introductory Microeconomics</td>
<td>MGMT*1000 [1.00] Introduction to Business</td>
<td>ECON*1100 [0.50] Introductory Macroeconomics</td>
<td>MATH*1030 [0.50] Business Mathematics</td>
</tr>
<tr>
<td>MGMT*1000 [1.00] Introduction to Business</td>
<td>MATH*1030 [0.50] Business Mathematics</td>
<td>PSYC*1200 [0.50] Dynamics of Behaviour</td>
<td>ECON*1050 [0.50] Consumer Behaviour</td>
</tr>
<tr>
<td>MATH*1030 [0.50] Business Mathematics</td>
<td>MCS*3020 [0.50] Financial Management</td>
<td>MCS*2600 [0.50] Fundamentals of Consumer Behaviour</td>
<td>MCS*3040 [0.50] Marketing Management</td>
</tr>
<tr>
<td>PSYC*1200 [0.50] Dynamics of Behaviour</td>
<td>MCS*2600 [0.50] Fundamentals of Consumer Behaviour</td>
<td>MCS*3620 [0.50] Marketing Communications</td>
<td>MCS*3040 [0.50] Marketing Management</td>
</tr>
<tr>
<td>MPS*1000 [0.50] Financial Management</td>
<td>MCS*3620 [0.50] Marketing Communications</td>
<td>0.50 History/GLOBAL Perspective electives (see List E2)</td>
<td>MCS*3500 [0.50] Market Analysis and Planning</td>
</tr>
<tr>
<td>MPS*1000 [0.50] Financial Management</td>
<td>MCS*3620 [0.50] Marketing Communications</td>
<td>0.50 History/GLOBAL Perspective electives (see List E2)</td>
<td>0.50 Leadership/Professionalism electives (see List E3)</td>
</tr>
<tr>
<td>MPS*1000 [0.50] Financial Management</td>
<td>MCS*3620 [0.50] Marketing Communications</td>
<td>0.50 History/GLOBAL Perspective electives (see List E2)</td>
<td>1.50 electives</td>
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<td>1.50 electives</td>
</tr>
<tr>
<td>MPS*1000 [0.50] Financial Management</td>
<td>MCS*3620 [0.50] Marketing Communications</td>
<td>0.50 History/GLOBAL Perspective electives (see List E2)</td>
<td>1.50 electives</td>
</tr>
<tr>
<td>MPS*1000 [0.50] Financial Management</td>
<td>MCS*3620 [0.50] Marketing Communications</td>
<td>0.50 History/GLOBAL Perspective electives (see List E2)</td>
<td>1.50 electives</td>
</tr>
</tbody>
</table>

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. Examples: (1) students can use a combination of restricted, Liberal Education, and free electives to earn the Certificate in Leadership. See [http://www.leadershipcertificate.com/](http://www.leadershipcertificate.com/) for information about this certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. Note: students also can take courses of interest as electives without concern for clustering.
Restricted Electives for the Marketing Management Major

The electives in the B.Comm. Marketing Management program help ensure achievement of all of the University's 10 Learning Outcomes 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).

Substitutions for restricted electives will be allowed if a Marketing and Consumer Studies Faculty Advisor agrees that a proposed alternative is relevant to marketing in today's world and has an appropriate level of rigor.

Marketing Environment Elective - List E1

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

- 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
- 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
- POLS*2300 [0.50] Canadian Government and Politics
- SOC*1100 [0.50] Sociology

History/Global Elective - List E2

To help marketing majors develop a sense of the fundamental relativity of knowledge and understanding over time and/or to help them gain the global perspective needed in senior marketing courses, marketing management majors must take one [0.50 credits] of:

- ARTH*2490 [0.50] History of Canadian Art
- BIOL*1500 [0.50] Humans in the Natural World
- EURO*1050 [0.50] The Emergence of a United Europe
- GEOG*2030 [0.50] Political Ecology & Geography
- HIST*1150 [0.50] The 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*2300 [0.50] The United States Since 1776
- HIST*2510 [0.50] Modern Europe Since 1789
- HIST*2800 [0.50] The History of the Modern Family
- HIST*2910 [0.50] Modern Asia
- HIST*2930 [0.50] Women and Cultural Change
- HIST*3070 [0.50] Modern India
- HIST*3150 [0.50] History and Culture of Mexico
- ISS*2000 [0.50] Asia
- MUSC*2280 [0.50] Masterworks of Music
- POLS*1500 [0.50] World Politics
- POLS*2080 [0.50] Development and Underdevelopment
- POLS*2200 [0.50] International Relations

Leadership/Professionalism Elective - List E3

To help prepare senior marketing management majors for leadership positions in organizations, they must take one [0.50 credits] of:

- ECON*2310 [0.50] Intermediate Microeconomics
- ECON*2410 [0.50] Intermediate Macroeconomics
- EDRD*3160 [0.50] International Communication
- EDRD*4120 [0.50] Leadership Development in Small Organizations
- HROB*2010 [0.50] Foundations of Leadership
- MCS*3080 [0.50] The Corporation and Society
- MGMT*3020 [0.50] Corporate Social Responsibility
- MGMT*4260 [0.50] International Business
- PHIL*2100 [0.50] Critical Thinking
- PHIL*2120 [0.50] Ethics
- PHIL*2600 [0.50] Business and Professional Ethics

Advanced Marketing Capstone Elective - List E4

To enhance their understanding of marketing in terms of theory and/or application, senior marketing management majors must take one [0.50 credits] of:

- HROB*4010 [0.50] Leadership Capstone

- MCS*3100 [0.50] Quality Management
- MCS*4040 [0.50] Management in Product Development
- MCS*4050 [0.50] The Evolution of Capitalism: A Canadian Perspective
- MCS*4100 [0.50] Entrepreneurship
- MCS*4020 [0.50] Research in Consumer Studies
- MCS*4300 [0.50] Marketing and Society
- MCS*4400 [0.50] Pricing Management
- MCS*4910 [0.50] Topics in Consumer Studies
- MCS*4920 [0.50] Topics in Consumer Studies
- MCS*4950 [0.50] Consumer Studies Practicum
- MGMT*4050 [0.50] Applied Community Project I
- MGMT*4060 [0.50] Applied Community Project II

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 multidisciplinary approach employing both a 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.

Students enrolled in the PMGT major complete three of the five required courses for the Certificate in Leadership as part of their core requirements for the program. If you would like to graduate both with a BComm degree and the Certificate in Leadership you should use two of your free electives to enrol in HROB*2100 in either semester 3 or 6 and HROB*4100 in semester 8. In addition to the five degree-credit courses selected from the above list, 120 hours of leadership practice are required to obtain the undergraduate Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements.

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.

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, 17.00 of the 20.00 credits are specified as core requirements and the remaining 3.00 as electives (including the Liberal Education Requirements of 1.50 credits).

Semester 1

- ECON*1050 [0.50] Introductory Microeconomics
- MCS*1000 [0.50] Introductory Marketing
- POLS*1000 [1.00] Introduction to Business
- POLS*1400 [0.50] Issues in Canadian Politics

Semester 2

- ECON*1100 [0.50] Introductory Macroeconomics
- HROB*2100 [1.00] Managing People in Organizations
- MATH*1030 [0.50] Business Mathematics
- POLS*2300 [0.50] Canadian Government and Politics

Semester 3

- ACC*2220 [0.50] Financial Accounting
- ECON*2310 [0.50] Intermediate Microeconomics
- POLS*3250 [0.50] Public Policy: Challenges and Prospects
- One of:
  - ECON*2200 [0.50] Industrial Relations
  - ECON*2650 [0.50] Introductory Development Economics
- One of:
  - ECON*2740 [0.50] Economic Statistics
  - STAT*2060 [0.50] Statistics for Business Decisions

Semester 4

- ACC*2220 [0.50] Management Accounting
- MCS*2020 [0.50] Marketing Information Management
- POLS*2250 [0.50] Public Administration and Governance
- One of:
  - MGMT*3020 [0.50] Corporate Social Responsibility
  - PHIL*2600 [0.50] Business and Professional Ethics
- 0.50 electives
Semester 5
BUS*3320 [0.50] Financial Management
ECON*2560 [0.50] Theory of Finance
FARE*3310 [0.50] Operations Management
POL*3470 [0.50] Business-Government Relations in Canada
One of:
MCS*3040 [0.50] Business and Consumer Law
HROB*3050 [0.50] Employment Law

Semester 6
POL*3310 [0.50] The Constitution and Canadian Federalism
POL*3367 [0.50] Comparative Public Policy and Administration
POL*3327 [0.50] Local Government in Ontario
POL*3440 [0.50] Corruption, Scandal and Political Ethics
0.50 electives

Semester 7
ECON*3610 [0.50] Public Economics
POL*4250 [0.50] Topics in Public Management
One of:
POL*4970 [0.50] Honours Political Science Research I
0.50 credits at the 4000 level in Political Science
1.00 electives

Semester 8
MGMT*4000 [1.00] Strategic Management
One of:
POL*4980 [0.50] Honours Political Science Research II
0.50 credits at the 4000 level in Political Science
1.00 electives

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 website.

Students enrolled in the PMGT major complete three of the five required courses for the Certificate in Leadership as part of their core requirements for the program. If you would like to graduate both with a BComm degree and the Certificate in Leadership you should consult with your Co-op Co-ordinator and Co-op Faculty Advisor.

Degree Programs, Bachelor of Commerce (B.Comm.)

Semester 3 - Fall
ACCT*2220 [0.50] Financial Accounting
COOP*1100 [0.00] Introduction to Co-operative Education
ECON*2310 [0.50] Intermediate Microeconomics
POL*3325 [0.50] Public Policy: Challenges and Prospects
One of:
ECON*2200 [0.50] Industrial Relations
ECON*2650 [0.50] Introductory Development Economics
ECON*2740 [0.50] Economic Statistics

Semester 4 - Winter
ACCT*2230 [0.50] Management Accounting
MCS*2020 [0.50] Marketing Information Management
POL*3250 [0.50] Public Administration and Governance
One of:
MGMT*3020 [0.50] Corporate Social Responsibility
PHIL*2600 [0.50] Business and Professional Ethics
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
BUS*3320 [0.50] Financial Management
ECON*2560 [0.50] Theory of Finance
FARE*3310 [0.50] Operations Management
POL*3470 [0.50] Business-Government Relations in Canada
0.50 electives

Semester 6 - Fall
ACCT*2220 [0.50] Financial Accounting
COOP*1100 [0.00] Introduction to Co-operative Education
ECON*2310 [0.50] Intermediate Microeconomics
POL*3325 [0.50] Public Policy: Challenges and Prospects
One of:
ECON*2200 [0.50] Industrial Relations
ECON*2650 [0.50] Introductory Development Economics
ECON*2740 [0.50] Economic Statistics

Semester 7 - Fall
ACCT*2230 [0.50] Management Accounting
MCS*2020 [0.50] Marketing Information Management
POL*3250 [0.50] Public Administration and Governance
One of:
MGMT*3020 [0.50] Corporate Social Responsibility
PHIL*2600 [0.50] Business and Professional Ethics
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
BUS*3320 [0.50] Financial Management
ECON*2560 [0.50] Theory of Finance
FARE*3310 [0.50] Operations Management
POL*3470 [0.50] Business-Government Relations in Canada
0.50 electives

Semester 6 - Fall
ACCT*2220 [0.50] Financial Accounting
COOP*1100 [0.00] Introduction to Co-operative Education
ECON*2310 [0.50] Intermediate Microeconomics
POL*3325 [0.50] Public Policy: Challenges and Prospects
One of:
ECON*2200 [0.50] Industrial Relations
ECON*2650 [0.50] Introductory Development Economics
ECON*2740 [0.50] Economic Statistics

Semester 7 - Fall
ACCT*2230 [0.50] Management Accounting
MCS*2020 [0.50] Marketing Information Management
POL*3250 [0.50] Public Administration and Governance
One of:
MGMT*3020 [0.50] Corporate Social Responsibility
PHIL*2600 [0.50] Business and Professional Ethics
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

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

Semester 6 - Fall
ACCT*2220 [0.50] Financial Accounting
COOP*1100 [0.00] Introduction to Co-operative Education
ECON*2310 [0.50] Intermediate Microeconomics
POL*3325 [0.50] Public Policy: Challenges and Prospects
One of:
ECON*2200 [0.50] Industrial Relations
ECON*2650 [0.50] Introductory Development Economics
ECON*2740 [0.50] Economic Statistics

Semester 7 - Fall
ACCT*2230 [0.50] Management Accounting
MCS*2020 [0.50] Marketing Information Management
POL*3250 [0.50] Public Administration and Governance
One of:
MGMT*3020 [0.50] Corporate Social Responsibility
PHIL*2600 [0.50] Business and Professional Ethics
0.50 electives

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

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

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

Semester 7 - Fall
MGMT*4000 [1.00] Strategic Management
POL*4250 [0.50] Topics in Public Management
One of:
POL*4970 [0.50] Honours Political Science Research I
0.50 credits at the 4000 level in Political Science
0.50 electives

Semester 8 - Winter
MGMT*4000 [1.00] Strategic Management
POL*4250 [0.50] Topics in Public Management
One of:
POL*4980 [0.50] Honours Political Science Research II
0.50 credits at the 4000 level in Political Science
0.50 electives

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 to graduate work in business, planning or the social sciences.

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. Examples: (1) students can use Liberal Education and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. (3) Students interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking the additional 4 required courses through University of British Columbia distance education by letter of permission to count as electives in their degree, once they have completed REAL*4820.

Note: students also can take courses of interest as electives without concern for clustering. Students may consult the REH Faculty 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

Students in the Real Estate and Housing major are required to take the courses listed below. For this major, 16.00 of the 20.00 credits are specified as core requirements and 4.00 as electives (including the Liberal Education Requirements of 1.50 credits.)

Semester 1

ECON*1050 [0.50] Introductory Microeconomics
REAL*1820 [0.50] Real Estate and Housing
MGMT*1000 [1.00] Introduction to Business
0.50 electives

Semester 2

ACCT*2220 [0.50] Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics
MCS*1000 [0.50] Introductory Marketing
MATH*1030 [0.50] Business Mathematics
0.50 electives

Semester 3

ACCT*2230 [0.50] Management Accounting
ECON*2310 [0.50] Intermediate Microeconomics
REAL*2850 [0.50] Service Learning in Housing
One of:
ECON*2740 [0.50] Economic Statistics
STAT*2060 [0.50] Statistics for Business Decisions
0.50 electives

Semester 4

ECON*2560 [0.50] Theory of Finance
HROB*2100 [1.00] Managing People in Organizations
REAL*2820 [0.50] Real Estate Finance
One of:
CIS*1200 [0.50] Introduction to Computing
CIS*1500 [0.50] Introduction to Programming
MCS*2020 [0.50] Marketing Information Management
0.50 electives

Semester 5

ECON*2410 [0.50] Intermediate Macroeconomics
REAL*4820 [0.50] Real Estate Appraisal
REAL*4840 [0.50] Housing and Real Estate Law
1.00 electives

Semester 6

BUS*3320 [0.50] Financial Management
ECON*3660 [0.50] Economics of Equity Markets
ECON*3960 [0.50] Money, Credit and the Financial System
LARC*3200 [0.50] Urban and Regional Planning
0.50 electives

Semester 7

ECON*3500 [0.50] Urban Economics
MGMT*4000 [1.00] Strategic Management
REAL*3810 [0.50] Real Estate Market Analysis
0.50 electives

Semester 8

POL*S*3270 [0.50] Local Government in Ontario
REAL*3890 [0.50] Property Management
0.50 electives

REAL*4830 [1.00] Real Estate Development Project
0.50 electives

Liberal Education and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. (3) Students interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking the additional 4 required courses through University of British Columbia distance education by letter of permission to count as electives in their degree, once they have completed REAL*4820.

Note: students also can take courses of interest as electives without concern for clustering.

For additional program information students should consult with the B.Comm Program Counsellors or their Co-op Co-ordinator and Co-op Faculty Advisor, listed on the Co-operative Education & 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

For this major, 16.00 of the 20.00 credits are specified as core requirements and 4.00 electives (including the Liberal Education Requirements of 1.50 credits.)

Semester 1 - Fall

ECON*1050 [0.50] Introductory Microeconomics
REAL*1820 [0.50] Real Estate and Housing
MGMT*1000 [1.00] Introduction to Business
0.50 electives

Semester 2 - Winter

ACCT*2220 [0.50] Financial Accounting
ECON*1100 [0.50] Introductory Macroeconomics
MCS*1000 [0.50] Introductory Marketing
MATH*1030 [0.50] Business Mathematics
0.50 electives

Semester 3 - Fall

ACCT*2230 [0.50] Management Accounting
ECON*2310 [0.50] Intermediate Microeconomics
REAL*2850 [0.50] Service Learning in Housing
One of:
ECON*2740 [0.50] Economic Statistics
STAT*2060 [0.50] Statistics for Business Decisions
0.50 electives

Semester 4 - Winter

ECON*2560 [0.50] Theory of Finance
HROB*2100 [1.00] Managing People in Organizations
REAL*2820 [0.50] Real Estate Finance
0.50 electives

REAL*4830 [1.00] Real Estate Development Project
0.50 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 term performance grading and work term report grading.

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. Examples: (1) students can use Liberal Education and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. (3) Students interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking the additional 4 required courses through University of British Columbia distance education by letter of permission to count as electives in their degree, once they have completed REAL*4820.

Note: students also can take courses of interest as electives without concern for clustering.

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

X. Degree Programs, Bachelor of Commerce (B.Comm.)
### Semester 1
**Fall Semester**
- COOP*1000 [0.00] Co-op Work Term I

**Winter Semester**
- ECON*3660 [0.50] Economics of Equity Markets
- ECON*3960 [0.50] Money, Credit and the Financial System
- REAL*3890 [0.50] Property Management

One of:
- CIS*1200 [0.50] Introduction to Computing
- CIS*1500 [0.50] Introduction to Programming
- MCS*2020 [0.50] Marketing Information Management

### Semester 2
**Fall Semester**
- ECON*1100 [0.50] Introductory Macroeconomics
- GEOG*1220 [0.50] Human Impact on the Environment
- HTM*2010 [0.50] Hospitality and Tourism Business Communications
- HTM*2100 [0.50] Lodging Operations
- MCS*1000 [0.50] Introductory Marketing

**Spring Semester**
- ACCT*2220 [0.50] Financial Accounting
- HROB*2100 [1.00] Managing People in Organizations

One of:
- ECON*2740 [0.50] Economic Statistics
- STAT*2060 [0.50] Statistics for Business Decisions

### Semester 3
**Fall Semester**
- BUS*3320 [0.50] Financial Management
- HTM*2170 [0.50] Tourism Policy, Planning and Development
- MCS*2020 [0.50] Marketing Information Management

0.50 from List A or electives

**Spring Semester**
- BUS*3320 [0.50] Financial Management
- HROB*3100 [0.50] Managerial Skills
- HTM*3080 [0.50] Hospitality and Tourism Marketing
- HTM*3160 [0.50] Destination Management and Marketing

0.50 from List A or electives

### Semester 4
**Fall Semester**
- FARE*4360 [0.50] Marketing Research
- HTM*2070 [0.50] Meetings and Convention Management
- HTM*3120 [0.50] Operations Analysis in the Hospitality and Tourism Industry
- MCS*3040 [0.50] Business and Consumer Law

0.50 from List A or electives

**Spring Semester**
- HTM*4190 [0.50] Hospitality and Tourism Operations Planning
- MGMT*4000 [1.00] Strategic Management

1.00 from List A or electives

### Semester 5
**Fall Semester**
- ECON*2650 [0.50] Economic Growth and Environmental Quality
- FARE*3400 [0.50] Sustainable Communities
- FARE*2700 [0.50] Survey of Natural Resource Economics
- FARE*4290 [0.50] Land Economics
- FARE*4310 [0.50] Resource Economics
- GEOG*2210 [0.50] Environment and Resources
- GEOG*3490 [0.50] Tourism and Environment
- PHIL*2070 [0.50] Philosophy of the Environment
- POLS*3370 [0.50] Environmental Politics and Governance

### Semester 6
**Fall Semester**
- HROB*4010 [0.50] Tourism Planning in the Less Developed World
- HTM*4170 [0.50] International Tourism

1.50 from List A or electives

### List A - Restricted Electives

Courses related to eco-tourism:
- ECON*3100 [0.50] Economic Growth and Environmental Quality
- FARE*3400 [0.50] Sustainable Communities
- FARE*2700 [0.50] Survey of Natural Resource Economics
- FARE*4290 [0.50] Land Economics
- FARE*4310 [0.50] Resource Economics
- GEOG*2210 [0.50] Environment and Resources
- GEOG*3490 [0.50] Tourism and Environment
- PHIL*2070 [0.50] Philosophy of the Environment
- POLS*3370 [0.50] Environmental Politics and Governance

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
- 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
- REAL*1820 [0.50] Real Estate and Housing
- REAL*2820 [0.50] Real Estate Finance
- REAL*3810 [0.50] Real Estate Market Analysis
- REAL*3890 [0.50] Property Management

### Verdict
The program ensures students have a solid foundation in tourism management, economics, and business skills. The curriculum is designed to provide a balance between theoretical knowledge and practical experience, preparing students for careers in the hospitality and tourism industry.
### Courses dealing with the social and economic environment of business:

- **ECON*2310** 0.50 Intermediate Microeconomics
- **ECON*2410** 0.50 Intermediate Macroeconomics
- **ECON*3520** 0.50 Labour Economics
- **ECON*3660** 0.50 Economics of Equity Markets
- **ECON*3760** 0.50 Fundamentals of Derivatives
- **ECON*3860** 0.50 International Finance
- **MCS*4050** 0.50 Money, Credit and the Financial System

### 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
- **HROB*2010** 0.50 Foundations of Leadership
- **HROB*3030** 0.50 Occupational Health and Safety
- **HROB*3050** 0.50 Employment Law
- **HROB*4010** 0.50 Leadership Capstone
- **ECON*2200** 0.50 Industrial Relations
- **PHIL*1010** 0.50 Introductory Philosophy: Social and Political Issues
- **PHIL*2600** 0.50 Business and Professional Ethics
- **POLS*1400** 0.50 Issues in Canadian Politics

### Courses dealing with marketing and consumer behaviour:

- **MCS*2600** 0.50 Fundamentals of Consumer Behaviour
- **MCS*3000** 0.50 Advanced Marketing
- **MCS*3010** 0.50 Quality Management
- **MCS*3620** 0.50 Marketing Communications
- **MCS*4400** 0.50 Pricing Management
- **PSYC*1200** 0.50 Dynamics of Behaviour

### Courses related to Hospitality and Tourism 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 Restaurant 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 Advanced Restaurant Operations
- **HTM*4130** 0.50 Current Management Topics
- **HTM*4250** 0.50 Hospitality Revenue Management
- **HTM*4500** 0.50 Special Study in Hospitality and Tourism

### Courses related to accounting and administration:

- **ACCT*2240** 0.50 Applied Financial Accounting
- **ACCT*3230** 0.50 Intermediate Management Accounting
- **ACCT*3280** 0.50 Auditing I
- **ACCT*3330** 0.50 Intermediate Financial Accounting I
- **ACCT*3340** 0.50 Intermediate Financial Accounting II
- **ACCT*3350** 0.50 Taxation
- **ACCT*4220** 0.50 Advanced Financial Accounting
- **ACCT*4230** 0.50 Advanced Management Accounting
- **FARE*3310** 0.50 Operations Management
- **MCS*2100** 0.50 Personal Financial Management
- **MGT*4260** 0.50 International Business

### Courses to prepare for The Certified Human Resource Professional (CHRP) designation:

- **ECON*2200** 0.50 Industrial Relations
- **HROB*3010** 0.50 Compensation Systems
- **HROB*3030** 0.50 Occupational Health and Safety
- **HROB*3070** 0.50 Recruitment and Selection
- **HROB*3090** 0.50 Training and Development
- **HROB*4060** 0.50 Human Resources Planning

### 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.

There are two majors available in the Bachelor of Computing honours program. The major in Computer Science provides a traditional computing foundation in software, hardware, and theory. The major in Software Engineering contains an emphasis on software development and design and has a greater focus on team work, communication skills, and professional standards.

Course projects are based on real-world software development scenarios and allows students to get the professional experience valued by today’s high-tech employers. The focused study in a second discipline (area of application) gives students the background to effectively apply their knowledge.

Both majors require the equivalent of 8 semesters of successful full-time study. The general program requires the equivalent of 6 semesters of successful full-time study are available. Students in the honours program must choose a major in either Computer Science or Software Engineering. The majors are also available with a Co-op option.

Since not all courses are offered in every semester and prerequisite dependencies must be observed, students are encouraged to consult the program B.Comp. counsellor to plan an initial program of study or when considering modifications to the suggested schedule of studies list.

Program Information

To graduate with an honours Degree with a major in Computer Science or Software Engineering a student must:

a. Successfully complete 20.00 credits. These must include the 11.25 CIS credits, a minimum of 4.00 credits in an Area of Application and an additional 4.75 credits as free electives. Not more than 6.00 credits from courses at the introductory (1000) level may be counted towards the 20.00 credit requirement.

b. Obtain a cumulative average at least 70% in CIS courses and a 60% cumulative average in all courses.

c. An Area of Application normally consists of 4.00 credits (normally 8 courses) of a minor. Minors are described under the B.A. and B.Sc. programs. Access to some courses may be limited. Minors are listed in Section X of the Calendar. A student may complete a minor should they decide to do so.

Students must consult the faculty advisor for approval of their Area of Application by semester 4. Not all disciplines or courses may be available as areas of application.

Students failing to meet the graduation requirements of the honours program may apply to graduate with a general degree if the requirements for the general degree are met.

Continuation of Study

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

General Program

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

To graduate from a general program a student must:

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

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

c. Successfully complete the following credits:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*1500</td>
<td>0.50</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>CIS*1910</td>
<td>0.50</td>
<td>Discrete Structures in Computing I</td>
</tr>
<tr>
<td>CIS*2430</td>
<td>0.50</td>
<td>Object Oriented Programming</td>
</tr>
<tr>
<td>CIS*2500</td>
<td>0.50</td>
<td>Intermediate Programming</td>
</tr>
<tr>
<td>CIS*2520</td>
<td>0.50</td>
<td>Data Structures</td>
</tr>
<tr>
<td>CIS*2750</td>
<td>0.75</td>
<td>Software Systems Development and Integration</td>
</tr>
<tr>
<td>CIS*2910</td>
<td>0.50</td>
<td>Discrete Structures in Computing II</td>
</tr>
<tr>
<td>CIS*3530</td>
<td>0.50</td>
<td>Data Base Systems and Concepts</td>
</tr>
<tr>
<td>0.50 additional CIS or STAT credits at the 2000 level or higher</td>
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<td></td>
</tr>
<tr>
<td>1.00 additional CIS credits at 3000 level or higher</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Computer Science (CS)

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

Major (Honours Program)

Since many courses are offered in only one semester and course pre-requisites place an ordering on courses, the following program of studies is designed so that students can schedule their courses over 8 semesters of study. Students deviating from this schedule must consult with their academic advisor.

Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*1500</td>
<td>0.50</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>0.50</td>
<td>Calculus I</td>
</tr>
<tr>
<td>1.50 credits in the Area of Application or electives</td>
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<td></td>
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</tbody>
</table>

Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*1910</td>
<td>0.50</td>
<td>Discrete Structures in Computing I</td>
</tr>
<tr>
<td>CIS*2500</td>
<td>0.50</td>
<td>Intermediate Programming</td>
</tr>
<tr>
<td>1.50 credits in the Area of Application or electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Semester 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*2030</td>
<td>0.50</td>
<td>Structure and Application of Microcomputers</td>
</tr>
<tr>
<td>CIS*2430</td>
<td>0.50</td>
<td>Object Oriented Programming</td>
</tr>
<tr>
<td>CIS*2520</td>
<td>0.50</td>
<td>Data Structures</td>
</tr>
<tr>
<td>CIS*2910</td>
<td>0.50</td>
<td>Discrete Structures in Computing II</td>
</tr>
<tr>
<td>0.50 credits in the Area of Application or electives</td>
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<td></td>
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</tbody>
</table>

Semester 4

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*2750</td>
<td>0.75</td>
<td>Software Systems Development and Integration</td>
</tr>
<tr>
<td>CIS*3110</td>
<td>0.50</td>
<td>Operating Systems</td>
</tr>
<tr>
<td>CIS*3490</td>
<td>0.50</td>
<td>The Analysis and Design of Computer Algorithms</td>
</tr>
<tr>
<td>0.75 credits in the Area of Application or elective</td>
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<td></td>
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</table>

Semester 5

<table>
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<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS*3150</td>
<td>0.50</td>
<td>Theory of Computation</td>
</tr>
<tr>
<td>CIS*3750</td>
<td>0.75</td>
<td>System Analysis and Design in Applications</td>
</tr>
<tr>
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<td></td>
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<tr>
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<td></td>
<td></td>
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<tr>
<td>CIS*2460</td>
<td>0.50</td>
<td>Modelling of Computer Systems</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>0.50</td>
<td>Statistics I</td>
</tr>
<tr>
<td>0.75 credits in the Area of Application or electives</td>
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Semester 6

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<tr>
<td>CIS*3760</td>
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<td>Software Engineering</td>
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<tr>
<td>0.50 C.I.S electives at the 3000 level or above</td>
<td></td>
<td></td>
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<tr>
<td>1.25 credits in the Area of Application or electives</td>
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Semester 7

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<td></td>
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</tr>
<tr>
<td>0.50 credits in CIS at 3000 level or above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00 credits in CIS at the 4000 level</td>
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Semester 8

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<tr>
<td>CIS*4000</td>
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<td>Applications of Computing Seminar</td>
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<tr>
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</tr>
<tr>
<td>0.50 credits in CIS at the 3000 level or above</td>
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<td></td>
</tr>
<tr>
<td>0.50 credits in CIS at the 4000 level</td>
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</tr>
</tbody>
</table>

Computer Science (Co-op) (CS:C)

Computing and Information Science, College of Physical and Engineering Science

The honours major in Computer Science is available with a Co-op educational option. Students may apply for this option at the time of University admission or completion of semester 2. Please check with CIS Co-op faculty advisor for semester planning.

Since many courses are offered in only one semester and course pre-requisites place an ordering on courses, the following program of studies is designed so that students can schedule their courses over 8 semesters of study. Students deviating from this schedule must consult with their Co-op faculty advisor.

Computer Science Co-op Work Term Schedule

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Academic</td>
<td>Academic</td>
<td>Off</td>
</tr>
<tr>
<td>2</td>
<td>Academic</td>
<td>Academic</td>
<td>Work Term 1</td>
</tr>
<tr>
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<td>Work Term 2</td>
<td>Academic</td>
<td>Work Term 3</td>
</tr>
<tr>
<td>4</td>
<td>Academic</td>
<td>Work Term 4</td>
<td>Work Term 5</td>
</tr>
<tr>
<td>5</td>
<td>Academic</td>
<td>Academic</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Note: that a total of four work terms are necessary to complete the Co-op requirement. Students are not required to take each eight month Co-op term at a single employer and can take two four month placements at different employers.
The course COOP*1100 must be successfully completed before the student may apply for a placement for the first work term (normally 2 semesters before the first work term). COOP*1000, COOP*2000, COOP*3000, COOP*4000 and COOP*5000 represent the first, second, third, fourth, and fifth work terms respectively.

Students are advised to plan their schedule of studies well in advance so that they can take all required prequisites for later (especially 4000 level) courses. Students should note that some 4000 level courses are only given in alternate years. Failure to plan may result in the inability to take a particular senior CIS course. Not all sequences may be viable. Please check with the CIS Co-op faculty advisor for semester planning.

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

**Major Co-op (Honours Program)**

The recommended schedule of studies for Co-op is as follows:

**Semester 1 - Fall**

- CIS*1500 [0.50] Introduction to Programming
- MATH*1200 [0.50] Calculus I
- 1.50 credits in the Area of Application or electives

**Semester 2 - Winter**

- CIS*1910 [0.50] Discrete Structures in Computing I
- CIS*2500 [0.50] Intermediate Programming
- 1.50 credits in the Area of Application or electives

**Summer Semester - Off**

**Semester 3 - Fall**

- CIS*2030 [0.50] Structure and Application of Microsystems
- CIS*2430 [0.50] Object Oriented Programming
- CIS*2520 [0.50] Data Structures
- CIS*2910 [0.50] Discrete Structures in Computing II
- COOP*1100 [0.00] Introduction to Co-operative Education
- 0.50 credits in the Area of Application or electives

**Semester 4 - Winter**

- CIS*2750 [0.75] Software Systems Development and Integration
- CIS*3110 [0.50] Operating Systems
- CIS*3260 [0.50] Software Design IV
- CIS*3750 [0.75] System Analysis and Design in Applications
- One of:
  - CIS*2460 [0.50] Modelling of Computer Systems
  - STAT*2040 [0.50] Statistics I
- 0.75 credits in the Area of Application or electives

**Summer Semester**

- COOP*1000 Work Term 1

**Fall Semester**

- COOP*2000 Work Term 2

**Semester 5 - Winter**

- CIS*3760 [0.75] Software Engineering
- 0.50 C.I.S electives at the 3000 level or above
- 1.25 credits in the Area of Application or electives

**Summer Semester**

- COOP*3000 Work Term 3

**Semester 6 - Fall**

- CIS*3150 [0.50] Theory of Computation
- CIS*3750 [0.75] System Analysis and Design in Applications
- One of:
  - CIS*2460 [0.50] Modelling of Computer Systems
  - STAT*2040 [0.50] Statistics I
- 0.75 credits in the Area of Application or electives

**Winter Semester**

- COOP*4000 Work Term 4

**Summer Semester**

- COOP*5000 Work Term 5

**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
- 0.50 credits in the Area of Application or electives
- 0.50 credits in CIS at 3000 level or above
- 0.50 credits in CIS at the 4000 level

**Software Engineering (SENG)**

**Computing and Information Science, College of Physical and Engineering Science**

The honours major in Software Engineering is available with a Co-operative Education option. Students may apply for this option at the time of University admission or completion of semester 2. Please check with CIS Co-op faculty advisor for semester planning.

Since many courses are offered in only one semester and course pre-requisites place an ordering on courses, the following program of studies is designed so that students can schedule their courses over 8 semesters of study. Students deviating from this schedule must consult with their Co-op faculty advisor.

**Software Engineering Co-op Work Term Schedule**

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Academic</td>
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</tr>
<tr>
<td>2</td>
<td>Academic</td>
<td>Academic</td>
<td>Work Term 1</td>
</tr>
<tr>
<td>3</td>
<td>Work Term 2</td>
<td>Academic</td>
<td>Work Term 3</td>
</tr>
<tr>
<td>4</td>
<td>Academic</td>
<td>Work Term 4</td>
<td>Work Term 5</td>
</tr>
<tr>
<td>5</td>
<td>Academic</td>
<td>Academic</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Note:** that a total of four work terms are necessary to complete the Co-op requirement. Students are not required to take each eight month Co-op term at a single employer and can take two four month placements at different employers.

The course COOP*1100 must be successfully completed before the student may apply for a placement for the first work term (normally 2 semesters before the first work term). COOP*1000, COOP*2000, COOP*3000, COOP*4000 and COOP*5000 represent the first, second, third, fourth, and fifth work terms respectively.
Students are advised to plan their schedule of studies well in advance so that they can take all required prerequisites for later (especially 4000 level) courses. Students should note that some 4000 level courses are only given in alternate years. Failure to plan may result in the inability to take a particular senior CIS course. Not all sequences may be viable. Please check with the CIS Co-op faculty advisor for semester planning. Conditions for graduation are the same as the corresponding regular B.Comp. program. In addition, all work reports and performance evaluations must have a grade of satisfactory or better.

**Major (Honours Program) Co-op**

The recommended schedule of studies for Co-op is as follows:

### Semester 1 - Fall
- **CIS*1250** Software Design I
- **CIS*1500** Introduction to Programming

1.50 credits in the Area of Application or electives

### Semester 2 - Winter
- **CIS*1910** Discrete Structures in Computing I
- **CIS*2250** Software Design II
- **CIS*2500** Intermediate Programming

1.00 credits in the Area of Application or electives

### Summer Semester - Off

### Semester 3 - Fall
- **CIS*2030** Structure and Application of Microcomputers
- **CIS*2430** Object Oriented Programming
- **CIS*2520** Data Structures
- **CIS*3250** Software Design III
- **COOP*1100** Introduction to Co-operative Education

0.50 credits in the Area of Application or electives

### Semester 4 - Winter
- **CIS*2750** Software Systems Development and Integration
- **CIS*3110** Operating Systems

0.75 credits in the Area of Application or elective

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

### Summer Semester
- **COOP*1000** Work Term 1

### Fall Semester
- **COOP*2000** Work Term 2

### Semester 5 - Winter
- **CIS*3760** Software Engineering

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

1.25 credits in the Area of Application or electives

### Summer Semester
- **COOP*3000** Work Term 3

### Semester 6 - Fall
- **CIS*3260** Software Design IV
- **CIS*3750** System Analysis and Design in Applications

One of:
- **CIS*2460** Modelling of Computer Systems
- **STAT*2040** Statistics I

0.75 credits in the Area of Application or electives

### Winter Semester
- **COOP*4000** Work Term 4

### Summer Semester
- **COOP*5000** Work Term 5

### Semester 7 - Fall
- **CIS*4150** Software Reliability and Testing
- **CIS*4250** Software Design V
- **CIS*4300** Human Computer Interaction

1.00 credits in the Area of Application or electives

### Semester 8 - Winter
1.50 credits in the Area of Application or electives

0.50 credits in CIS at 3000 level or above

0.50 credits in CIS at the 4000 level
Bachelor of Engineering [B.Eng.]

Program Information

Objectives of the Program

Students in this program obtain a liberal engineering education, which includes a comprehensive core of science, mathematics and engineering science that provides a strong foundation for engineering design and analysis. This enables students to undertake the solution of engineering problems in the areas of biological, biomedical, computer, engineering systems and computing, environmental, mechanical and water resources. Core subjects, combined with elective opportunities, provide an understanding of the connection between engineering and science, coupled with the interdisciplinary skills needed to address the problems and challenges faced by engineers in society today.

The curriculum includes a strong emphasis on engineering design. Students engage in engineering design throughout the program, and gain experience in computer aided design and modeling, conceptual design and physical construction. Emphasis is on teamwork and communications skills, as well as working on interdisciplinary projects.

Career opportunities are open in many segments of the economy. Examples are: consulting services to municipalities, utilities and industry; resource agencies in advisory, regulatory, planning and utilization; service industries of construction, power and water supply and public health; manufacturing, design of computer and control systems, hardware and software development; mechatronics and emerging energy systems; medical devices, pharmaceutical and food industries and industrial ergonomics; academic research and graduate studies within and without the field of engineering.

Many engineers assume management responsibilities after gaining experience in design, development and operations. The balance provided by liberal arts and engineering education allows graduates to enjoy a great deal of career mobility.

Accreditation

The baccalaureate degree programs in all engineering programs with the exception of Computer Engineering; Biomedical Engineering and Mechanical Engineering 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.

According to CEAB regulations, the Mechanical Engineering Program is not eligible for accreditation until the first class graduates in June 2013. Computer Engineering and Biomedical Engineering will be eligible for accreditation in June 2014. However, due to the common core in all B.Eng. programs and the School's experience with the CEAB process, the School expects to achieve accreditation for the first class of all three new programs.

Requirements of the Program

Students combine their required courses in mathematics, physical sciences and engineering with additional credits providing the opportunity for specialization in: one of the programs; complementary studies courses; and elective subjects. A minimum of 23.50 credits must be obtained for the following programs: Biological Engineering, Engineering Systems and Computing; Environmental Engineering; Mechanical Engineering, and Water Resources Engineering. A minimum of 23.25 credits must be obtained for Biomedical Engineering. A minimum of 24.00 credits must be obtained for Computer Engineering. At least 3.00 credits must be complementary studies, which consist of courses in the social sciences, arts, management, engineering economics and communication. They complement the technical content of the curriculum. All credits are selected according to the schedule of studies for the student's chosen program. Restrictions apply to the number of non-core credits which may be at the 1000 level. Further information on approved courses may be obtained from the B.Eng. Program Guide available from the director or program counsellor of the School of Engineering.

Programs

Entry into a specific B.Eng. program is done two ways. Students can select their desired program of study (major) at the time of application. If accepted, students will be given an offer to their program of choice. Students also have the option of selecting the Undeclared First Year (Undeclared Stream) entry point due to the similarities of first year. Students in the Undeclared Stream then normally select their specific program of study during course selection for Semester II. Students in the Undeclared stream are strongly encouraged to meet with their Program Counsellor during Semester I. The School's Associate Director - Undergraduate Affairs or designate approve program selection during the semester add periods. There are no enrollment caps on any program, so students are free to select their programs of choice. Students wanting to make a switch in majors after the above dates are free to do so with prior approval, but will be off sequence and may be required to take additional courses.

The available programs are:

- Undeclared First Year: Students selecting this entry point are required to select one of the B.Eng. Majors at the time of course selection in Semester II.
- Biological Engineering - the application of engineering to the control and management of biological processes, environments, and human factors in engineering design.
- Biomedical Engineering - the application of engineering to health and medicine.
- Computer Engineering - the application of engineering to the design, fabrication, and testing of computing machines and computer systems.
- Engineering Systems and Computing - the application of engineering to the design, operation and management of data sensing, transmission and, processing systems, and of control systems.
- Environmental Engineering - the application of engineering to protect and restore the environment, through the prevention and treatment of gaseous, liquid and solid wastes.
- Mechanical Engineering - The application of engineering to the design, manufacturing and control of mechanical and electro-mechanical equipment, systems and devices.
- Water Resources Engineering - the application of engineering to the control and management of water and soil resources to meet human needs while sustaining the natural environment.

The schedule of studies for each program is provided below but guidance in the selection of appropriate courses is available from the program counsellor of the School of Engineering.

Additional Course Requirements

Students lacking specific subject requirements are advised to consult the Recommendations and Notes in Section IV--Admission Information B.Eng.,

Continuation of Study

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

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

Conditions for Graduation

To qualify for the degree the student must complete the courses required for a B.Eng. program, obtaining a minimum of 23.50 credits for one of: Biological Engineering, Environmental Engineering, Mechanical Engineering, Engineering Systems and Computing Engineering; or 23.25 credits for Biomedical Engineering; or 24.00 credits for Computer Engineering, and must achieve an overall minimum cumulative average of at least 60% and a minimum cumulative average of at least 60% in all ENGG courses.

Co-operative Education

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

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

Successful applicants will:

1. have a minimum cumulative average of 70% in semesters 1 and 2.
2. have successfully completed all of the credits required in the schedule of studies for semesters 1 and 2.
3. be employable in Canada or be in possession of an appropriate work-permit for Co-op students.
4. have obtained the approval of their Co-op advisor in the school to participate in the program. The Co-op advisor's approval will signify that the schedule of work semesters in the Co-op program as planned by the student is compatible with the schedule of studies in the program in which the student is enrolled.
5. completion of COOP*1100 is a requirement for entry into the first work term.

Please refer to Co-operative Education Program for Admission requirements into the Co-op Program.

B. Eng. Co-op Work Term Schedule

<table>
<thead>
<tr>
<th>Semester</th>
<th>Yr. 1</th>
<th>Yr. 2</th>
<th>Yr. 3</th>
<th>Yr. 4</th>
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</tr>
<tr>
<td>Winter</td>
<td>2</td>
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<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Summer</td>
<td>work</td>
<td>work</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All candidates must complete a minimum of 4 of the preceding 5 work terms with at least one work-term in each of a Fall, Winter and Summer semester.

Undeclared First Year Entry - B.Eng. Program Regular and Co-op

School of Engineering, College of Physical and Engineering Science
Semester 1

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
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<tbody>
<tr>
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<tr>
<td>CIS*1500</td>
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<td>Introduction to Programming</td>
</tr>
<tr>
<td>ENGG*1100</td>
<td>0.75</td>
<td>Engineering and Design I</td>
</tr>
<tr>
<td>MATH*1200</td>
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<td>Calculus I</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGG*1210</td>
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<tr>
<td>HIST*1250</td>
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</table>

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 Regular or Co-op (Biological Engineering, Biomedical Engineering, Environmental Engineering, Water Resources Engineering)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
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<td>General Chemistry II</td>
</tr>
<tr>
<td>ENGG*1500</td>
<td>0.50</td>
<td>Engineering Analysis</td>
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<tr>
<td>MATH*1210</td>
<td>0.50</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1130</td>
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<td>Physics with Applications</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*1210</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1250</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Semester 2 Regular or Co-op (Computer Engineering, Engineering Systems and Computing)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>ENGG*1500</td>
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<td>Engineering Analysis</td>
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<tr>
<td>MATH*1210</td>
<td>0.50</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1010</td>
<td>0.50</td>
<td>Introductory Electricity and Magnetism</td>
</tr>
<tr>
<td>PHYS*1130</td>
<td>0.50</td>
<td>Physics with Applications</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*1210</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1250</td>
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</table>

Semester 2 Regular or Co-op (Mechanical Engineering)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*1500</td>
<td>0.50</td>
<td>Engineering Analysis</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>0.50</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1010</td>
<td>0.50</td>
<td>Introductory Electricity and Magnetism</td>
</tr>
<tr>
<td>PHYS*1130</td>
<td>0.50</td>
<td>Physics with Applications</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*1210</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1250</td>
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</tr>
</tbody>
</table>

Biomedical Engineering Program Regular and Co-op (BME/BME:C)

School of Engineering, College of Physical and Engineering Science

Biomedical Engineering is a field of engineering that deals with health and medicine. (e.g.: electronic and mechanical devices used on biological materials, animals and humans, medical implants and instruments, ergonomics, bioinstrumentation, imaging and pharmacology). Graduates in Biomedical engineering are able to apply mathematical, scientific and engineering principles to a wide variety of fields and find employment across the private and public sectors of the health care industry. The program provides students with a common base of knowledge essential to engineering, and then allows them to select from a menu of electives to attain a degree of specialization in one of three areas, or to choose electives which broaden their general knowledge base. Elective concentrations are available in the areas of biomechanics; biosignal processing; and pharmaceuticals. The program is built around the concept of interdisciplinary application of engineering principles to health related problems.

Major (Honours Program)

Semester 1 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>0.50</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>ENGG*1100</td>
<td>0.75</td>
<td>Engineering and Design I</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>0.50</td>
<td>Calculus I</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGG*1210</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1250</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>0.50</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>ENGG*1500</td>
<td>0.50</td>
<td>Engineering Analysis</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>0.50</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1130</td>
<td>0.50</td>
<td>Physics with Applications</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*1210</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1250</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 3 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1080</td>
<td>0.50</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>COOP*1100</td>
<td>0.00</td>
<td>Introduction to Co-operative Education</td>
</tr>
<tr>
<td>ENGG*2120</td>
<td>0.50</td>
<td>Material Science</td>
</tr>
<tr>
<td>ENGG*2400</td>
<td>0.50</td>
<td>Engineering Systems Analysis</td>
</tr>
<tr>
<td>MATH*2270</td>
<td>0.50</td>
<td>Applied Differential Equations</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*2100</td>
<td>0.75</td>
</tr>
<tr>
<td>STAT*2120</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
<td>0.50</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>BIOM*2000</td>
<td>0.50</td>
<td>Concepts in Human Physiology</td>
</tr>
<tr>
<td>ENGG*2230</td>
<td>0.50</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>ENGG*2450</td>
<td>0.50</td>
<td>Electric Circuits</td>
</tr>
<tr>
<td>MATH*2130</td>
<td>0.50</td>
<td>Numerical Methods</td>
</tr>
</tbody>
</table>

Note: Students pursuing the pharmaceutical series of electives may select ENGG*2660 in Semester 4. If ENGG*2660 is selected, students must select BIOM*2000 in semester 5 in place of the 0.50 restricted elective.

Semester 5 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOM*3010</td>
<td>0.50</td>
<td>Comparative Mammalian Anatomy</td>
</tr>
<tr>
<td>ENGG*3170</td>
<td>0.50</td>
<td>Biomaterials</td>
</tr>
<tr>
<td>ENGG*3240</td>
<td>0.50</td>
<td>Engineering Economics</td>
</tr>
<tr>
<td>ENGG*3260</td>
<td>0.50</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>ENGG*3450</td>
<td>0.50</td>
<td>Electrical Devices</td>
</tr>
</tbody>
</table>

0.50 restricted electives

Semester 6 Regular / Semester 7 Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*3100</td>
<td>0.75</td>
<td>Engineering and Design III</td>
</tr>
<tr>
<td>ENGG*3410</td>
<td>0.50</td>
<td>Systems and Control Theory</td>
</tr>
<tr>
<td>PATH*3610</td>
<td>0.50</td>
<td>Principles of Disease</td>
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</table>

1.50 restricted electives

Semester 7 Regular / Semester 6 Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*4390</td>
<td>0.75</td>
<td>Bio-instrumentation Design</td>
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</table>

2.50 restricted electives

Semester 8 (Winter) - Regular or Co-op

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*3430</td>
<td>0.50</td>
<td>Heat and Mass Transfer</td>
</tr>
<tr>
<td>ENGG*4180</td>
<td>1.00</td>
<td>Biomedical Engineering Design IV</td>
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</tbody>
</table>

1.25 restricted electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements

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

Biomedical 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 Biomedical 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>0.50</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>ENGG*1100</td>
<td>0.75</td>
<td>Engineering and Design I</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>0.50</td>
<td>Calculus I</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>ENGG*1210</td>
<td>0.50</td>
</tr>
<tr>
<td>HIST*1250</td>
<td>0.50</td>
</tr>
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Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.
Semester 2 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credit</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>0.50</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>ENGG*1500</td>
<td>0.50</td>
<td>Engineering Analysis</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>0.50</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1130</td>
<td>0.50</td>
<td>Physics with Applications</td>
</tr>
<tr>
<td>ENGG*1210</td>
<td>0.50</td>
<td>Engineering Mechanics I</td>
</tr>
<tr>
<td>HIST*1250</td>
<td>0.50</td>
<td>Science and Society Since 1500</td>
</tr>
</tbody>
</table>

Semester 3 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credit</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
<td>0.50</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>COOP*1100</td>
<td>0.00</td>
<td>Introduction to Co-operative Education</td>
</tr>
<tr>
<td>ENGG*2120</td>
<td>0.50</td>
<td>Material Science</td>
</tr>
<tr>
<td>ENGG*2160</td>
<td>0.50</td>
<td>Engineering Mechanics II</td>
</tr>
<tr>
<td>ENGG*2400</td>
<td>0.50</td>
<td>Engineering Systems Analysis</td>
</tr>
<tr>
<td>MATH*2270</td>
<td>0.50</td>
<td>Applied Differential Equations</td>
</tr>
<tr>
<td>ENGG*2100</td>
<td>0.75</td>
<td>Engineering and Design II</td>
</tr>
<tr>
<td>STAT*2120</td>
<td>0.50</td>
<td>Probability and Statistics for Engineers</td>
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Semester 4 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credit</th>
<th>Course Name</th>
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<tbody>
<tr>
<td>BIOL*2580</td>
<td>0.50</td>
<td>Introduction to Biochemistry</td>
</tr>
<tr>
<td>ENGG*2230</td>
<td>0.50</td>
<td>Fluid Mechanics</td>
</tr>
<tr>
<td>ENGG*2450</td>
<td>0.50</td>
<td>Electric Circuits</td>
</tr>
<tr>
<td>ENGG*2660</td>
<td>0.50</td>
<td>Biological Engineering Systems I</td>
</tr>
<tr>
<td>MATH*2130</td>
<td>0.50</td>
<td>Numerical Methods</td>
</tr>
<tr>
<td>ENGG*2100</td>
<td>0.75</td>
<td>Engineering and Design II</td>
</tr>
<tr>
<td>STAT*2120</td>
<td>0.50</td>
<td>Probability and Statistics for Engineers</td>
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</table>

Semester 5 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credit</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1080</td>
<td>0.50</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>ENGG*3160</td>
<td>0.50</td>
<td>Biological Engineering Systems II</td>
</tr>
<tr>
<td>ENGG*3170</td>
<td>0.50</td>
<td>Biomaterials</td>
</tr>
<tr>
<td>ENGG*3240</td>
<td>0.50</td>
<td>Engineering Economics</td>
</tr>
<tr>
<td>ENGG*3260</td>
<td>0.50</td>
<td>Thermodynamics</td>
</tr>
<tr>
<td>ENGG*3450</td>
<td>0.50</td>
<td>Electrical Devices</td>
</tr>
<tr>
<td>ENGG*3110</td>
<td>0.75</td>
<td>Engineering and Design III</td>
</tr>
<tr>
<td>ENGG*3410</td>
<td>0.50</td>
<td>Systems and Control Theory</td>
</tr>
<tr>
<td>ENGG*3430</td>
<td>0.50</td>
<td>Heat and Mass Transfer</td>
</tr>
<tr>
<td>ENGG*4390</td>
<td>0.75</td>
<td>Bio-instrumentation Design</td>
</tr>
</tbody>
</table>

Semester 6 Regular / Semester 7 Co-op

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credit</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*3100</td>
<td>0.75</td>
<td>Engineering and Design III</td>
</tr>
<tr>
<td>ENGG*3410</td>
<td>0.50</td>
<td>Systems and Control Theory</td>
</tr>
<tr>
<td>ENGG*3430</td>
<td>0.50</td>
<td>Heat and Mass Transfer</td>
</tr>
<tr>
<td>ENGG*4390</td>
<td>0.75</td>
<td>Bio-instrumentation Design</td>
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Semester 7 Regular / Semester 6 Co-op

<table>
<thead>
<tr>
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<th>Credit</th>
<th>Course Name</th>
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</thead>
<tbody>
<tr>
<td>ENGG*4110</td>
<td>1.00</td>
<td>Biological Engineering Design IV</td>
</tr>
<tr>
<td>ENGG*4280</td>
<td>0.75</td>
<td>Digital Process Control Design</td>
</tr>
</tbody>
</table>

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

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

Computer Engineering Program Regular and Co-op

(CENG/CENG:C)

School of Engineering, College of Physical and Engineering Science

Computer Engineering is a field of engineering that focuses on the design and organization of computer systems. Graduates in Computer Engineering are able to apply mathematical, scientific and engineering principles to design and integrate computer systems suitable for applications in a wide range of fields. The program provides students with a common base of knowledge essential to computer engineering and then allows them to select from a menu of electives to attain a degree of specialization in one of four areas or to choose electives to broaden their knowledge base. Elective concentrations are available in areas of Electronic Design automation, Software Design, Artificial Intelligence and Robotics, and Microsystems.

Major (Honours Program)

Semester 1 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credit</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>0.50</td>
<td>Introduction to Programming</td>
</tr>
</tbody>
</table>
### Major (Honours Program)

#### Semester 1 - Regular or Co-op
- CHEM*1040 [0.50] General Chemistry I
- CIS*1500 [0.50] Introduction to Programming
- ENGG*1100 [0.75] Engineering and Design I
- MATH*1200 [0.50] Calculus I

One of:
- ENGG*1210 [0.50] Engineering Mechanics I
- HIST*1250 [0.50] Science and Society Since 1500

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

#### Semester 2 - Regular or Co-op
- CIS*2500 [0.50] Intermediate Programming
- ENGG*1500 [0.50] Engineering Analysis
- MATH*1210 [0.50] Calculus II
- PHYS*1010 [0.50] Introductory Electricity and Magnetism
- PHYS*1130 [0.50] Physics with Applications

One of:
- ENGG*1210 [0.50] Engineering Mechanics I
- HIST*1250 [0.50] Science and Society Since 1500

#### Semester 3 - Regular or Co-op
- CIS*2430 [0.50] Object Oriented Programming
- COOP*1100 [0.00] Introduction to Co-operative Education
- 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

One of:
- ENGG*2100 [0.75] Engineering and Design II
- STAT*2120 [0.50] Probability and Statistics for Engineers

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

#### 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

0.50 restricted electives

One of:
- ENGG*2100 [0.75] Engineering and Design II
- STAT*2120 [0.50] Probability and Statistics for Engineers

#### Semester 5 - Regular or Co-op
- CIS*2520 [0.50] Data Structures
- ENGG*3260 [0.50] Thermodynamics
- ENGG*3390 [0.50] Signal Processing
- ENGG*3450 [0.50] Electrical Devices
- ENGG*3640 [0.50] Microcomputer Interfacing

0.50 restricted electives

#### Semester 6 - Regular / Semester 7 - Co-op
- ENGG*3100 [0.75] Engineering and Design III
- ENGG*3410 [0.50] Systems and Control Theory
- ENGG*3430 [0.50] Heat and Mass Transfer

1.00 or 1.25 restricted electives

#### Semester 7 - Regular / Semester 6 - Co-op
- ENGG*3240 [0.50] Engineering Economics
- ENGG*4420 [0.75] Real-time Systems Design
- ENGG*4450 [0.50] Large-Scale Software Architecture Engineering

1.00 or 1.25 restricted electives

#### Semester 8 - Regular or Co-op
- ENGG*4120 [1.00] Engineering Systems and Computing Design IV
- ENGG*4280 [0.75] Digital Process Control Design

1.00 electives

### Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

- 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 1.50 credits in ES&C Engineering electives
- 0.75 credits in ES&C Engineering Design electives

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

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

### Major (Honours Program)

#### Semester 1 - Regular or Co-op
- CHEM*1040 [0.50] General Chemistry I
- CIS*1500 [0.50] Introduction to Programming
- ENGG*1100 [0.75] Engineering and Design I
- MATH*1200 [0.50] Calculus I

One of:
- ENGG*1210 [0.50] Engineering Mechanics I
- HIST*1250 [0.50] Science and Society Since 1500

Note: ENGG*1210 or HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

#### Semester 2 - Regular or Co-op
- CIS*2500 [0.50] Intermediate Programming
- ENGG*1500 [0.50] Engineering Analysis
- MATH*1210 [0.50] Calculus II
- PHYS*1010 [0.50] Introductory Electricity and Magnetism
- PHYS*1130 [0.50] Physics with Applications

One of:
- ENGG*1210 [0.50] Engineering Mechanics I
- HIST*1250 [0.50] Science and Society Since 1500

#### Semester 3 - Regular or Co-op
- CIS*2430 [0.50] Object Oriented Programming
- COOP*1100 [0.00] Introduction to Co-operative Education
- 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

One of:
- ENGG*2100 [0.75] Engineering and Design II
- STAT*2120 [0.50] Probability and Statistics for Engineers

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

#### 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

0.50 restricted electives

One of:
- ENGG*2100 [0.75] Engineering and Design II
- STAT*2120 [0.50] Probability and Statistics for Engineers

#### Semester 5 - Regular or Co-op
- CIS*2520 [0.50] Data Structures
- ENGG*3260 [0.50] Thermodynamics
- ENGG*3390 [0.50] Signal Processing
- ENGG*3450 [0.50] Electrical Devices
- ENGG*3640 [0.50] Microcomputer Interfacing

0.50 restricted electives

#### Semester 6 - Regular / Semester 7 - Co-op
- ENGG*3100 [0.75] Engineering and Design III
- ENGG*3410 [0.50] Systems and Control Theory
- ENGG*3430 [0.50] Heat and Mass Transfer

1.00 or 1.25 restricted electives

#### Semester 7 - Regular / Semester 6 - Co-op
- ENGG*3240 [0.50] Engineering Economics
- ENGG*4420 [0.75] Real-time Systems Design
- ENGG*4450 [0.50] Large-Scale Software Architecture Engineering

1.00 or 1.25 restricted electives

#### Semester 8 - Regular or Co-op
- ENGG*4120 [1.00] Engineering Systems and Computing Design IV
- ENGG*4280 [0.75] Digital Process Control Design

1.00 electives

### Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.
Minor (Honours Program)

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

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

- BIOC*2580 [0.50] Introduction to Biochemistry
- CHEM*3360 [0.50] Environmental Chemistry and Toxicology
- ENGG*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 incorporate an environmental application as part of their capstone design course worth 1.00 credits in the final semester of their B.Eng major program.

Food Engineering (FENG)

School of Engineering, College of Physical and Engineering Science

Minor (Honours Program)

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

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

- ACCT*2220 [0.50] Financial Accounting
- BIOC*2580 [0.50] Introduction to Biochemistry
- ENGG*2660 [0.50] Biological Engineering Systems I
- ENGG*3830 [0.50] Bio-Process Engineering
- FOOD*2150 [0.50] Introduction to Nutritional and Food Science
- MICR*1020 [0.50] Fundamentals of Applied Microbiology

One of:

- ENGG*4300 [0.75] Food Processing Engineering Design
- ENGG*4380 [0.75] Bioreactor Design

Two of:

- FOOD*4070 [0.50] Food Packaging
- FOOD*4110 [0.50] Meat and Poultry Processing
- MCS*3010 [0.50] Quality Management

One of:

- FOOD*3160 [0.75] Food Processing I
- FOOD*4520 [0.50] Utilization of Cereal Grains for Human Food

One of:

- FOOD*2400 [0.50] Introduction to Food Chemistry
- FOOD*3010 [0.50] Food Chemistry
- FOOD*3230 [0.75] Food Microbiology
- FOOD*3260 [0.50] Industrial Microbiology

*Students must incorporate a food engineering application as part of their capstone design course worth 1.0 credits in the final semester of their B.Eng. major program.

NOTE: Courses taken for the minors are credited to appropriate elective areas.

Mechanical Engineering Program Regular and Co-op (MECH/MECH:C)

School of Engineering, College of Physical and Engineering Science

Mechanical Engineering at Guelph is built around concepts of sustainability and sustainable design to equip graduates to tackle issues associated with emerging technologies. Graduates in mechanical engineering are able to apply mathematical, scientific and engineering principles to a wide variety of fields and find employment across the private and public sectors. The program provides students with a common base of knowledge essential to mechanical engineering, and then allows them to select from a menu of electives to attain a degree of specialization in one of five areas, or to choose electives which broaden their general knowledge base. Elective concentrations are available in the areas of wind and solar energy, food and beverage engineering, mechatronics, manufacturing system design and biomechanics.

Major (Honours Program)

Semester 1 - Regular or Co-op

- CHEM*1040 [0.50] General Chemistry I
- CIS*1500 [0.50] Introduction to Programming
- ENGG*1100 [0.75] Engineering and Design I
- MATH*1200 [0.50] Calculus I

One of:

- ENGG*1210 [0.50] Engineering Mechanics I
- HIST*1250 [0.50] Science and Society Since 1500

Note: One of ENGG*1210 and HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

Semester 2 - Regular or Co-op

- ENGG*1500 [0.50] Engineering Analysis
- MATH*1210 [0.50] Calculus II
- PHYS*1010 [0.50] Introductory Electricity and Magnetism
- PHYS*1130 [0.50] Physics with Applications

One of:

- ENGG*1210 [0.50] Engineering Mechanics I
- HIST*1250 [0.50] Science and Society Since 1500

Semester 3 - Regular or Co-op

- COOP*1100 [0.00] Introduction to Co-operative Education
- ENGG*2120 [0.50] Material Science
- ENGG*2160 [0.50] Engineering Mechanics II
- ENGG*2400 [0.50] Engineering Systems Analysis
- ENGG*3240 [0.50] Engineering Economics
- MATH*2270 [0.50] Applied Differential Equations

One of:

- ENGG*2100 [0.75] Engineering and Design II
- STAT*2120 [0.50] Probability and Statistics for Engineers

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

Semester 4 - Regular or Co-op

- ENGG*2230 [0.50] Fluid Mechanics
- ENGG*2340 [0.50] Kinematics and Dynamics
- ENGG*2450 [0.50] Electric Circuits
- MATH*2130 [0.50] Numerical Methods

One of:

- ENGG*2100 [0.75] Engineering and Design II
- STAT*2120 [0.50] Probability and Statistics for Engineers

0.50 restricted electives

Semester 5 - Regular or Co-op

- ENGG*2410 [0.50] Digital Systems Design Using Descriptive Languages
- ENGG*3260 [0.50] Thermodynamics
- ENGG*3280 [0.75] Machine Design
- ENGG*3450 [0.50] Electrical Devices
- ENGG*3510 [0.50] Electromechanical Devices

0.50 restricted electives

Semester 6 - Regular / Semester 7 - Co-op

- ENGG*1070 [0.25] Occupational Health and Safety
- ENGG*3100 [0.75] Engineering and Design III
- ENGG*3370 [0.50] Applied Fluids and Thermodynamics
- ENGG*3410 [0.50] Systems and Control Theory
- ENGG*3430 [0.50] Heat and Mass Transfer

0.50 restricted electives

Semester 7 - Regular / Semester 6 - Co-op

2.50 restricted electives

Semester 8 - Regular or Co-op

- ENGG*4160 [1.00] Mechanical Engineering Design IV

2.25 restricted electives

Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

- A minimum of 2.00 credits in Complementary Studies (Students need to take 0.50 credits from each of the three sub-lists noted in the Program Guide. The remaining 0.50 credits can be taken from any Complementary Studies sub-list.)
- 0.75 credits in Mechanical Engineering Design electives.
- A minimum of 3.50 credits in Mechanical Engineering electives. Specific credit requirements vary by the mechanical engineering design elective chosen. Please consult the Program Guide for further information on the prerequisite requirements specific to each mechanical engineering design elective.

Water Resources Engineering Program Regular and Co-op (WRE/WRE:C)

School of Engineering, College of Physical and Engineering Science
Water resources engineering focuses on the use and management of land and water resources in rural and urban watersheds. The hydrologic and hydraulic behaviour of watershed flow systems is combined with engineering science and ecological principles in the design of water management systems and strategies. Water management includes flood prevention, warning and control; drainage; design of natural channels; irrigation; and erosion prevention and control. The supply of water for municipal, industrial and agricultural purposes is considered in the context of resource conservation. Identification of potential point and diffused sources of pollutants is used to develop efficient, environmentally sustainable and economical methods to preserve high-quality water to sustain human life and water-dependent ecosystems.

### Major (Honours Program)

#### Semester 1 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1040</td>
<td>General Chemistry I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>Introduction to Programming</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*1100</td>
<td>Engineering and Design I</td>
<td>[0.75]</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>Calculus I</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

One of:
- ENGG*1210 | Engineering Mechanics I | [0.50] |
- HIST*1250 | Science and Society Since 1500 | [0.50] |

Note: One of ENGG*1210 and HIST*1250 must be taken in semester 1; the remaining course must be taken in semester 2.

#### Semester 2 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>General Chemistry II</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*1500</td>
<td>Engineering Analysis</td>
<td>[0.50]</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>Calculus II</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PHYS*1130</td>
<td>Physics with Applications</td>
<td>[0.50]</td>
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</tbody>
</table>

One of:
- ENGG*1210 | Engineering Mechanics I | [0.50] |
- HIST*1250 | Science and Society Since 1500 | [0.50] |

#### Semester 3 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>COOP*1100</td>
<td>Introduction to Co-operative Education</td>
<td>[0.00]</td>
</tr>
<tr>
<td>ENGG*2120</td>
<td>Material Science</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*2400</td>
<td>Engineering Systems Analysis</td>
<td>[0.50]</td>
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<tr>
<td>GEOG*2000</td>
<td>Geomorphology</td>
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<tr>
<td>MATH*2270</td>
<td>Applied Differential Equations</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

One of:
- BIOL*1090 | Introduction to Molecular and Cellular Biology | [0.50] |
- MICR*2420 | Introduction to Microbiology | [0.50] |

One of:
- ENGG*2100 | Engineering and Design II | [0.75] |
- STAT*2120 | Probability and Statistics for Engineers | [0.50] |

Note: ENGG*2100 or STAT*2120 must be taken in semester 3; the remaining course must be taken in semester 4.

#### Semester 4 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*2230</td>
<td>Fluid Mechanics</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*2450</td>
<td>Electric Circuits</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*2550</td>
<td>Water Management</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*2560</td>
<td>Environmental Engineering Systems</td>
<td>[0.50]</td>
</tr>
<tr>
<td>MATH*2130</td>
<td>Numerical Methods</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

One of:
- ENGG*2100 | Engineering and Design II | [0.75] |
- STAT*2120 | Probability and Statistics for Engineers | [0.50] |

#### Semester 5 - Regular or Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>ENGG*3240</td>
<td>Engineering Economics</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*3260</td>
<td>Thermodynamics</td>
<td>[0.50]</td>
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<tr>
<td>ENGG*3590</td>
<td>Water Quality</td>
<td>[0.50]</td>
</tr>
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<td>ENGG*3650</td>
<td>Hydrology</td>
<td>[0.50]</td>
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<tr>
<td>ENGG*3670</td>
<td>Soil Mechanics</td>
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</table>

0.50 restricted electives

#### Semester 6 - Regular / Semester 7 - Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGG*3100</td>
<td>Engineering and Design III</td>
<td>[0.75]</td>
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<tr>
<td>ENGG*3430</td>
<td>Heat and Mass Transfer</td>
<td>[0.50]</td>
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<tr>
<td>GEOG*3060</td>
<td>Groundwater</td>
<td>[0.50]</td>
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</table>

1.50 restricted electives

#### Semester 7 - Regular / Semester 6 - Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>ENGG*3340</td>
<td>Geographic Information Systems in Environmental Engineering</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENGG*4360</td>
<td>Soil-Water Conservation Systems Design</td>
<td>[0.75]</td>
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<tr>
<td>ENGG*4370</td>
<td>Urban Water Systems Design</td>
<td>[0.75]</td>
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</table>

1.00 restricted electives

#### Semester 8 (Winter) Regular or Co-op

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit</th>
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<tr>
<td>ENGG*4150</td>
<td>Water Resources Engineering Design IV</td>
<td>[1.00]</td>
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<tr>
<td>ENGG*4250</td>
<td>Watershed Systems Design</td>
<td>[0.75]</td>
</tr>
</tbody>
</table>

1.00 restricted electives

Note: ENGG*4250 can be taken in Semester 6

### Restricted Electives (see Program Guide for more information)

A maximum of 1.50 credits at the 1000 level is allowed for elective requirements.

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

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2011-2012 Undergraduate Calendar

Last Revision: March 15, 2014
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) and is recognized by the American Society of Landscape Architects, C.S.L.A. Graduates of accredited landscape architecture programs have the educational qualifications to apply for membership in provincial and state professional associations 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.

Completion 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)

<table>
<thead>
<tr>
<th>Semester 1</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>BIOL*1500</td>
<td>0.50</td>
<td>Humans in the Natural World</td>
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<tr>
<td>ENGL*1200</td>
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<td>Reading the Contemporary World</td>
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<tr>
<td>LARC*1100</td>
<td>0.75</td>
<td>Design and Communications Studio</td>
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<tr>
<td>LARC*1950</td>
<td>0.50</td>
<td>History of Cultural Form I</td>
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<tr>
<td>One of:</td>
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<tr>
<td>ANTH*1150</td>
<td>0.50</td>
<td>Introduction to Anthropology</td>
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<tr>
<td>PHIL*1010</td>
<td>0.50</td>
<td>Introductory Philosophy: Social and Political Issues</td>
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<tr>
<td>PSYC*1100</td>
<td>0.50</td>
<td>Principles of Behaviour</td>
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<td>SOC*1100</td>
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<td>Sociology</td>
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<tr>
<td>Semester 2</td>
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<tr>
<td>LARC*2020</td>
<td>0.75</td>
<td>Design Studio</td>
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<tr>
<td>LARC*2230</td>
<td>0.50</td>
<td>Planting Design</td>
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<td>LARC*2420</td>
<td>0.50</td>
<td>Materials and Techniques</td>
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<td>PHIL*2070</td>
<td>0.50</td>
<td>Philosophy of the Environment</td>
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<tr>
<td>0.50 electives</td>
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<tr>
<td>Semester 3</td>
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<tr>
<td>LARC*2100</td>
<td>0.50</td>
<td>Landscape Analysis</td>
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<tr>
<td>LARC*2240</td>
<td>0.50</td>
<td>Plants in the Landscape</td>
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<tr>
<td>LARC*2410</td>
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<td>Site Engineering</td>
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<td>LARC*3040</td>
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<td>Site Planning and Design Studio</td>
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<td>0.50 electives</td>
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<td>Semester 4</td>
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<tr>
<td>LARC*2820</td>
<td>0.50</td>
<td>Urban and Regional Planning</td>
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<tr>
<td>LARC*3050</td>
<td>0.75</td>
<td>Landscape Architecture I</td>
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<tr>
<td>LARC*3340</td>
<td>0.50</td>
<td>Landscape Construction I</td>
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<tr>
<td>0.50 Social Science elective</td>
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<tr>
<td>*Note: A &quot;Social Science&quot; elective can be any course in the following areas: Anthropology, Economics, Geography, Women's Studies, International Development, Political Science, Psychology or Sociology.</td>
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<tr>
<td>Semester 5</td>
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<tr>
<td>LARC*3060</td>
<td>0.75</td>
<td>Landscape Architecture II</td>
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<tr>
<td>LARC*3440</td>
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<td>Landscape Construction II</td>
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<td>LARC*4610</td>
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<tr>
<td>Semester 6</td>
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<tr>
<td>Choose one of the following three options:</td>
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<tr>
<td>Option 1</td>
<td>2.00 electives</td>
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<tr>
<td>Option 2</td>
<td>LARC*4620 [1.00] Internship in Landscape Architecture</td>
<td>1.00 electives</td>
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<td>Option 3</td>
<td>Exchange Program (2.00 credits)</td>
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<td>Semester 7</td>
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<tr>
<td>LARC*3070 [1.00]</td>
<td>Landscape Architecture III</td>
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<tr>
<td>LARC*3320 [0.50]</td>
<td>Principles of Landscape Ecology</td>
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<tr>
<td>LARC*4510 [0.50]</td>
<td>Honours Thesis</td>
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<tr>
<td>Semester 8</td>
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<tr>
<td>LARC*4090 [0.50] Seminar</td>
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<tr>
<td>LARC*4710 [1.00] Integrative Design Studio</td>
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<tr>
<td>0.50 electives</td>
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</tbody>
</table>
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/grade 12 credit or its equivalent is required in a subject area to allow entrance to the initial university course. Students who lack this requirement can remedy the deficiency by successful completion of:

- BIOL*1020 for students lacking biology
- CHEM*1060 for students lacking chemistry
- 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/Approval_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 at the 3000/4000 level required for the degree.

7. Continuation of Study

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

Doctor of Veterinary Medicine.

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

General Program (BSCG)

Continuation of Study

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

Conditions for Graduation

In order to qualify for graduation from the general program the student is required to attain a passing grade in a minimum of 15.00 required credits as outlined in the Total Course Requirements for all students in the General Science Program and have achieved a minimum cumulative average of 50%.

Total Course Requirements for all Students in the General Science Program

Total of 15.00 credits as follows:

1. 4.00 credits from the first year science core - 1.00 credits beyond the 4U/ grade 12 level in each of biological science, chemistry, mathematical science, physics. Note: A maximum of 7.00 credits at the 1000 level may be used towards the degree requirements.

2. An additional 0.50 credits from at least 3 of the following subject areas: biological science, biochemistry/chemistry, mathematical science, physics.

3. 6.50 additional credits selected from the list of approved sciences electives for the B.Sc. degree program of which 2.50 credits must be at the 3000 or 4000 level. Note: One of: BIOL*1020, CHEM*1060, 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**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1070</td>
<td>[0.50]</td>
<td>Discovering Biodiversity *</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>[0.50]</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>MATH*1080</td>
<td>[0.50]</td>
<td>Elements of Calculus I</td>
</tr>
<tr>
<td>PHYS*1070</td>
<td>[0.50]</td>
<td>Introductory Physics for Life Sciences</td>
</tr>
</tbody>
</table>

0.50 Arts or Social Science electives

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

**Semester 2**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
<td>[0.50]</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1050</td>
<td>[0.50]</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>PHYS*1080</td>
<td>[0.50]</td>
<td>Physics for Life Sciences</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIS*1000</td>
<td>[0.50]</td>
<td>Introduction to Computer Applications</td>
</tr>
<tr>
<td>CIS*1200</td>
<td>[0.50]</td>
<td>Introduction to Computing</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>[0.50]</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>[0.50]</td>
<td>Statistics I</td>
</tr>
<tr>
<td>MATH*2080</td>
<td>[0.50]</td>
<td>Elements of Calculus II</td>
</tr>
</tbody>
</table>

0.50 Arts or Social Science electives

* BIOL*1080 is a prerequisite for some courses in the biological sciences. Students are strongly recommended to also complete this course by the end of the third semester.

**Semester 3 to 6**

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

**Recommended Schedule for Students in Physical Science Areas**

**Semester 1**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1040</td>
<td>[0.50]</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>[0.50]</td>
<td>Calculus I</td>
</tr>
<tr>
<td>PHYS*1000</td>
<td>[0.50]</td>
<td>An Introduction to Mechanics</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL*1070</td>
<td>[0.50]</td>
<td>Discovering Biodiversity</td>
</tr>
<tr>
<td>BIOL*1080</td>
<td>[0.50]</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>[0.50]</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
</tbody>
</table>

0.50 Arts or Social Science electives

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

**Semester 2**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>[0.50]</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>[0.50]</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1010</td>
<td>[0.50]</td>
<td>Introductory Electricity and Magnetism</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL*1070</td>
<td>[0.50]</td>
<td>Discovering Biodiversity</td>
</tr>
<tr>
<td>BIOL*1080</td>
<td>[0.50]</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>[0.50]</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
</tbody>
</table>

0.50 Arts or Social Science electives

**Semester 3 to 6**

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

**Honours Programs (BSCH)**

**Honours Program Majors**

The following honours majors are available:

**Biological Sciences:**
- 20.00 credits - Animal Biology (ABIO)
- 20.25 credits - Biochemistry (BIOC)
- 20.00 credits - Biological Science (BIOS)
- 20.00 credits - Bio-Medical Science (BIOM)
- 20.00 credits - Human Kinetics (HK)
- 20.00 credits - Marine and Freshwater Biology (MFB)
- 20.00 credits - Microbiology (MIRC)
- 20.00 credits - Molecular Biology and Genetics (MBG)
- 20.00 credits - Nutritional and Nutraceutical Sciences (NANS)
- 20.00 credits - Plant Science (PLSC)
- 20.00 credits - Wild Life Biology (WLB)
- 20.00 credits - Zoology (ZOOG)

**Physical Sciences:**
- 20.00 credits - Biological and Pharmaceutical Chemistry (BPCH)
- 21.25 credits - Biophysics (BIOP)
- 21.75 credits - Chemical Physics (CHPY)
- 20.25 credits - Chemistry (CHEM)
- 20.00 credits - Nanoscience (NANO)
- 20.00 credits - Physical Science (PSCI)
- 21.25 credits - Physics (PHYS)
- 21.25 credits - Theoretical Physics (THPY)

**Environmental Sciences:**
- 20.00 credits - Ecology (ECOL)*
- 20.00 credits - Environmental Biology (ENVB)*
- 20.00 credits - Toxicology (TOX)

*also see B.SC.(ENV.)

**Computing Science, Mathematics, Statistics**

- 20.00 credits - Mathematics (MATH)
- 20.00 credits - Statistics (STAT)

**Additional Disciplines:**

- 20.00 credits - Food Science (FOOD)
- 20.00 credits - Psychology: Brain & Cognition (PBC)

**Co-operative Educational Programs:**

- 20.00 credits - Applied Mathematics and Statistics (Co-op) (APMS:C)
- 20.25 credits - Biochemistry (Co-op) (BIOC:C)
- 21.25 credits - Biophysics (Co-op) (BIOP:C)
- 21.25 credits - Chemical Physics (Co-op) (CHPY:C)
- 20.25 credits - Chemistry (Co-op) (CHEM:C)
- 20.00 credits - Food Science (Co-op) (FOOD:C)
- 20.00 credits - Microbiology (Co-op) (MICR:C)
- 21.25 credits - Physics (Co-op) (PHYS:C)
- 20.00 credits - Toxicology (Co-op) (TOX:C)

**Honours Program Minors**

Minors are available in the following science areas with the particular credit requirements being given (additional minors are available from the College of Arts and the College of Social and Applied Human Sciences). A minor may include additional prerequisites - consult with the appropriate faculty advisor.

**Biological Sciences:**
- 5.00 credits - Biology (BIOL)
- 5.00 credits - Biochemistry (BIOC)
- 5.00 credits - Biotechnology (BIOT)
- 5.00 credits - Functional Foods and Nutraceuticals (FFAN)
- 5.25 credits - Microbiology (MICR)
- 5.00 credits - Molecular Biology and Genetics (MBG)
- 5.00 credits - Neuroscience (NEUR)
- 5.00 credits - Nutritional and Nutraceutical Sciences (NANS)
- 5.00 credits - Plant Science (PLSC)
- 5.00 credits - Zoology (ZOOG)

**Physical Sciences:**
- 5.00 credits - Chemistry (CHEM)
- 5.00 credits - Physics (PHYS)

**Environmental Sciences:**
- 5.00 credits - Ecology (ECOL)
- 5.00 credits - Forest Systems (FSYS)
- 5.00 credits - Geographic Information Systems (GIS) and Environmental Analysis
- 5.00 credits - Geology (GEOL)

**Mathematical Sciences:**
- 5.25 credits - Computing and Information Science (CIS)
- 5.00 credits - Mathematical Science (MSCI)
- 5.00 credits - Mathematics (MATH)
- 5.00 credits - Statistics (STAT)

**Additional Disciplines:**

- 5.00 credits - Business Administration (BADM)
- 5.00 credits - Food Science (FOOD)
- 5.00 credits - Psychology: Brain & Cognition (PBC)

**Continuation of Study**

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

**Conditions for Graduation**

**Schedules 1 and 2**

In order to qualify for graduation from the honours program, the student must fulfill all program requirements and have achieved 60%, or higher, cumulative average in all course attempts.
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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1080</td>
<td>0.50</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>MATH*1080</td>
<td>0.50</td>
<td>Elements of Calculus I</td>
</tr>
<tr>
<td>PHYS*1070</td>
<td>0.50</td>
<td>Introductory Physics for Life Sciences</td>
</tr>
</tbody>
</table>

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revseds

Semester 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
<td>0.50</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1050</td>
<td>0.50</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>PHYS*1080</td>
<td>0.50</td>
<td>Physics for Life Sciences</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
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</tr>
<tr>
<td>CIS*1000</td>
<td>0.50</td>
<td>Introduction to Computer Applications</td>
</tr>
<tr>
<td>CIS*1200</td>
<td>0.50</td>
<td>Introduction to Computing</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>0.50</td>
<td>Introduction to Programming</td>
</tr>
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</table>

0.50 Arts or Social Science electives

Semester 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AGR*2350</td>
<td>0.50</td>
<td>Animal Production Systems, Health and Industry</td>
</tr>
<tr>
<td>BIOC*2580</td>
<td>0.50</td>
<td>Introduction to Biochemistry</td>
</tr>
<tr>
<td>MBG*2040</td>
<td>0.50</td>
<td>Foundations in Molecular Biology and Genetics</td>
</tr>
</tbody>
</table>

0.50 Arts or Social Science electives

Semester 4

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANSC*2340</td>
<td>0.50</td>
<td>Structure of Farm Animals</td>
</tr>
<tr>
<td>MCB*2050</td>
<td>0.50</td>
<td>Molecular Biology of the Cell</td>
</tr>
<tr>
<td>NUTR*3210</td>
<td>0.50</td>
<td>Fundamentals of Nutrition</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>0.50</td>
<td>Statistics I</td>
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</table>

0.50 electives or restricted electives

Semester 5

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC*3080</td>
<td>0.50</td>
<td>Agricultural Animal Physiology</td>
</tr>
<tr>
<td>ANSC*3120</td>
<td>0.50</td>
<td>Introduction to Animal Nutrition</td>
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</table>

1.50 electives or restricted electives

Semester 6

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
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</tr>
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<tbody>
<tr>
<td>ANSC*3210</td>
<td>0.50</td>
<td>Principles of Animal Care and Welfare</td>
</tr>
<tr>
<td>ANSC*4650</td>
<td>0.50</td>
<td>Comparative Immunology</td>
</tr>
<tr>
<td>MBG*3060</td>
<td>0.50</td>
<td>Quantitative Genetics</td>
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1.00 electives or restricted electives

Semester 7

<table>
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<tr>
<th>Course Code</th>
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</thead>
<tbody>
<tr>
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</tbody>
</table>

Semester 8

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.50 electives or restricted electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.
Department of Molecular and Cellular Biology, College of Biological Science

A B.Sc. in Biochemistry offers a multidisciplinary curriculum that gives students broad exposure to the life sciences with specific attention paid to the physical and chemical nature of biomolecular systems. The lab-intensive experience in this program prepares students to pursue postgraduate research opportunities in many different life science-related fields. Graduates are also positioned to be successful in obtaining entrance to a number of professional programs, as well as employment in industry and government.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. The major will require the completion of at least 20.25 credits as indicated below:

**Major (Honours Program)**

### Semester 1
- **BIOL*1090** [0.50] Introduction to Moleculer and Cellular Biology
- **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 lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/revisedss](http://www.bsc.uoguelph.ca/revisedss)

### Semester 2
- **BIOL*1070** [0.50] Discovering Biodiversity
- **BIOL*1080** [0.50] Biological Concepts of Health
- **CHEM*1050** [0.50] General Chemistry II
- **MATH*1210** [0.50] Calculus II
- **PHYS*1010** [0.50] Introductory Electricity and Magnetism

### Semester 3
- **BIOC*2580** [0.50] Introduction to Biochemistry
- **CHEM*2060** [0.50] Structure and Bonding
- **CHEM*2880** [0.50] Physical Chemistry
- **MBG*2040** [0.50] Foundations in Molecular Biology and Genetics
- **STAT*2040** [0.50] Introduction to Statistics I

0.50 Arts or Social Science electives

### Semester 4
- **BIOC*3560** [0.50] Structure and Function in Biochemistry
- **CHEM*2480** [0.50] Analytical Chemistry I
- **CHEM*2700** [0.50] Organic Chemistry I
- **MBG*2050** [0.50] Molecular Biology of the Cell
- **MICR*2420** [0.50] Introduction to Microbiology

### Semester 5
- **BIOC*3570** [0.75] Analytical Biochemistry
- **CHEM*3750** [0.50] Organic Chemistry II
- **MICR*2430** [0.50] Microbiology Methods I
- **STAT*2040** [0.50] Statistics I

Minimum 0.25 electives or restricted electives*

*Note: There are a limited number of 0.25 credit courses available. Students should consult their faculty advisor or program counsellor for additional information.

### Semester 6
- **MBG*3350** [0.75] Laboratory Methods in Molecular Biology I
- **PHYS*2030** [0.50] Biophysics of Excitable Cells

2.00 electives or restricted electives

### Semester 7
- **BIOC*4540** [0.75] Enzymology

1.75 electives or restricted electives

### Restricted Electives

Students must take as part of their program: 3.5 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050

- **BIOC*4520** [0.50] Metabolic Processes
- **BIOC*4580** [0.50] Membrane Biochemistry
- **BIOM*3200** [1.00] Mammalian Physiology
- **MCB*4010** [0.50] Advanced Cell Biology
- **MCB*4050** [0.50] Protein and Nucleic Acid Structure
- **MCB*4500** [1.00] Research Project in Molecular & Cellular Biology I
- **MCB*4510** [1.00] Research Project in Molecular & Cellular Biology 2
- **MICR*3230** [0.50] Immunology
- **MICR*3330** [0.50] World of Viruses
- **MICR*4330** [0.50] Molecular Virology
- **MICR*4530** [0.50] Immunology II
- **PBIO*3110** [0.50] Crop Physiology
- **PBIO*4750** [0.50] Genetic Engineering of Plants
- **TOX*4590** [0.50] Biochemical Toxicology

One of:
- **MBG*3080** [0.50] Bacterial Genetics
- **MBG*4080** [0.50] Molecular Genetics

### Minor (Honours Program)

A minor in Biochemistry consists of at least 5.00 course credits. The following courses are required:

- **BIOC*3560** [0.50] Structure and Function in Biochemistry
- **BIOC*3570** [0.75] Analytical Biochemistry
- **BIOC*4540** [0.75] Enzymology
- **CHEM*2480** [0.50] Analytical Chemistry I
- **CHEM*2700** [0.50] Organic Chemistry I

One of:
- **MBG*2040** [0.50] Foundations in Molecular Biology and Genetics
- **MICR*2420** [0.50] Introduction to Microbiology

In addition, at least 1.50 credits must be chosen from the following courses, with at least 1.00 credits from the first three courses listed:

- **BIOC*4520** [0.50] Metabolic Processes
- **BIOC*4580** [0.50] Membrane Biochemistry
- **MBG*3350** [0.75] Laboratory Methods in Molecular Biology I
- **MCB*4050** [0.50] Protein and Nucleic Acid Structure
- **MICR*3230** [0.50] Immunology
- **MICR*3330** [0.50] World of Viruses
- **TOX*4590** [0.50] Biochemical Toxicology

### Biochemistry (Co-op) (BIOC:C)

**Department of Molecular and Cellular Biology, College of Biological Science**
A B.Sc. in Biochemistry offers a multidisciplinary curriculum that gives students broad exposure to the life sciences with specific attention paid to the physical and chemical nature of biomolecular systems. The lab-intensive experience in this program prepares students to pursue graduate research opportunities in many different life science related fields. Graduates are also positioned to be successful in obtaining entrance to a number of professional programs, as well as employment in industry and government.

Two Streams are available. Stream A is different from Stream B in that Stream A has a double work term following academic semester 5. The course content of semesters 1-4 is the same as that listed above for the regular Honours Program Major. Students in the Co-op program must also take COOP*1100 in the second academic semester. The total program requirements, including the selection of electives are also the same.

Students will be expected to undertake their work terms after semester 3 and completion of course CHEM*2480. Since certain courses must be taken in a different semester from usual, consult your Faculty Co-op Advisor for assistance with course selection.

To graduate from the Co-op program a minimum of 4 successfully completed work terms is normally required. This major requires the completion of 20.25 credits as indicated below.

### Stream A

<table>
<thead>
<tr>
<th>Semester 1 - Fall</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIOL*1090</td>
<td>0.50</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>MATH*1200</td>
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<td>Calculus I</td>
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<td>PHYS*1000</td>
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<tr>
<th>Semester 2 - Winter</th>
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<tbody>
<tr>
<td>BIOL*1070</td>
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<td>Discovering Biodiversity</td>
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<td>BIOL*1080</td>
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<td>Biological Concepts of Health</td>
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<td>CHEM*1050</td>
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<td>General Chemistry II</td>
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<td>COOP*1100</td>
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<td>Introduction to Co-operative Education</td>
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<td>MATH*1210</td>
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<td>Calculus II</td>
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<td>PHYS*1010</td>
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<td>CHEM*2060</td>
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<tr>
<td>CHEM*2480</td>
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<td>Physical Chemistry</td>
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<td>MCBG*2040</td>
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<tr>
<th>Semester 5 - Fall</th>
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<tbody>
<tr>
<td>BIOC*3560</td>
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<td>Structure and Function in Biochemistry</td>
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<td>CHEM*3750</td>
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<td>MCBG*3350</td>
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<tr>
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### Restricted Electives

Students must take as part of their program: 3.5 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050

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<td>MCB*4010</td>
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One of:

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### Stream B

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<tbody>
<tr>
<td>BIOL*1090</td>
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<td>Introduction to Molecular and Cellular Biology</td>
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<tr>
<td>CHEM*1040</td>
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<td>General Chemistry I</td>
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<td>PHYS*1000</td>
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<td>An Introduction to Mechanics</td>
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<tr>
<th>Semester 2 - Winter</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIOL*1070</td>
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<td>Discovering Biodiversity</td>
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<td>BIOL*1080</td>
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<td>Biological Concepts of Health</td>
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<td>CHEM*1050</td>
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<td>COOP*1100</td>
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<td>MATH*1210</td>
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<td>Calculus II</td>
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<td>PHYS*1010</td>
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<td>Introductory Electricity and Magnetism</td>
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<th>Course Title</th>
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<th>Semester 3 - Fall</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIOC*2580</td>
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<td>Introduction to Biochemistry</td>
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<tr>
<td>CHEM*2060</td>
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<td>Structure and Bonding</td>
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<td>CHEM*2480</td>
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<td>Analytical Chemistry I</td>
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<td>CHEM*2880</td>
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<td>Physical Chemistry</td>
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<tr>
<td>MCBG*2040</td>
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<td>Foundations in Molecular Biology and Genetics</td>
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<td>BIOC*3570</td>
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<td>Analytical Biochemistry</td>
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<td>CHEM*2700</td>
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<td>MCBR*2420</td>
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<td>STAT*2040</td>
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<tr>
<th>Semester 5 - Fall</th>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>BIOC*3560</td>
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<td>Structure and Function in Biochemistry</td>
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<tr>
<td>CHEM*3750</td>
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<td>Organic Chemistry II</td>
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<td>MCBR*2050</td>
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<td>Molecular Biology of the Cell</td>
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<td>MCBR*2430</td>
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<th>Course Title</th>
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<tr>
<td>MCBG*3350</td>
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<th>Semester 7 - Winter</th>
<th>Course Code</th>
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<td>BIOC*4540</td>
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<th>Summer Semester</th>
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<th>Course Title</th>
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<td>COOP*3000</td>
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Last Revision: March 15, 2014
Summer Semester

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

Semester 8 - Fall

2.50 electives or restricted electives

Restricted Electives

Students must take as part of their program: 3.5 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050

BIOC*4520 [0.50] Metabolic Processes
BIOC*4580 [0.50] Membrane Biochemistry
BIOM*3200 [1.00] Mammalian Physiology
MCB*4010 [0.50] Advanced Cell Biology
MCB*4050 [0.50] Protein and Nucleic Acid Structure
MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I
MCB*4510 [1.00] Research Project in Molecular & Cellular Biology 2
MICR*3230 [0.50] Immunology
MICR*3330 [0.50] World of Viruses
MICR*4330 [0.50] Molecular Virology
MICR*4530 [0.50] Immunology II
PBIO*3110 [0.50] Crop Physiology
PBIO*4750 [0.50] Genetic Engineering of Plants
TOX*4590 [0.50] Biochemical Toxicology

One of:
MBG*3080 [0.50] Bacterial Genetics
MBG*4080 [0.50] Molecular Genetics

Biological and Pharmaceutical Chemistry (BPCH)

Department of Chemistry, College of Physical and Engineering Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Chemistry Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

Semester 1

Biol*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
MATH*1200 [0.50] Calculus I
PHYS*1000 [0.50] An Introduction to Mechanics

0.50 Arts or Social Science electives

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050 [0.50] General Chemistry II
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism

One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health

0.50 Arts or Social Science electives

Semester 3

BIOC*2580 [0.50] Introduction to Biochemistry
CHEM*2060 [0.50] Structure and Bonding
CHEM*2400 [0.75] Analytical Chemistry I
CHEM*2880 [0.50] Physical Chemistry

0.25 electives or restricted electives *

Semester 4

CHEM*2070 [0.50] Structure and Spectroscopy
CHEM*2700 [0.50] Organic Chemistry I
CHEM*3430 [0.50] Analytical Chemistry II: Instrumental Analysis
MICR*2420 [0.50] Introduction to Microbiology
STAT*2040 [0.50] Statistics I

Semester 5

BIOC*3570 [0.75] Analytical Biochemistry
CHEM*3750 [0.50] Organic Chemistry II

One of:
CHEM*3640 [0.50] Chemistry of the Elements I **

0.50 electives or restricted electives *

0.75 electives or restricted electives *

** CHEM*3640 is a prerequisite for CHEM*3650

Semester 6

Select either Option A or Option B

Option A (at Guelph)

BIOC*3560 [0.50] Structure and Function in Biochemistry
CHEM*3650 [0.50] Chemistry of the Elements II

CHEM*3760 [0.50] Organic Chemistry III

1.00 electives or restricted electives *

Option B (at Seneca)

2.50 credits from:
XSEN*3020 [0.50] Pharmaceutical Analysis
XSEN*3030 [0.50] Pharmacology and Applied Toxicology
XSEN*3040 [0.50] Occupational Health and Chemistry
XSEN*3060 [0.50] Pharmaceutical Analysis - Advanced
XSEN*3070 [0.50] Pharmaceutical Product Formulations
XSEN*3080 [0.50] Pharmaceutical Manufacturing
XSEN*3090 [0.50] Biopharmaceuticals

Note: All XSEN courses are taught at the Seneca@York campus of Seneca College in Toronto. (For more information, go to: http://www.chemistry.uoguelph.ca/bpch/)

Semester 7

One of:
CHEM*4730 [0.50] Synthetic Organic Chemistry
CHEM*4740 [0.50] Topics in Bio-Organic Chemistry

2.00 electives or restricted electives *

Semester 8

2.50 electives or restricted electives *

* Restricted Electives

Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

1. 1.00 credits from the following:

   MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
   MCB*2050 [0.50] Molecular Biology of the Cell
   TOX*2000 [0.50] Principles of Toxicology

2. A minimum of 1.50 credits at the 4000 level and 2.50 credits at the 3000/4000 level from the following list:

   BIOC*3560 [0.50] Structure and Function in Biochemistry
   BIOC*4520 [0.50] Metabolic Processes
   BIOC*4540 [0.75] Enzymology **
   BIOC*4580 [0.50] Membrane Biochemistry
   BIOM*3090 [0.50] Principles of Pharmacology **
   BIOM*3200 [1.00] Mammalian Physiology
   BIOM*4090 [0.50] Pharmacology **
   CHEM*3360 [0.50] Environmental Chemistry and Toxicology
   CHEM*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation
   CHEM*3640 [0.50] Chemistry of the Elements I
   CHEM*3650 [0.50] Chemistry of the Elements II **
   CHEM*3760 [0.50] Organic Chemistry III
   CHEM*4010 [0.50] Chemistry and Industry
   CHEM*4400 [0.50] Advanced Topics in Analytical Chemistry
   CHEM*4630 [0.50] Bioinorganic Chemistry **
   CHEM*4720 [0.50] Organic Reactivity **
   CHEM*4730 [0.50] Synthetic Organic Chemistry **
   CHEM*4740 [0.50] Topics in Bio-Organic Chemistry
   CHEM*4900 [1.00] Chemistry Research Project I **
   CHEM*4910 [1.00] Chemistry Research Project II **
   MBG*3350 [0.75] Laboratory Methods in Molecular Biology I **
   MCB*4050 [0.50] Protein and Nucleic Acid Structure **
   MICR*3230 [0.50] Immunology
   NUTR*3210 [0.50] Fundamentals of Nutrition
   PATH*3610 [0.50] Principles of Disease
   TOX*4590 [0.50] Biochemical Toxicology **

Biological and Pharmaceutical Chemistry (Co-op) (BPCH:C)

Department of Chemistry, College of Physical and Engineering Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Chemistry Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

Semester 1 - Fall

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1040 [0.50] General Chemistry I
MATH*1200 [0.50] Calculus I
PHYS*1000 [0.50] An Introduction to Mechanics

0.50 Arts or Social Science electives

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss
### BIO*3560 [0.50] Structure and Function in Biochemistry
### BIO*4520 [0.50] Metabolic Processes
### BIO*4540 [0.75] Enzymology **
### BIO*4580 [0.50] Membrane Biochemistry
### BIOM*3090 [0.50] Principles of Pharmacology **
### BIOM*3200 [1.00] Mammalian Physiology
### BIOM*4090 [0.50] Pharmacology **
### CHEM*3360 [0.50] Environmental Chemistry and Toxicology
### CHEM*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation
### CHEM*3640 [0.50] Chemistry of the Elements I
### CHEM*3650 [0.50] Chemistry of the Elements II **
### CHEM*3760 [0.50] Organic Chemistry III
### CHEM*4010 [0.50] Chemistry and Industry
### CHEM*4400 [0.50] Advanced Topics in Analytical Chemistry
### CHEM*4630 [0.50] Bioinorganic Chemistry **
### CHEM*4720 [0.50] Organic Reactivity **
### CHEM*4730 [0.50] Synthetic Organic Chemistry **
### CHEM*4740 [0.50] Topics in Bio-Organc Chemistry
### CHEM*4900 [1.00] Chemistry Research Project I **
### CHEM*4910 [1.00] Chemistry Research Project II **
### MBG*3350 [0.75] Laboratory Methods in Molecular Biology I **
### MBG*4080 [0.50] Molecular Genetics **
### MCB*4050 [0.50] Protein and Nucleic Acid Structure **
### MICR*3230 [0.50] Immunology
### NUTR*3210 [0.50] Fundamentals of Nutrition
### PATH*3610 [0.50] Principles of Disease
### TOX*4590 [0.50] Biochemical Toxicology **

### 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1070</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*1050</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*1060</td>
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<tr>
<td>MATH*1080</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*1070</td>
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</tr>
</tbody>
</table>

0.50 Arts or Social Science electives

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/revisedss](http://www.bsc.uoguelph.ca/revisedss)

#### Semester 2

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BIOL*1080</td>
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<td>CHEM*1090</td>
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<tr>
<td>CHEM*1050</td>
<td>0.50</td>
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<tr>
<td>PHYS*1080</td>
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</table>

0.50 Arts or Social Science electives

#### Semester 3

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>BIOL*1070</td>
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<td>CHEM*1040</td>
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<tr>
<td>CHEM*1050</td>
<td>0.50</td>
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<td>CHEM*1060</td>
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<td>MATH*1080</td>
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<tr>
<td>PHYS*1070</td>
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</table>

0.50 Arts or Social Science electives

#### Semester 4

<table>
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<th>Course</th>
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<td>BIOL*1080</td>
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<tr>
<td>CHEM*1090</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*1050</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*1080</td>
<td>0.50</td>
</tr>
</tbody>
</table>

0.50 Arts or Social Science electives

#### Semester 5 to 8

2.50 in each semester **

*Restricted Electives*

#### Semester 1

1. Ecology Elective - 0.50 credits:
   - BIOL*2060 [0.50] Ecology
   - BIOL*3110 [0.50] Population Ecology
   - BOT*3050 [0.50] Plant Functional Ecology

2. Mathematical or Computational Science Elective - 0.50 credits:
   - BIOL*2250 [0.50] Biostatistics and the Life Sciences

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2011-2012 Undergraduate Calendar

Last Revision: March 15, 2014
Introducing Computer Applications
Introduction to Computing
Elements of Calculus II
Statistics II
Biostatistics and the Life Sciences

3. Physiology Elective - 0.50 credits:
Biom*3200 [1.00] Mammalian Physiology
Bot*2100 [0.50] Life Strategies of Plants
Hub*3950 [1.25] Human Physiology
Zoo*3200 [0.50] Comparative Animal Physiology I

4. 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 http://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* May include 1 of Biol*1020, Chem*1060, Phys*1020
2.00 - Approved Arts or Social Science electives
2.00 - Electives
*2.00 science credits must be at the 4000 level.

Biology (BIOI)

College of Biological Science

Minor (Honours Program)
A minor in Biology consists of a minimum of 5.00 credits including the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol*1070</td>
<td>[0.50] Discovering Biodiversity</td>
</tr>
<tr>
<td>Biol*1090</td>
<td>[0.50] Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>MBG*2040</td>
<td>[0.50] Foundations in Molecular Biology and Genetics</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biol*2060</td>
<td>[0.50] Ecology</td>
</tr>
<tr>
<td>Biol*3110</td>
<td>[0.50] Population Ecology</td>
</tr>
<tr>
<td>Bot*3050</td>
<td>[0.50] Plant Functional Ecology</td>
</tr>
</tbody>
</table>

Of the additional 3.00 credits approved science electives, students must complete a minimum of 1.50 credits at the 3000 or 4000 level, from courses offered by the following departments: Human Health and Nutritional Sciences, Integrative Biology, and Molecular and Cellular Biology. BIOL*1080 is a prerequisite for some CBS courses. This minor is restricted to students registered in B.Sc. majors in the Physical Sciences, B.A.S., and the B.A. degree programs.

Bio-Medical Science (BIOM)

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

This joint program of the Department of Human Health and Nutritional Sciences and the Department of Biomedical Sciences 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 Bio-Medical 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 eight core courses as prescribed by the Schedule of Studies (see below). Students with a minimum average of 75% average will be guaranteed continuation in this major. For students with a 70-74.9% average, continuation will be competitive based on available spaces. Students with an average below 70% will 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

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1080</td>
<td>[0.50] Biological Concepts of Health</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>[0.50] General Chemistry I</td>
</tr>
<tr>
<td>MATH*1080</td>
<td>[0.50] Elements of Calculus I</td>
</tr>
<tr>
<td>PHYS*1070</td>
<td>[0.50] Introductory Physics for Life Sciences</td>
</tr>
</tbody>
</table>

0.50 electives or restricted electives

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedscheds

Semester 2

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1070</td>
<td>[0.50] Discovering Biodiversity</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>[0.50] Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1050</td>
<td>[0.50] General Chemistry II</td>
</tr>
<tr>
<td>PHYS*1080</td>
<td>[0.50] Physics for Life Sciences</td>
</tr>
</tbody>
</table>

0.50 electives or restricted electives

Semester 3 (see admission statement above)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOLC*2580</td>
<td>[0.50] Introduction to Biochemistry</td>
</tr>
<tr>
<td>MBG*2040</td>
<td>[0.50] Foundations in Molecular Biology and Genetics</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>[0.50] Statistics I</td>
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</table>

1.00 electives or restricted electives

Semester 4

<table>
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<tr>
<th>Course</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>BIOL*3560</td>
<td>[0.50] Structure and Function in Biochemistry</td>
</tr>
<tr>
<td>MC*2050</td>
<td>[0.50] Molecular Biology of the Cell</td>
</tr>
<tr>
<td>NUTR*3210</td>
<td>[0.50] Fundamentals of Nutrition</td>
</tr>
</tbody>
</table>

1.00 electives or restricted electives

Semester 5

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>POPM*3240</td>
<td>[0.50] Epidemiology</td>
</tr>
</tbody>
</table>

One of:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*3200</td>
<td>[1.00] Mammalian Physiology</td>
</tr>
<tr>
<td>Hub*3940</td>
<td>[1.25] Human Physiology</td>
</tr>
</tbody>
</table>

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

Semester 6

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOM*3040</td>
<td>[0.75] Medical Embryology</td>
</tr>
<tr>
<td>BIOM*3090</td>
<td>[0.50] Principles of Pharmacology</td>
</tr>
</tbody>
</table>

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

Semester 7

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.50 electives or restricted electives</td>
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</tbody>
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Semester 8

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
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</thead>
<tbody>
<tr>
<td>PATI*3610</td>
<td>[0.50] Principles of Disease</td>
</tr>
<tr>
<td>2.00 electives or restricted electives*</td>
<td></td>
</tr>
</tbody>
</table>

Restricted Electives

1. Anatomy Elective - 1 of BIOM*3010, Hub*3401/2, Hub*3501/2, ZOO*2090
2. Histology Elective - BIOM*4070 or ZOO*3000
3. Immunology Elective - ANSC*4650 or MICR*3230
4. Advanced Study Electives - 2.00 credits from BIOM*4030, BIOM*4050, BIOM*4090, BIOM*4110, BIOM*4150, BIOM*4180, BIOM*4210, BIOM*4220, BIOM*4420, BIOM*4500, BIOM*4510, BIOM*4521/2, Hub*4070, Hub*4230, Hub*4360, Hub*4371/2, Hub*4441/2, Hub*4460, Nutr*4320, Nutr*4350, Nutr*4360, Nutr*4510.
5. Arts and Social Science Electives - 2.00 credits (1.00 credits must be from: Phlb*2030, Phlb*2070, Phlb*2100, Phlb*2120, Phlb*2180, PsyC*XXX, Soc*XXX)

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 Faculty Advisor. Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. This major requires the completion of 21.25 credits as indicated below. At least 1.00 credits must be from Arts and/or Social Science courses.

Semester 1
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
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 lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2
CHEM*1050 [0.50] General Chemistry II
One of (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:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
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
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
PHYS*2440 [0.75] Mechanics I
PHYS*2460 [0.75] Electricity and Magnetism I

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] Introduction to Biochemistry
MATH*3100 [0.50] General Chemistry 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
Two of:
PHYS*4001 [0.50] Research in Physics
PHYS*4120 [0.50] Atomic and Molecular Physics
PHYS*4500 [0.50] Advanced Physics Laboratory
0.50 electives
0.50 electives

Note: At least one of PHYS*4120 in semester 7 or PHYS*4150 in semester 8 must be taken. Either PHYS*4001/2 in semesters 7 and 8 or PHYS*4300 in semester 8 must be taken.

Semester 8
BIOC*4580 [0.50] Membrane Biochemistry
One of:
PHYS*4002 [0.50] Research in Physics
PHYS*4300 [0.50] Inquiry in Physics
One of:
PHYS*4150 [0.50] Solid State Physics
0.50 electives
0.50 electives
Note: At least one of PHYS*4120 in semester 7 or PHYS*4150 in semester 8 must be taken. Either PHYS*4001/2 in semesters 7 and 8 or PHYS*4300 in semester 8 must be taken.

Note: PHYS*4001/2 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
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
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 lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter
CHEM*1050 [0.50] General Chemistry II
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
One of (MATH*1210 recommended):
MATH*1210 [0.50] Calculus II
MATH*2080 [0.50] Elements of Calculus II
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 lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 3 - Fall
BIOC*2580 [0.50] Introduction to Biochemistry
COOP*1100 [0.00] Introduction to Co-operative Education
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 - Winter
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 - Winter
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

Summer Semester
COOP*1100 [0.00] Co-op Work Term I ++

Semester 5 - Fall
BIOC*3560 [0.50] Structure and Function in Biochemistry
MATH*3100 [0.50] Differential Equations II
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS*3100</td>
<td>Electronics</td>
</tr>
<tr>
<td>PHYS*3230</td>
<td>Quantum Mechanics I</td>
</tr>
<tr>
<td>PHYS*3240</td>
<td>Statistical Physics I</td>
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**Winter Semester**

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<tbody>
<tr>
<td>COOP*2000</td>
<td>Co-op Work Term II ++</td>
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**Summer Semester**

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<th>Title</th>
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<tbody>
<tr>
<td>COOP*3000</td>
<td>Co-op Work Term III ++</td>
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</table>

**Semester 6 - Fall**

<table>
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<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBG*2040</td>
<td>Foundations in Molecular Biology and Genetics</td>
</tr>
<tr>
<td>MCB*4050</td>
<td>Protein and Nucleic Acid Structure</td>
</tr>
<tr>
<td>PHYS*4240</td>
<td>Statistical Physics II</td>
</tr>
<tr>
<td>PHYS*4560</td>
<td>Biophysical Methods</td>
</tr>
</tbody>
</table>

0.50 electives *

**Semester 7 - Winter**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC*4580</td>
<td>Membrane Biochemistry</td>
</tr>
<tr>
<td>PHYS*3220</td>
<td>Waves and Optics</td>
</tr>
<tr>
<td>PHYS*3510</td>
<td>Intermediate Laboratory</td>
</tr>
<tr>
<td>PHYS*4040</td>
<td>Quantum Mechanics II</td>
</tr>
</tbody>
</table>

0.50 electives *

**Summer Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*4000</td>
<td>Co-op Work Term IV ++</td>
</tr>
</tbody>
</table>

**Fall Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*5000</td>
<td>Co-op Work Term V ++</td>
</tr>
</tbody>
</table>

**Semester 8 - Winter**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS*4540</td>
<td>Molecular Biophysics</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>PHYS*4150</td>
<td>Solid State Physics</td>
</tr>
<tr>
<td>0.50 electives *</td>
<td></td>
</tr>
<tr>
<td>PHYS*4300</td>
<td>Inquiry in Physics</td>
</tr>
<tr>
<td>0.50 electives *</td>
<td></td>
</tr>
<tr>
<td>PHYS*4500</td>
<td>Advanced Physics Laboratory</td>
</tr>
<tr>
<td>0.50 electives *</td>
<td></td>
</tr>
</tbody>
</table>

A minimum of 1.00 credits of Arts/Social Sciences electives is required for completion of this program.

++Four work terms are required for the completion of the co-op degree. It is also necessary that there be at least one work term in each of Fall, Winter and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. Whether the student completes four or five work terms, a report is required for each work term completed. Contact the co-op faculty advisor for further details.

**Biotechnology (BIOT)**

Department of Molecular and Cellular Biology, College of Biological Science

**Minor (Honours Program)**

A minimum of 5.00 credits is required.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC*3560</td>
<td>Structure and Function in Biochemistry</td>
</tr>
<tr>
<td>MBG*2040</td>
<td>Foundations in Molecular Biology and Genetics</td>
</tr>
<tr>
<td>MICR*2420</td>
<td>Introduction to Microbiology</td>
</tr>
<tr>
<td>MICR*2430</td>
<td>Microbiology Methods I</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>ENGG*2660</td>
<td>Biological Engineering Systems I</td>
</tr>
<tr>
<td>ENGG*3830</td>
<td>Bio-Process Engineering</td>
</tr>
<tr>
<td>FOOD*2620</td>
<td>Food Engineering Principles</td>
</tr>
<tr>
<td>Two of:</td>
<td></td>
</tr>
<tr>
<td>ECON*1050</td>
<td>Introductory Microeconomics</td>
</tr>
<tr>
<td>ECON*1100</td>
<td>Introductory Macroeconomics</td>
</tr>
<tr>
<td>ECON*2100</td>
<td>Economic Growth and Environmental Quality</td>
</tr>
<tr>
<td>ECON*2310</td>
<td>Intermediate Microeconomics</td>
</tr>
<tr>
<td>ECON*2410</td>
<td>Intermediate Macroeconomics</td>
</tr>
<tr>
<td>MCS*1000</td>
<td>Introductory Marketing</td>
</tr>
<tr>
<td>Three of:</td>
<td></td>
</tr>
<tr>
<td>ANSC*4050</td>
<td>Biotechnology in Animal Science</td>
</tr>
<tr>
<td>FOOD*3260</td>
<td>Industrial Microbiology</td>
</tr>
<tr>
<td>MBG*4240</td>
<td>Applied Molecular Genetics</td>
</tr>
<tr>
<td>MICR*3230</td>
<td>Immunology</td>
</tr>
<tr>
<td>MICR*4180</td>
<td>Microbial Processes in Environmental Management</td>
</tr>
<tr>
<td>PBOI*3750</td>
<td>Plant Tissue Culture</td>
</tr>
</tbody>
</table>

**Business Administration (BADM)**

Department of Economics and Finance, College of Management and Economics

**Minor (Honours Program)**

A minimum of 5.00 credits is required.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT*2220</td>
<td>Financial Accounting</td>
</tr>
<tr>
<td>ACCT*2230</td>
<td>Management Accounting</td>
</tr>
<tr>
<td>ECON*1050</td>
<td>Introductory Microeconomics</td>
</tr>
<tr>
<td>ECON*1100</td>
<td>Introductory Macroeconomics</td>
</tr>
<tr>
<td>ECON*2310</td>
<td>Intermediate Microeconomics</td>
</tr>
<tr>
<td>ECON*2410</td>
<td>Intermediate Macroeconomics</td>
</tr>
<tr>
<td>ECON*2560</td>
<td>Theory of Finance</td>
</tr>
<tr>
<td>MCS*1000</td>
<td>Introductory Marketing</td>
</tr>
<tr>
<td>MCS*3040</td>
<td>Business and Consumer Law</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>BUS*2090</td>
<td>Individuals and Groups in Organizations</td>
</tr>
<tr>
<td>FARE*3310</td>
<td>Operations Management</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM*1040</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>Calculus I</td>
</tr>
<tr>
<td>PHYS*1000</td>
<td>An Introduction to Mechanics</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>BIOL*1070</td>
<td>Discovering Biodiversity</td>
</tr>
<tr>
<td>BIOL*1080</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
</tbody>
</table>

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uquelph.ca/revisedss

**Semester 2**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1010</td>
<td>Introductory Electricity and Magnetism</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>BIOL*1070</td>
<td>Discovering Biodiversity</td>
</tr>
<tr>
<td>BIOL*1080</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>0.50 Arts or Social Science electives</td>
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</tr>
</tbody>
</table>

**Semester 3**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*2060</td>
<td>Structure and Bonding</td>
</tr>
<tr>
<td>MATH*2160</td>
<td>Linear Algebra I</td>
</tr>
<tr>
<td>MATH*2200</td>
<td>Advanced Calculus I</td>
</tr>
<tr>
<td>PHYS*2440</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>PHYS*2460</td>
<td>Electricity and Magnetism I</td>
</tr>
</tbody>
</table>

**Semester 4**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*2070</td>
<td>Structure and Spectroscopy</td>
</tr>
<tr>
<td>CHEM*2480</td>
<td>Analytical Chemistry I</td>
</tr>
<tr>
<td>MATH*2170</td>
<td>Differential Equations I</td>
</tr>
<tr>
<td>PHYS*2450</td>
<td>Mechanics II</td>
</tr>
<tr>
<td>PHYS*2470</td>
<td>Electricity and Magnetism II</td>
</tr>
</tbody>
</table>

**Semester 5**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM*2820</td>
<td>Thermodynamics and Kinetics</td>
</tr>
<tr>
<td>CHEM*3860</td>
<td>Quantum Chemistry</td>
</tr>
<tr>
<td>PHYS*3100</td>
<td>Electronics</td>
</tr>
<tr>
<td>PHYS*3230</td>
<td>Quantum Mechanics I</td>
</tr>
<tr>
<td>PHYS*3240</td>
<td>Statistical Physics I</td>
</tr>
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</table>

**Semester 6**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*3430</td>
<td>Analytical Chemistry II: Instrumental Analysis</td>
</tr>
<tr>
<td>PHYS*3220</td>
<td>Waves and Optics</td>
</tr>
<tr>
<td>PHYS*4040</td>
<td>Quantum Mechanics II</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
</tr>
<tr>
<td>CHEM*2700</td>
<td>Organic Chemistry I</td>
</tr>
<tr>
<td>0.50 Arts or Social Science electives</td>
<td></td>
</tr>
</tbody>
</table>

One of:
2011-2012 Undergraduate Calendar

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
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
One of:
BIOL*1070 [0.50] Discovering Biodiversity
CHEM*1080 [0.50] Biological Concepts of Health
BIOC*1090 [0.50] Introduction to Molecular and Cellular Biology

Students who are lacking one 4U / grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter
CHEM*1050 [0.50] General Chemistry II
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOC*1080 [0.50] Biological Concepts of Health
BIOC*1090 [0.50] Introduction to Molecular and Cellular Biology
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
COOP*1100 [0.00] Introduction to Co-operative Education
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 - Winter
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

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

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

Semester 5 - Winter
CHEM*3430 [0.50] Analytical Chemistry II: Instrumental Analysis
PHYS*3220 [0.50] Waves and Optics
One of:
CHEM*2700 [0.50] Organic Chemistry I
0.50 electives *
One of:
CHEM*3870 [0.50] Molecular Spectroscopy +
0.50 electives *
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*3860 [0.50] Quantum Chemistry
MATH*3100 [0.50] Differential Equations II
PHYS*3230 [0.50] Quantum Mechanics I
PHYS*3240 [0.50] Statistical Physics I

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

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

Semester 8** - Fall
PHYS*4040 [0.50] Quantum Mechanics II
One of:
CHEM*3760 [0.50] Organic Chemistry II
0.50 electives *
CHEM*3750 [0.50] Organic Chemistry II
0.50 electives *

Semester 8** - Winter
PHYS*4040 [0.50] Quantum Mechanics II
One of:
CHEM*3760 [0.50] Organic Chemistry II
0.50 electives *

** A minimum of 2.00 credits in science courses at the 4000 level is required for graduation.
+ One of CHEM*3870 or CHEM*4880 is required for graduation.
++ Four work terms are required for the completion of the co-op degree. It is also necessary that at least one work term in each of Fall, Winter and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. Whether the student completes four or five work terms, a report is required for each work term completed. Contact the co-op faculty advisor for further details.

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*1090 [0.50] Introduction to Molecular and Cellular Biology
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 lacking one 4U / grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss
### 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**

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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
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</tr>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*1000</td>
<td>0.50</td>
</tr>
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</table>

**Semester 2 - Winter**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1050</td>
<td>0.50</td>
</tr>
<tr>
<td>COOP*1100</td>
<td>0.00</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*1010</td>
<td>0.50</td>
</tr>
</tbody>
</table>

#### Stream B: double work term option

**Semester 1 - Fall**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
<td>0.50</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>0.50</td>
</tr>
<tr>
<td>PHYS*1000</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**Semester 2 - Winter**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1050</td>
<td>0.50</td>
</tr>
<tr>
<td>COOP*1100</td>
<td>0.00</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Last Revision: March 15, 2014

2011-2012 Undergraduate Calendar
PHYS*1010 [0.50] Introductory Electricity and Magnetism
PHYS*1070 [0.50] Discovering Biodiversity
PHYS*1080 [0.50] Biological Concepts of Health
0.50 electives

**Semester 3 - Fall**

BIOC*2580 [0.50] Introduction to Biochemistry
CHEM*2060 [0.50] Structure and Bonding
CHEM*2400 [0.75] Analytical Chemistry I
MATH*2150 [0.50] Applied Matrix Algebra
0.50 electives*

**Winter Semester**

COP*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
PHYS*2260 [0.50] Quantum Physics

**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
0.50 electives*

**Summer Semester**

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

**Fall Semester**

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

**Semester 7 - Winter**

2.50 electives* or restricted electives**

**Summer Semester**

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

**Semester 8 - Fall**

CHEM*3440 [0.50] Analytical Chemistry III: Analytical Instrumentation
2.00 electives* or restricted electives**

* selection of electives is subject to the following:
1. At least 1.00 credits must be in the Arts & Social Sciences.
2. Approval of the Faculty Advisor must be obtained for the selection of courses not listed as restrictive electives.
3. Options for an "Area of Focus" or a minor are available. Subject areas include Biochemistry, Computing and Information Science, Earth and Planetary Science, 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

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

**Minor (Honours Program)**

CIS*1500 [0.50] Introduction to Programming
CIS*1910 [0.50] Discrete Structures in Computing I
CIS*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

**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**

BIOC*1070 [0.50] Discovering Biodiversity
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 lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/revisedss](http://www.bsc.uoguelph.ca/revisedss)

**Semester 2**

BIOC*1080 [0.50] Biological Concepts of Health
BIOC*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1050 [0.50] General Chemistry II
PHYS*1080 [0.50] Physics for Life Sciences
0.50 Arts or Social Science electives

**Semester 3**

MBO*2040 [0.50] Foundations in Molecular Biology and Genetics
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 or restricted electives*

**Semester 4**

BIOC*2580 [0.50] Introduction to Biochemistry
BIOC*3110 [0.50] Population Ecology

One of:
- BIOL*2250 [0.50] Biostatistics and the Life Sciences
- STAT*2050 [0.50] Statistics II
- STAT*2250 [0.50] Biostatistics and the Life Sciences

1.00 electives*

**Semester 5**

BIOC*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:
- BIOL*3020 [0.50] Population Genetics
- BIOL*3400 [0.50] Evolution

1.00 electives

**Semester 6**

BIOC*3120 [0.50] Community Ecology
2.00 electives

**Semester 7**

BIOC*4110 [0.75] Ecological Methods
1.75 electives

**Semester 8**

BIOC*4120 [0.50] Evolutionary Ecology
2.00 electives

* Restricted Electives

One of:
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)

1.75 additional science credits, at least 1.50 of which are at the 3000 or 4000 level

Interpretive Ecology (IE)

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)

Resource Conservation (RC)

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)

Minor (Honours Program)

A minimum of 5.00 credits is required to completed the minor, which must include:

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)

School of Environmental Sciences, Ontario Agricultural College

The honours B.Sc. program in Environmental Biology combines a broad education in the life sciences with a more specialized understanding of the biological consequences of interactions between humans and the environment. This major prepares students for post-graduate work in environmental biology and related life sciences and provides a strong foundation for students wishing to pursue careers in teaching, government service or the private sector.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. This major requires the completion of 20.00 credits. A minimum of 16.00 of these 20.00 must be science credits. Of these 16.00 science credits, a minimum of 6.00 must be at the 3000 - 4000-levels with a minimum of 2.00 credits at the 4000-level.

Semester 1

Biol*1070 [0.50] Discovering Biodiversity
Chem*1040 [0.50] General Chemistry I
Math*1080 [0.50] Elements of Calculus I
Phys*1070 [0.50] Introductory Physics for Life Sciences

Semester 2

Biol*1090 [0.50] Introduction to Molecular and Cellular Biology
Chem*1050 [0.50] General Chemistry II
Phys*1080 [0.50] Physics for Life Sciences

Semester 3

Biol*1110 [0.50] Evolution
Chem*1060 [0.50] General Chemistry III
Phys*1090 [0.50] Introductory Physics for Science Students

Semester 4

Biol*3110 [0.50] Population Ecology
Envb*2100 [0.50] Problem-Solving in Environmental Biology
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics

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)

Students are encouraged to take (ENVS*3410 and ENVS*3420) or ENVS*3430 in Semesters 5 and 6.

Semester 6

Biol*3400 [0.50] Evolution
Envb*3330 [0.50] Ecosystem Processes and Applications
1.50 electives or restricted electives chosen from lists A, B, C and/or D

Semester 7

2.50 electives or restricted electives chosen from lists A, B, C and/or D

Students contemplating graduate studies are encouraged to take ENVS*4410 in semester 7 and ENVS*4420 in semester 8, or ENVS*4430 in either semester 7 or 8.

Semester 8

2.50 electives or restricted electives chosen from lists A, B, C and/or D

Restricted Electives

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*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] Integrated Management of Invasive Insect Pests **
- **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
- **PBO*4750** [0.50] Genetic Engineering of Plants **

**List B - Impacts of Pollution on Living Organisms**

Minimum of 1.00 credits from the following list:

- **BIOL*3450** [0.50] Introduction to Aquatic Environments
- **BIOL*4350** [0.50] Biology of Polluted Waters **
- **BIOL*4610** [0.75] Arctic Ecology
- **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] Toxicological 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
- **PBO*4530** [0.50] Environmental Pollution Stresses on Plants **
- **TOX*3360** [0.50] Environmental Chemistry and Toxicology

**List C - Conservation of Biodiversity & Natural Resources**

Minimum of 1.00 credits from the following list:

- **BIOL*3130** [0.50] Conservation Biology
- **BIOL*4040** [0.50] Natural Resources Policy
- **BIOL*4150** [0.50] Wildlife Conservation and Management
- **BIOL*4600** [0.50] Tropical Ecology
- **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*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 **
- **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 **

**List D - Supporting Courses**

- **ENVS*3410** [0.50] Independent Research I
- **ENVS*3420** [0.50] Independent Research II
- **ENVS*3430** [1.00] Independent Research **
- **ENVS*4410** [1.00] Advanced Independent Research I
- **ENVS*4420** [1.00] Advanced Independent Research II
- **ENVS*4430** [2.00] Advanced Independent Research

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
- **MCB*2050** [0.50] Molecular Biology of the Cell
- **SOIL*2010** [0.50] Soil Science

**Environmental Geoscience and Geomatics (EGG)**

Department of Geography, College of Social and Applied Human Sciences

This program provides opportunities for study of the processes and properties of the biophysical environment and a core foundation in the analytical techniques (i.e., Geographical Information Science and Remote Sensing) used for their interpretation, analysis and presentation.

Graduates of the program that select courses required for a ‘Professional Geoscientist’ will meet the academic requirements for eligibility for membership as an Environmental Geoscientist in the Association of Professional Geoscientists of Ontario (APGO), allowing for use of the designation P. Geo. Ontario’s legislation under the Professional Geoscientists Act, 2000 (the Act), requires registration with the APGO of anyone wishing to practice geoscience in Ontario. Details on the course requirements for APGO membership can be found on the Department of Geography website:

**Major (Honours Program)**

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult with a B.Sc. Faculty Advisor in the Department of Geography. All students are encouraged to consult with the advisor on a regular basis.

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

**Semester 1**

- **BIOL*1070** [0.50] Discovering Biodiversity
- **CHEM*1040** [0.50] General Chemistry I
- **GEOG*1050** [0.50] Geology and the Environment
- **PHYS*1080** [0.50] Physics for Life Sciences

One of:

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

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/reviseds

**Semester 2**

- **BIOL*1090** [0.50] Introduction to Molecular and Cellular Biology
- **CHEM*1050** [0.50] General Chemistry II
- **GEOG*1300** [0.50] Introduction to the Biophysical Environment
- **PHYS*1130** [0.50] Physics with Applications

0.50 Arts or Social Science electives* (GEOG*1220 is recommended)

**Semester 3**

- **GEOG*2000** [0.50] Geomorphology
- **GEOG*2420** [0.50] The Earth From Space
- **GEOG*2480** [0.50] Mapping and GIS

One of:

- **GEOG*2460** [0.50] Analysis in Geography
- **STAT*2040** [0.50] Statistics I

0.50 Arts or Social Science electives*

**Semester 4**

- **GEOG*2110** [0.50] Climate and the Biophysical Environment
- **GEOG*2210** [0.50] Environment and Resources

One of:

- **CIS*1200** [0.50] Introduction to Computing
- **CIS*1500** [0.50] Introduction to Programming
- **MATH*1210** [0.50] Calculus II
- **MATH*2080** [0.50] Elements of Calculus II

1.00 approved Science electives*

**Semester 5**

- **GEOG*3000** [0.50] Fluvial Processes
- **GEOG*3110** [0.50] Biotic and Natural Resources

One of:

- **GEOG*3200** [0.50] Global Environmental Change
- **GEOG*3090** [0.50] Gender and Environment
- **GEOG*3210** [0.50] Management of the Biophysical Environment

1.00 electives, at least 0.50 from approved Science electives*

**Semester 6**

- **GEOG*3420** [0.50] Remote Sensing of the Environment
- **GEOG*3480** [0.50] GIS and Spatial Analysis
- **GEOG*3610** [0.50] Environmental Hydrology

1.00 electives, at least 0.50 from approved Science electives*

**Semester 7**

- **GEOG*4110** [1.00] Environmental Systems Analysis

1.50 electives, at least 1.00 from approved Science electives* (GEOG*4690 is recommended)

**Semester 8**

- **GEOG*4480** [1.00] Applied Geographic Information Systems

1.50 electives, at least 1.00 from approved Science electives*

**Program Requirements**

1. Students are required to complete 16.00 credits in science of which a minimum of 6.00 credits must be 3000 or 4000 level, of which at least 2.00 must be at the 4000 level.

2. * Students should refer to the list of Approved Science and Arts/Social Science electives for BSc students: http://www.bsc.uoguelph.ca/Approved_electives.shtml

2011-2012 Undergraduate Calendar

Last Revision: March 15, 2014
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

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<thead>
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<th>Credit</th>
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0.50 Arts or Social Science electives

Note: C IS*1200, rather than an Arts or Social Science credit is recommended for those needing to improve their computer skills.

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revision/2011-2012-Undergraduate-Calendar

Semester 2 - Winter

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0.50 Arts or Social Science electives

Semester 3 - Fall

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0.50 electives

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0.50 electives

Semester 5 - Fall

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0.50 electives

Semester 6 - Winter

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0.50 electives

Semester 7 - Fall

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2.00 electives

Semester 8 - Winter

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<td>F O O D*4600</td>
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1.50 electives

Notes:

1. E N G L*1200 is recommended for those students needing to improve their English grammar.
2. F O O D*2150 could be replaced by F O O D*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 a list of Restricted Electives.
   At least 1.00 must be from additional science electives (1.50 if M C S*3010 is chosen as a Restricted Elective)

Restricted Electives:

<table>
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<td>M C S*3010</td>
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Notes:

1.90 electives

Food Science (Co-op) (FOOD:C)

Department of Food Science, Ontario Agricultural College

Major (Honours Program)

Semester 1 - Fall

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<td>P H Y S*1070</td>
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</table>

0.50 Arts or Social Science electives

Note: C IS*1200, rather than an Arts or Social Science credit is recommended for those needing to improve their computer skills.

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revision/2011-2012-Undergraduate-Calendar

Semester 2 - Winter

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0.50 Arts or Social Science electives

Semester 3 - Fall

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0.50 electives

Semester 4 - Winter

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0.50 electives
### Functional Foods and Nutraceuticals (FFAN)

**Department of Human Health and Nutritional Sciences, College of Biomedical Science**

**Department of Food Science, Ontario Agricultural College.**

**Minor (Honours Program)**

A minor in Functional Foods and Nutraceuticals consists of 5.00 credits.

<table>
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<td>ECON*1050</td>
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<td>Fundamentals of Nutrition</td>
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<td>TOX*2000</td>
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<td>Principles of Toxicology</td>
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<td>Introduction to Nutritional and Food Science</td>
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<tr>
<td>FOOD*4090</td>
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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 Genetics**, and Pathology.

**Notes:**

*students in these majors must select restricted electives outside of the major Geographical 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:

<table>
<thead>
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<th>Credits</th>
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<tr>
<td>GEOG*4210</td>
<td>[0.50]</td>
<td>Environmental Governance</td>
</tr>
</tbody>
</table>

0.50 electives

### Geology (GEOL)

**School of Environmental Sciences, Ontario Agricultural College**

**Minor (Honours Program)**

A minor will consist of at least 5.00 credits in Geology. The following 6 courses are mandatory:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL*3090</td>
<td>[0.50]</td>
<td>Environmental Systems Analysis</td>
</tr>
<tr>
<td>GEOL*4090</td>
<td>[0.50]</td>
<td>Applied Structural Geology</td>
</tr>
<tr>
<td>GEOL*4210</td>
<td>[0.50]</td>
<td>Sedimentology</td>
</tr>
</tbody>
</table>

### 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 who are lacking one 4U or grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/revsedss](http://www.bsc.uoguelph.ca/revsedss)

### Statistics I

**Department of Mathematics and Statistics, College of Social and Applied Human Sciences**

**Semester 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Title</th>
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<tbody>
<tr>
<td>BIOL*1080</td>
<td>[0.50]</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>[0.50]</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>MATH*1080</td>
<td>[0.50]</td>
<td>Elements of Calculus I</td>
</tr>
<tr>
<td>PHYS*1070</td>
<td>[0.50]</td>
<td>Introductory Physics for Life Sciences</td>
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### Semester 2

<table>
<thead>
<tr>
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<th>Title</th>
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<tbody>
<tr>
<td>BIOL*1070</td>
<td>[0.50]</td>
<td>Discovering Biodiversity</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>[0.50]</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1050</td>
<td>[0.50]</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>PHYS*1080</td>
<td>[0.50]</td>
<td>Physics for Life Sciences</td>
</tr>
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### Semester 3

<table>
<thead>
<tr>
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<th>Credits</th>
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<tbody>
<tr>
<td>BIOL*2580</td>
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<td>Introduction to Biochemistry</td>
</tr>
<tr>
<td>MBG*2040</td>
<td>[0.50]</td>
<td>Foundations in Molecular Biology and Genetics</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>[0.50]</td>
<td>Statistics I</td>
</tr>
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</table>

1.50 electives
0.50 Arts or Social Science electives

Semester 4
HK*2270 [0.50] Principles of Human Biomechanics
MCB*2050 [0.50] Molecular Biology of the Cell
NUTR*3210 [0.50] Fundamentals of Nutrition
0.50 electives

0.50 Arts or Social Science electives

Semester 5
HK*3600 [0.75] Human Anatomy: Dissection
HK*3940 [1.25] Human Physiology
One of
HK*3401 [0.75] Human Anatomy: Dissection
HK*3501 [0.75] Human Anatomy: Prosection

Semester 6
BIOC*3560 [0.50] Structure and Function in Biochemistry
HK*3100 [0.50] Neuromuscular Physiology
HK*4600 [0.75] Applied Human Kinetics II
One of
HK*3402 [0.75] Human Anatomy: Dissection (if registered in HK*3401 in semester 5)
HK*3502 [0.75] Human Anatomy (if registered in HK*3501 in semester 5)

Semester 7
HK*4550 [0.50] Human Cardio-respiratory Physiology
NUTR*4210 [0.50] Nutrition, Exercise and Energy Metabolism
1.50 electives or restricted electives

Semester 8
2.50 electives or restricted electives

Restricted Electives
A minimum of 1.00 credits of restricted electives are required which must be selected from HK*4XXX, NUTR*4XXX (must be an approved B.Sc. Science Elective).

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*1070 [0.50] Discovering Biodiversity
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 lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1050 [0.50] General Chemistry II
PHYS*1080 [0.50] Physics for Life Sciences
0.50 Arts or Social Science electives*

Semester 3
STAT*2040 [0.50] Statistics I
ZOO*2090 [0.50] Vertebrate Structure and Function
ZOO*2100 [0.50] Developmental Biology
1.00 electives**

Semester 4
BIOC*2580 [0.50] Introduction to Biochemistry
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
ZOO*2700 [0.50] Invertebrate Morphology & Evolution
1.00 electives**

Semester 5
BIOL*3110 [0.50] Population Ecology
BIOL*3400 [0.50] Evolution
BIOL*3450 [0.50] Introduction to Aquatic Environments
ZOO*3200 [0.50] Comparative Animal Physiology I
ZOO*3700 [0.50] Integrative Biology of Invertebrates

Semester 6
BIOL*3120 [0.50] Community Ecology
ZOO*3210 [0.50] Comparative Animal Physiology II
1.50 electives***

Semester 7
BIOL*4350 [0.50] Biology of Polluted Waters
ZOO*4570 [0.50] Marine Ecological Processes
ZOO*4910 [0.50] Integrative Vertebrate Biology
ZOO*4930 [0.25] Lab Studies in Ichthyology
0.75 electives**

Semester 8
BIOL*4010 [0.50] Adaptational Physiology
ZOO*4330 [0.50] 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*4550 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
   - BIOL*4410 [0.75] Field Ecology
   - BIOL*4610 [0.75] Arctic Ecology
   - BIOL*4700 [0.50] Field Biology
   - BIOL*4710 [0.25] Field Biology
   - BIOL*4800 [0.50] Field Biology
   - BIOL*4810 [0.25] Field Biology
   - IBIO*4500 [0.75] Research in Integrative Biology I
   - IBIO*4510 [0.75] Research in Integrative Biology II
   - IBIO*4521/2 [2.00] Thesis in Integrative Biology
   - ZOO*4300 [0.75] Marine Biology and Oceanography
   - ZOO*4540 [0.50] Marine and Freshwater Research

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 a total of 20.00 credits. Students who are lacking one 4U /grade 12 course in Mathematics, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 1
CHEM*1040 [0.50] General Chemistry I
CIS*1500 [0.50] Introduction to Programming
MATH*1210 [0.50] Calculus I
PHYS*1080 [0.50] Introduction to Mechanics

One of
   - BIOL*1070 [0.50] Discovering Biodiversity
   - BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
   - BIOL*3110 [0.50] Evolution
   - BIOL*3400 [0.50] Population Ecology
   - BIOL*3450 [0.50] Introduction to Aquatic Environments
   - MATH*1210 [0.50] Calculus I

Semester 2
CHEM*1050 [0.50] General Chemistry II
MATH*1210 [0.50] Calculus II
PHYS*1080 [0.50] Introduction to Mechanics

One of
   - BIOL*1070 [0.50] Discovering Biodiversity
   - BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
   - BIOL*3110 [0.50] Evolution
   - BIOL*3400 [0.50] Population Ecology
   - BIOL*3450 [0.50] Introduction to Aquatic Environments

Last Revision: March 15, 2014
**Major (Honours Program)**

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A minimum of 6.00 science credits must be at the 3000/4000 level of which at least 2.00 credits must be at the 4000 level (including the 1.00 from the restricted elective credits).

**Semester 1**
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
- CHEM*1040 [0.50] General Chemistry I
- MATH*1080 [0.50] Elements of Calculus I
- PHYS*1070 [0.50] Introductory Physics for Life Sciences
- 0.50 Arts or Social Science electives

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/revisedsds](http://www.bsc.uoguelph.ca/revisedsds)

**Semester 2**
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health
- CHEM*1050 [0.50] General Chemistry II
- PHYS*1080 [0.50] Physics for Life Sciences
- 0.50 Arts or Social Science electives

**Semester 3**
- BIOL*2580 [0.50] Introduction to Biochemistry
- MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
- MICR*2420 [0.50] Introduction to Microbiology
- STAT*2040 [0.50] Statistics I
- 0.50 Arts or Social Science electives

**Semester 4**
- BIOL*3560 [0.50] Structure and Function in Biochemistry
- MCB*2050 [0.50] Molecular Biology of the Cell
- MICR*2430 [0.50] Microbiology Methods I
- 0.50 electives
- 0.50 Arts or Social Science electives

**Semester 5**
- MBG*3080 [0.50] Bacterial Genetics
- MICR*3420 [0.50] Microbial Diversity
- 1.50 electives or restricted electives

**Semester 6**
- MBG*3350 [0.75] Laboratory Methods in Molecular Biology I
- MICR*3260 [0.50] Microbial Adaptation and Development
- MICR*3430 [0.50] Microbiology Methods II
- A minimum of 0.75 electives or restricted electives

**Semester 7**
- 2.50 electives or restricted electives which can include MCB*4500

**Semester 8**
- 2.50 electives or restricted electives which can include MCB*4510

**Restricted Elective Credits**
- 3.50 restricted elective credits of which 1.00 credit must be at the 4000 level.
- BIOL*4540 [0.75] Enzymology
- BIOL*4580 [0.50] Membrane Biophysics
- BIOL*3050 [0.50] Mycology
- ENVB*3280 [0.50] Waterborne Disease Ecology
- FOOD*3230 [0.75] Food Microbiology
- FOOD*3260 [0.50] Industrial Microbiology
- FOOD*4400 [0.50] Dairy Processing
- MCB*4060 [0.50] Molecular & Cell Biology of Yeast
- MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I
- MCB*4510 [1.00] Research Project in Molecular & Cellular Biology 2
- MCB*4600 [0.50] Topics in Molecular and Cellular Biology
- MICR*3220 [0.50] Plant Microbiology
- MICR*3230 [0.50] Immunology
- MICR*3330 [0.50] World of Viruses
- MICR*4010 [0.50] Pathogenic Bacteriology
- MICR*4140 [0.50] Soil Microbiology and Biotechnology
- MICR*4180 [0.50] Microbial Processes in Environmental Management
- MICR*4280 [0.50] Microbial Ecology
- MICR*4330 [0.50] Molecular Virology
- MICR*4430 [0.50] Medical Virology
- MICR*4520 [0.50] Microbial Cell Biology
- MICR*4550 [0.50] Immunology II
- PATH*3040 [0.50] Principles of Parasitology

*Only 1 of MICR*4140 and MICR*4180 can be used to meet the restricted elective requirements.*
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*2420 [0.50] Introduction to Microbiology
- MICR*2430 [0.50] Microbiology Methods I

2.00 credits from:
- BIOI*3050 [0.50] Mycology
- FOOD*3320 [0.75] Food Microbiology
- FOOD*3320 [0.50] Industrial Microbiology
- MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
- MBG*3080 [0.50] Bacterial Genetics
- MICR*3220 [0.50] Plant Microbiology
- MICR*3230 [0.50] Immunology
- MICR*3260 [0.50] Microbial Adaptation and Development
- MICR*3330 [0.50] World of Viruses
- MICR*3420 [0.50] Microbial Diversity
- MICR*4140 [0.50] Soil Microbiology and Biotechnology
- MICR*4180 [0.50] Microbial Processes in Environmental Management
- MICR*4520 [0.50] Microbial Cell Biology

1.00 credits from:
- MICR*4060 [0.50] Molecular & Cell Biology of Yeast
- MICR*4010 [0.50] Pathogenic Bacteriology
- MICR*4280 [0.50] Microbial Ecology
- MICR*4330 [0.50] Molecular Virology
- MICR*4430 [0.50] Medical Virology
- MICR*4530 [0.50] Immunology II

Microbiology (Co-op) (MICR:C)

Department of Molecular and Cellular Biology, College of Biological Science

Students in the Major in Microbiology program may take the Co-op option. Students do not begin their first work term until they have completed semester 3 and courses BIOC*1090, BIOC*1810, BIOC*1900 and MICR*2430. Students in the co-op program must also complete Coop*1180 in the second academic semester. At least 3 work terms (Coop*1000, Coop*2000, Coop*3000) are required in the co-op program, and the course requirements are the same as shown for the major program. Some courses must be taken during a different semester than usual, and Co-op students generally require an additional semester to meet all the program requirements. Students should plan their programs in consultation with the faculty advisor. A total of 20.00 credits are required to complete the major. A minimum of 6.00 science credits must be at the 3000/4000 level of which at least 2.00 credits must be at the 4000 level (including the 1.00 from the restricted elective credits).

Major (Honours Program)

Semester 1 - Fall
- BIOC*1090 [0.50] Introduction to Molecular and Cellular Biology
- CHEM*1040 [0.50] General Chemistry I
- MATH*1080 [0.50] Elements of Calculus I
- PHYS*1070 [0.50] Introductory Physics for Life Sciences

0.50 Arts or Social Science electives

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revseds

Semester 2 - Winter
- BIOC*1070 [0.50] Discovering Biodiversity
- BIOC*1810 [0.50] Biological Concepts of Health
- CHEM*1050 [0.50] General Chemistry II
- PHYS*1080 [0.50] Physics for Life Sciences

0.50 Arts or Social Science electives

Summer Semester

No academic semester or work term

Semester 3 - Fall
- BIOC*2580 [0.50] Introduction to Biochemistry
- COOP*1100 [0.00] Introduction to Co-operative Education
- MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
- MICR*2420 [0.50] Introduction to Microbiology
- STAT*2040 [0.50] Statistics I

0.50 Arts or Social Science electives

Semester 4 - Winter
- BIOC*3560 [0.50] Structure and Function in Biochemistry
- MCB*2050 [0.50] Molecular Biology of the Cell
- MICR*2430 [0.50] Microbiology Methods I

0.50 electives

Restricted Elective Credits

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

- BIOC*4540 [0.75] Enzymology
- BIOC*4580 [0.50] Membrane Biochemistry
- BIOC*3050 [0.50] Mycology
- ENVB*3280 [0.50] Waterborne Disease Ecology
- FOOD*3320 [0.75] Food Microbiology
- FOOD*3320 [0.50] Industrial Microbiology
- MCB*4060 [0.50] Molecular & Cell Biology of Yeast
- MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I
- MCB*4510 [1.00] Research Project in Molecular & Cellular Biology II
- MCB*4560 [0.50] Plant Microbiology
- MCB*3230 [0.50] Immunology
- MCB*3330 [0.50] World of Viruses
- MCB*4010 [0.50] Pathogenic Bacteriology
- MCB*4140 [0.50] Soil Microbiology and Biotechnology
- MCB*4180 [0.50] Microbial Processes in Environmental Management
- MCB*4520 [0.50] Microbial Cell Biology
- MCB*4530 [0.50] Immunology II
- MCB*4280 [0.50] Microbial Ecology
- MCB*4330 [0.50] Molecular Virology
- MCB*4430 [0.50] Medical Virology
- MCB*4600 [0.50] General Virology
- PATH*3040 [0.50] Principles of Parasitology

*Only 1 of MICR*4140 and MCB*4180 can be used to meet the restricted elective requirements.

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
- BIOC*1090 [0.50] Introduction to Molecular and Cellular Biology
- CHEM*1040 [0.50] General Chemistry I
- MATH*1080 [0.50] Elements of Calculus I
- PHYS*1070 [0.50] Introductory Physics for Life Sciences

0.50 Arts or Social Science electives

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revseds
<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Semester 2</td>
<td>BIOL*1070</td>
<td>[0.50]</td>
<td>Discovering Biodiversity</td>
</tr>
<tr>
<td></td>
<td>BIOL*1080</td>
<td>[0.50]</td>
<td>Biological Concepts of Health</td>
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<tr>
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<td>CHEM*1050</td>
<td>[0.50]</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td></td>
<td>PHYS*1080</td>
<td>[0.50]</td>
<td>Physics for Life Sciences</td>
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<tr>
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<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>CIS*1200</td>
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<td>CIS*1500</td>
<td>[0.50]</td>
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<tr>
<td>Semester 3</td>
<td>BIOC*2580</td>
<td>[0.50]</td>
<td>Introduction to Biochemistry</td>
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<td>MBG*2040</td>
<td>[0.50]</td>
<td>Foundations in Molecular Biology and Genetics</td>
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<tr>
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<td>MICR*2420</td>
<td>[0.50]</td>
<td>Introduction to Microbiology</td>
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<td>Electives or Restricted Electives</td>
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<tr>
<td>Semester 4</td>
<td>MCB*2050</td>
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<td>[1.00]</td>
<td>Electives or Restricted Electives</td>
</tr>
<tr>
<td>Semester 5</td>
<td>MBG*3350</td>
<td>[0.75]</td>
<td>Laboratory Methods in Molecular Biology I</td>
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<td>[1.75]</td>
<td>Electives or Restricted Electives</td>
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<td>Semester 6</td>
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<td>[2.50]</td>
<td>Electives or Restricted Electives</td>
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<tr>
<td>Semester 7*</td>
<td>MCB*4500</td>
<td>[1.00]</td>
<td>Research Project in Molecular &amp; Cellular Biology I</td>
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<td>Semester 8*</td>
<td>MCB*4510</td>
<td>[1.00]</td>
<td>Research Project in Molecular &amp; Cellular Biology II</td>
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</tbody>
</table>

**Restricted Electives**

1. **Ecology Elective - 0.50 credits**
   - BIOL*2060 | [0.50] | Ecology |
   - BIOL*3110 | [0.50] | Population Ecology |
   - BOT*3050 | [0.50] | Plant Functional Ecology |
   - MICR*4280 | [0.50] | Microbial Ecology |

2. **Arts and Social Science Electives - 2.00 credits**

3. **Physiology Elective - 0.50 credits**
   - BIOM*3200 | [1.00] | Mammalian Physiology |
   - 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 MCB*4600 is taken instead of MCB*4500 and MCB*4510)
     - BIOL*3560 | [0.50] | Structure and Function in Biochemistry |
     - BIOL*3020 | [0.50] | Population Genetics |
     - BIOL*3300 | [0.50] | Applied Bioinformatics |
     - MCB*3050 | [0.50] | Human Genetics |
     - MBG*3060 | [0.50] | Quantitative Genetics |
     - MBG*3080 | [0.50] | Bacterial 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*3300 | [0.50] | World of Viruses |
     - MICR*4330 | [0.50] | Molecular Virology |

**Minor (Honours Program)**

A minor in Molecular Biology and Genetics requires 5.00 credits in Molecular Biology and Genetics chosen in consultation with the faculty advisor, and will include:

- MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
- MCB*2050 | [0.50] | Molecular Biology of the Cell |

**Nanoscience (NANO)**

- MICR*3360 | [0.50] | Nanomaterials |
- NANO*3200 | [0.50] | Nanotechnology |
- NANO*3300 | [0.50] | Nanoscience Courses |
- NANO*3700 | [0.50] | Nanomaterials and Nanotechnology |

**Major (Honours Program)**

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

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Course Code</th>
<th>Credits</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BIOL*1090</td>
<td>[0.50]</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td></td>
<td>CHEM*1040</td>
<td>[0.50]</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td></td>
<td>MATH*1200</td>
<td>[0.50]</td>
<td>Calculus I</td>
</tr>
<tr>
<td></td>
<td>NANO*1000</td>
<td>[0.50]</td>
<td>Introduction to Nanoscience</td>
</tr>
<tr>
<td></td>
<td>PHYS*1000</td>
<td>[0.50]</td>
<td>An Introduction to Mechanics</td>
</tr>
</tbody>
</table>

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/revisedss](http://www.bsc.uoguelph.ca/revisedss)
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*2480
- Semester 5: CHEM*3760
- 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 6: ENGG*2410, ENGG*3450
- Semester 7: ENGG*4550
- Semester 8: 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

**Nanoscience (NANO:C)**

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

**Major (Honours Program)**

The major will require the completion of 20.00 credits as indicated below. To graduate from the co-op program, a minimum of 4 successfully completed work terms is normally required.

**Semester 1 - Fall**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
<td>Introduction to Molecular and Cellular Biology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>General Chemistry I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>Calculus I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>NANO*1000</td>
<td>Introduction to Nanoscience</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PHYS*1000</td>
<td>An Introduction to Mechanics</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

Students who are lacking one 4U grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/revisedss](http://www.bsc.uoguelph.ca/revisedss)

**Semester 2 - Winter**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>General Chemistry II</td>
<td>[0.50]</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>Calculus II</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PHYS*1010</td>
<td>Introductory Electricity and Magnetism</td>
<td>[0.50]</td>
</tr>
<tr>
<td>BIOL*1070</td>
<td>Discovering Biodiversity</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

* 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.

**Semester 3 - Fall**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*2060</td>
<td>Structure and Bonding</td>
<td>[0.50]</td>
</tr>
<tr>
<td>COOP*1110</td>
<td>Introduction to Co-operative Education</td>
<td>[0.00]</td>
</tr>
<tr>
<td>MATH*2160</td>
<td>Linear Algebra I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>NANO*2000</td>
<td>Synthesis of Nanomaterials</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PHYS*2310</td>
<td>Mechanics I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PHYS*2330</td>
<td>Electricity and Magnetism</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

**Semester 4 - Winter**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*2070</td>
<td>Structure and Spectroscopy</td>
<td>[0.50]</td>
</tr>
<tr>
<td>MATH*2170</td>
<td>Differential Equations I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>NANO*2100</td>
<td>Analysis of Nanomaterials</td>
<td>[0.50]</td>
</tr>
<tr>
<td>1.00 electives*</td>
<td></td>
<td></td>
</tr>
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</table>

**Summer Semester**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*1000</td>
<td>Co-op Work Term I</td>
<td>[0.00]</td>
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**Semester 5 - Fall**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Winter Semester**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
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</thead>
<tbody>
<tr>
<td>COOP*2000</td>
<td>Co-op Work Term II</td>
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**Summer Semester**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*3000</td>
<td>Co-op Work Term III</td>
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</table>

**Semester 6 - Fall**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NANO*4100</td>
<td>Biological Nanomaterials</td>
<td>[0.50]</td>
</tr>
<tr>
<td>2.00 electives</td>
<td></td>
<td></td>
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</tbody>
</table>

**Semester 7 - Winter**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NANO*3200</td>
<td>Nanolithographic Techniques</td>
<td>[0.50]</td>
</tr>
<tr>
<td>NANO*3300</td>
<td>Spectroscopy of Nanomaterials</td>
<td>[0.50]</td>
</tr>
<tr>
<td>NANO*3700</td>
<td>Introduction to Quantum Computing</td>
<td>[0.50]</td>
</tr>
<tr>
<td>1.00 electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Summer Semester**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*4000</td>
<td>Co-op Work Term IV</td>
<td>[0.00]</td>
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</table>

**Fall Semester**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COOP*5000</td>
<td>Co-op Work Term V</td>
<td>[0.00]</td>
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</tbody>
</table>

**Semester 8**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NANO*4200</td>
<td>Topics in Nanomaterials</td>
<td>[0.50]</td>
</tr>
<tr>
<td>2.00 electives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 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.

Note: Four work terms are required for the completion of the co-op degree. It is also necessary that there be at least one work term in each of Winter, Fall, and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. It is only required to complete 4 of the 5 listed work terms. A report is required for each work term completed, even when all 5 are done. Contact the co-op faculty advisor for further details.

**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 found under the listing for the regular program.

**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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEUR*4000</td>
<td>Current Issues in Neuroscience</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2410</td>
<td>Behavioural Neuroscience I</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PSYC*2410</td>
<td>Quantification in Psychology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>Statistics I</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

1 of:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOM*2000</td>
<td>Concepts in Human Physiology for B.A. students only</td>
<td>[0.50]</td>
</tr>
<tr>
<td>BIOM*3200</td>
<td>Mammalian Physiology</td>
<td>[0.00]</td>
</tr>
<tr>
<td>HK*3940</td>
<td>Human Physiology</td>
<td>[1.25]</td>
</tr>
<tr>
<td>ZOO*3200</td>
<td>Comparative Animal Physiology</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

Last Revision: March 15, 2014
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
- BIOM*4521/2 [2.00] Research in Biomedical Sciences
- HK*4360 [1.00] Research in Human Health and Nutritional Sciences
- HK*4371/2 [1.00] Research in Human Health and Nutritional Sciences II
- IBO*4500 [0.75] Research in Integrative Biology I
- IBO*4510 [0.75] Research in Integrative Biology II
- MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I
- NEUR*4401/2 [1.00] Research in Neurosciences
- NEUR*4450 [1.00] Research in Neurosciences
- PSYC*4510 [0.50] Current Issues in Psychology
- PSYC*4870 [0.50] Honours Thesis I
- PSYC*4880 [1.00] Honours Thesis II

0.50 credits of the required research project may be selected from:

- BIOM*4500 [0.50] Literature-based Research in Biomedical Sciences
- HK*4230 [0.50] Advanced Study in Human Health and Nutritional Sciences
- MCB*4600 [0.50] Topics in Molecular and Cellular Biology
- PSYC*4500 [0.50] Current Theoretical Issues in Psychology

and 2.00 from the following:

- BIOM*3000 [0.50] Functional Mammalian Neuroanatomy
- BIOM*3090 [0.50] Principles of Pharmacology
- BIOM*4030 [0.50] Endocrine Physiology
- HK*3100 [0.50] Neuromuscular Physiology
- 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*3410 [0.50] Behavioural Neuroscience I
- PSYC*4050 [0.50] Seminar in Animal Learning
- PSYC*4470 [0.50] Behavioural Neuroscience Seminar
- PSYC*4600 [0.50] Cognitive Neuroscience
- PSYC*4750 [0.50] Seminar in Motivation and Emotion

In fulfillment of the 2.00 additional credits, students may take 1 of:

- BIOM*3040 [0.75] Medical Embryology
- ZOO*2100 [0.50] Developmental Biology

and non-B.Sc. students may also select:

- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
- MBG*2040 [0.50] Foundations in Molecular Biology and Genetics

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, spreadsheet use and data management, the student should select CIS*1200 as early in the program as possible.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. A total of 20.00 credits is required, including 2.00 credits from Arts and Social Sciences courses.

Semester 1

- BIOL*1080 [0.50] Biological Concepts of Health
- CHEM*1040 [0.50] General Chemistry I
- MATH*1080 [0.50] Elements of Calculus I
- PHYS*1070 [0.50] Introductory Physics for Life Sciences

0.50 arts or social science electives

Students who are lacking one 4U grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/reviseds

Semester 2

- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
- CHEM*1050 [0.50] General Chemistry II
- PHYS*1080 [0.50] Physics for Life Sciences

0.50 arts or social science electives

Semester 3

- BIOM*2580 [0.50] Introduction to Biochemistry
- MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
- STAT*2040 [0.50] Statistics I

0.50 electives or restricted electives

0.50 arts or social science electives

Semester 4

- BIOM*3560 [0.50] Structure and Function in Biochemistry
- MCB*2050 [0.50] Molecular Biology of the Cell
- NUTR*3210 [0.50] Fundamentals of Nutrition

0.50 electives or restricted electives

0.50 arts or social science electives

Semester 5

- HK*3940 [1.25] Human Physiology
- NUTR*3330 [0.50] Micronutrients, Phytochemicals and Health
- NUTR*3390 [0.75] Applied Nutritional and Nutraceutical Sciences I

Semester 6

- BIOM*3090 [0.50] Principles of Pharmacology
- NUTR*4090 [0.50] Functional Foods and Nutraceuticals
- NUTR*4320 [0.50] Nutrition and Metabolic Control of Disease
- NUTR*4330 [0.75] Applied Nutritional and Nutraceutical Sciences II

A minimum of 0.25 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

1.00 credits from the following:

- HK*4230 [0.50] Advanced Study in Human Health and Nutritional Sciences
- HK*4360 [1.00] Research in Human Health and Nutritional Sciences
- HK*4371/2 [1.00] Research in Human Health and Nutritional Sciences II
- HK*4460 [0.50] Regulation of Human Metabolism
- NUTR*4350 [0.50] Current Issues in Nutrition
- NUTR*4360 [0.50] Current Issues in Nutrigenomics
- PATH*3610 [0.50] Principles of Disease

Minor (Honours Program)

A minor in Nutritional and Nutraceutical Sciences (NANS) requires 5.00 credits as follows:

- BIOM*2580 [0.50] Introduction to Biochemistry
- NUTR*3210 [0.50] Fundamentals of Nutrition
- NUTR*3330 [0.50] Micronutrients, Phytochemicals and Health
- NUTR*4090 [0.50] Functional Foods and Nutraceuticals
- STAT*2040 [0.50] Statistics I

At least 0.50 credits from:

- ANSC*3080 [0.50] Agricultural Animal Physiology (restricted to ABIO majors)
- BIOM*3200 [1.00] Mammalian Physiology
- 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 Crustacean
- ANSC*3180 [0.50] Wildlife Nutrition
- ANSC*4260 [0.50] Beef Cattle Nutrition
- ANSC*4270 [0.50] Dairy Cattle Nutrition
- ANSC*4280 [0.50] Poultry Nutrition
- ANSC*4290 [0.50] Swine Nutrition
- ANSC*4560 [0.50] Pet Nutrition
- EQN*4020 [0.50] Feeding the Performance Horse
- FOOD*2010 [0.50] Principles of Food Science
- HK*4230 [0.50] Advanced Study in Human Health and Nutritional Sciences
- HK*4360 [1.00] Research in Human Health and Nutritional Sciences
- HK*4371/2 [1.00] Research in Human Health and Nutritional Sciences II
- NUTR*2150 [0.50] Introduction to Nutritional and Food Sciences
- NUTR*3390 [0.75] Applied Nutritional and Nutraceutical Sciences I
- NUTR*4210 [0.50] Nutrition, Exercise and Energy Metabolism
- NUTR*4320 [0.50] Nutrition and Metabolic Control of Disease
- NUTR*4330 [0.75] Applied Nutritional and Nutraceutical Sciences II
- NUTR*4350 [0.50] Current Issues in Nutrition
- NUTR*4360 [0.50] Current Issues in Nutrigenomics
- NUTR*4510 [0.50] Toxicology, Nutrition and Food

Physical Science (PSCI)

College of Physical and Engineering Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

1. Basic Science Core - 4.00 credits
1.00 - Biology (BIOL*1070, BIOL*1080, BIOL*1090)
1.00 - Chemistry (CHEM*1040, CHEM*1050)
1.00 - Physics (PHYS*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
0.50 (CIS*1200 or CIS*1500)
7.00 physical science credits, including at least 4.00 credits at the 3000 or 4000 level of which 2.00 credits must be at the 4000 level.

3. Science Electives - 4.00 credits

4.00 science credits from the List of Approved Science Electives for B.Sc. Students*

4. Arts and Social Science Electives - 2.00

2.00 acceptable Arts or Social Science credits selected from the List of Approved B.Sc. Electives*

5. Free Electives - 2.00 credits

Note: the program must include a total of 6.00 science credits at the 3000 or 4000 level. Of these, at least 2.00 credits must be physical science at the 4000 level.

Semester 1

CHEM*1040 [0.50] General Chemistry I
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
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

CHEM*1050 [0.50] General Chemistry II
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
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

Semester 3

1.50 science electives from the approved list of acceptable B.Sc. science electives* 0.50 electives

One of:
CIS*1200 [0.50] Introduction to Computing
CIS*1500 [0.50] Introduction to Programming
OR
STAT*2040 [0.50] Statistics I

Semester 4

1.50 science electives from the approved list of B.Sc. science electives* 0.50 electives

One of:
CIS*1200 [0.50] Introduction to Computing
CIS*1500 [0.50] Introduction to Programming
(if a statistics course is chosen in Semester 3)
OR
STAT*2040 [0.50] Statistics I
(if a computing course is chosen in Semester 3)

Semester 5 to 8

Total of 2.50 credits per semester including at least 2.00 science electives.

Sufficient courses at the 3000 or 4000 level must be selected in Semesters 5 through 8 to total 6.00 credits in science at the 3000 or 4000 level with at least 2.00 physical science at the 4000 level.

*approved course lists are available in the B.Sc. Academic Counselling Office or at: http://www.bsc.uoguelph.ca/Approved_electives.shtml

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 *

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

One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 *

CHEM*1050 [0.50] General Chemistry II
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism

One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

* students 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
Students who are lacking one 4U / grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2 - Winter
CHEM*1050 [0.50] General Chemistry II
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
One of:
CIS*2500 [0.50] Intermediate Programming
0.50 Arts or Social Science electives*

Semester 3 - Fall
COOP*1100 [0.00] Introduction to Co-operative Education
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*

Semester 4 - Winter
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

Summer Semester
COOP*2000 [0.00] Co-op Work Term I ++

Semester 5 - Fall
MATH*3100 [0.50] Differential Equations II
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

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 +
PHYS*4180 [0.50] Advanced Electromagnetic Theory
One of:
CIS*2520 [0.50] Data Structures
One of:
MATH*2000 [0.50] Set Theory
0.50 electives*
One of:
PHYS*4240 [0.50] Statistical Physics II
0.50 electives**
0.50 electives **

Semester 7 - Winter +
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**

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

Fall Semester
COOP*5000 [0.00] Co-op Work Term V ++
Semester 8 - Winter +
PHYS*4500 [0.50] Advanced Physics Laboratory
One of:
  PHYS*4130 [0.50] Subatomic Physics
  0.50 electives**
One of:
  PHYS*4150 [0.50] Solid State Physics
  0.50 electives**
One of:
  PHYS*4300 [0.50] Inquiry in Physics
  0.50 electives**
  * 1.00 must be taken as Arts or Social Science electives in this Major
+ students going on to graduate school in physics should take PHYS*4130, PHYS*4150, and PHYS*4240
**At least 1.50 credits must be from lists A and B below. At least 1.00 credits must be from list A. Substitutions of courses in list B by other 3000 or 4000 level courses must be approved by the Physics Faculty Advisor.

++Four work terms are required for the completion of the co-op degree. It is also necessary that there be at least one work term in each of Fall, Winter and Summer semesters. Therefore, one of the summer work terms could be missed and the student would still graduate successfully. Whether the student completes four or five work terms, a report is required for each work term completed. Contact the co-op faculty advisor for further details.

List A
PHYS*4130 [0.50] Subatomic Physics
PHYS*4150 [0.50] Solid State Physics
PHYS*4240 [0.50] Statistical Physics II

List B
EDRD*3120 [0.50] Educational Communication
GEOG*3420 [0.50] Remote Sensing of the Environment
GEOL*3060 [0.50] Groundwater
PHYS*4300 [0.50] Inquiry in Physics
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

Plant Science (PLSC)
Department of Plant Agriculture, Ontario Agricultural College
School of Environmental Sciences, Ontario Agricultural College
Department of Integrative Biology, College of Biological Science
Department of Molecula and Cellular Biology, College of Biological Science

Major (Honours Program)
Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Faculty Advisor. The major requires the completion of 20.00 credits and students must declare one of the following areas of emphasis: Applied Plant Science, Botany, Plant Biotechnology, Plant Environmental Science or Unspecialized.

Semester 1
BIOL*1070 [0.50] Discovering Biodiversity
CHEM*1040 [0.50] General Chemistry I
MATH*1080 [0.50] Elements of Calculus I
PHYS*1070 [0.50] Introductory Physics for Life Sciences
  0.50 Arts or Social Science electives
Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
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*2800 [0.50] Elements of Calculus II
  0.50 Arts or Social Science electives

Semester 3
AGR*2470 [0.50] Introduction to Plant Agriculture
BIOC*2580 [0.50] Introduction to Biochemistry

Program Requirements
1. A minimum of 6.00 credits must be at the 3000 or 4000 levels with a minimum of
2. 1.50 credits of Arts and Social Science electives

Electives and Restricted Elective (9.00 credits)
1. Students are to choose 5.00 credits for an area of emphasis: Applied Plant Science, Botany, Plant Biotechnology, Plant Environmental Science or Unspecialized.
2. Of the 9.00 credits, 6.50 must be approved science electives.
3. Restricted electives, indicated with *, are non-science electives.
4. Restricted electives, indicated with **, require other restricted electives as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements.
5. Students interested in graduate studies are encouraged to take two semesters of research projects which will count towards restricted elective requirements in an area of emphasis:
   AGR*4450 [1.00] Research Project I
   AGR*4460 [1.00] Research Project II
   IBIO*4500 [0.75] Research in Integrative Biology I
   IBIO*4510 [0.75] Research in Integrative Biology II
   MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I
   MCB*4510 [1.00] Research Project in Molecular & Cellular Biology II

Area of Emphasis
Applied Plant Science (APSC)
SOIL*2010 [0.50] Soil Science
CROP*4240 [0.50] Weed Science
ENVB*3210 [0.50] Plant Pathology
ENVB*4100 [0.50] Integrated Management of Invasive Insect Pests **
  δ 3.00 credits from:
  CROP*3300 [0.50] Grain Crops
  CROP*3110 [0.50] Protein and Oilseed Crops
  CROP*3340 [0.50] Managed Grasslands
  CROP*4220 [0.50] Cropping Systems **
  ENVB*2040 [0.50] Plant Health and the Environment
  ENVB*3030 [0.50] Pesticides and the Environment
  ENVB*3160 [0.50] Management of Turfgrass Diseases **
  ENVB*4070 [0.50] Biological and Cultural Control of Plant Diseases **
  HORT*2450 [0.50] Introduction to Turfgrass Science
  HORT*3010 [0.50] Annual, Perennial and Indoor Plants - Identification and Use
  HORT*3050 [0.50] Management of Turfgrass Insect Pests and Weeds **
  HORT*3230 [0.50] Plant Propagation
  HORT*3270 [0.50] Medicinal Plants
  HORT*3280 [0.50] Greenhouse Production
  HORT*3350 [0.50] Woody Plant Production and Culture
  HORT*3430 [0.50] Wine-Grape Culture
  HORT*3510 [0.50] Vegetable Production
  HORT*4200 [0.50] Turf, the Environment and Society **
**Unspecialized (UNSP)**

Choose 5.00 credits from any courses listed in the other areas of emphasis.

**Minor (Honours Program)**

A minor in Plant Science requires 5.00 credits in the Plant Science Program chosen in consultation with the Faculty Advisor. The courses include:

- AGR*2470 [0.50] Introduction to Plant Agriculture
- BOT*2100 [0.50] Life Strategies of Plants
- BOT*3310 [0.50] Plant Growth and Development
- BOT*3410 [0.50] Plant Anatomy
- BOT*3710 [0.50] Plant Diversity and Evolution
- BOT*4380 [0.50] Metabolism in the Whole Life of Plants

2.00 credits from any courses listed in the areas of emphasis.

Restricted electives, indicated with *, are non-science electives. Restricted electives, indicated with **, require other restricted electives as prerequisites.

**Psychology: Brain & Cognition (PBC)**

Department of Psychology, College of Social and Applied Human Sciences

The B.Sc. Major in Psychology: Brain and Cognition offers an opportunity for students to develop interests within learning, perception, cognition, and biopsychology from a sound base in physical and biological sciences. Students primarily interested in other areas within psychology should consult the schedule of studies for the Bachelor of Arts program. Psychology courses in the above focuses may also be studied via the B.A. program.

**Note on Honours Courses**

Honours Courses: courses designated with (H) are designed for students in a psychology honours specialization. This includes B.A. Honours Psychology (PYS) major or minor, B.A. Information Systems and Human Behaviour (ISHB) major, B.Sc. Psychology: Brain and Cognition (PBC), major or minor, and the Neuroscience (NEUR) minor. (H) courses are Honours level requiring for registration a cumulative average of at least 70% in all course attempts in Psychology or registration in the ISHB major, NEUR minor, or PBC major or minor. Unless otherwise specified, all other courses may be taken by students in a general or honours program, providing the prerequisites are met.

**Major (Honours Program)**

**Semester 1**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL*1000</td>
<td>[0.50] Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>[0.50] General Chemistry I</td>
</tr>
<tr>
<td>MATH*1080</td>
<td>[0.50] Elements of Calculus I</td>
</tr>
<tr>
<td>PHYS*1070</td>
<td>[0.50] Introductory Physics for Life Sciences</td>
</tr>
<tr>
<td>PSYC*1100</td>
<td>[0.50] Principles of Behaviour</td>
</tr>
<tr>
<td>PSYC*1200</td>
<td>[0.50] Dynamics of Behaviour</td>
</tr>
</tbody>
</table>

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: [http://www.bsc.uoguelph.ca/reviseds](http://www.bsc.uoguelph.ca/reviseds)

**Semester 2**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>[0.50] General Chemistry II</td>
</tr>
<tr>
<td>PHYS*1080</td>
<td>[0.50] Physics for Life Sciences</td>
</tr>
<tr>
<td>BIOL*1070</td>
<td>[0.50] Discovering Biodiversity</td>
</tr>
<tr>
<td>BIOL*1080</td>
<td>[0.50] Biological Concepts of Health</td>
</tr>
<tr>
<td>CIS*1200</td>
<td>[0.50] Introduction to Computing</td>
</tr>
<tr>
<td>CIS*1500</td>
<td>[0.50] Introduction to Programming</td>
</tr>
<tr>
<td>PSYC*1100</td>
<td>[0.50] Principles of Behaviour</td>
</tr>
<tr>
<td>PSYC*1200</td>
<td>[0.50] Dynamics of Behaviour</td>
</tr>
</tbody>
</table>

**Semester 3**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSYC*2230</td>
<td>[0.50] Principles of Learning</td>
</tr>
<tr>
<td>PSYC*2410</td>
<td>[0.50] Behavioural Neuroscience I</td>
</tr>
<tr>
<td>PSYC*2390</td>
<td>[0.50] Principles of Sensation and Perception</td>
</tr>
<tr>
<td>PSYC*2650</td>
<td>[0.50] Cognitive Psychology</td>
</tr>
<tr>
<td>PSYC*2010</td>
<td>[0.50] Quantification in Psychology</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>[0.50] Statistics I</td>
</tr>
</tbody>
</table>

0.50 Arts/Non-Psychology Social Science electives *
Semester 4
PSYC*2040 [0.50] Research Statistics
PSYC*2360 [0.50] Introductory Research Methods
0.50 Psychology core (PSYC*2330, PSYC*2390, PSYC*2410, PSYC*2650)
One of:
PSYC*2310 [0.50] Introduction to Social Psychology
PSYC*2450 [0.50] Introduction to Developmental Psychology
PSYC*2740 [0.50] Personality
0.50 Arts/Non-Psychology Science electives*

Semester 5 **
2.50 electives or restricted electives (Students contemplating graduate studies should see Graduate Studies Advisory Note below)

Semester 6 **
PSYC*3250 [0.50] Psychological Measurement
2.00 electives or restricted electives

Semester 7 **
2.50 electives or restricted electives

Semester 8 **
2.50 electives or restricted electives*

Restricted Electives
3.00 credits from:
PSYC*3030 [0.50] Neurochemical Basis of Behaviour
PSYC*3100 [0.50] Evolutionary Psychology
PSYC*3330 [0.50] Memory
PSYC*3340 [0.50] Psycholinguistics
PSYC*3370 [0.50] Experimental Design and Analysis
PSYC*3380 [0.50] Non-experimental Research Methods
PSYC*3410 [0.50] Behavioural Neuroscience II
PSYC*3440 [0.50] Cognitive Development
PSYC*3850 [0.50] Intellectual Disabilities
PSYC*3900 [0.50] Psychology Research Internship***
PSYC*4050 [0.50] Seminar in Animal Learning
PSYC*4470 [0.50] Behavioural Neuroscience Seminar
PSYC*4500 [0.50] Current Theoretical Issues in Psychology***
PSYC*4510 [0.50] Current Issues in Psychology***
PSYC*4600 [0.50] Cognitive Neuroscience
PSYC*4750 [0.50] Seminar in Motivation and Emotion
PSYC*4870 [0.50] Honours Thesis I***
PSYC*4880 [1.00] Honours Thesis II***
PSYC*4900 [0.50] Psychology Seminar

Program Requirements:
1. 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 at the 4000 level
2. *Students should refer to the list of Approved Science and Arts/Social Science electives for BSc students: http://www.bsc.uoguelph.ca/Approved_electives.shtml
3. 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.

**Graduate Studies Advisory Note**
Students planning to enter a graduate program in Psychology are advised to complete PSYC*3370 and PSYC*3380 in Semesters 5 and 6, as well as and PSYC*4880 in Semesters 7 and 8, respectively. PSYC*4370 or PSYC*4900 must be completed prior to or concurrently with either PSYC*4870 or PSYC*4880.

*** Depending upon the project chosen, these courses will be evaluated by the faculty advisor to determine their suitability as science electives.

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 Restricted Electives list above

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.

Major (Honours Program)
Semester 1
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
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2
CHEM*1050 [0.50] General Chemistry II
MATH*1210 [0.50] Calculus II
PHYS*1010 [0.50] Introductory Electricity and Magnetism
One of:
BIOL*1070 [0.50] Discovering Biodiversity
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
0.50 Arts or Social Science electives*

Semester 3
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.

Last Revision: March 15, 2014
** 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:

One of:
- MATH*1080 [0.50] Elements of Calculus I
- MATH*1200 [0.50] Calculus I

One of:
- MATH*1210 [0.50] Calculus II
- MATH*2080 [0.50] Elements of Calculus II

One of:
- MATH*2150 [0.50] Applied Matrix Algebra
- MATH*2160 [0.50] Linear Algebra I

- STAT*2040 [0.50] Statistics I
- STAT*2050 [0.50] Statistics II
- STAT*3100 [0.50] Introductory Mathematical Statistics I
- STAT*3110 [0.50] Introductory Mathematical Statistics II
- STAT*3240 [0.50] Applied Regression Analysis

0.50 additional credits in Statistics
0.50 additional credits in Statistics or Mathematics

**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 **

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>CTS*1500</td>
<td>0.50</td>
<td>Introduction to Programming</td>
</tr>
<tr>
<td>MATH*1200</td>
<td>0.50</td>
<td>Calculus I</td>
</tr>
<tr>
<td>PHYS*1000</td>
<td>0.50</td>
<td>An Introduction to Mechanics</td>
</tr>
</tbody>
</table>

One of:
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

0.50 additional credits in Science

** Semester 2 **

<table>
<thead>
<tr>
<th>Course code</th>
<th>Credits</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM*1050</td>
<td>0.50</td>
<td>General Chemistry II</td>
</tr>
<tr>
<td>MATH*1210</td>
<td>0.50</td>
<td>Calculus II</td>
</tr>
<tr>
<td>PHYS*1010</td>
<td>0.50</td>
<td>Introductory Electricity and Magnetism</td>
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</table>

One of:
- BIOL*1070 [0.50] Discovering Biodiversity
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

0.50 Arts or Social Science electives

** Semester 3 **

<table>
<thead>
<tr>
<th>Course code</th>
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<tbody>
<tr>
<td>MATH*2160</td>
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<td>Linear Algebra I</td>
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<tr>
<td>MATH*2200</td>
<td>0.50</td>
<td>Advanced Calculus I</td>
</tr>
<tr>
<td>PHYS*2440</td>
<td>0.75</td>
<td>Mechanics I</td>
</tr>
<tr>
<td>PHYS*2460</td>
<td>0.75</td>
<td>Electricity and Magnetism I</td>
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One of:
- STAT*2040 [0.50] Statistics I

0.50 Arts electives
0.50 Social Science electives

** Semester 4 **

<table>
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<tr>
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<tbody>
<tr>
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<td>Differential Equations I</td>
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<tr>
<td>PHYS*2260</td>
<td>0.50</td>
<td>Quantum Physics</td>
</tr>
<tr>
<td>PHYS*2450</td>
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<td>Mechanics II</td>
</tr>
<tr>
<td>PHYS*2470</td>
<td>0.75</td>
<td>Electricity and Magnetism II</td>
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One of:
- MATH*2000 [0.50] Set Theory
0.50 electives

** Semester 5 **

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<tr>
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<td>Differential Equations II</td>
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<td>PHYS*3100</td>
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<td>PHYS*3230</td>
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<tr>
<td>PHYS*3240</td>
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<td>Statistical Physics I</td>
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One of:
- MATH*2210 [0.50] Advanced Calculus II

0.50 electives

** Semester 6 **

<table>
<thead>
<tr>
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<th>Credits</th>
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<tr>
<td>MATH*3260</td>
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<td>Complex Analysis</td>
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<tr>
<td>PHYS*3220</td>
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<td>Waves and Optics</td>
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<tr>
<td>PHYS*3540</td>
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<td>PHYS*3510</td>
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<td>Intermediate Laboratory</td>
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<tr>
<td>PHYS*4040</td>
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<td>Quantum Mechanics II</td>
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** Semester 7 **

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<tbody>
<tr>
<td>PHYS*4120</td>
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<td>Atomic and Molecular Physics</td>
</tr>
<tr>
<td>PHYS*4180</td>
<td>0.50</td>
<td>Advanced Electromagnetic Theory</td>
</tr>
<tr>
<td>PHYS*4240</td>
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<td>Statistical Physics II</td>
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Two of:
- PHYS*4001 [0.50] Research in Physics
- PHYS*4500 [0.50] Advanced Physics Laboratory

0.50 electives

** Semester 8 **

<table>
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<tr>
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<tbody>
<tr>
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<tr>
<td>PHYS*4150</td>
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<td>Solid State Physics</td>
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</table>

One of:
- PHYS*4002 [0.50] Research in Physics
- PHYS*4300 [0.50] Inquiry in Physics

0.50 electives

** Interdisciplinary Program, Departments of Biomedical Sciences, Chemistry, School of Environmental Sciences, Molecular and Cellular Biology **

** Major (Honours Program)**

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major must consult the Department Advisor. A minimum of 20.00 credits are required for graduation.

** Semester 1 **

<table>
<thead>
<tr>
<th>Course code</th>
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</thead>
<tbody>
<tr>
<td>BIOL*1090</td>
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<td>Introduction to Molecular and Cellular Biology</td>
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<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
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<td>MATH*1080</td>
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<td>Elements of Calculus I</td>
</tr>
<tr>
<td>PHYS*1070</td>
<td>0.50</td>
<td>Introductory Physics for Life Sciences</td>
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<td>0.50 Arts or Social Science electives</td>
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** Semester 2 **

<table>
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<tbody>
<tr>
<td>BIOL*1090</td>
<td>0.50</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>0.50</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>MATH*1080</td>
<td>0.50</td>
<td>Elements of Calculus I</td>
</tr>
<tr>
<td>PHYS*1070</td>
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<td>Introductory Physics for Life Sciences</td>
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<tr>
<td>STAT*2040</td>
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<td>Statistics I</td>
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<tr>
<td>0.50 Arts or Social Science electives</td>
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** Semester 3 **

<table>
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<tr>
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<td>BIOL*1290</td>
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<td>Mechanics I</td>
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<tr>
<td>BIOL*1300</td>
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<td>Electricity and Magnetism I</td>
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** Semester 4 **

<table>
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<tr>
<td>CHEM*1280</td>
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<td>Advanced Calculus II</td>
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<td>PHYS*1290</td>
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<td>Mechanics II</td>
</tr>
<tr>
<td>PHYS*1300</td>
<td>0.50</td>
<td>Electricity and Magnetism II</td>
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<tr>
<td>0.50 Arts or Social Science electives</td>
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<tr>
<td>Semester 5</td>
<td>BIOC*3560 [0.50] Structure and Function in Biochemistry</td>
<td>CHEM*3750 [0.50] Organic Chemistry II</td>
</tr>
<tr>
<td>Semester 7</td>
<td>MBG*3350 [0.75] Laboratory Methods in Molecular Biology I</td>
<td>TOX*4000 [0.50] Medical Toxicology</td>
</tr>
<tr>
<td>Semester 8</td>
<td>TOX*4100 [0.50] Toxicological Pathology</td>
<td>TOX*4200 [0.50] Topics in Toxicology</td>
</tr>
<tr>
<td>List C - Environmental</td>
<td>BIOL*2060 [0.50] Ecology</td>
<td>BIOL*3450 [0.50] Introduction to Aquatic Environments</td>
</tr>
<tr>
<td>List B - Biomedical</td>
<td>BIOC*4090 [0.50] Pharmacology</td>
<td>MBG*4270 [0.50] DNA Replication, Recombination and Repair</td>
</tr>
<tr>
<td>Major (Honours Program)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semester 1 - Fall</td>
<td>BIOC*1090 [0.50] Introduction to Molecular and Cellular Biology</td>
<td>CHEM*1040 [0.50] General Chemistry I</td>
</tr>
<tr>
<td>Semester 2 - Winter</td>
<td>BIOL*1080 [0.50] Biological Concepts of Health</td>
<td>CHEM*1050 [0.50] General Chemistry II</td>
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</tbody>
</table>

**List A - Research**

- TOX*4900 [1.00] Toxicology Research Project I
- TOX*4910 [1.00] Toxicology Research Project II

**List B - Biomedical**

- BIOC*4070 [0.75] Biomedical Histology
- BIOC*4090 [0.50] Pharmacology
- MBG*4270 [0.50] DNA Replication, Recombination and Repair
- MIRC*3230 [0.50] Immunology
- NUTR*3210 [0.50] Fundamentals of Nutrition
- NUTR*4510 [0.50] Toxicology, Nutrition and Food

**List C - Environmental**

- BIOL*2060 [0.50] Ecology
- BIOL*3450 [0.50] Introduction to Aquatic Environments
- BIOL*4350 [0.50] Biology of Polluted Waters
- BOT*2100 [0.50] Life Strategies of Plants
- ENVB*4240 [0.50] Biological Activity of Pesticides
- MIRC*4180 [0.50] Microbial Processes in Environmental Management
- PBIO*4530 [0.50] Environmental Pollution Stresses on Plants
- SOIL*2010 [0.50] Soil Science
- STAT*3510 [0.50] Environmental Risk Assessment

**Toxicology (Co-op) (TOX:C)**

- PHYS*1080 [0.50] Physics for Life Sciences
- STAT*2040 [0.50] Statistics I

**Semester 3 - Fall**

- BIOC*2580 [0.50] Introduction to Biochemistry
- CHEM*2480 [0.50] Analytical Chemistry I
- MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
- TOX*2000 [0.50] Principles of Toxicology

**Winter Semester**

- COOP*1100 [0.00] Co-op Work Term I

**Semester 4 - Summer**

- CHEM*2700 [0.50] Organic Chemistry I
- PATH*3610 [0.50] Principles of Disease
- STAT*2050 [0.50] Statistics II
- TOX*3300 [0.50] Environmental Chemistry and Toxicology

**Summer Semester**

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

**Fall Semester**

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

**Semester 6 - Winter**

- BIOC*3560 [0.50] Structure and Function in Biochemistry
- CHEM*3750 [0.50] Organic Chemistry II
- TOX*3300 [0.50] Analytical Toxicology
- One of:
  - MCB*2050 [0.50] Molecular Biology of the Cell
  - BIOM*3200 [1.00] Mammalian Physiology
  - ZOO*3200 [0.50] Comparative Animal Physiology I

**Semester 7 - Winter**

- ZOO*3210 [0.50] Comparative Animal Physiology II (if ZOO*3200 selected in semester 5)

**Semester 8 - Fall**

- MBG*3350 [0.75] Laboratory Methods in Molecular Biology I
- TOX*4000 [0.50] Medical Toxicology
- TOX*4590 [0.50] Biochemical Toxicology

**List A - Research**

- TOX*4900 [1.00] Toxicology Research Project I
- TOX*4910 [1.00] Toxicology Research Project II

**List B - Biomedical**

- BIOC*4070 [0.75] Biomedical Histology
- BIOC*4090 [0.50] Pharmacology
- MBG*4270 [0.50] DNA Replication, Recombination and Repair
- MIRC*3230 [0.50] Immunology
- NUTR*3210 [0.50] Fundamentals of Nutrition
- NUTR*4510 [0.50] Toxicology, Nutrition and Food

**List C - Environmental**

- BIOL*2060 [0.50] Ecology
- BIOL*3450 [0.50] Introduction to Aquatic Environments
- BIOL*4350 [0.50] Biology of Polluted Waters
- BOT*2100 [0.50] Life Strategies of Plants
- ENVB*4240 [0.50] Biological Activity of Pesticides
- MIRC*4180 [0.50] Microbial Processes in Environmental Management
- PBIO*4530 [0.50] Environmental Pollution Stresses on Plants
- SOIL*2010 [0.50] Soil Science
- STAT*3510 [0.50] Environmental Risk Assessment

**Semester 5 - Fall**

- BIOM*3200 [1.00] Mammalian Physiology
- ZOO*3200 [0.50] Comparative Animal Physiology I

**Semester 6 - Winter**

- ZOO*3210 [0.50] Comparative Animal Physiology II (if ZOO*3200 taken in semester 5)

**List B - Biomedical**

- BIOC*4070 [0.75] Biomedical Histology
- BIOC*4090 [0.50] Pharmacology
- MBG*4270 [0.50] DNA Replication, Recombination and Repair
- MIRC*3230 [0.50] Immunology
- NUTR*3210 [0.50] Fundamentals of Nutrition
- NUTR*4510 [0.50] Toxicology, Nutrition and Food

**List C - Environmental**

- BIOL*2060 [0.50] Ecology
- BIOL*3450 [0.50] Introduction to Aquatic Environments
- BIOL*4350 [0.50] Biology of Polluted Waters
- BOT*2100 [0.50] Life Strategies of Plants
- ENVB*4240 [0.50] Biological Activity of Pesticides
- MIRC*4180 [0.50] Microbial Processes in Environmental Management
- PBIO*4530 [0.50] Environmental Pollution Stresses on Plants
- SOIL*2010 [0.50] Soil Science
- STAT*3510 [0.50] Environmental Risk Assessment

**Semester 7 - Winter**

- MCB*2050 [0.50] Molecular Biology of the Cell
- BIOM*3200 [1.00] Mammalian Physiology
- ZOO*3200 [0.50] Comparative Animal Physiology I

**Semester 8 - Fall**

- MBG*3350 [0.75] Laboratory Methods in Molecular Biology I
- TOX*4000 [0.50] Medical Toxicology
- TOX*4590 [0.50] Biochemical Toxicology

**Restricted Electives**

At least 1.50 credits must be completed from the following list of allowable courses.

**List A - Research**

- TOX*4900 [1.00] Toxicology Research Project I
- TOX*4910 [1.00] Toxicology Research Project II

**List B - Biomedical**

- BIOC*4070 [0.75] Biomedical Histology
- BIOC*4090 [0.50] Pharmacology
- MBG*4270 [0.50] DNA Replication, Recombination and Repair
- MIRC*3230 [0.50] Immunology
- NUTR*3210 [0.50] Fundamentals of Nutrition
- NUTR*4510 [0.50] Toxicology, Nutrition and Food

**List C - Environmental**

- BIOL*2060 [0.50] Ecology
- BIOL*3450 [0.50] Introduction to Aquatic Environments
- BIOL*4350 [0.50] Biology of Polluted Waters
- BOT*2100 [0.50] Life Strategies of Plants
- ENVB*4240 [0.50] Biological Activity of Pesticides
- MIRC*4180 [0.50] Microbial Processes in Environmental Management
- PBIO*4530 [0.50] Environmental Pollution Stresses on Plants
- SOIL*2010 [0.50] Soil Science
- STAT*3510 [0.50] Environmental Risk Assessment

**List D - Environmental**

- BIOL*4350 [0.50] Biology of Polluted Waters
- BOT*2100 [0.50] Life Strategies of Plants
- ENVB*4240 [0.50] Biological Activity of Pesticides
- MIRC*4180 [0.50] Microbial Processes in Environmental Management
- PBIO*4530 [0.50] Environmental Pollution Stresses on Plants
- SOIL*2010 [0.50] Soil Science
- STAT*3510 [0.50] Environmental Risk Assessment
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*1070 [0.50] Discovering Biodiversity
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 lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: http://www.bsc.uoguelph.ca/revisedss

Semester 2

BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1050 [0.50] General Chemistry II
PHYS*1080 [0.50] Physics for Life Sciences

0.50 Arts or Social Science electives

Semester 3

BIOC*2580 [0.50] Introduction to Biochemistry
STAT*2040 [0.50] Statistics I
ZOO*2090 [0.50] Vertebrate Structure and Function
ZOO*2100 [0.50] Developmental Biology

0.50 electives *

Semester 4

MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
NUTR*3210 [0.50] Fundamentals of Nutrition
ZOO*2700 [0.50] Invertebrate Morphology & Evolution

1.00 electives *

Semester 5

BIOL*3010 [0.50] Laboratory and Field Work in Ecology
BIOL*3110 [0.50] Population Ecology
BIOL*3400 [0.50] Evolution
BOT*3050 [0.50] Plant Functional Ecology
ZOO*3200 [0.50] Comparative Animal Physiology I

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
BIOL*4150 [0.50] Wildlife Conservation and Management
ZOO*4070 [0.50] Animal Behaviour
ZOO*4910 [0.50] Integrative Vertebrate Biology

0.25 electives *

Semester 8

2.50 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:

BIOL*4410 [0.75] Field Ecology
BIOL*4610 [0.75] Arctic Ecology
BIOL*4700 [0.50] Field Biology
BIOL*4710 [0.25] Field Biology
BIOL*4800 [0.50] Field Biology
BIOL*4810 [0.25] Field Biology
IBIO*4500 [0.75] Research in Integrative Biology I
IBIO*4510 [0.75] Research in Integrative Biology II
IBIO*4521/2 [2.00] Thesis in Integrative Biology

ZOO*4300 [0.75] Marine Biology and Oceanography

Other field or research courses with approval of faculty advisor.

Electives must include:

1. A minimum of 0.50 credits from:
   ZOO*4920 [0.25] Lab Studies in Ornithology
   ZOO*4930 [0.25] Lab Studies in Ichthyology
   ZOO*4940 [0.25] Lab Studies in Herpetology
   ZOO*4950 [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. At least 6.00 science credits must be at the 3000 or 4000 level, 2.00 of which must be at the 4000 level.

8.50 credits are electives, including at least 1.00 Arts or Social Science electives and 0.75 credit from restricted electives. BIOL*2250 is strongly recommended if independent research project courses are anticipated in semesters 7 and/or 8 CIS*1200 is recommended for those needing to improve their computer skills.

Semester 1

BIOL*1070 [0.50] Discovering Biodiversity
CHEM*1040 [0.50] General Chemistry I
MATH*1080 [0.50] Elements of Calculus I
PHYS*1070 [0.50] Introductory Physics for Life Sciences

0.50 Arts or Social Science electives

Semester 2

BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1050 [0.50] General Chemistry II
PHYS*1080 [0.50] Physics for Life Sciences

0.50 Arts or Social Science electives *

Semester 3

BIOL*3010 [0.50] Laboratory and Field Work in Ecology
BIOL*3110 [0.50] Population Ecology
BIOL*3400 [0.50] Evolution
BOT*3050 [0.50] Plant Functional Ecology
ZOO*3200 [0.50] Comparative Animal Physiology I

Semester 4

MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
NUTR*3210 [0.50] Fundamentals of Nutrition
ZOO*2700 [0.50] Invertebrate Morphology & Evolution

1.00 electives *

Semester 5

BIOL*3110 [0.50] Population Ecology
BIOL*3400 [0.50] Evolution
ZOO*3200 [0.50] Comparative Animal Physiology I
ZOO*3700 [0.50] Integrative Biology of Invertebrates

0.50 electives or restricted electives

Semester 6

STAT*2040 [0.50] Statistics I
ZOO*2090 [0.50] Vertebrate Structure and Function
ZOO*2100 [0.50] Developmental Biology

1.00 electives or restricted electives

Semester 7

BIOL*3110 [0.50] Population Ecology
BIOL*3400 [0.50] Evolution
ZOO*3200 [0.50] Comparative Animal Physiology I
ZOO*3700 [0.50] Integrative Biology of Invertebrates

0.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

Restricted Electives must include:

1. A minimum of 0.25 credits from:
   ZOO*4920 [0.25] Lab Studies in Ornithology
   ZOO*4930 [0.25] Lab Studies in Ichthyology
ZOO*4940  [0.25]  Lab Studies in Herpetology  
ZOO*4950  [0.25]  Lab Studies in Mammalogy  

2. A minimum of 0.50 credits from:

- BIOL*4410  [0.75]  Field Ecology  
- BIOL*4610  [0.75]  Arctic Ecology  
- BIOL*4700  [0.50]  Field Biology  
- BIOL*4710  [0.25]  Field Biology  
- BIOL*4800  [0.50]  Field Biology  
- BIOL*4810  [0.25]  Field Biology  
- IBIO*4500  [0.75]  Research in Integrative Biology I  
- IBIO*4510  [0.75]  Research in Integrative Biology II  
- IBIO*4521/2  [2.00]  Thesis in Integrative Biology  
- ZOO*4170  [0.50]  Experimental Comparative Animal Physiology  
- ZOO*4300  [0.75]  Marine Biology and Oceanography  

Other field or research courses with approval of faculty advisor.

**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  
- BIOL*3400  [0.50]  Evolution  
- ZOO*2090  [0.50]  Vertebrate Structure and Function  
- ZOO*2100  [0.50]  Developmental Biology  
- ZOO*2700  [0.50]  Invertebrate Morphology & Evolution  
- ZOO*3000  [0.50]  Comparative Histology  
- ZOO*3200  [0.50]  Comparative Animal Physiology I  
- ZOO*3210  [0.50]  Comparative Animal Physiology II  
- ZOO*3700  [0.50]  Integrative Biology of Invertebrates  
- ZOO*4070  [0.50]  Animal Behaviour  
- ZOO*4330  [0.50]  Biology of Fishes  
- ZOO*4910  [0.50]  Integrative Vertebrate Biology  
- ZOO*4920  [0.25]  Lab Studies in Ornithology  
- ZOO*4930  [0.25]  Lab Studies in Ichthyology  
- ZOO*4940  [0.25]  Lab Studies in Herpetology  
- ZOO*4950  [0.25]  Lab Studies in Mammalogy  

The remaining 1.00 credits may also come from this list or from outside this list, in consultation with a faculty advisor.
Bachelor of Science in Agriculture [B.Sc.(Agr.)]

The B.Sc.(Agr.) degree program is a 4 year honours science program designed to provide a fundamental education in the science of agriculture. The curriculum includes courses in the agricultural sciences, the physical, biological and social sciences, and in the arts.

### Program Information

Agricultural scientists must be effective communicators and problem solvers, self-directed in their learning, and have a global perspective of the agrifood systems. Students will be involved in co-operative group learning activities and will experience courses that are multidisciplinary and integrate the teaching activities of many faculty and departments.

Students will have the option of completing a broad agricultural program (honours agricultural science) or another major in which they take 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:

- Animal Science
- Crop, Horticulture and Turfgrass Science
- Honours Agricultural Science
- Organic Agriculture

### Declaration of a Major

All students are admitted into an undeclared major upon entry. Students will be required to select a major by semester 3 through consultation with the Program Counsellor and Faculty Advisors. The course requirements are listed for each major in the following section.

Students may, with appropriate approvals, elect to complete Minors associated with other degree programs as listed in the undergraduate calendar.

### 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 other provinces 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)

<table>
<thead>
<tr>
<th>Semester 1</th>
<th>Credits</th>
<th>Courses</th>
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<tbody>
<tr>
<td>AGR*1100</td>
<td>[0.50]</td>
<td>Introduction to the Agrifood Systems</td>
</tr>
<tr>
<td>BIOL*1070</td>
<td>[0.50]</td>
<td>Discovering Biodiversity</td>
</tr>
<tr>
<td>CHEM*1040</td>
<td>[0.50]</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>ECON*1050</td>
<td>[0.50]</td>
<td>Introductory Microeconomics</td>
</tr>
<tr>
<td>MATH*1080</td>
<td>[0.50]</td>
<td>Elements of Calculus I</td>
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<tr>
<th>Semester 2</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AGR*1250</td>
<td>[0.50]</td>
<td>Agrifood System Trends &amp; Issues</td>
</tr>
<tr>
<td>BIOL*1080</td>
<td>[0.50]</td>
<td>Biological Concepts of Health</td>
</tr>
<tr>
<td>BIOL*1090</td>
<td>[0.50]</td>
<td>Introduction to Molecular and Cellular Biology</td>
</tr>
<tr>
<td>CHEM*1050</td>
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<td>General Chemistry II</td>
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<thead>
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<th>Semester 3</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AGR*2320</td>
<td>[0.50]</td>
<td>Soils in Agroecosystems</td>
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<tr>
<td>AGR*2350</td>
<td>[0.50]</td>
<td>Animal Production Systems, Health and Industry</td>
</tr>
<tr>
<td>AGR*2400</td>
<td>[0.50]</td>
<td>Economics of the Canadian Food System</td>
</tr>
<tr>
<td>AGR*2470</td>
<td>[0.50]</td>
<td>Introduction to Plant Agriculture</td>
</tr>
<tr>
<td>0.50 restricted electives</td>
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<table>
<thead>
<tr>
<th>Semester 4</th>
<th>Credits</th>
<th>Courses</th>
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<tr>
<td>NRS*3000</td>
<td>[0.50]</td>
<td>Environmental Issues in Agriculture and Landscape Management</td>
</tr>
<tr>
<td>STAT*2040</td>
<td>[0.50]</td>
<td>Statistics I</td>
</tr>
<tr>
<td>One of:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CROP*2110</td>
<td>[0.50]</td>
<td>Crop Ecology</td>
</tr>
<tr>
<td>HORT*3350</td>
<td>[0.50]</td>
<td>Woody Plant Production and Culture</td>
</tr>
<tr>
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<tr>
<td>ANSC*2340</td>
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<td>Structure of Farm Animals</td>
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<tr>
<td>ANSC*3210</td>
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<td>Principles of Animal Care and Welfare</td>
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<th>Semester 5</th>
<th>Credits</th>
<th>Courses</th>
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<tbody>
<tr>
<td>FARE*2700</td>
<td>[0.50]</td>
<td>Survey of Natural Resource Economics</td>
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<tr>
<td>FOOD*3090</td>
<td>[0.50]</td>
<td>Food Science and Human Nutrition</td>
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<tr>
<td>1.50 electives or restricted electives</td>
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<thead>
<tr>
<th>Semester 6</th>
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<td>Sustainable Communities</td>
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<tr>
<td>2.00 electives</td>
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### Semester 7 & 8

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

##### Option A

<table>
<thead>
<tr>
<th>Credits</th>
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<tr>
<td>AGR*4500</td>
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##### Option B

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<tr>
<th>Credits</th>
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<tbody>
<tr>
<td>1.00</td>
<td>Research Project I</td>
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<tr>
<td>AGR*4450</td>
<td>[1.00]</td>
</tr>
<tr>
<td>1.00</td>
<td>Research Project II</td>
</tr>
<tr>
<td>AGR*4460</td>
<td>[1.00]</td>
</tr>
<tr>
<td>3.00</td>
<td>Electives</td>
</tr>
</tbody>
</table>

### Restricted Electives

1. 2 of the following Restricted Electives are required:

   - BIOC*2580 [0.50] Introduction to Biochemistry
   - BOT*2100 [0.50] Life Strategies of Plants
   - ECON*1100 [0.50] Introductory Macroeconomics
   - ECON*2310 [0.50] Intermediate Microeconomics
   - MBG*2040 [0.50] Foundations in Molecular Biology and 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. 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
X. Degree Programs, Bachelor of Science in Agriculture [B.Sc.(Agr.)]

Climate & Agroecosystems Management:
- GEOG*3020 [0.50] Global Environmental Change
- GEOG*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:
- GEOG*2200 [0.50] Glacial Geology
- SOIL*3060 [0.50] Environmental Soil Chemistry
- SOIL*3070 [0.50] Environmental Soil Physics
- SOIL*3220 [0.50] Environmental Soil Biology
- SOIL*4130 [0.50] Soil and Nutrient Management

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

Agroforestry
- BOT*3050 [0.50] Plant Functional 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*3330 [0.50] Ecosystem Processes and Applications **
- ENVB*4780 [0.50] Forest Ecology **
- HORT*3230 [0.50] Plant Propagation
- NRS*2120 [0.50] Introduction to Environmental Stewardship
- PBIO*4100 [0.50] Soil Plant Relationships
- SOIL*4090 [0.50] Soil Management
- SOIL*4130 [0.50] Soil and Nutrient Management

Communication, Organizations and Development

General Recommendations:
- 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*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 **
- SOC*2080 [0.50] Rural Sociology **
- SOC*2280 [0.50] Society and Environment **

International Agriculture

General Recommendations:
- AGR*2500 [0.50] Field Course 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
- EDRD*4210 [0.50] World Agriculture and Economic Development
- HORT*4380 [0.50] Tropical and Sub-Tropical Crops
- NRS*2120 [0.50] Soil Plant Relationships
- SOIL*3080 [0.50] Soil and Water Conservation
- SOIL*4090 [0.50] Soil Management
- SOIL*4130 [0.50] Soil and Nutrient Management
- ECON*2410 [0.50] Intermediate Macroeconomics

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] Integrated Management of Invasive Insect Pests **
- 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 **

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] Integrated Management of Invasive Insect Pests **
- ENVB*4240 [0.50] Biological Activity of Pesticides

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*3210 [0.50] Principles of Animal Care and Welfare
- ANSC*4050 [0.50] Biotechnology in Animal Science
- MBG*3090 [0.50] Applied Animal Genetics
- MBG*2040 [0.50] Foundations in Molecular Biology and 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] Integrated Management of Invasive Insect Pests **
- ENVB*4240 [0.50] Biological Activity of Pesticides

Horticultural Science:
- HORT*3230 [0.50] Plant Propagation
- HORT*3280 [0.50] Greenhouse Production
- HORT*3340 [0.50] Culture of Plants
- 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*2200 [0.50] Organic Marketing
- OAGR*2050 [0.50] Gateway to Organic Agriculture
- OAGR*3030 [0.50] Tutorials in Organic Agriculture I
- OAGR*3130 [0.50] Tutorials in Organic Agriculture II
### Department of Animal and Poultry Science

#### Semester 1
- AGR*1100 [0.50] Introduction to the Agrifood Systems
- BIOL*1070 [0.50] Discovering Biodiversity
- 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*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
- CHEM*1050 [0.50] General Chemistry II
- 0.50 electives

#### Semester 3
- AGR*2320 [0.50] Soils in Agroecosystems
- AGR*2350 [0.50] Animal Production Systems, Health and Industry
- AGR*2400 [0.50] Economics of the Canadian Food System
- AGR*2470 [0.50] Introduction to Plant Agriculture
- MBG*2040 [0.50] Foundations in Molecular Biology and Genetics
- 0.50 electives

#### Semester 4
- ANSC*2340 [0.50] Structure of Farm Animals
- BIOC*2580 [0.50] Introduction to Biochemistry
- MICR*2420 [0.50] Introduction to Microbiology
- 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
  - One of:
    - POPM*4230 [0.50] Animal Health (even-numbered years)*
    - OR
    - 0.50 electives (odd-numbered years)*
  - *Note: POPM*4230 needs to be taken in either Semester 5 or 7 as course is offered in even-numbered years only.

#### Semester 6
- 2.50 electives or restricted electives

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

**Option A:**
- **Semester 7**
  - POPM*4230 [0.50] Animal Health
  - One of:
    - 2.00 electives or restricted electives (odd-numbered years)
    - OR
    - 2.50 electives or restricted electives (even-numbered years)
  - *Note: POPM*4230 needs to be taken in either Semester 5 or 7 as course is offered in even-numbered years only.

**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
  - *Note: POPM*4230 needs to be taken in either Semester 5 or 7 as course is offered in even-numbered years only.

### Crop, Horticulture and Turfgrass Sciences (CHAT)

#### Department of Plant Agriculture

#### Semester 1
- AGR*1100 [0.50] Introduction to the Agrifood Systems
- BIOL*1070 [0.50] Discovering Biodiversity
- 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*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
- CHEM*1050 [0.50] General Chemistry II
- 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*2040 [0.50] Foundations in Molecular Biology and Genetics
- 0.50 electives

#### Semester 4
- ANSC*2340 [0.50] Structure of Farm Animals
- BIOC*2580 [0.50] Introduction to Biochemistry
- MICR*2420 [0.50] Introduction to Microbiology
- 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
  - One of:
    - POPM*4230 [0.50] Animal Health (even-numbered years)*
    - OR
    - 0.50 electives (odd-numbered years)*
  - *Note: POPM*4230 needs to be taken in either Semester 5 or 7 as course is offered in even-numbered years only.

#### Semester 6
- 2.50 electives or restricted electives

#### Semester 7 & 8
- Students with an interest in business courses should select ACCT*2230 as an elective.

**Note:** Students with an interest in business courses should select ACCT*2230 as an elective.

**Semester 4**
- BIOC*2580 [0.50] Introduction to Biochemistry
- BOT*2100 [0.50] Life Strategies of Plants
- STAT*2040 [0.50] Statistics I
- One of:
  - BOT*3050 [0.50] Plant Functional Ecology (in semester 5)
  - CROP*2110 [0.50] Crop Ecology
  - 0.50 to 1.00 electives or restricted electives

**Note:** Students with an interest in business courses should select ACCT*2230 as an elective.

**Semester 5**
- BOT*3050 [0.50] Plant Functional Ecology (in semester 5)
- FOOD*3080 [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*3110 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 courses from one of the following three course groups.

Note: Some courses listed below may have prerequisites not included among the mandatory courses for the CHATS major listed above. Students are advised to pay particular attention to prerequisite requirements when choosing individual courses, and seek advice as needed.

1. 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, Health and Industry
ENVB*3210 [0.50] Plant Pathology
ENVB*4100 [0.50] Integrated Management of Invasive Insect Pests
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
Choose two courses (1.00 credits) among the following:
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

2. 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*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

3. Turfgrass Science
CROP*4240 [0.50] Weed Science
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*4450 [0.50] Advanced Turfgrass Science

Business Electives
Students who wish to add business courses to their program are advised to select ACCT*2220 and ACCT*2230 plus two courses (1.00 credits) as electives from the following list:
BUS*2090 [0.50] Indivduals and Groups in Organizations
BUS*3000 [0.50] Human Resources Management
FARE*3110 [0.50] Operations Management
FARE*3400 [0.50] Agribusiness Financial Management
FARE*4220 [0.50] Advanced Agribusiness Management
FARE*4240 [0.50] Futures and Options Markets
FARE*4370 [0.50] Food & Agri Marketing Management

Organic Agriculture (OAGR)

Department of Plant Agriculture and School of Environmental Sciences

Semester 1
AGR*1100 [0.50] Introduction to the Agrifoods Systems
BIOL*1070 [0.50] Discovering Biodiversity
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*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
CHEM*1050 [0.50] General Chemistry II

Semester 3
AGR*2320 [0.50] Soils in Agroecosystems
AGR*2350 [0.50] Animal Production Systems, Health 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
2.00 electives or restricted electives

Semester 5
AGR*3500 [0.50] Experiential Education I
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 I
0.50 electives or restricted electives

Semester 6
EDRD*3400 [0.50] Sustainable Communities
OAGR*3130 [0.50] Tutorials in Organic Agriculture II
SOIL*3200 [0.50] Environmental Soil Biology
1.00 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:

   **Note:** Some courses listed below may have prerequisites not included among the mandatory courses for the OAGR major listed above. Students are advised to pay particular attention to prerequisite requirements when choosing individual courses, and seek advice as needed.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSC*3210</td>
<td>Principles of Animal Care and Welfare</td>
<td>[0.50]</td>
</tr>
<tr>
<td>CROP*2110</td>
<td>Crop Ecology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>CROP*4240</td>
<td>Weed Science</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENVB*2040</td>
<td>Plant Health and the Environment</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENVB*3210</td>
<td>Plant Pathology</td>
<td>[0.50]</td>
</tr>
<tr>
<td>ENVB*4100</td>
<td>Integrated Management of Invasive Insect Pests</td>
<td>[0.50]</td>
</tr>
<tr>
<td>GEOG*3320</td>
<td>Agriculture and Society</td>
<td>[0.50]</td>
</tr>
<tr>
<td>NRS*3000</td>
<td>Environmental Issues in Agriculture and Landscape Management</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PBIO*4100</td>
<td>Soil Plant Relationships</td>
<td>[0.50]</td>
</tr>
<tr>
<td>PHIL*2070</td>
<td>Philosophy of the Environment</td>
<td>[0.50]</td>
</tr>
<tr>
<td>SOAN*4220</td>
<td>Gender and Change in Rural Canada</td>
<td>[0.50]</td>
</tr>
<tr>
<td>SOC*3380</td>
<td>Society and Nature</td>
<td>[0.50]</td>
</tr>
<tr>
<td>SOC*4210</td>
<td>Advanced Topics in Rural Sociology</td>
<td>[0.50]</td>
</tr>
</tbody>
</table>

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.
Bachelor of Science in Environmental Sciences
[B.Sc.(Env.)]

Program Information

Objectives of the Program
The Environmental Sciences program is designed to provide a strong interdisciplinary grounding in specific environmental sciences including the socioeconomic context in which environmental issues are resolved. There is an emphasis on management and decision-making skills for the application of scientific knowledge to environmental problems, and the evaluation of appropriate environmental policies. A practical perspective based on defining and resolving problems is central to the program, and this is often done in the context of group work. Substantial emphasis is placed on communication skills, including the development of competence in both written and oral presentations. These skills will be progressively developed in core courses from the first to the fourth year. Students in the final year of their program will be expected to take part in more intensive communication skill development. Graduates will seek employment in a range of fields, from government agencies to private industry and research.

Academic Counselling
General information on the degree program is available from the Program Counsellor. Advising for each major is available through the assigned faculty advisor responsible for the major. Students are encouraged to seek the advice of the faculty advisors when choosing restricted electives and planning course selections.

Degree
The degree granted for the successful completion of this honours program will be the Bachelor of Science in Environmental Sciences--B.Sc.(Env.).

Continuation of Study
Students are advised to consult the regulations for Continuation of Study in Section VIII--Undergraduate Degree Regulations and Procedures of this Calendar.

Conditions for Graduation
In order to graduate from the B.Sc.(Env.) program, students must successfully complete a minimum of 20.00 credits including all the stated course requirements for the program. As well, students must achieve a cumulative average of 60% or higher over all course attempts.

Environmental Sciences (Co-op)
A 5-year Honours Program in Environmental Sciences is offered as a Co-operative Education Program. This option is offered within the B.Sc. (Env.) degree and is available to all majors. The course requirements are the same as those listed for the regular B.Sc. (Env.) program, by the Co-operative Education Program and as outlined in the Continuation of Study policy (Section VIII--Undergraduate Degree Regulations & Procedures). 3 co-op work terms (COOP*1000, COOP*2000, COOP*3000) are required. An optional 4th co-op work term (COOP*4000) is available. COOP*1100 must be completed during semester 2.

Environmental Sciences Co-op Work Term Schedule

<table>
<thead>
<tr>
<th>Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Summer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Academic Term 1</td>
<td>Academic Term 2</td>
<td>Off</td>
</tr>
<tr>
<td>2</td>
<td>Academic Term 3</td>
<td>COOP*1000</td>
<td>Academic Term 4</td>
</tr>
<tr>
<td>3</td>
<td>COOP*2000</td>
<td>Academic Term 5</td>
<td>COOP*3000</td>
</tr>
<tr>
<td>4</td>
<td>Academic Term 6</td>
<td>Academic Term 7</td>
<td>COOP*4000 (Optional)</td>
</tr>
<tr>
<td>5</td>
<td>Academic Term 8</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Since some of the course requirements in the degree program (core or major) are not offered each semester, careful planning and program consultation with the Faculty Co-op Advisor is essential. In particular, students are encouraged to seek advice when choosing for their Summer academic semester.

The Environmental Sciences Program
The degree in Environmental Sciences consists of a minimum of 20.00 credits, as follows:

1. 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 no specific subject requirements for the elective courses, however, you may NOT select the following: BIOL*1500, BOT*1200, CHEM*1100, CIS*1000, GEOL*1100, MET*1000, MICR*1020, MBG*1000, PHYS*1600.

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

First Year Curriculum
The first year courses have been selected to provide students with sufficient background and knowledge to enter any one of the Environmental Sciences majors.

Semester 1
- BIOL*1070 [0.50] Discovering Biodiversity
- CHEM*1040 [0.50] General Chemistry I
- ENVS*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
- 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 9 credits of 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*4011/2 [0.50] Project in Environmental Sciences
- ENVS*4300 [0.50] Environmental Law & Regulation
- MET*2030 [0.50] Meteorology and Climatology
- PHIL*2070 [0.50] Philosophy of the Environment

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
Natural Resources Management

Requirements for each of these majors are described in the detailed schedules of studies below.

Earth and Atmospheric Science (EAAS)

School of Environmental Sciences, 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*1070 [0.50] Discovering Biodiversity
- 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
- CHEM*1050 [0.50] General Chemistry II
- ECON*1050 [0.50] Introductory Microeconomics
SOIL*3060 [0.50] Environmental Soil Chemistry
SOIL*3070 [0.50] Environmental Soil Physics
SOIL*3080 [0.50] Soil and Water Conservation
One of:
SOIL*4090 [0.50] Soil Management
SOIL*4130 [0.50] Soil and Nutrient Management

List C - Water
ENGG*3250 [0.50] Water Management
ENGG*3650 [0.50] Hydrology
GEOS*4150 [0.50] Sedimentary Processes
GEOL*3190 [0.50] Environmental Water Chemistry
SOIL*3080 [0.50] Soil and Water Conservation

Note: BIOL*4040 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.

Semester 5
GEOL*3110 [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

Semester 6
ENVS*3510 [0.50] Aquatic Systems
GEOG*3420 [0.50] Remote Sensing of the Environment
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 must choose one of the following:
GEOL*3520 [0.50] Field Methods in Geosciences
MET*4210 [0.50] Atmospheric Experimentation and Instrumentation
SOIL*4250 [0.50] Soils in the Landscape

Students in the Earth and Atmospheric Science major are required to choose 3.50 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 3000-4000 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*3190 [0.50] Environmental Water Chemistry
GEOL*4090 [0.50] Sedimentology
GEOL*4130 [0.50] Clay and Humic Chemistry
GEOL*4240 [0.50] Geochemistry

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*3200 [0.50] Environmental Soil Biology
One of:
SOIL*4090 [0.50] Soil Management
SOIL*4130 [0.50] Soil and Nutrient Management

List D - Atmosphere
MET*3050 [0.50] Microclimatology
MET*4210 [0.50] Atmospheric Experimentation and Instrumentation

Earth and Atmospheric Science (EAAS:C)

School of Environmental Sciences, 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*1070 [0.50] Discovering Biodiversity
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
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
One of:
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

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:
ENCON*2100 [0.50] Economic Growth and Environmental Quality
FARE*2700 [0.50] Survey of Natural Resource Economics

Semester 4 - Winter
ENVS*3150 [0.50] Aquatic Systems
GEOG*3420 [0.50] Remote Sensing of the Environment
PHIL*2070 [0.50] Philosophy of the Environment
1.00 electives or restricted electives

Semester 5 - Fall
ENVS*4011 [0.00] Project in Environmental Sciences
ENVS*4300 [0.50] Environmental Law & Regulation
2.00 electives or restricted electives

Semester 6 - Winter
ENVS*4012 [0.50] Project in Environmental Sciences
2.00 electives or restricted electives

Restricted Electives
Students must choose one of the following:
GEOL*3520 [0.50] Field Methods in Geosciences
MET*4210 [0.50] Atmospheric Experimentation and Instrumentation
SOIL*4250 [0.50] Soils in the Landscape

Students in the Earth and Atmospheric Science major are required to choose 3.50 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 3000-4000 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*3190 [0.50] Environmental Water Chemistry
GEOL*4090 [0.50] Sedimentology
GEOL*4130 [0.50] Clay and Humic Chemistry
GEOL*4240 [0.50] Geochemistry

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*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*3250 [0.50] Water Management
ENGG*3650 [0.50] Hydrology
GEOS*4150 [0.50] Sedimentary Processes
GEOL*3190 [0.50] Environmental Water Chemistry
SOIL*3080 [0.50] Soil and Water Conservation

Note: BIOL*4040 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Semester 7 - Winter
ENVS*4011 [0.50] 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: BIOL*4040 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Semester 8 - Fall
ENVS*4012 [0.50] Project in Environmental Sciences
2.00 electives or restricted electives

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

Semester 9 - Summer
COOP*2000 [0.00] Co-op Work Term II

Spring Semester
ENVS*4300 [0.50] Environmental Law & Regulation
2.00 electives or restricted electives

Note: BIOL*4040 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.

Semester 7 - Winter
ENVS*4011 [0.50] Project in Environmental Sciences
2.00 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
2.00 electives or restricted electives
Restricted Electives

Students must choose one of the following:
- GEO*3250 [0.50] Field Methods in Geosciences
- MET*4210 [0.50] Atmospheric Experimentation and Instrumentation
- SOIL*4250 [0.50] Soils in the Landscape

Students in the Earth and Atmospheric Science major are required to choose 3.50 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. 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
- GEO*2020 [0.50] Stratigraphy
- GEO*2200 [0.50] Glacial Geology
- GEO*3190 [0.50] Environmental Water Chemistry
- GEO*4090 [0.50] Sedimentology
- GEO*4130 [0.50] Clay and Humic Chemistry
- GEO*4240 [0.50] Geomicrobiology

List B - Soil Science
- FBIO*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*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
- GEO*3190 [0.50] Environmental Water Chemistry
- SOIL*3080 [0.50] Soil and Water Conservation

List D - Atomsphere
- MET*3050 [0.50] Microclimatology
- MET*4210 [0.50] Atmospheric Experimentation and Instrumentation

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*1070 [0.50] Discovering Biodiversity
- 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
- 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

One of:
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Note: ECOL students are required to take BIOL*1090 in semester 3 if not taken in semester 2.

Semester 3
- ENVS*2150 [0.50] Terrestrial Systems
- MET*2030 [0.50] Meteorology and Climatology
- STAT*2040 [0.50] Statistics I

1.00 electives or restricted electives

Note: ECOL students are required to take BIOL*1090 in semester 3 if not taken in semester 2.

Semester 4
- BIOL*2580 [0.50] Introduction to Biochemistry
- BIOL*3110 [0.50] Population Ecology
- MBG*2400 [0.50] Foundations in Molecular Biology and Genetics
- STAT*2050 [0.50] Statistics II

0.50 electives or restricted electives

One of:
- BOT*2100 [0.50] Life Strategies of Plants
- ZOO*3200 [0.50] Comparative Animal Physiology I

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*1070 [0.50] Discovering Biodiversity
- 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
- 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

One of:
- BIOL*1080 [0.50] Biological Concepts of Health
- BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Note: ECOL students are required to take BIOL*1090 in semester 3 if not taken in semester 2.

Semester 3 - Fall
- ENVS*2150 [0.50] Terrestrial Systems
- MET*2030 [0.50] Meteorology and Climatology
- STAT*2040 [0.50] Statistics I

1.00 electives or restricted electives

Note: ECOL students are required to take BIOL*1090 in semester 3 if not taken in semester 2.

Winter Semester
- COOP*1100 [0.00] Co-op Work Term I

Semester 4 - Summer
- BIOL*2580 [0.50] Introduction to Biochemistry
- PHIL*2070 [0.50] Philosophy of the Environment

1.50 electives or restricted electives

One of:
- ECON*2100 [0.50] Economic Growth and Environmental Quality
- FARE*2700 [0.50] Survey of Natural Resource Economics

1.00 electives or restricted electives

Semester 6
- BIOL*3120 [0.50] Community Ecology
- ENVS*3150 [0.50] Aquatic Systems
- PHIL*2070 [0.50] Philosophy of the Environment

1.00 electives or restricted electives

Semester 7
- BIOL*4110 [0.75] Ecological Methods
- ENVS*4011 [0.00] Project in Environmental Sciences
- ENVS*4300 [0.50] Environmental Law & Regulation

Note: One of GEOG*3210 or POLS*3370 must be taken in Semester 7.

Semester 8
- BIOL*4120 [0.50] Evolutionary Ecology
- ENVS*4012 [0.50] Project in Environmental Sciences

1.50 electives

Note: Ecology majors are not required to complete BIOL*2060 as a core course.

Restricted Electives

One of:
- BIOL*3020 [0.50] Population Genetics
- BIOL*3400 [0.50] Evolution

One of:
- BOT*3410 [0.50] Plant Anatomy
- ZOO*2090 [0.50] Vertebrate Structure and Function

One of:
- CIS*1200 [0.50] Introduction to Computing
- CIS*1500 [0.50] Introduction to Programming
- GEOG*2420 [0.50] The Earth From Space
- GEOG*2480 [0.50] Mapping and GIS
- GEOG*3420 [0.50] Remote Sensing of the Environment

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

Semester 5 - Winter
BIOL*3110 [0.50] Population Ecology
ENV*3510 [0.50] Aquatic Systems
ENVS*3150 [0.50] Project in Environmental Sciences
MBG*2040 [0.50] Foundations in Molecular Biology and Genetics

One of:
ECON*2100 [0.50] Economic Growth and Environmental Quality
FARE*2700 [0.50] Survey of Natural Resource Economics

1.00 electives or restricted electives

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

Semester 6 - Fall
BIOL*3010 [0.50] Laboratory and Field Work in Ecology
ENV*4011 [0.00] Project in Environmental Sciences
ENVS*4012 [0.50] Project in Environmental Sciences

One of:
ECON*2100 [0.50] Economic Growth and Environmental Quality
FARE*2700 [0.50] Survey of Natural Resource Economics

1.00 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
POL*3370 [0.50] Environmental Politics and Governance

0.75 electives or restricted electives

Note: BIOL*4040 may be substituted for GEOG*3210 or POL*3370 and would be taken in Semester 8.

Note: Ecology majors are not required to complete as a core course.

Restricted Electives

One of:
BIOL*3020 [0.50] Population Genetics
BIOL*3400 [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

One of:
CIS*1200 [0.50] Introduction to Computing
CIS*1500 [0.50] Introduction to Programming
GEOG*2420 [0.50] The Earth From Space
GEOG*2480 [0.50] Mapping and GIS
GEOG*3420 [0.50] Remote Sensing of the Environment

Environmental Biology (ENVB)

School of Environmental Sciences, Ontario Agricultural College

Major

Please note that not all courses in the "One of:" options are available each semester (Fall, Winter, Summer). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

Semester 1
BIOL*1070 [0.50] Discovering Biodiversity
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
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

One of:
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Note: ENVB students are required to take BIOL*1090 in semester 3 if not taken in semester 2.

Semester 3
ENVS*2150 [0.50] Terrestrial Systems
MET*2030 [0.50] Meteorology and Climatology
TOX*2000 [0.50] Principles of Toxicology

One of:
ECON*2100 [0.50] Economic Growth and Environmental Quality
FARE*2700 [0.50] Survey of Natural Resource Economics

0.50 electives or restricted electives

Note: ENVB students are required to take BIOL*1090 in semester 3 if not taken in semester 2.

Semester 4
BIOL*2580 [0.50] Introduction to Biochemistry
BIOL*2600 [0.50] Ecology
MBG*2040 [0.50] Foundations in Molecular Biology and 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
POL*3370 [0.50] Environmental Politics and Governance

2.00 electives or restricted electives

Note: BIOL*4040 may be substituted for GEOG*3210 or POL*3370 and would be taken in Semester 8.

Semester 6
ENVS*3150 [0.50] Aquatic Systems
PHIL*2070 [0.50] Philosophy of the Environment

1.50 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 in the Environmental Biology major are required to choose 5.00 credits from the following list. Students are encouraged to seek advice on their preferences 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*4150 [0.50] Wildlife Conservation and Management
BIOL*4350 [0.50] Biology of Polluted Waters
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*3280 [0.50] Waterborne Disease Ecology
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*4450 [0.50] Toxicological Risk Characterization *
ENVB*4780 [0.50] Forest Ecology *
ENVS*3410 [0.50] Independent Research I
ENVS*3420 [0.50] Independent Research II *
ENVS*3430 [1.00] Independent Research
ENVS*4410 [1.00] Advanced Independent Research I *
ENVS*4420 [1.00] Advanced Independent Research II *
ENVS*4430 [2.00] Advanced Independent Research *
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
PBIOS*4530 [0.50] Environmental Pollution Stresses on Plants *
SOIL*3080 [0.50] Soil and Water Conservation *
TOX*3360 [0.50] Environmental Chemistry and Toxicology

* 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)

**School of Environmental Sciences, 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

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>BIOL*1070</td>
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**Note:** BIOL*1100 is required in semester 3 if not taken in semester 2.

### Semester 2 - Winter

<table>
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<tr>
<th>Code</th>
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<td>CHEM*1050</td>
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**Note:** ENVS*1100 is required in semester 3 if not taken in semester 2.

#### Winter Semester

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### Semester 4 - Summer

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1.00 electives or restricted electives

#### Fall Semester

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### Semester 5 - Winter

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<td>PHIL*2070</td>
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**One of:**

- ECON*2100 [0.50] Economic Growth and Environmental Quality
- FARE*2700 [0.50] Survey of Natural Resource Economics

0.50 electives or restricted electives

**Note:** Students are required to take BIOL*1100 in semester 3 if not taken in semester 2.

### Fall Semester

<table>
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<td>COOP*2000</td>
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### Semester 6 - Fall

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2.50 electives or restricted electives

### Semester 7 - Winter

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<td>ENVS*4012</td>
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2.00 electives or restricted electives

### Summer Semester - (Optional)

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### Semester 8 - Fall

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<td>ENVS*4300</td>
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</table>

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.

<table>
<thead>
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<tr>
<td>BIOL*3450</td>
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<tr>
<td>BIOL*4150</td>
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</table>

### Environmental Economics and Policy (EEP)

**Department of Economics and Finance, 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

<table>
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<tr>
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<tbody>
<tr>
<td>BIOL*1070</td>
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<td>PHYS*1080</td>
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**Note:** BIOL*1100 is required in semester 3 if not taken in semester 2.

### Semester 2

<table>
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<tr>
<td>CHEM*1050</td>
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<tr>
<td>COOP*1100</td>
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<tr>
<td>ECON*1050</td>
<td>[0.50]</td>
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<tr>
<td>GEOG*1300</td>
<td>[0.50]</td>
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<tr>
<td>PHYS*1130</td>
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</table>

**One of:**

- ECON*2100 [0.50] Economic Growth and Environmental Quality
- FARE*2700 [0.50] Survey of Natural Resource Economics

0.50 electives or restricted electives

**Note:** ENVS*1100 is required in semester 3 if not taken in semester 2.

### Semester 3

<table>
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<tr>
<th>Code</th>
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<td>COOP*1100</td>
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<td>PHYS*1130</td>
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**One of:**

- BIOL*1090 [0.50] Biological Concepts of Health

2.00 electives or restricted electives

**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 and Finance, 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

<table>
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<tr>
<td>BIOL*1070</td>
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**Note:** BIOL*1100 is required in semester 3 if not taken in semester 2.

### Semester 2

<table>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CHEM*1050</td>
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<td>COOP*1100</td>
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<td>GEOG*1300</td>
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<tr>
<td>PHYS*1130</td>
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</table>

**One of:**

- ECON*2100 [0.50] Economic Growth and Environmental Quality
- FARE*2700 [0.50] Survey of Natural Resource Economics

0.50 electives or restricted electives

**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:C)
Department of Economics and Finance, 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*1070 [0.50] Discovering Biodiversity
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
CHEM*1050 [0.50] General Chemistry II
COOP*1100 [0.00] Introduction to Co-operative Education
ENVS*1020 [0.50] Environmental Law & Regulation
GEOG*2210 [0.50] Field Geomorphology
PHYS*1130 [0.50] Physics with Applications
One of:
   BIOL*1080 [0.50] Biological Concepts of Health
   BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Semester 3 - Fall
ECON*1060 [0.50] Introduction to Microeconomics
ECON*2100 [0.50] Economic Growth and Environmental Quality
ENVS*1250 [0.50] Terrestrial Systems
FARE*2700 [0.50] Survey of Natural Resource Economics
MET*2030 [0.50] Meteorology and Climatology

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: ECON*2740 may be substituted for STAT*2040.

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

Semester 5 - Winter
ENVS*3150 [0.50] Aquatic Systems
FARE*3170 [0.50] Cost-Benefit Analysis
One of:
   GEOG*3210 [0.50] Management of the Biophysical Environment

Semester 6
ECON*3740 [0.50] Introduction to Econometrics
ENVS*4011 [0.00] Project in Environmental Sciences
FARE*3430 [0.50] Environmental Law & Regulation
1.00 electives or restricted electives

Semester 7
ECON*3710 [0.50] Advanced Microeconomics
ENVS*4011 [0.00] Project in Environmental Sciences
FARE*4290 [0.50] Land Economics
1.50 electives or restricted electives
Note: FARE*4290 is taught in even-numbered years.

Semester 8
ECON*4930 [0.50] Environmental Economics
ENVS*4300 [0.50] Project in Environmental Sciences
FARE*4310 [0.50] Resource Economics
0.50 electives or restricted electives

Restricted Electives
Students in the Environmental Economics and Policy major are required to choose 2.50 credits additional Food, Agricultural and Resource Economics (FARE*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*1070 [0.50] Discovering Biodiversity
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
CHEM*1050 [0.50] General Chemistry II
COOP*1100 [0.00] Introduction to Co-operative Education
ENVS*1020 [0.50] Environmental Law & Regulation
GEOG*2210 [0.50] Field Geomorphology
PHYS*1130 [0.50] Physics with Applications
One of:
   BIOL*1080 [0.50] Biological Concepts of Health
   BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

Semester 3
ECON*1060 [0.50] Introduction to Microeconomics
ECON*2100 [0.50] Economic Growth and Environmental Quality
ENVS*1250 [0.50] Terrestrial Systems
FARE*2700 [0.50] Survey of Natural Resource Economics
MET*2030 [0.50] Meteorology and Climatology

Semester 4
ENVS*2150 [0.50] Terrestrial Systems
GEOG*2200 [0.50] Geomorphology
GEOG*2460 [0.50] Analysis in Geography
MET*2030 [0.50] Meteorology and Climatology
One of:
   ECON*2100 [0.50] Economic Growth and Environmental Quality
   FARE*2700 [0.50] Survey of Natural Resource Economics

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 BIOL*4040). BIOL*4040 may be substituted for POLS*3370 and would be taken in Semester 8.
Semester 6
ENVS*3150 [0.50] Aquatic Systems
GEOG*3480 [0.50] GIS and Spatial Analysis
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
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
At least two of:
GEOG*3020 [0.50] Global Environmental Change
GEOG*4110 [1.00] 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*1070 [0.50] Discovering Biodiversity
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
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
One of:
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
Semester 3 - Fall
ENVS*2150 [0.50] Terrestrial Systems
GEOG*2000 [0.50] Geomorphology
GEOG*2460 [0.50] Analysis in Geography
MET*2030 [0.50] Meteorology and Climatology
One of:
ECON*2100 [0.50] Economic Growth and Environmental Quality
FARE*2700 [0.50] Survey of Natural Resource Economics
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
ENVS*3150 [0.50] Aquatic Systems
GEOG*2110 [0.50] Climate and the Biophysical Environment
GEOG*2480 [0.50] Mapping and GIS
1.00 electives or restricted electives*

Semester 5 - Winter
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 BIOL*4040). BIOL*4040 may be substituted for POLS*3370 and would be taken in Semester 7.

Semester 7 - Winter
ENVS*4012 [0.50] Project in Environmental Sciences
GEOG*4880 [0.50] Contemporary Geographic Thought
1.50 electives or restricted electives*

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
At least two of:
GEOG*3020 [0.50] Global Environmental Change
GEOG*4110 [1.00] Environmental Systems Analysis
GEOG*4210 [0.50] Environmental Governance
GEOG*4230 [0.50] Environmental Impact Assessment

Natural Resources Management (NRM)
School of Environmental Sciences, 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*1070 [0.50] Discovering Biodiversity
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
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
One of:
BIOL*1080 [0.50] Biological Concepts of Health
BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology
Semester 3
ENVS*2150 [0.50] Terrestrial Systems
GEOG*2000 [0.50] Geomorphology
GEOG*2460 [0.50] Analysis in Geography
MET*2030 [0.50] Meteorology and Climatology
One of:
ECON*2100 [0.50] Economic Growth and Environmental Quality
FARE*2700 [0.50] Survey of Natural Resource Economics
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
ENVS*3150 [0.50] Aquatic Systems
GEOG*2110 [0.50] Climate and the Biophysical Environment
GEOG*2480 [0.50] Mapping and GIS
1.00 electives or restricted electives*

Semester 5 - Winter
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 BIOL*4040). BIOL*4040 may be substituted for POLS*3370 and would be taken in Semester 7.

Semester 7 - Winter
ENVS*4012 [0.50] Project in Environmental Sciences
GEOG*4880 [0.50] Contemporary Geographic Thought
1.50 electives or restricted electives*

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
At least two of:
GEOG*3020 [0.50] Global Environmental Change
GEOG*4110 [1.00] Environmental Systems Analysis
GEOG*4210 [0.50] Environmental Governance
GEOG*4230 [0.50] Environmental Impact Assessment

Last Revision: March 15, 2014
2011-2012 Undergraduate Calendar
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: BIOL*4040 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 8.)

Semester 6
ENVS*3150 [0.50] Aquatic 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

1.00 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

1.50 electives or restricted electives

Semester 8
BIOL*3130 [0.50] Conservation Biology
ENVS*4012 [0.50] Project in Environmental Sciences

1.50 electives or restricted electives

Restricted Electives
Students in the Natural Resources Management major are required to choose 2.50 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
ENVS*3410 [0.50] Independent Research I
ENVS*3420 [0.50] Independent Research II
ENVS*3430 [1.00] Independent Research
ENVS*4410 [1.00] Advanced Independent Research I
ENVS*4420 [1.00] Advanced Independent Research II
ENVS*4430 [2.00] Advanced Independent Research
GEOG*2420 [0.50] The Earth From Space
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*4230 [0.50] Environmental Impact Assessment
LARC*3320 [0.50] Principles of Landscape Ecology
LARC*4520 [0.50] Park and Recreation Administration
MET*3050 [0.50] Microclimatology
SOIL*3060 [0.50] Environmental Soil Chemistry
SOIL*3070 [0.50] Environmental Soil Physics
SOIL*3200 [0.50] Environmental Soil Biology

Natural Resources Management (NRM:C)
School of Environmental Sciences, 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*1070 [0.50] Discovering Biodiversity
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
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
One of:
  BIOL*1080 [0.50] Biological Concepts of Health
  BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology

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
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

1.00 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:
  ECON*2100 [0.50] Economic Growth and Environmental Quality
  FARE*2700 [0.50] Survey of Natural Resource Economics
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: BIOL*4040 may be substituted for GEOG*3210 or POLS*3370 and would be taken in Semester 7.)

Semester 7 - Winter
BIOL*3130 [0.50] Conservation Biology
ENVS*4012 [0.50] Project in Environmental Sciences
NRS*3100 [0.50] Resource Planning Techniques

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
NRS*4110 [0.50] Natural Resources Management Field Camp

1.50 electives or restricted electives

Restricted Electives
Students in the Natural Resources Management major are required to choose 2.50 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
ENVS*3410 [0.50] Independent Research I
ENVS*3420 [0.50] Independent Research II
ENVS*3430 [1.00] Independent Research
ENVS*4410 [1.00] Advanced Independent Research I
ENVS*4420 [1.00] Advanced Independent Research II
ENVS*4430 [2.00] Advanced Independent Research
GEOG*2420 [0.50] The Earth From Space
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*4230 [0.50] Environmental Impact Assessment
LARC*3320 [0.50] Principles of Landscape Ecology
LARC*4520 [0.50] Park and Recreation Administration
MET*3050 [0.50] Microclimatology
SOIL*3060 [0.50] Environmental Soil Chemistry
SOIL*3070 [0.50] Environmental Soil Physics
SOIL*3200 [0.50] Environmental Soil Biology

PHYS*1080 [0.50] Physics for Life Sciences

2011-2012 Undergraduate Calendar

Last Revision: March 15, 2014
X. Degree Programs, Bachelor of Science in Environmental Sciences [B.Sc.(Env.)]

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG*4230</td>
<td>0.50</td>
<td>Environmental Impact Assessment</td>
</tr>
<tr>
<td>LARC*3320</td>
<td>0.50</td>
<td>Principles of Landscape Ecology</td>
</tr>
<tr>
<td>LARC*4520</td>
<td>0.50</td>
<td>Park and Recreation Administration</td>
</tr>
<tr>
<td>MET*3050</td>
<td>0.50</td>
<td>Microclimatology</td>
</tr>
<tr>
<td>SOIL*3060</td>
<td>0.50</td>
<td>Environmental Soil Chemistry</td>
</tr>
<tr>
<td>SOIL*3070</td>
<td>0.50</td>
<td>Environmental Soil Physics</td>
</tr>
<tr>
<td>SOIL*3200</td>
<td>0.50</td>
<td>Environmental Soil Biology</td>
</tr>
</tbody>
</table>
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 associate Dean, Students provides academic counselling and referral to other appropriate resources for all D.V.M. students. In particular, students who are requesting a Supplemental Privilege are required to meet with the Associate Dean so that the student can be informed of appropriate resources (such as Learning and Writing Services and the Counselling and Student Resource Centre) and use them to deal with his/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 have the discretion to select the courses that the student will register in on a part-time basis. Students permitted to take courses on a part-time basis are cautioned that there is an enrolment limitation for the program and that access to certain courses or resumption of the program on a full-time basis will be conditional on the availability of space.

Failed Courses

1. Continuation of study from one phase of the D.V.M. Program to the next is dependent on the successful completion of all courses, or approved equivalents, in the published schedule of studies for the D.V.M. Program.

2. A student who fails one course in a Phase may be required to repeat all courses in the Phase. The consequences of failure of any particular course in the D.V.M. Program are as follows:

   a. Failure in any of the following courses result in the Repeat of the Course:
      - VETM*3000
      - VETM*3210
      - VETM*3390
      - VETM*3430
      - VETM*3220
      - VETM*3440
      - VETM*3510
      - VETM*4220
      - VETM*4450
      - VETM*4530
      - VETM*4610
      - VETM*4620
      - VETM*4660
      - VETM*4670
      - VETM*4680
      - VETM*4710
      - VETM*4720
      - VETM*4870
      - VETM*4880
      - VETM*4890
      - VETM*4900
      - VETM*4920
      - VETM*4930
      - VETM*4940

   b. Failure in any of the following courses result in the Repeat of the Phase:
      - VETM*3070
      - VETM*3080
      - VETM*3120
      - VETM*3400
      - VETM*3410
      - VETM*3450
      - VETM*3460
      - VETM*3470
      - VETM*4460
      - VETM*4470
      - VETM*4480
      - VETM*4490
      - VETM*4540

   This information is also available as part of the Phase Handbooks.

   3. A student will be allowed to fail a particular course only once. Any student who fails the same course twice will be required to withdraw and will be ineligible for readmission to the D.V.M. Program.

   4. Grades obtained by D.V.M. students who repeat one or more VETM course(s) will be reported on the transcript in addition to the original course grade. In the instance where all courses in a Phase are repeated, the grades from the repeated VETM courses will constitute the new Phase Average (PHA). The new D.V.M. Program Average will include the grades obtained in both the original and repeated VETM course attempts.

Supplemental Privileges

1. In the circumstances of a failed course, the Academic Review Sub-Committee may, if appropriate and under special circumstances only, allow a student the opportunity to gain credit standing in a failed course by granting a supplemental privilege (see Failed Courses and Supplemental Privilege in Section VIII). Students must request a supplemental privilege by submitting the request to the Academic Review Sub-Committee, and the fee for the privilege, within 7 days of the release of grades for the phase in which the failure occurred. The Academic Review Sub-Committee, upon receiving a request from a student, and after consulting with the instructor and reviewing the student's course performance, will determine whether a supplemental privilege should be granted.

   2. Students will be permitted supplemental privileges in a maximum of two courses over the entire D.V.M. Program. A supplemental privilege will not be granted for a second failure in a course. Any student granted a supplemental privilege must meet with the Associate Dean for Student Affairs who will inform the student of appropriate resources to be used to deal with his/her academic difficulties.

Conditions for Graduation

In order to qualify for graduation from the D.V.M. program, the student must have completed successfully all of the courses approved for the program. Students will not be allowed to graduate with a PA of < 60% or PHA of < 60% in Phase 4.

Voluntary Withdrawal from the Program

Students who have voluntarily withdrawn from the D.V.M. program and who wish to return must give notice to the 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/calendar/index.cfm?undergraduate](http://www.uoguelph.ca/registrar/calendar/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 1

<table>
<thead>
<tr>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA &lt; 50%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA ≥ 50% but &lt; 60%</td>
<td>Required to Repeat Phase</td>
</tr>
<tr>
<td>PA ≥ 60%</td>
<td>Eligible to Continue</td>
</tr>
</tbody>
</table>

If Repeating Phase 1:

<table>
<thead>
<tr>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA &lt; 60%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA ≥ 60%</td>
<td>Eligible to Continue</td>
</tr>
</tbody>
</table>

For Course Attempts in Phase 2

<table>
<thead>
<tr>
<th>Program Average (PA) and Phase Average (PHA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA &lt; 50%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA or PHA ≥ 50% but &lt; 60%</td>
<td>Required to Repeat Phase</td>
</tr>
<tr>
<td>PA and PHA ≥ 60%</td>
<td>Eligible to Continue</td>
</tr>
</tbody>
</table>

If Repeating Phase 2:

<table>
<thead>
<tr>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA &lt; 60%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA ≥ 60%</td>
<td>Eligible to Continue</td>
</tr>
</tbody>
</table>

For Course Attempts in Phase 3

<table>
<thead>
<tr>
<th>Program Average (PA) and Phase Average (PHA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA &lt; 50%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA or PHA ≥ 50% but &lt; 60%</td>
<td>Required to Repeat Phase*</td>
</tr>
<tr>
<td>PA and PHA ≥ 60%</td>
<td>Eligible to Continue</td>
</tr>
</tbody>
</table>

* 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:

<table>
<thead>
<tr>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA &lt; 60%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA ≥ 60%</td>
<td>Eligible to Continue</td>
</tr>
</tbody>
</table>

For Course Attempts in Phase 4

<table>
<thead>
<tr>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA &lt; 60%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA ≥ 60%</td>
<td>Eligible to Continue</td>
</tr>
</tbody>
</table>

Continuation of Study Assessment for DVM Students in Phase 4

<table>
<thead>
<tr>
<th>Program Average (PA) and Phase Average (PHA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA &lt; 50%</td>
<td>Required to Withdraw</td>
</tr>
<tr>
<td>PA or PHA ≥ 50% but &lt; 60%</td>
<td>Required to Remediate*</td>
</tr>
<tr>
<td>PA and PHA ≥ 60%</td>
<td>Eligible to Continue**</td>
</tr>
</tbody>
</table>

* 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>VETM*3000</td>
<td>0.50</td>
<td>Veterinary Biochemistry</td>
</tr>
<tr>
<td>VETM*3070</td>
<td>2.00</td>
<td>Veterinary Anatomy</td>
</tr>
<tr>
<td>VETM*3080</td>
<td>1.50</td>
<td>Veterinary Physiology</td>
</tr>
<tr>
<td>VETM*3120</td>
<td>0.75</td>
<td>Veterinary Histology</td>
</tr>
<tr>
<td>VETM*3210</td>
<td>0.50</td>
<td>Art of Veterinary Medicine I</td>
</tr>
<tr>
<td>VETM*3390</td>
<td>0.50</td>
<td>Veterinary Medical Genetics</td>
</tr>
<tr>
<td>VETM*3400</td>
<td>0.75</td>
<td>Health Management I</td>
</tr>
<tr>
<td>VETM*3430</td>
<td>0.25</td>
<td>Clinical Medicine I</td>
</tr>
</tbody>
</table>

Phase 2

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>VETM*3220</td>
<td>0.50</td>
<td>Art of Veterinary Medicine II</td>
</tr>
<tr>
<td>VETM*3410</td>
<td>0.75</td>
<td>Health Management II</td>
</tr>
<tr>
<td>VETM*3440</td>
<td>0.50</td>
<td>Clinical Medicine II</td>
</tr>
<tr>
<td>VETM*3450</td>
<td>2.75</td>
<td>Principles of Disease in Veterinary Medicine</td>
</tr>
<tr>
<td>VETM*3460</td>
<td>0.75</td>
<td>Theriogenology</td>
</tr>
<tr>
<td>VETM*3470</td>
<td>0.75</td>
<td>Anaesthesiology and Pharmacology</td>
</tr>
<tr>
<td>VETM*3510</td>
<td>0.25</td>
<td>Principles of Surgery</td>
</tr>
</tbody>
</table>

Phase 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>VETM*4220</td>
<td>0.50</td>
<td>Art of Veterinary Medicine III</td>
</tr>
<tr>
<td>VETM*4420</td>
<td>0.25</td>
<td>Clinical Pharmacology</td>
</tr>
<tr>
<td>VETM*4450</td>
<td>0.50</td>
<td>Equine Medicine and Surgery</td>
</tr>
<tr>
<td>VETM*4460</td>
<td>1.00</td>
<td>Food Animal Medicine and Surgery</td>
</tr>
<tr>
<td>VETM*4470</td>
<td>1.00</td>
<td>Medicine and Surgery of Dog and Cat</td>
</tr>
<tr>
<td>VETM*4480</td>
<td>0.75</td>
<td>Comparative Medicine</td>
</tr>
<tr>
<td>VETM*4490</td>
<td>1.00</td>
<td>Systems Pathology</td>
</tr>
<tr>
<td>VETM*4530</td>
<td>0.50</td>
<td>Health Management III</td>
</tr>
<tr>
<td>VETM*4540</td>
<td>1.75</td>
<td>Surgical Exercises</td>
</tr>
<tr>
<td>VETM*4870</td>
<td>0.25</td>
<td>Clinical Medicine III</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>VETM*4610</td>
<td>3.25</td>
<td>Small Animal Clinics - Small Animal Stream</td>
</tr>
<tr>
<td>VETM*4620</td>
<td>1.00</td>
<td>Health Management - Small Animal Stream</td>
</tr>
<tr>
<td>VETM*4880</td>
<td>3.25</td>
<td>Electives in Veterinary Medicine I</td>
</tr>
<tr>
<td>VETM*4900</td>
<td>2.50</td>
<td>Veterinary Externship</td>
</tr>
</tbody>
</table>

Mixed Stream:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>VETM*4660</td>
<td>2.00</td>
<td>Small Animal Clinics - Mixed Stream</td>
</tr>
<tr>
<td>VETM*4670</td>
<td>1.50</td>
<td>Large Animal Clinics - Mixed Stream</td>
</tr>
<tr>
<td>VETM*4680</td>
<td>2.00</td>
<td>Health Management - Mixed Stream</td>
</tr>
<tr>
<td>VETM*4890</td>
<td>2.00</td>
<td>Electives in Veterinary Medicine II</td>
</tr>
<tr>
<td>VETM*4900</td>
<td>2.50</td>
<td>Veterinary Externship</td>
</tr>
</tbody>
</table>

Equine Stream:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>VETM*4920</td>
<td>1.50</td>
<td>Small Animal Clinics - Equine Stream</td>
</tr>
<tr>
<td>VETM*4930</td>
<td>2.50</td>
<td>Large Animal Clinics - Equine Stream</td>
</tr>
<tr>
<td>VETM*4940</td>
<td>1.50</td>
<td>Health Management - Equine Stream</td>
</tr>
<tr>
<td>VETM*4890</td>
<td>2.00</td>
<td>Electives in Veterinary Medicine II</td>
</tr>
<tr>
<td>VETM*4900</td>
<td>2.50</td>
<td>Veterinary Externship</td>
</tr>
</tbody>
</table>

Food Animal Stream:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Program Average (PA)</th>
<th>Status of Student</th>
</tr>
</thead>
<tbody>
<tr>
<td>VETM*4710</td>
<td>1.00</td>
<td>Large Animal Clinics - Food Animal Stream</td>
</tr>
<tr>
<td>VETM*4720</td>
<td>3.25</td>
<td>Health Management - Food Animal Stream</td>
</tr>
<tr>
<td>VETM*4880</td>
<td>3.25</td>
<td>Electives in Veterinary Medicine I</td>
</tr>
<tr>
<td>VETM*4900</td>
<td>2.50</td>
<td>Veterinary Externship</td>
</tr>
</tbody>
</table>
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 & Career Services as suitable learning experiences relevant to the students’ area of academic study. A graded Co-op Work Term Report and Work 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 co-op 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 dependent 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 80% to apply to the co-op program. Once accepted to the University of Guelph, the student must maintain a 70% cumulative average in the first 2 semesters (full-time study) in order to remain in the co-op program.

Transfer students must meet normal admission requirements, as well as complete one academic semester at Guelph and achieve a minimum 70% average prior to participating in the co-op process. An academic and work schedule must also be approved prior to the student being accepted into the co-op program.

Continuation of Study

Students will be allowed to continue in the co-op program only if their cumulative average, over 4.0 credits, is 70% or higher after two full-time academic semesters. Students are also required to meet the conditions for continuation of study for their degree program as listed in the Undergraduate Calendar. In addition, all students must satisfactorily complete COOP*1100 before their first employment process.

Co-op fees 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 http://www.cecs.uoguelph.ca/home/gen_students.cfm.

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 & Career Services their University of Guelph transcript and any transcript from other post-secondary institutions that may be part of the Academic Record held by the Registrar's Office. Students also grant permission to Co-operative Education & Career 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 Co-op Work Term Performance Evaluation, and the Co-op 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 co-op Work Terms with the same employer should consult with their Co-op Faculty Advisor regarding Co-op Work Report requirements for eight-month co-op Work Terms. A grade of Outstanding, Very Good, Good, Satisfactory, or Unsatisfactory will appear on the student's Academic Record.

A student who receives an Unsatisfactory Co-op Work Report Evaluation will be given an opportunity to make revisions and resubmit the report. Students who are resubmitting a Co-op 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.

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/.