2019-2020 Undergraduate Calendar

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2019-2020 academic year, including the Summer Semester 2019, the Fall Semester 2019 and the Winter Semester 2020. For your convenience the Undergraduate Calendar is available in PDF format.

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

The University is a full member of:

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Disclaimer

University of Guelph 2019

The information published in this Undergraduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2019-2020 academic year, including the Summer Semester 2019, the Fall Semester 2019 and the Winter Semester 2020.

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

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

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

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Collection, Use and Disclosure of Personal Information

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

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

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

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

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

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

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

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

An update on Institutional and Ministry of Training, Colleges and Universities Act Notice of Disclosure Activities is posted at https://www.ontario.ca/page/ministry-advanced-education-and-skills-development

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

Authority to Disclose Personal Information to Statistics Canada

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

Notification of Disclosure of Personal Information to Statistics Canada

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

Address for University Communication

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

Email Address

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

Home Address

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

Name Changes

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

Student Confidentiality and Release of Student Information Policy Excerpt

The University undertakes to protect the privacy of each student and the confidentiality of their record. To this end the University shall refuse to disclose personal information to any person other than the individual to whom the information relates where disclosure would constitute an unjustified invasion of the personal privacy of that person or of any other individual. All members of the University community must respect the confidential nature of the student information which they acquire in the course of their work. Complete policy at https://uoguelph.civicweb.net/document/68892/ORSInfoReleasePolicy060610.pdf?handle=FF982F8A9AEA4076BE4F3D88147172B8.

Learning Outcomes

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

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

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

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

1. Critical and Creative Thinking

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

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

2. Literacy

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

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

3. Global Understanding:

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

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

4. Communicating

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

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

5. Professional and Ethical Behaviour

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

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

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X. Degree Programs

Specializations and Their Degrees

Specializations and the Degree under which they are offered.

| Specialization Name | Specialization Acronym | Honours Program Major | Honours Program Minor | Honours Program Area of Emphasis | General Program | Co-op Program |
|---------------------------------------------|---------------------------|--------------------------|--------------------------|-------------------------------------|-----------------|---------------|
| Accounting | ACCT | BCOM | | | | BCOM |
| Adult Development | ADEV | BASC | | | | BASC |
| Agriculture | AGR | | BSAG BAS | | | |
| Agriculture & Food Security | AFS | | | BAH.IDS | | |
| (Honours) Agricultural | AGRS | BSAG | | | | |
| Animal Biology | ABIO | BSC | | | | |
| Animal Science | ANSC | BSAG | | | | |
| Anthropology | ANTH | BA | BA BAS | | BA | |
| Applied Human Nutrition | AHN | BASC | | | | |
| Applied Plant Science | APSC | | | BSCH.PLSC | | |
| Art History | ARTH | BA | BA BAS | | | |
| Arts, Culture and Heritage Management | ACHM | | BA BAS | | | |
| Biochemistry | BIOC | BSC | BSC BAS | | | BSC |
| Biodiversity | BIOD | BSC | | | | |
| Bioinformatics | BINF | | | BSCH.MSCI | | |
| Biological & Medical Physics | BMPH | BSC | | | | BSC |
| Biological and Pharmaceutical Chemistry | BPCH | BSC | | | | BSC |
| Biological Engineering | BIOE | BENG | | | | BENG |
| Biological Science | BIOS | BSC | | | BSC | |
| Biology | BIOL | | BSC BAS | | | |
| Biomathematical or Biostatistical Modelling | BBM | | | BSCH.MSCI | | |
| Bio-Medical Science | BIOM | BSC | | | | |
| Biomedical Engineering | BME | BENG | | | | BENG |
| Biomedical Toxicology | BTOX | BSC | | | | BSC |
| Biotechnology | BIOT | | BSC BAS | | | |
| Botany | BOT | | | BSCH.PLSC | | |
| Business | BUS | | BA BAS | | | |
| Business Economics | BECN | | BA BSC BAS | | | |
| Chemical Physics | CHPY | BSC | | | | BSC |
| Chemistry | CHEM | BSC | BSC BAS | | | BSC |
| Child, Youth and Family | CYF | BASC | | | | BASC |
| Classical Studies | CLAS | BA | BA BAS | | | |
| Computer Engineering | CENG | BENG | | | | BENG |
| Computer Science | CS | BCOMP | | BAH.MSCI BSCH.MSCI | | BCOMP |
| Computing | | | | | BCOMP | |
| Computing & Information Science | CIS | | BA BSC BAS | | | |
| Creative Writing | CW | | BA BAS | | | |
| Criminal Justice & Public Policy | CJPP | BA | BA BAS | | | |

Last Revision: July 4, 2019

| Specialization Name | Specialization Acronym | Honours Program Major | Honours Program Minor | Honours Program Area of Emphasis | General Program | Co-op Program |
|-------------------------------------------|---------------------------|--------------------------|--------------------------|-------------------------------------|-----------------|---------------|
| Crop, Horticulture and Turfgrass Sciences | CHAT | BSAG | | | | |
| Development in the Canadian Context | DCC | | | BAH.IDS | | |
| Development in the Fragile Contexts | DFC | | | BAH.IDS | | |
| Ecology | ECOL | BSES | BSC BAS | | | BSES |
| Economics | ECON | BA | BA BAS | BAH.MSCI BSCH.MSCI | | BA |
| Electricity & Systems | EAS | | | BSCH.MSCI | | |
| Energy & Mass Transfer | EMT | | | BSCH.MSCI | | |
| Engineering Systems & Computing | ESC | BENG | | | | BENG |
| English | ENGL | BA | BA BAS | | ВА | |
| Environmental Biology | ENVB | BSC | | | | |
| Environmental Economics & Policy | EEP | BSES | | | | BSES |
| Environmental Engineering | ENVE | BENG | BENG | | | BENG |
| Environmental Geomatics | EG | BSC | | | | BSC |
| Environmental Governance | EGOV | BA | | | | |
| Environmental Management | EM | BBRM | | | | |
| Environment and Resource Management | ERM | BSES | | | | BSES |
| Environmental Sciences | ENVS | BSES | | | | BSES |
| Environmental and Sustainable Development | ESD | | | BAH.IDS | | BSES |
| Equine Management | EQM | BBRM | | | | |
| European Culture & Civilization | ECC | | BA BAS | BAH.EURS | | |
| European Business Studies | EBS | | | BAH.EURS | | |
| European Studies | EURS | BA | | | | |
| Family & Child Studies | FCS | | BA BAS | | | |
| Finance | FIN | | | BCOM.MEF | | |
| Food and Agricultural Business | FAB | BCOM | | | | BCOM |
| Food, Agricultural and Resource Economics | FARE | BA | | | | |
| Food Engineering | FENG | | BENG | | | |
| Food Industry Management | FIM | BBRM | | | | BBRM |
| Food Science | FOOD | BSC | | | | BSC |
| French Studies | FREN | BA | BA BAS | | ВА | |
| GIS & Environmental Analysis | GIS | | BSC BAS | | | |
| Geography | GEOG | BA | BA BAS | | BA | |
| German | GERM | | BA BAS | | | |
| History | HIST | BA | BA BAS | | ВА | |
| Hospitality and Tourism Management | HTM | BCOM | | | | BCOM |
| Hotel and Lodging | HAL | | | BCOMM. HTM | | |
| Human Kinetics | НК | BSC | | | | |
| Human Resources | HR | | BA BAS | | | |
| Individual Studies | IS | BA | | | | |
| Individualized | INDV | | | BAH.MSCI BSCH.MSCI | | |
| International Development Studies | IDS | BA | BA BAS | | BA | BA |
| Italian | ITAL | | BA BAS | | | |
| Landscape Architecture | | BLA | | | | |

| Specialization Name | Specialization Acronym | Honours Program Major | Honours Program Minor | Honours Program Area of Emphasis | General Program | Co-op Program |
|--------------------------------------|---------------------------|--------------------------|--------------------------|-------------------------------------|-----------------|---------------|
| Management | MGMT | BCOM | | BCOM.MEF | | ВСОМ |
| Management Economics & Finance | MEF | ВСОМ | | | | ВСОМ |
| Marine & Freshwater Biology | MFB | BSC | | | | BSC |
| Marketing Management | MKMN | BCOM | | | | BCOM |
| Marketing | MKTG | | BA | | | |
| | | | BAS | | | |
| Mathematical Economics | MAEC | BA | | | | BA |
| Mathematical Science | MSCI | BA | BSC | | | |
| Mathematics | мати | bsc | DAS | | D A | |
| manematics | MAIN | | BSC | | DA | |
| | | | BAS | | | |
| Mechanical Engineering | MECH | BENG | | | | BENG |
| Media & Cinema Studies | MCST | | BA | | | |
| Miarchiology | MICP | PSC . | DAS | | | DSC. |
| Microbiology | MICK | bsc | BAS | | | DSC |
| Molecular Biology & Genetics | MBG | BSC | BSC | | | |
| | | | BAS | | | |
| Museum Studies | MS | | BA | | | |
| Musia | MUSC | DA | DAS | | DA | |
| Wusie | MOSC | DA | BAS | | DA | |
| Nanoscience | NANO | BSC | | | | BSC |
| Neuroscience | NEUR | BSC | BSC | | | |
| | | | BAS | | | |
| Nutritional & Nutraceutical Sciences | NANS | BSC | BSC BAS | | | |
| Philosophy | РНП | BA | BAS | | BA | |
| 1 mosophy | | DIT | BAS | | DIT | |
| Physical Science | PSCI | BSC | | | BSC | |
| Physics | PHYS | BSC | BSC | | | BSC |
| | | | BAS | | | |
| Plant Biotechnology | PBTC | | | BSCH.PLSC | | |
| Plant Environmental Science | PESC | Dag | Dag | BSCH.PLSC | | |
| Plant Science | PLSC | BSC | BSC BAS | | | |
| Political Science | POLS | BA | BA | | BA | BA |
| | | | BAS | | | |
| Psychology | PSYC | BA | BA | | BA | BA |
| D-hl's Management | DMCT | DCOM | BAS | | | DCOM |
| Public Management | PMGI | BCOM | | | | BCOM |
| Real Estate & Housing | | всом | | PCOMM HTM | | BCOM |
| Signal Processing | KAS SD | | | BCOMM. HTM PSCH MSCI | | |
| Sociology | SOC | BA | BA | bsen.wser | BA | |
| bollology | boe | DA | BAS | | DA | |
| Spanish and Hispanic Studies | SPAH | BA | BA | | BA | |
| | | | BAS | | | |
| Software Engineering | SENG | BCOMP | | | | BCOMP |
| Statistics | STAT | | BA BSC BAS | | BA | |
| Studio Art | SART | BA | BA BAS | | | |
| Theatre Studies | THST | BA | BA BAS | | BA | |
| Theoretical Physics | THPY | BSC | | | | |
| Tourism | TRM | | | BCOMM. HTM | | |
| Veterinary Medicine | | DVM | | | | |

Last Revision: July 4, 2019

2019-2020 Undergraduate Calendar

| Specialization Name | Specialization | Honours Program | Honours Program | Honours Program | General Program | Co-op Program |
|---------------------------------|----------------|-----------------|-----------------|------------------|-----------------|---------------|
| | Acronym | Major | Minor | Area of Emphasis | | |
| Water Resources Engineering | WRE | BENG | | | | BENG |
| Wildlife Biology & Conservation | WBC | BSC | | | | |
| Zoology | ZOO | BSC | BSC | | | |
| | | | BAS | | | |

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

Program Information

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

Adult Development (ADEV)

Applied Human Nutrition (AHN)

Child, Youth and Family (CYF)

Co-operative Education is available in the following programs:

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

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

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

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

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

Academic Counselling

Program Counselling

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

Academic Advising

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

Continuation of Study

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

Conditions for Graduation

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

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

Schedule of Studies

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

Special Expenses

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

Adult Development (ADEV)

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

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

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

Program Requirements

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

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

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

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

Students may take one minor in addition to the Adult Development major. See the University of Guelph Calendar, Section X, Degree Programs, Specialization and Their Degrees for list of minors : <u>http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c10/index.shtml</u>. 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: https://www.uoguelph.ca/uaic/facultyadvisors or contact the B.A.Sc. Program Counsellor for further information.

Major

| Semester I | | |
|----------------|--------|---------------------------------|
| FRHD*1100 | [0.50] | Life: Health and Well-Being |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| One of: | | |
| ANTH*1150 | [0.50] | Introduction to Anthropology |
| SOC*1100 | [0.50] | Sociology |
| 0.50 electives | | |
| Semester 2 | | |
| FRHD*1010 | [0.50] | Human Development |
| FRHD*1020 | [0.50] | Couple and Family Relationships |
| One of: | | |
| BIOM*2000 | [0.50] | Concepts in Human Physiology |
| MBG*1000 | [0.50] | Genetics and Society |
| 1.00 electives | | - |

Semester 3

| ent and Aging | Adult Development (Co-op) (ADEV:C) | | |
|--------------------|-------------------------------------------------------------------------------------|--|--|
| | Department of Family Relations and Applied Nutrition, College of Social and Applied | | |
| blied Statistics I | Human Sciences | | |

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

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

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

Program Requirements

The Co-op program in Adult Development is a four year program, including three work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|----------------------------|--------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | Academic Semester 6 |
| 4 | Academic Semester 7 | COOP*3000 Work Term III | Academic Semester 8 |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

Credit Summary (21.50 Total Credits)

10.50 - Required Core Courses

9.50 - Electives

1.50 - Co-op Work Terms

Note: Three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement.

The recommended program sequence is outlined below.

Major

| Semester 1 - Fa | all | |
|-----------------|--------------|---------------------------------|
| FRHD*1100 | [0.50] | Life: Health and Well-Being |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| One of: | | |
| ANTH*1150 | [0.50] | Introduction to Anthropology |
| SOC*1100 | [0.50] | Sociology |
| 0.50 electives | | |
| Semester 2 - W | inter | |
| FRHD*1010 | [0.50] | Human Development |
| FRHD*1020 | [0.50] | Couple and Family Relationships |
| One of: | | |
| BIOM*2000 | [0.50] | Concepts in Human Physiolog |

iology MBG*1000 [0.50] Genetics and Society 1.00 electives

FRHD*2060 [0.50] Adult Developme FRHD*2100 [0.50] Development of STAT*2080 [0.50] Introductory Applied Statistics I 1.00 electives Semester 4 FRHD*2400 [0.50] Introduction to Human Services FRHD*3150 [0.50] Strategies for Behaviour Change STAT*2090 [0.50] Introductory Applied Statistics II 1.00 electives Semester 5 FRHD*3070 [0.50] Research Methods: Family Studies FRHD*3400 [0.50] Communication and Counselling Skills 1.50 electives Semester 6 FRHD*3040 [0.50] Parenting and Intergenerational Relationships FRHD*3290 [1.00] Practicum I: Adult Development 1.00 electives Note: FRHD*3290 may be taken in Semester 5 or Semester 6 Semester 7 FRHD*4310 [0.50] Professional Issues * 2.00 electives Semester 8 FRHD*4250 [0.50] Aging and Health One of: FRHD*4260 [0.50] Social Policy and Gerontology FRHD*4320 [0.50] Social Policies for Children, Youth and Families 1.50 electives

Electives - Recommended and Program Options

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

Adult Development and Aging Interest

| FRHD*3060 | [0.50] | Principles of Social Gerontology | | | |
|-------------------------------------|--------------------------------------|----------------------------------|--|--|--|
| FRHD*4190 | [0.50] | Assessment in Gerontology | | | |
| FRHD*4290 | [1.00] | Practicum II: Adult Development | | | |
| NUTR*3150 | [0.50] | Aging and Nutrition | | | |
| Family and Soc | Family and Social Relations Interest | | | | |
| FRHD*3090 | [0.50] | Poverty and Health | | | |
| FRHD*4020 | [0.50] | Family Theory | | | |
| FRHD*4290 | [1.00] | Practicum II: Adult Development | | | |
| Human Sexuality and Health Interest | | | | | |
| FRHD*4200 | [0.50] | Issues in Human Sexuality | | | |
| FRHD*4290 | [1.00] | Practicum II: Adult Development | | | |
| Research Intere | Research Interest | | | | |
| FRHD*4810 | [0.50] | Thesis I | | | |
| FRHD*4910 | [1.00] | Thesis II | | | |
| Graduate and Professional Studies | | | | | |

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

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

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

* Exchange/Study Abroad Opportunities

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

| - | - | - | • | • | • | - | | | |
|----|---------|-------|----------|-----------|-------|-------|----------|---------|---|
| Ad | lult De | evelo | pment Ac | ademic an | d Co- | op Wo | ork Term | Schedul | e |
| | | 1 | | | | | | | |

| Semester 3 - Fa | ıll | | | |
|---------------------|--------|--------------------------------------------------|--|--|
| COOP*1100 | [0.00] | Introduction to Co-operative Education | | |
| FRHD*2100 | [0.50] | Development of Human Sexuality | | |
| FRHD*2060 | [0.50] | Adult Development and Aging | | |
| FRHD*3070 | [0.50] | Research Methods: Family Studies | | |
| FRHD*3400 | [0.50] | Communication and Counselling Skills | | |
| STAT*2080 | [0.50] | Introductory Applied Statistics I | | |
| Semester 4 - W | inter | | | |
| FRHD*3150 | [0.50] | Strategies for Behaviour Change | | |
| FRHD*2400 | [0.50] | Introduction to Human Services | | |
| STAT*2090 | [0.50] | Introductory Applied Statistics II | | |
| 1.00 electives | | | | |
| Summer Semes | ster | | | |
| COOP*1000 | [0.50] | Co-op Work Term I | | |
| Fall Semester | | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | | |
| Semester 5 - W | inter | | | |
| FRHD*3040 | [0.50] | Parenting and Intergenerational Relationships | | |
| FRHD*3290 | [1.00] | Practicum I: Adult Development | | |
| FRHD*4250 | [0.50] | Aging and Health | | |
| One of: | | | | |
| FRHD*4260 | [0.50] | Social Policy and Gerontology | | |
| FRHD*4320 | [0.50] | Social Policies for Children, Youth and Families | | |
| Semester 6 - Su | ımmer | | | |
| 2.50 electives | | | | |
| Semester 7 - Fa | ıll | | | |
| FRHD*4310 | [0.50] | Professional Issues | | |
| 2.00 electives | | | | |
| Winter Semest | er | | | |
| COOP*3000 | [0.50] | Co-op Work Term III | | |
| Semester 8 - Summer | | | | |
| 2.50 electives | | | | |

Electives that Complement the Major

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

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

Graduate and Professional Studies

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

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

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

Applied Human Nutrition (AHN)

Department of Family Relations and Applied Nutrition, College of Social and Applied Human Sciences The Applied Human Nutrition major recognizes both the biological and the social facets of human nutrition. It focuses on nutrition from a preventive, maintenance and therapeutic perspective, all of which require a thorough understanding of the related biological sciences and of selected aspects of the behavioral sciences. Students learn about nutrition and its application to the maintenance of health and the prevention and treatment of disease. They also learn about individual and social behaviour, particularly in family settings, and the implications of behavioral factors in the establishment of good nutrition status from conception through to old age. 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 health and education careers in the government or private sectors, or with the food industry. Others may proceed to graduate study in fields such as nutrition, public health nutrition, medicine or education.

An Area of Emphasis in Dietetics is also offered for those interested in becoming Registered Dietitians. Successful completion of the additional required and restricted elective courses will allow students to compete for a limited number of dietetic internship positions after graduation. Graduates who complete dietetic internships are eligible to write national registration examination and become Registered Dietitians, a regulated health profession. The Area of Emphasis in this dietetic education program is accredited under the Partnership for Dietetic Education and Practice (PDEP) and prepares students for eligibility for registration with a provincial dietetics regulatory body. Most graduates completing dietetic internships are employed in hospitals and other health care agencies such as community health centres and long-term care facilities where the credential of Registered Dietitian is required for practice. Some Registered Dietitians also find employment in a wide range of careers in health and education, and in the private sector. Still others proceed to graduate study in fields such as nutrition, public health nutrition, medicine or education.

Program Requirements

Students in the Applied Human Nutrition Major must include the core of 13.50 required credits in the minimum of 20.00 credits. Students in the Area of Emphasis in Dietetics take an additional 2.00 required credits plus 1.50 restricted electives for 17.00 required credits in the minimum 20.00 credits. 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 taking the Area of Emphasis in Dietetics are strongly encouraged to seek help from departmental advisors to ensure they have selected all the required courses be eligible to apply for internships.

Minors

Students may take one minor in addition to the Applied Human Nutrition Major. See the University of Guelph Calendar, Section X, Degree Programs, Specialization and Their Degrees for list of minors: <u>https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c10/index.shtml</u>

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: https://www.uoguelph.ca/uaic/facultyadvisors or contact the B.A.Sc. Program Counsellor for further information.

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.

Major

HTM*2700

One of:

NUTR*1010

[0.50]

[0.50]

| Semester 1 | | |
|------------------|---------------|----------------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| FRHD*1100 | [0.50] | Life: Health and Well-Being |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| One of: | | |
| HTM*2700 | [0.50] | Understanding Foods |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| 0.50 electives | | |
| Note: HTM*270 | 0 is recomme | ended for Semester 1 if capacity allows, but may also be |
| taken in Semeste | r 2 by choosi | ing NUTR*1010 in Semester 1 |
| Semester 2 | | |
| CHEM*1050 | [0.50] | General Chemistry II |
| NUTR*1020 | [0.50] | Professional Practice in Applied Nutrition |
| One of: | | - • |

Understanding Foods

Introduction to Nutrition

| FRHD*1020 | [0.50] | Couple and Family Relationships |
|-------------------|--------------|-------------------------------------------------|
| SOC*1100 | [0.50] | Sociology |
| 0.50 electives | | |
| *See note in Sem | ester 1 | |
| Semester 3 | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| HTM*2030 | [0.50] | Control Systems in the Hospitality Industry |
| NUTR*2050 | [0.50] | Nutrition Through the Life Cycle |
| STAT*2080 | [0.50] | Introductory Applied Statistics I |
| 0.50 electives | | |
| Note: HTM*2030 |) may be tak | en in Semester 4. |
| Note: Students co | ompleting ar | Area of Emphasis in Dietetics must take one of: |
| CIS*1200 | [0.50] | Introduction to Computing |
| MCS*2020 | [0.50] | Information Management |
| Semester 4 | | |
| BIOM*3200 | [1.00] | Biomedical Physiology |

| SIOM*5200 | [1.00] | biomedical Physiology |
|------------|--------|-----------------------------------------|
| IROB*2090 | [0.50] | Individuals and Groups in Organizations |
| /ICR*2420 | [0.50] | Introduction to Microbiology |
| STAT*2090 | [0.50] | Introductory Applied Statistics II |
| Semester 5 | | |
| | | |

FRHD*3070[0.50]Research Methods: Family StudiesNUTR*3210[0.50]Fundamentals of Nutrition

1.50 electives or restricted electives

Note: Students completing an Area of Emphasis in Dietetics must take HTM*3090. HTM*3090 is recommended in Semester 5 in place of elective or restricted elective if capacity allows, but it may also be taken in Semester 6. If taken in Semester 6 take FRHD*3400 and HROB*2290 in Semester 5.

Semester 6

5

| FRHD*3400 | [0.50] | Communication and Counselling Skills | |
|----------------------------------------|--------|-----------------------------------------------|--|
| HROB*2290 | [0.50] | Human Resources Management | |
| NUTR*3070 | [0.50] | Nutrition and Physical Activity Interventions | |
| NUTR*3090 | [1.00] | Clinical Nutrition I | |
| Semester 7 | | | |
| NUTR*4010 | [0.50] | Nutritional Assessment | |
| NUTR*4070 | [0.50] | Nutrition Education | |
| 1.50 electives or restricted electives | | | |

Note: Students completing an Area of Emphasis in Dietetics must take NUTR*4040. Semester 8

| NUTR*4900 | [0.50] | Selected Topics in Human Nutrition |
|-------------------|---------------|------------------------------------|
| 2.00 electives or | restricted el | ectives |

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

Area of Emphasis in Dietetics Additional Courses Required

Additional Courses Required (2.00 credits)HTM*3090[1.00]Restaurant Operations ManagementNUTR*4040[0.50]Clinical Nutrition IIOne of:

| one on | | |
|------------------------|--------|---------------------------|
| CIS*1200 | [0.50] | Introduction to Computing |
| MCS*2020 | [0.50] | Information Management |
| Restricted Elec | tives | - |

Students must take 1.50 restricted electives, including of

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*3430 | [0.50] | Introduction to Food Analysis |
| FOOD*3700 | [0.50] | Sensory Evaluation of Foods |
| HTM*2740 | [0.50] | Cultural Aspects of Food |
| HTM*3780 | [0.50] | Managing Food in Canada |
| NUTR*3110 | [0.50] | Food Security |
| NUTR*3150 | [0.50] | Aging and Nutrition |
| One of | | |
| FOOD*2400 | [0.50] | Introduction to Food Chemistry |
| FOOD*3030 | [0.50] | Food Chemistry I |
| FOOD*3050 | [0.50] | Food Chemistry I |
| One of | | |
| FOOD*2410 | [0.50] | Introduction to Food Processing |
| FOOD*3160 | [0.75] | Food Processing I |
| One of | | |
| FOOD*2420 | [0.50] | Introduction to Food Microbiology |
| FOOD*3230 | [0.75] | Food Microbiology |
| FOOD*3240 | [0.50] | Food Microbiology |
| Note: Some of th | e restricted | electives require prerequisites that are not included |

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

Child, Youth and Family (CYF)

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

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

Articulation Agreements

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

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

Program Requirements

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

Minors

Students may take one minor in addition to the Child, Youth and Family major. See the University of Guelph Calendar, Section X, Degree Programs, Specialization and Their Degrees for list of minors : <u>http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c10/index.shtml</u>. 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: https://www.uoguelph.ca/uaic/facultyadvisors or contact the B.A.Sc. Program Counsellor for further information.

Major

| Semester 1 | | |
|----------------|--------|---------------------------------|
| FRHD*1100 | [0.50] | Life: Health and Well-Being |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| One of: | | |
| ANTH*1150 | [0.50] | Introduction to Anthropology |
| SOC*1100 | [0.50] | Sociology |
| 0.50 electives | | |
| Semester 2 | | |
| BIOM*2000 | [0.50] | Concepts in Human Physiology |
| FRHD*1020 | [0.50] | Couple and Family Relationships |
| MBG*1000 | [0.50] | Genetics and Society |
| One of: | | |
| FRHD*2260 | [0.50] | Infant Development |

| FRHD*2280 | [0.50] | Adolescent Development |
|---------------------|---------------|--------------------------------------------------|
| 0.50 electives | | |
| Semester 3 | | |
| FRHD*2100 | [0.50] | Development of Human Sexuality |
| FRHD*2110 | [0.50] | Children and Youth with Exceptionalities |
| 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 |
| 0.50 electives | | |
| Semester 4 | | |
| FRHD*3150 | [0.50] | Strategies for Behaviour Change |
| STAT*2090 | [0.50] | Introductory Applied Statistics II |
| One of: | | |
| FRHD*2040 | [0.50] | Principles of Program Design for Children |
| FRHD*2400 | [0.50] | Introduction to Human Services |
| 1.00 electives | | |
| Semester 5 | | |
| FRHD*3070 | [0.50] | Research Methods: Family Studies |
| FRHD*3180 | [0.50] | Observation and Assessment Laboratory |
| FRHD*3400 | [0.50] | Communication and Counselling Skills |
| One of: | | |
| FRHD*3200 | [1.00] | Practicum I: Child |
| FRHD*3250 | [1.00] | Practicum I: Youth |
| Note: FRHD*320 | 0 and FRHE | D*3250 may be taken in Semester 6 |
| Semester 6 | | |
| FRHD*3040 | [0.50] | Parenting and Intergenerational Relationships |
| 2.00 electives | | |
| Semester 7 | | |
| FRHD*4310 | [0.50] | Professional Issues |
| 2.00 electives or 1 | estricted ele | ctives |
| Semester 8 | | |
| FRHD*4320 | [0.50] | Social Policies for Children, Youth and Families |
| 2.00 electives or 1 | estricted ele | ctives |

Restricted Electives

In addition to the 11.50 required credits, 0.50 must be taken from the Department of Family Relations and Applied Nutrition at the 4000 level. (excluding FRHD*4330, FRHD*4340 or FRHD*4350).

Electives - Recommended and Program Options

Child and Youth Services

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

| FRHD*2270 | [0.50] | Development in Early and Middle Childhood |
|--------------------|-------------|------------------------------------------------------------|
| FRHD*2280 | [0.50] | Adolescent Development |
| FRHD*3250 | [1.00] | Practicum I: Youth |
| FRHD*4340 | [1.00] | Practicum II: Youth |
| FRHD*4400 | [0.50] | Youth, Risk and Resilience |
| Students who int | end to purs | ue a career in child and youth services may wish to choose |
| electives from the | e following | list: |
| EDRD*3120 | [0.50] | Educational Communication |
| | | |

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

Early Childhood Education

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

| FRHD*2040 | [0.50] | Principles of Program Design for Children |
|-----------|--------|--------------------------------------------|
| FRHD*2260 | [0.50] | Infant Development |
| FRHD*2270 | [0.50] | Development in Early and Middle Childhood |
| FRHD*3190 | [0.50] | Administration of Programs for Children |
| FRHD*3200 | [1.00] | Practicum I: Child |
| FRHD*4210 | [0.50] | Senior Seminar in Early Education and Care |
| FRHD*4330 | [1.00] | Practicum II: Child |
| FRHD*4350 | [1.00] | Practicum III: Child |
| | | |

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

| | - | |
|-----------|--------|-----------------------------------|
| ENGL*2740 | [0.50] | Children's Literature |
| FRHD*3090 | [0.50] | Poverty and Health |
| FRHD*4810 | [0.50] | Thesis I |
| FRHD*4910 | [1.00] | Thesis II |
| NUTR*2050 | [0.50] | Nutrition Through the Life Cycle |
| PSYC*3850 | [0.50] | Intellectual Disabilities |
| SOAN*2290 | [0.50] | Identities and Cultural Diversity |
| | | |

Education - Primary / Junior / Intermediate

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

Graduate and Professional Studies

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

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

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

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

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

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.

Program Requirements

The Co-op program in Adult Development is a four year program, including three work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| , | sind, found and funning freudenne und es op work ferm senedule | | | |
|------|----------------------------------------------------------------|----------------------------|--------------------------|--|
| Year | Fall | Winter | Summer | |
| 1 | Academic Semester 1 | Academic Semester 2 | Off | |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I | |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | Academic Semester 6 | |
| 4 | Academic Semester 7 | COOP*3000 Work Term III | Academic Semester 8 | |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)

11.50 - Required Core Courses

0.50 - Restricted Electives (from lists)

8.00 - Free Electives

1.50 - Co-op Work Terms

Note: Three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement.

The recommended program sequence is outlined below.

Major

| Semester 1 | | |
|-------------------|----------------|--------------------------------------------------|
| FRHD*1100 | [0.50] | Life: Health and Well-Being |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| One of: | | |
| ANTH*1150 | [0.50] | Introduction to Anthropology |
| SOC*1100 | [0.50] | Sociology |
| 0.50 electives | | |
| Semester 2 | | |
| BIOM*2000 | [0.50] | Concepts in Human Physiology |
| FRHD*1020 | [0.50] | Couple and Family Relationships |
| MBG*1000 | [0.50] | Genetics and Society |
| One of: | | |
| FRHD*2260 | [0.50] | Infant Development |
| FRHD*2280 | [0.50] | Adolescent Development |
| 0.50 electives | | |
| Semester 3 | | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| FRHD*2100 | [0.50] | Development of Human Sexuality |
| FRHD*2110 | [0.50] | Children and Youth with Exceptionalities |
| FRHD*3070 | [0.50] | Research Methods: Family Studies |
| STAT*2080 | [0.50] | Introductory Applied Statistics I |
| One of: | 10 501 | |
| FKHD*2060 | [0.50] | Adult Development and Aging |
| FKHD*2270 | [0.30] | Development in Early and Middle Childhood |
| Semester 4 | FO F O3 | |
| FRHD*3150 | [0.50] | Strategies for Behaviour Change |
| FKHD*3400 | [0.50] | Latroductory Applied Statistics U |
| STAT*2090 | [0.50] | Introductory Applied Statistics II |
| FRHD*2040 | [0 50] | Principles of Program Design for Children |
| FRHD*2400 | [0.50] | Introduction to Human Services |
| 0.50 electives | [0.50] | Introduction to Human Services |
| Summer Seme | ster | |
| COOP*1000 | [0 50] | Co-on Work Term I |
| Fall Semester | [0.50] | |
| | [0 50] | Co. on Work Torm II |
| Somester 5 W | [0.30] | co-op work term if |
| Semester 5 - W | | |
| FKHD*3040 | [0.50] | Parenting and Intergenerational Relationships |
| FKHD*4320 | [0.50] | Social Policies for Children, Youth and Families |
| EPUD*2200 | [1.00] | Practicum I: Child |
| FRHD*3200 | [1.00] | Practicum I: Vouth |
| 0.50 electives | [1.00] | Tracticulii I. Touur |
| Semester 6 - Si | ummer | |
| 2 50 electives | ummer | |
| Somester 7 - F | all | |
| Semester / - Fa | all 10.501 | |
| FKHD*3180 | [0.50] | Observation and Assessment Laboratory |
| FKHD*4310 | [U.SU] | Professional issues |
| Winter Semest | estricted ele | |
| | 10 503 | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 8 - Si | ummer | |
| 2.50 electives | | |
| Restricted Electi | ives | |

0.50 restricted electives from the Department of Family Relations and Applied Nutrition at the 4000 level (excluding FRHD*4330, FRHD*4340 or FRHD*4350).

Education - Primary / Junior / Intermediate

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

Graduate and Professional Studies

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

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

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

Bachelor of Arts (B.A.)

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

Program Information

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

Academic Counselling

Program Counselling

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

Departmental Advising

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

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

Academic Residence Requirements

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

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

Continuation of Study

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

Conditions for Graduation

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

Distribution Requirements

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

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

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

1. A minimum of 1.50 credits over at least 2 different subject areas in the humanities:

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

- SART Studio Art
- SPAN Spanish and Hispanic Studies
- THST Theatre Studies
- WMST Women's Studies
- 2. A minimum of 1.50 credits over at least two of the following subject areas in the social sciences:
 - ANTH Anthropology
 - ECON Economics
 - GEOG Geography
 - IDEV International Development
 - ISS Interdisciplinary Social Science
 - POLS Political Science
 - PSYC Psychology
 - SOAN Sociology and Anthropology
 - SOC Sociology WMST Women's Studies
- 3. 1.00 credits in natural and/or mathematical sciences from the list below.

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

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

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

| AGR*2150 | [0.50] | Plant Agriculture for International Development |
|--------------------|-------------|-------------------------------------------------|
| BIOL*1020 | [0.50] | Introduction to Biology |
| BIOL*1500 | [0.50] | Humans in the Natural World |
| BIOM*2000 | [0.50] | Concepts in Human Physiology |
| BOT*1200 | [0.50] | Plants and Human Use |
| CHEM*1060 | [0.50] | Introductory Chemistry |
| CHEM*1100 | [0.50] | Chemistry Today |
| CIS*1000 | [0.50] | Introduction to Computer Applications |
| ENVS*1060 | [0.50] | Principles of Geology |
| ENVS*2060 | [0.50] | Soil Science |
| ENVS*2130 | [0.50] | Eating Sustainably in Ontario |
| ENVS*2210 | [0.50] | Apiculture and Honey Bee Biology |
| ENVS*2270 | [0.50] | Impacts of Climate Change |
| FOOD*2010 | [0.50] | Principles of Food Science |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| GEOG*1350 | [0.50] | Earth: Hazards and Global Change |
| HORT*1120 | [0.50] | Grape and Wine Science |
| HORT*1130 | [0.50] | Science of Gardening |
| MBG*1000 | [0.50] | Genetics and Society |
| MUSC*1090 | [0.50] | Physics of Music |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| PHYS*1600 | [0.50] | Contemporary Astronomy |
| PHYS*1810 | [0.50] | Physics of Music |
| Other acceptable c | ourses whic | ch require 4U or university preparation: |
| BIOL*1XXX | [0.00] | Any BIOL course at the 1000 level |
| CHEM*1XXX | [0.00] | Any CHEM course at the 1000 level |
| CIS*1XXX | [0.00] | Any CIS course at the 1000 level |
| ENVS*2030 | [0.50] | Meteorology and Climatology |
| ENVS*2250 | [0.50] | Geology of Natural Disasters |
| MATH*1XXX | [0.00] | Any MATH course at the 1000 level |
| PHYS*1XXX | [0.00] | Any PHYS course at the 1000 level |
| STAT*2XXX | [0.00] | Any STAT course at the 2000 level |
| | | |

Double Counting of Courses

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

Program Regulations

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

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

General Degree Requirements (BAG)

To graduate from a general program a student must:

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

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

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

Honours Degree Requirements (BAH)

To graduate from an honours program a student must:

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

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

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

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

Semester One Requirements

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

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

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

Special Study Options

Study at Other Universities

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

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

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

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

Study Abroad

Business

Business Economics

Computing and Information Science

Criminal Justice and Public Policy

Classical Studies

Creative Writing

Economics

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

Honours and General Specializations Available in the B.A. Degree General Program Areas of Concentration

Anthropology English French Studies Geography History International Development Mathematics Music Philosophy Political Science Psychology Sociology Spanish and Hispanic Studies Statistics Theatre Studies The schedule of studies for each area of concentration is given on the following pages under its subject heading. **Honours Program Majors** Anthropology Art History **Classical Studies** Criminal Justice and Public Policy Economics* English Environmental Governance European Studies Food, Agricultural and Resource Economics French Studies Geography History Individual Studies International Development Mathematical Economics* Mathematical Science Music Philosophy Political Science Psychology* Sociology Spanish and Hispanic Studies Studio Art Theatre Studies Subjects marked with an asterisk (*) may be available as Co-operative Education programs. The schedule of studies for each major is given on the following pages under its subject heading. **Honours Program Minors** Anthropology Art History Arts, Culture and Heritage Management

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

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

Anthropology (ANTH)

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

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

Courses will normally be offered in the semesters designated. Please check with the department for information about additional semester offerings. In addition to regularly scheduled courses, students may elect to do independent study. A student who wishes to do a reading course should first consult the professor with whom they wish 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 Anthropology specialization.

Area of Concentration (General Program)

| A minimum of 5. | 00 credits is | required, including: |
|--------------------|---------------|---------------------------------------------------------------|
| ANTH*1150 | [0.50] | Introduction to Anthropology |
| ANTH*2160 | [0.50] | Social Anthropology |
| ANTH*2230 | [0.50] | Regional Ethnography |
| ANTH*3690 | [0.50] | Engaging Anthropological Theory |
| ANTH*3770 | [0.50] | Kinship, Family, and Power |
| SOAN*2120 | [0.50] | Introductory Methods |
| One of: | | |
| MUSC*2270 | [0.50] | World Music |
| PHIL*2100 | [0.50] | Critical Thinking |
| 1.00 additional cr | edits in ANT | ГН |
| 0.50 additional cr | edits in SOA | N |
| Note: 1.00 credits | of these add | itional credits must be completed at the 3000 level or above. |
| Major (Hono | urs Progi | cam) |
| A minimum of 9. | 00 credits is | required, including: |
| ANTH*1150 | [0.50] | Introduction to Anthropology |

| | | | [0.50] | Contemporary Canadian Art |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A minimum of 9.00 credits is required including. | | | [0.50] | Public Art |
| [0 50] | Introduction to Anthropology | ARTH*3150 | [0.50] | Space: Roman Art and Urbanism |
| [0.50] | Social Anthropology | ARTH*3200 | [0.50] | Colour: Practice & Meanings in Western Art |
| [0.50] | Regional Ethnography | ARTH*3210 | [0.50] | Critical Issues in Art History |
| [0.50] | Engaging Anthropological Theory | ARTH*3220 | [0.50] | Nationalism & Identity in Art |
| [0.50] | Kinshin, Family and Power | ARTH*3320 | [0.50] | Lives: Aspects of Western Art |
| [0.50] | Issues in Contemporary Anthropological Theory | ARTH*3330 | [0.50] | Display: Visual Culture in Western Europe |
| [0.50] | Introductory Methods | ARTH*3340 | [0.50] | Studies in Renaissance and Baroque Art |
| [0.50] | Qualitative and Observational Methods | ARTH*3520 | [0.50] | Idea: Art Since 1950 |
| [0.00] | | ARTH*3600 | [0.50] | Topics in the Long Eighteenth Century |
| [0,50] | Introduction to Linguistics | ARTH*3620 | [0.50] | Museum Studies |
| [0.50] | World Music | ARTH*3780 | [0.50] | Gender and Art |
| | 00 credits is [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | 00 credits is required, including: [0.50] Introduction to Anthropology [0.50] Social Anthropology [0.50] Regional Ethnography [0.50] Engaging Anthropological Theory [0.50] Kinship, Family, and Power [0.50] Issues in Contemporary Anthropological Theory [0.50] Introductory Methods [0.50] Qualitative and Observational Methods [0.50] Introduction to Linguistics [0.50] World Music | InstructionARTH*301000 credits is required, including:ARTH*3060[0.50]Introduction to AnthropologyARTH*3150[0.50]Social AnthropologyARTH*3200[0.50]Regional EthnographyARTH*3210[0.50]Engaging Anthropological TheoryARTH*3220[0.50]Kinship, Family, and PowerARTH*3320[0.50]Issues in Contemporary Anthropological TheoryARTH*3330[0.50]Introductory MethodsARTH*3340[0.50]Qualitative and Observational MethodsARTH*3520[0.50]Introduction to LinguisticsARTH*3600[0.50]World MusicARTH*3780 | Instruction ARTH*3010 [0.50] 00 credits is required, including: ARTH*3010 [0.50] [0.50] Introduction to Anthropology ARTH*3150 [0.50] [0.50] Social Anthropology ARTH*3200 [0.50] [0.50] Regional Ethnography ARTH*3210 [0.50] [0.50] Engaging Anthropological Theory ARTH*3320 [0.50] [0.50] Kinship, Family, and Power ARTH*3330 [0.50] [0.50] Issues in Contemporary Anthropological Theory ARTH*3340 [0.50] [0.50] Introductory Methods ARTH*3340 [0.50] [0.50] Qualitative and Observational Methods ARTH*3600 [0.50] [0.50] Introduction to Linguistics ARTH*3620 [0.50] [0.50] World Music ARTH*3780 [0.50] |

Minor (Honours Program)

| - (| | / |
|---------------------|---------------|-------------------------------------------------------|
| A minimum of 5.0 | 00 credits is | required, including: |
| ANTH*1150 | [0.50] | Introduction to Anthropology |
| ANTH*2160 | [0.50] | Social Anthropology |
| ANTH*2230 | [0.50] | Regional Ethnography |
| ANTH*3690 | [0.50] | Engaging Anthropological Theory |
| ANTH*3770 | [0.50] | Kinship, Family, and Power |
| SOAN*2120 | [0.50] | Introductory Methods |
| One of: | | |
| MUSC*2270 | [0.50] | World Music |
| PHIL*2100 | [0.50] | Critical Thinking |
| 1.00 additional cro | edits in ANT | ГН |
| 0.50 additional cro | edits in SOA | N |
| Note: 1.00 of thes | e additional | credits must be completed at the 3000 level or above. |

Art History (ARTH)

School of Fine Art and Music, College of Arts

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

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

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

Student Counselling

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

Major (Honours Program)

Α

| A minimum of 9.00 |) credits is | required, including: |
|--------------------|--------------|--------------------------------------------|
| ARTH*1510 | [0.50] | Art Historical Studies I |
| ARTH*1520 | [0.50] | Art Historical Studies II |
| ARTH*2220 | [0.50] | The Visual Arts Today |
| ARTH*2480 | [0.50] | Introduction to Art Theory and Criticism |
| ARTH*2540 | [0.50] | Medieval Art |
| ARTH*2550 | [0.50] | The Italian Renaissance |
| ARTH*2600 | [0.50] | Early Modern Art |
| 1.50 credits from: | | |
| ARTH*2050 | [0.50] | Modern Latin American Art |
| ARTH*2060 | [0.50] | Aboriginal Arts in the Americas |
| ARTH*2070 | [0.50] | Art of the USA |
| ARTH*2120 | [0.50] | Introduction to Museology |
| ARTH*2150 | [0.50] | Art and Archaeology of Greece |
| ARTH*2280 | [0.50] | Modern Architecture |
| ARTH*2290 | [0.50] | History of Photographic Media |
| ARTH*2490 | [0.50] | History of Canadian Art |
| ARTH*2580 | [0.50] | Late Modern Art: 1900-1950 |
| ARTH*2950 | [0.50] | Baroque Art |
| 2.00 credits from: | | |
| ARTH*3010 | [0.50] | Contemporary Canadian Art |
| ARTH*3060 | [0.50] | Public Art |
| ARTH*3150 | [0.50] | Space: Roman Art and Urbanism |
| ARTH*3200 | [0.50] | Colour: Practice & Meanings in Western Art |
| ARTH*3210 | [0.50] | Critical Issues in Art History |
| ARTH*3220 | [0.50] | Nationalism & Identity in Art |
| ARTH*3320 | [0.50] | Lives: Aspects of Western Art |
| ARTH*3330 | [0.50] | Display: Visual Culture in Western Europe |
| ARTH*3340 | [0.50] | Studies in Renaissance and Baroque Art |
| ARTH*3520 | [0.50] | Idea: Art Since 1950 |
| ARTH*3600 | [0.50] | Topics in the Long Eighteenth Century |
| ARTH*3620 | [0.50] | Museum Studies |
| ARTH*3780 | [0.50] | Gender and Art |

| 2.00 credits from | n 4000-level | seminar courses: |
|-------------------|--------------|-------------------------------------|
| ARTH*4310 | [1.00] | Topics in Art & Visual Culture I |
| ARTH*4320 | [1.00] | Topics in Art & Visual Culture II |
| ARTH*4330 | [1.00] | Topics in Art & Visual Culture III |
| ARTH*4340 | [1.00] | Topics in Art & Visual Culture IV |
| ARTH*4350 | [1.00] | Topics in Art & Visual Culture V |
| Students may co | unt either A | RTH*4600 "Individual Study: Art His |

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

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

[0.50] ARTH*1510 Art Historical Studies I

ARTH*1520 [0.50] Art Historical Studies II

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

Arts, Culture and Heritage Management (ACHM)

This minor prepares students for careers in the management of the artistic and cultural sectors. By examining arts, culture and heritage institutions, business models and consumer trends, students develop and demonstrate an understanding of the relationship between culture and society, cultural economies and the arts both globally and in the Canadian context. Attention is given to visual culture, film and theatre, sound/ music, heritage, management, law, marketing, communications and ethics. The experiential component allows students to gain practical experience in the field of their choice. The minor in Arts, Culture and Heritage Management guides students to an understanding of the pertinent questions at stake in today's entrepreneurial and diverse cultural environments.

Minor (Honours Program)

A minimum of 5.00 credits is required including:

| ri minimum or 5. | oo creans n | required meruding. | | |
|------------------------------------------------------------------------------------|-------------|----------------------------------------------|--|--|
| HUMN*1300 | [0.50] | Fundamentals of Arts Management I | | |
| HUMN*2300 | [0.50] | Fundamentals of Arts Management II | | |
| HROB*2010 | [0.50] | Foundations of Leadership | | |
| MGMT*2150 | [0.50] | Introduction to Canadian Business Management | | |
| Note: B.Comm students interested in this minor must substitute MGMT*2150 with 0.50 | | | | |
| additional credits from the Arts and Culture list below. | | | | |
| 1.00 credit from A | Arts and Cu | lture | | |
| | 50 501 | | | |

| noo erean nomin | to und cure | | |
|--------------------------------------------------------|-------------|------------------------------------------------------|--|
| ANTH*2660 | [0.50] | Contemporary Indigenous Peoples in Canada | |
| ANTH*3650 | [0.50] | The Anthropology of Indigenous Peoples Before Canada | |
| ARTH*2060 | [0.50] | Aboriginal Arts in the Americas | |
| ARTH*2120 | [0.50] | Introduction to Museology | |
| ARTH*2220 | [0.50] | The Visual Arts Today | |
| ARTH*2290 | [0.50] | History of Photographic Media | |
| ARTH*3010 | [0.50] | Contemporary Canadian Art | |
| ARTH*3060 | [0.50] | Public Art | |
| ARTH*3520 | [0.50] | Idea: Art Since 1950 | |
| ARTH*3620 | [0.50] | Museum Studies | |
| ENGL*3380 | [0.50] | Studies in the History of Literary Production | |
| EURO*1100 | [0.50] | European Cinema | |
| FREN*3140 | [0.50] | Women in Literature, Art and Film | |
| FREN*3160 | [0.50] | Songs, Lyrics and Poetry in French | |
| HIST*3260 | [0.50] | Cinema and the Moving Image | |
| HIST*3450 | [0.50] | The Uses of History | |
| MUSC*2030 | [0.50] | Music in Canada | |
| MUSC*2150 | [0.50] | Music and Popular Culture | |
| MUSC*2270 | [0.50] | World Music | |
| SART*1150 | [0.50] | Contemporary Artistic Practice | |
| THST*2500 | [0.50] | Contemporary Cinema | |
| THST*3530 | [0.50] | Canadian Cinema | |
| THST*4240 | [0.50] | Theatrical Organization and Culture | |
| WMST*2000 | [0.50] | Women and Representation | |
| 1.00 credit from Or | ganization | al Management | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting | |
| ACCT*2230 | [0.50] | Management Accounting | |
| EDRD*4120 | [0.50] | Leadership Development in Small Organizations | |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations | |
| HROB*3010 | [0.50] | Compensation Systems | |
| HROB*3050 | [0.50] | Employment Law | |
| HROB*3070 | [0.50] | Recruitment and Selection | |
| HROB*3090 | [0.50] | Training and Development | |
| HROB*3100 | [0.50] | Developing Management and Leadership Competencies | |
| HROB*4060 | [0.50] | Human Resource Planning | |
| HTM*1700 | [0.50] | Foodservice Management | |
| HTM*2070 | [0.50] | Event Management | |
| MCS*1000 | [0.50] | Introductory Marketing | |
| MCS*2100 | [0.50] | Personal Financial Management | |
| MCS*3000 | [0.50] | Advanced Marketing | |
| 0.50 additional credits from Ethics and Communication. | | | |

| EDRD*2020 | [0.50] | Interpersonal Communication |
|-------------------|-------------|------------------------------------|
| EDRD*3140 | [0.50] | Organizational Communication |
| EDRD*3160 | [0.50] | International Communication |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| PHIL*2100 | [0.50] | Critical Thinking |
| PHIL*2120 | [0.50] | Ethics |
| PHIL*2600 | [0.50] | Business and Professional Ethics |
| 0.50 additional c | redits from | Experiential Learning. |
| ARTH*4800 | [0.50] | Experiential Learning |
| CLAS*3700 | [0.50] | Experiential Learning and Language |
| EURO*3700 | [0.50] | Experiential Learning and Language |
| FREN*3700 | [0.50] | Experiential Learning and Language |
| GERM*3700 | [0.50] | Experiential Learning and Language |
| HIST*3480 | [0.50] | Workplace Learning |
| ITAL*3700 | [0.50] | Experiential Learning and Language |
| SART*3800 | [0.50] | Experiential Learning I |
| SPAN*3700 | [0.50] | Experiential Learning and Language |
| THST*3000 | [0.50] | Experiential Learning |

Note: ANTH*3950, ANTH*4880, ASCI*3700, ASCI*4700, ASCI*4710, HIST*4470, HUMN*3190, HUMN*4190, MGMT*4050, MUSC*4200 can be counted toward the 0.50 credits in experiential learning if the proposed project is related to arts, culture and heritage management. Please consult the faculty advisor for the minor for details.

Experiential Learning

At least 1.00 credits must be at 3000 level or higher.

[0.50]

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

Business (BUS)

THST*3010

Department of Management, Gordon S. Lang School of Business and Economics

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

Minor (Honours Program)

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

| riequirea courses (| Dioo ereana | |
|---------------------|---------------|--------------------------------------------------------------|
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*1000 | [0.50] | Introductory Marketing |
| MGMT*2150 | [0.50] | Introduction to Canadian Business Management |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| Restricted Elective | es (2.00 cred | lits of which at least 1.00 credits are at the 3000 level or |
| above): | | |
| ACCT*2230 | [0.50] | Management Accounting |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| ECON*2720 | [0.50] | Business History |
| EDRD*3140 | [0.50] | Organizational Communication |
| EDRD*3160 | [0.50] | International Communication |
| EDRD*4120 | [0.50] | Leadership Development in Small Organizations |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*4050 | [0.50] | Quality Control |
| ENGG*4070 | [0.50] | Life Cycle Assessment for Sustainable Design |
| ENGG*4510 | [0.50] | Assessment & Management of Risk |
| FARE*3030 | [0.50] | The Firm and Markets |
| FARE*3310 | [0.50] | Operations Management |
| FARE*4360 | [0.50] | Marketing Research |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| HROB*2010 | [0.50] | Foundations of Leadership |
| HROB*2200 | [0.50] | Labour Relations |
| HROB*2290 | [0.50] | Human Resources Management |
| HTM*3120 | [0.50] | Service Operations Analysis |
| MCS*2020 | [0.50] | Information Management |
| MCS*2100 | [0.50] | Personal Financial Management |
| MCS*2600 | [0.50] | Fundamentals of Consumer Behaviour |
| MCS*3000 | [0.50] | Advanced Marketing |
| MCS*3040 | [0.50] | Business and Consumer Law |
| MGMT*3320 | [0.50] | Financial Management |
| MGMT*4050 | [0.50] | Business Consulting |
| MGMT*4060 | [0.50] | Business Consulting |
| PHIL*2600 | [0.50] | Business and Professional Ethics |
| POLS*2250 | [0.50] | Public Administration and Governance |
| | | |

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

| POLS*3470 | [0.50] | Business-Government Relations in Canada |
|-----------|--------|-----------------------------------------|
| PSYC*4330 | [0.50] | Industrial/Organizational Psychology |
| SOAN*3040 | [0.50] | Globalization of Work and Organizations |

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

Business Economics (BECN)

Department of Economics and Finance, Gordon S. Lang School of Business and Economics

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

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

| 11 mmmun of Die | | required, meruding. |
|-----------------|--------|------------------------------------------------|
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| ACCT*2230 | [0.50] | Management Accounting |
| ECON*1050 | [0.50] | Introductory Microeconomics * |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| ECON*2560 | [0.50] | Introduction to Finance |
| One of: | | |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| MATH*1030 | [0.50] | Business Mathematics |
| MATH*1080 | [0.50] | Elements of Calculus I |
| MATH*1200 | [0.50] | Calculus I |
| One of: | | |
| ECON*2740 | [0.50] | Economic Statistics |
| PSYC*1010 | [0.50] | Making Sense of Data in Psychological Research |
| SOAN*2120 | [0.50] | Introductory Methods |
| STAT*2040 | [0.50] | Statistics I |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| STAT*2080 | [0.50] | Introductory Applied Statistics I |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| One of: | | |
| ECON*3660 | [0.50] | Investments |
| ENGG*3240 | [0.50] | Engineering Economics |
| FARE*3310 | [0.50] | Operations Management |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*1000 | [0.50] | Introductory Marketing |
| MCS*3040 | [0.50] | Business and Consumer Law |
| MGMT*3320 | [0.50] | Financial Management |
| | | |

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

Classical Studies (CLAS)

School of Languages and Literatures, College of Arts

[0.50]

[0.50]

[0.50]

The program in Classical Studies is intended particularly for students interested in Greek and Roman culture, society and history. The advanced study of both Greek and Latin is recommended to students who want a more precise understanding of the ancient cultures. Consult the Head of Classical Studies for detailed information.

Core Requirements

| a. CLAS*1000, plus EITHER (GREK*1100, GREK*1110, GREK*2020) OR | EN |
|------------------------------------------------------------------------------------------|----|
| (LAT*1100, LAT*1110, LAT*2000) | |
| b. one of CLAS*2000, CLAS*2150, CLAS*2350, CLAS*3100 | EN |
| c. one of CLAS*3000, CLAS*3010, CLAS*3020 | EN |
| d. one of CLAS*3030, CLAS*3040 | EN |
| e. one of CLAS*3150, HIST*2850, PHIL*2140 | EN |
| Major (Honours Program) | EN |
| A minimum of 8.00 credits is required, including: | EN |
| a the Classical Studies Core | EN |
| b CI AS*4000 CI AS*4150 CI AS*4400 | EN |
| 2. 250 additional and its in Classics, 1.00 af which much taken from the following as | EN |
| c. 2.50 additional credits in Classics, 1.00 of which may be taken from the following as | EN |
| part of the program: | EN |

Major Writers

The Medieval World

What Makes a Literary Classic?

| LING*1000 | [0.50] | Introduction to Linguistics | | |
|-------------------------|--------|-----------------------------|--|--|
| PHIL*3060 | [0.50] | Medieval Philosophy | | |
| Minor (Honours Program) | | | | |

A minimum of 5.00 credits is required, including:

a. the Classical Studies Core

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

Computing and Information Science (CIS)

School of Computer Science, College of Engineering and Physical Sciences

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

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

| CIS*1300 | [0.50] | Programming |
|-----------------|--------------|----------------------------------------------|
| CIS*1910 | [0.50] | Discrete Structures in Computing I |
| CIS*2170 | [0.75] | User Interface Design |
| CIS*2430 | [0.50] | Object Oriented Programming |
| CIS*2500 | [0.50] | Intermediate Programming |
| CIS*2520 | [0.50] | Data Structures |
| CIS*2750 | [0.75] | Software Systems Development and Integration |
| 0.50 additional | credits from | CIS courses at the 2000 level or above |
| | | |

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

Creative Writing (CW)

The Creative Writing minor reflects the significant role that creative writing plays in our cultural life, from travel writing and blogs, gaming and journalism, to poems, novels and films. The minor hones students' skills in expressive writing, and teaches students to situate their work within a broader context of local, global and historical creative texts. Workshops and a capstone seminar provide students with the opportunity to revise their work and develop a creative portfolio.

Minor (Honours Program)

| A minimum of 5.00 credits is required including: | | | |
|--------------------------------------------------|-------------|---------------------------------------------------------|--|
| ENGL*1080 | [0.50] | Literatures in English I: Reading the Past | |
| ENGL*2920 | [0.50] | Elements of Creative Writing | |
| ENGL*4720 | [1.00] | Creative Writing: Prose/Poetry | |
| 1.00 credit from th | e following | | |
| ENGL*3050 | [0.50] | Intermediate Fiction Writing Workshop | |
| ENGL*3060 | [0.50] | Intermediate Poetry Writing Workshop | |
| ENGL*3070 | [0.50] | Intermediate Screenwriting Workshop | |
| ENGL*3090 | [0.50] | Special Topics in Creative Writing Workshop | |
| THST*2120 | [0.50] | Writing for Performance | |
| 2.00 credits from t | he followin | g: | |
| CLAS*2000 | [0.50] | Classical Mythology | |
| CLAS*3030 | [0.50] | Epic Heroes and Poems | |
| ENGL*2040 | [0.50] | Latina/o Literature and Cultural Production: Intro | |
| ENGL*2080 | [0.50] | Literatures in English II: Finding a Critical Voice | |
| ENGL*2090 | [0.50] | Studies in Shakespeare | |
| ENGL*2120 | [0.50] | Seminar: Critical Practices | |
| ENGL*2130 | [0.50] | Seminar: Literature and Social Change | |
| ENGL*2190 | [0.50] | Queer Literatures and Cultures | |
| ENGL*2200 | [0.50] | Postcolonial Literatures, Film, and Other Media | |
| ENGL*2260 | [0.50] | Law and Literature | |
| ENGL*2270 | [0.50] | Fairy, Trickster, and Mythical Hero | |
| ENGL*2280 | [0.50] | Sporting Bodies | |
| ENGL*2290 | [0.50] | Outlaws | |
| ENGL*2310 | [0.50] | Vampires, Ghosts, and Mummies: Literature and the | |
| | | Supernatural | |
| ENGL*2330 | [0.50] | Print Culture and Cinema | |
| ENGL*2360 | [0.50] | Medieval Literature | |
| ENGL*2550 | [0.50] | North American Native Literatures | |
| ENGL*2640 | [0.50] | Culture, Location, Identity: Minoritized Literatures in | |
| | | Canada and Beyond | |
| ENGL*2740 | [0.50] | Children's Literature | |
| ENGL*2880 | [0.50] | Women in Literature | |
| ENGL*3080 | [0.50] | History and Linguistics of the English Language | |
| ENGL*3240 | [0.50] | Studies in Early Modern Literature and Culture | |
| ENGL*3380 | [0.50] | Studies in the History of Literary Production | |
| ENGL*3420 | [0.50] | 20th- & 21st-Century Drama | |
| ENGL*3460 | [0.50] | Literature in London | |
| ENGL*3470 | [0.50] | Twentieth-Century British Literature I | |
| ENGL*3480 | [0.50] | Twentieth-Century British Literature II | |
| ENGL*3540 | [0.50] | Writing the United States | |

ENGL*1410

HIST*2200

d.

| ENGL*3550[0.50]Modern United States LiteraturesENGL*3680[0.50]20th- & 21st-Century Canadian Literature and CriticismENGL*3750[0.50]Studies in Postcolonial LiteraturesENGL*3760[0.50]The Atlantic WorldENGL*3870[0.50]Topics in Literary and Cultural StudiesENGL*3880[0.50]Topics in Literary and Cultural StudiesFREN*2020[0.50]France: Literature and SocietyFREN*2020[0.50]Quebec: Literature and SocietyFREN*3030[0.50]Good and EvilFREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Representing the SelfFREN*3140[0.50]Songs, Lyrics and Poetry in FrenchFREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]What Makes a Literary Classic?HUMN*1030[0.50]Myth and Fairy Tales in GermanyHUMN*3000[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*3220[0.50]Hispanic Literary StudiesSPAN*3230[0.50]Hispanic Literary TalesSPAN*3230[0.50]Literature and Arts II: Latin America | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|--------------------------------------------------------|
| ENGL*3680[0.50]20th- & 21st-Century Canadian Literature and CriticismENGL*3750[0.50]Studies in Postcolonial LiteraturesENGL*3760[0.50]The Atlantic WorldENGL*3870[0.50]Topics in Literary and Cultural StudiesENGL*3880[0.50]Topics in Literary and Cultural StudiesFREN*2020[0.50]France: Literature and SocietyFREN*3030[0.50]Good and EvilFREN*3030[0.50]Classics of French LiteratureFREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Women in Literature, Art and FilmFREN*3140[0.50]Songs, Lyrics and Poetry in FrenchFREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3000[0.50]Narratives of MigrationHUMN*1030[0.50]Myth and Fairy Tales in GermanyHUMN*3000[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*3220[0.50]Hispanic Literary StudiesSPAN*3230[0.50]Hispanic Literary Tales in Germany | ENGL*3550 | [0.50] | Modern United States Literatures |
| ENGL*3750[0.50]Studies in Postcolonial LiteraturesENGL*3760[0.50]The Atlantic WorldENGL*3870[0.50]Topics in Literary and Cultural StudiesENGL*3880[0.50]Topics in Literary and Cultural StudiesFREN*2020[0.50]France: Literature and SocietyFREN*3030[0.50]Good and EvilFREN*3090[0.50]Classics of French LiteratureFREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Representing the SelfFREN*3140[0.50]Songs, Lyrics and Poetry in FrenchFREN*3160[0.50]Frictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3000[0.50]What Makes a Literary Classic?HUMN*1030[0.50]Narratives of MigrationHUMN*3400[0.50]Renaissance Lovers and FoolsSPAN*2209[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Hispanic Literary TalesSPAN*3220[0.50]Hispanic Literary TalesSPAN*3220[0.50]Hispanic Literary TalesSPAN*3220[0.50]Hispanic Literary TalesSPAN*3220[0.50]Hispanic Literary TalesSPAN*3220[0.50]Hispanic Literary TalesSPAN*3220[0.50]Literature and Arts II: Jatin America | ENGL*3680 | [0.50] | 20th- & 21st-Century Canadian Literature and Criticism |
| ENGL*3760[0.50]The Atlantic WorldENGL*3870[0.50]Topics in Literary and Cultural StudiesENGL*3880[0.50]Topics in Literary and Cultural StudiesFREN*2020[0.50]France: Literature and SocietyFREN*2060[0.50]Quebec: Literature and SocietyFREN*3030[0.50]Good and EvilFREN*3100[0.50]Classics of French LiteratureFREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Representing the SelfFREN*3140[0.50]Songs, Lyrics and Poetry in FrenchFREN*3160[0.50]Frictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3000[0.50]What Makes a Literary Classic?HUMN*1030[0.50]Narratives of MigrationHUMN*3000[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*3220[0.50]Hispanic Literary StudiesSPAN*3230[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Jatin America | ENGL*3750 | [0.50] | Studies in Postcolonial Literatures |
| ENGL*3870[0.50]Topics in Literary and Cultural StudiesENGL*3880[0.50]Topics in Literary and Cultural StudiesFREN*2020[0.50]France: Literature and SocietyFREN*2060[0.50]Quebec: Literature and SocietyFREN*3030[0.50]Good and EvilFREN*3090[0.50]Classics of French LiteratureFREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Representing the SelfFREN*3140[0.50]Women in Literature, Art and FilmFREN*3160[0.50]Frictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]What Makes a Literary Classic?HUMN*1030[0.50]Narratives of MigrationHUMN*3000[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*3220[0.50]Hispanic Literary StudiesSPAN*3230[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | ENGL*3760 | [0.50] | The Atlantic World |
| ENGL*3880[0.50]Topics in Literary and Cultural StudiesFREN*2020[0.50]France: Literature and SocietyFREN*2060[0.50]Quebec: Literature and SocietyFREN*3030[0.50]Good and EvilFREN*3090[0.50]Classics of French LiteratureFREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Representing the SelfFREN*3140[0.50]Women in Literature, Art and FilmFREN*3160[0.50]Frictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]What Makes a Literary Classic?HUMN*1030[0.50]Narratives of MigrationHUMN*3000[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*3220[0.50]Hispanic Literary StudiesSPAN*3230[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Jatin America | ENGL*3870 | [0.50] | Topics in Literary and Cultural Studies |
| FREN*2020[0.50]France: Literature and SocietyFREN*2060[0.50]Quebec: Literature and SocietyFREN*3030[0.50]Good and EvilFREN*3090[0.50]Classics of French LiteratureFREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Representing the SelfFREN*3140[0.50]Women in Literature, Art and FilmFREN*3160[0.50]Songs, Lyrics and Poetry in FrenchFREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]What Makes a Literary Classic?HUMN*1030[0.50]Narratives of MigrationHUMN*3020[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2290[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts II: Latin America | ENGL*3880 | [0.50] | Topics in Literary and Cultural Studies |
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| FREN*3110[0.50]Storytelling in the Francophone WorldFREN*3130[0.50]Representing the SelfFREN*3140[0.50]Women in Literature, Art and FilmFREN*3160[0.50]Songs, Lyrics and Poetry in FrenchFREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]Holocaust & WWII in German Lit. & FilmHUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2290[0.50]Literature and Arts I: SpainSPAN*3220[0.50]Literature and Arts II: Latin America | FREN*3090 | [0.50] | Classics of French Literature |
| FREN*3130[0.50]Representing the SelfFREN*3140[0.50]Women in Literature, Art and FilmFREN*3160[0.50]Songs, Lyrics and Poetry in FrenchFREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]Holocaust & WWII in German Lit. & FilmHUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3000[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | FREN*3110 | [0.50] | Storytelling in the Francophone World |
| FREN*3140[0.50]Women in Literature, Art and FilmFREN*3160[0.50]Songs, Lyrics and Poetry in FrenchFREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]Holocaust & WWII in German Lit. & FilmHUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3020[0.50]Myth and Fairy Tales in GermanyHUMN*3040[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | FREN*3130 | [0.50] | Representing the Self |
| FREN*3160[0.50]Songs, Lyrics and Poetry in FrenchFREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]Holocaust & WWII in German Lit. & FilmHUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3000[0.50]Myth and Fairy Tales in GermanyHUMN*3000[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Jatin America | FREN*3140 | [0.50] | Women in Literature, Art and Film |
| FREN*3170[0.50]Fictions of ChildhoodGERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]Holocaust & WWII in German Lit. & FilmHUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3020[0.50]Myth and Fairy Tales in GermanyHUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | FREN*3160 | [0.50] | Songs, Lyrics and Poetry in French |
| GERM*3020[0.50]Myth and Fairy Tales in GermanyGERM*3470[0.50]Holocaust & WWII in German Lit. & FilmHUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3020[0.50]Myth and Fairy Tales in GermanyHUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | FREN*3170 | [0.50] | Fictions of Childhood |
| GERM*3470[0.50]Holocaust & WWII in German Lit. & FilmHUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3020[0.50]Myth and Fairy Tales in GermanyHUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | GERM*3020 | [0.50] | Myth and Fairy Tales in Germany |
| HUMN*1030[0.50]What Makes a Literary Classic?HUMN*3000[0.50]Narratives of MigrationHUMN*3020[0.50]Myth and Fairy Tales in GermanyHUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | GERM*3470 | [0.50] | Holocaust & WWII in German Lit. & Film |
| HUMN*3000[0.50]Narratives of MigrationHUMN*3020[0.50]Myth and Fairy Tales in GermanyHUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | HUMN*1030 | [0.50] | What Makes a Literary Classic? |
| HUMN*3020[0.50]Myth and Fairy Tales in GermanyHUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | HUMN*3000 | [0.50] | Narratives of Migration |
| HUMN*3400[0.50]Renaissance Lovers and FoolsITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | HUMN*3020 | [0.50] | Myth and Fairy Tales in Germany |
| ITAL*3400[0.50]Renaissance Lovers and FoolsSPAN*2990[0.50]Hispanic Literary StudiesSPAN*3220[0.50]Literature and Arts I: SpainSPAN*3230[0.50]Literature and Arts II: Latin America | HUMN*3400 | [0.50] | Renaissance Lovers and Fools |
| SPAN*2990 [0.50] Hispanic Literary Studies SPAN*3220 [0.50] Literature and Arts I: Spain SPAN*3230 [0.50] Literature and Arts II: Latin America | ITAL*3400 | [0.50] | Renaissance Lovers and Fools |
| SPAN*3220 [0.50] Literature and Arts I: Spain SPAN*3230 [0.50] Literature and Arts II: Latin America | SPAN*2990 | [0.50] | Hispanic Literary Studies |
| SPAN*3230 [0 50] Literature and Arts II: Latin America | SPAN*3220 | [0.50] | Literature and Arts I: Spain |
| Entertaile and fits II. Each finited | SPAN*3230 | [0.50] | Literature and Arts II: Latin America |

Students with a compelling reason to work in a genre other than prose or poetry at the 4000 level may substitute ENGL*4810 and ENGL*4910 for ENGL*4720 with the faculty advisor's permission.

Note: Substituted courses may have their own prerequisites; check the course descriptions in the academic calendar.

Criminal Justice and Public Policy (CJPP)

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

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

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

| POLS*1400 | [0.50] | Issues in Canadian Politics | |
|----------------------------------------------------------------------------------|-----------|------------------------------------------|--|
| POLS*2250 or H | POLS*2300 | | |
| POLS*2350 | [0.50] | Law from a Political Science Perspective | |
| SOAN*2120 | [0.50] | Introductory Methods | |
| SOC*1500 | [0.50] | Crime and Criminal Justice | |
| SOC*2700 | [0.50] | Criminological Theory | |
| Students wishing to declare the CJPP minor must also meet the above requirement. | | | |

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

Major (Honours Program)

A minimum of 9.00 credits is required, including:

| 71 minimum of 7. | 50 creans 15 | required, including. |
|-------------------|--------------|------------------------------------------------------|
| PHIL*1010 | [0.50] | Introductory Philosophy: Social and Political Issues |
| POLS*1400 | [0.50] | Issues in Canadian Politics |
| POLS*2250 or PO | DLS*2300 | |
| POLS*2350 | [0.50] | Law from a Political Science Perspective |
| SOAN*2120 | [0.50] | Introductory Methods |
| SOC*1500 | [0.50] | Crime and Criminal Justice |
| SOC*2700 | [0.50] | Criminological Theory |
| 0.50 credits from | the followin | g: |
| POLS*3650 | [0.50] | Quantitative Methods of Data Analysis |
| SOAN*3120 | [0.50] | Quantitative Methods |
| 1.50 credits from | the followin | g: |
| SOC*2070 | [0.50] | Social Deviance |
| SOC*2760 | [0.50] | Homicide |
| SOC*3490 | [0.50] | Law and Society |
| SOC*3710 | [0.50] | Youth Justice |
| SOC*3730 | [0.50] | Courts and Society |
| SOC*3740 | [0.50] | Corrections and Penology |

| SOC*3750 | [0.50] | Police in Society |
|----------------------|---------------|------------------------------------------------------|
| 1.50 credits from th | ne following: | - |
| POLS*3130 | [0.50] | Law, Politics and Judicial Process |
| POLS*3140 | [0.50] | Canadian Charter of Rights and Freedoms |
| POLS*3210 | [0.50] | The Constitution and Canadian Federalism |
| POLS*3250 | [0.50] | Public Policy: Challenges and Prospects |
| POLS*3300 | [0.50] | Governing Criminal Justice |
| POLS*3440 | [0.50] | Corruption, Scandal and Political Ethics |
| POLS*3670 | [0.50] | Comparative Public Policy and Administration |
| 0.50 credits from th | ne following: | · · |
| HIST*3130 | [0.50] | Popular Culture and Punishment, 1700-1900 |
| PHIL*3040 | [0.50] | Philosophy of Law |
| PHIL*3230 | [0.50] | Theories of Justice |
| PSYC*3020 | [0.50] | Psychology of Law |
| 1.50 credits from th | ne following: | |
| POLS*4050 | [1.00] | Advanced Topics in Law and Politics |
| POLS*4060 | [0.50] | Advanced Topics Lecture in Law and Politics |
| POLS*4070 | [1.00] | Courts and Parliament |
| POLS*4100 | [1.00] | Women, Justice and Public Policy |
| POLS*4160 | [1.00] | Multi-Level Governance in Canada |
| POLS*4250 | [1.00] | Topics in Public Management |
| POLS*4260 | [1.00] | Topics in Public Policy |
| POLS*4270 | [0.50] | Advanced Lecture in Public Management |
| POLS*4280 | [0.50] | Advanced Lecture in Public Policy |
| POLS*4310 | [0.50] | Advanced Lecture in Women, Justice and Public Policy |
| POLS*4740 | [1.00] | Advanced Topics in Rights and Liberties |
| POLS*4780 | [0.50] | Advanced Lecture in Rights and Liberties |
| POLS*4970 | [0.50] | Honours Political Science Research I |
| POLS*4980 | [0.50] | Honours Political Science Research II |
| SOC*4010 | [0.50] | Violence and Society |
| SOC*4030 | [0.50] | Advanced Topics in Criminology |
| SOC*4200 | [0.50] | Advanced Topics in Criminal Justice |
| SOC*4900 | [0.50] | Honours Sociology Thesis I |

Minor (Honours Program)

[0.50]

SOC*4910

| A minimum of 5.00 credits is required, including: | | | |
|---------------------------------------------------|--------------|------------------------------------------------------|--|
| PHIL*1010 | [0.50] | Introductory Philosophy: Social and Political Issues | |
| POLS*1400 | [0.50] | Issues in Canadian Politics | |
| POLS*2250 or P | OLS*2300 | | |
| POLS*2350 | [0.50] | Law from a Political Science Perspective | |
| SOAN*2120 | [0.50] | Introductory Methods | |
| SOC*1500 | [0.50] | Crime and Criminal Justice | |
| SOC*2700 | [0.50] | Criminological Theory | |
| 1.50 credits from | the followin | g list, including 0.50 SOC and 0.50 POLS: | |
| POLS*3130 | [0.50] | Law, Politics and Judicial Process | |
| POLS*3210 | [0.50] | The Constitution and Canadian Federalism | |
| POLS*3300 | [0.50] | Governing Criminal Justice | |
| POLS*3250 | [0.50] | Public Policy: Challenges and Prospects | |
| POLS*3440 | [0.50] | Corruption, Scandal and Political Ethics | |
| POLS*3670 | [0.50] | Comparative Public Policy and Administration | |
| SOC*2070 | [0.50] | Social Deviance | |
| SOC*2760 | [0.50] | Homicide | |
| SOC*3490 | [0.50] | Law and Society | |
| SOC*3710 | [0.50] | Youth Justice | |
| SOC*3730 | [0.50] | Courts and Society | |
| SOC*3740 | [0.50] | Corrections and Penology | |
| SOC*3750 | [0.50] | Police in Society | |
| | | | |

Honours Sociology Thesis II

Economics (ECON)

Department of Economics and Finance, Gordon S. Lang School of Business and **Economics**

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

Core Requirements

| ECON*1050 | [0.50] | Introductory Microeconomics |
|-----------|--------|-----------------------------|
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| One of: | | |

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

Major (Honours Program)

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

| The Economics core requirements | | | |
|---------------------------------|--------|-----------------------------------------|--|
| ECON*2740 | [0.50] | Economic Statistics | |
| ECON*2770 | [0.50] | Introductory Mathematical Economics | |
| ECON*3710 | [0.50] | Advanced Microeconomics | |
| ECON*3740 | [0.50] | Introduction to Econometrics | |
| ECON*3810 | [0.50] | Advanced Macroeconomics | |
| ECON*4710 | [0.50] | Advanced Topics in Microeconomics | |
| ECON*4810 | [0.50] | Advanced Topics in Macroeconomics | |
| One of: | | | |
| ECON*2720 | [0.50] | Business History | |
| ECON*3730 | [0.50] | The Origins of International Inequality | |
| ECON*4720 | [0.50] | Topics in Economic History | |

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

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

Minor (Honours Program)

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

a. The Economics core

| b. One of: | | |
|------------|--------|-------------------------------------|
| ECON*2560 | [0.50] | Introduction to Finance |
| ECON*2740 | [0.50] | Economic Statistics |
| ECON*2770 | [0.50] | Introductory Mathematical Economics |

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

Notes:

1. ECON*3740 is recommended.

2. Students wishing to pursue a more structured Economics minor should take ECON*3710 as well as ECON*3740.

Economics (Co-op) (ECON:C)

Department of Economics and Finance, Gordon S. Lang School of Business and Economics

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

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

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

Program Requirements

The Co-op program in Economics is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Economics | Academic | and Co-o | n Work Tern | n Schedule |
|-----------|----------|----------|-------------|------------|

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

9.50 - Required Core Courses

1.50 - Humanities credits from at least two subject areas (BA distribution requirement)

0.50 - Social Science credit outside of ECON (BA distribution requirement)

8.50 - Electives

2.00 - Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 22.50

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1

1.50 electives

| 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 |

Semester 2 (Winter)

| ECON*1100 | [0.50] | Introductory Macroeconomics |
|-----------------|---------------|-----------------------------|
| One computer so | cience 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 (Wi | inter) | | | | |
| ECON*3740 | [0.50] | Introduction to Econometrics | | | |
| One economic his | One economic history course* | | | | |
| 1.50 electives | | | | | |
| Summer Semes | ster | | | | |
| COOP*1000 | [0.50] | Co-op Work Term I | | | |
| Fall Semester | | | | | |

COOP*2000 [0.50] Semester 5 (Winter)

ECON*3810 [0.50] Advanced Macroeconomics

1.00 credits in Economics at the 3000 level 1.00 electives

Summer Semester

COOP*3000 [0.50] Co-op Work Term III Semester 6 (Fall)

Co-op Work Term II

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

1.50 electives

Winter Semester COOP*4000 [0.50]

Co-op Work Term IV

Co-op Work Term V [0.50]

[0.50] Advanced Topics in Microeconomics 0.50 credits in Economics at the 4000 level

1.00 electives

0.50 restricted electives

Summer Semester COOP*5000

Semester 7 (Fall) ECON*4710

Semester 8 (Winter)

ECON*4810 [0.50] Advanced Topics in Macroeconomics 0.50 credits in Economics at the 4000 level 1.50 electives

School of English and Theatre Studies, College of Arts

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

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

Area of Concentration (General Program)

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

English core - 2.00 credits as follows:

1. ENGL*1080, ENGL*2080, ENGL*2120

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

English electives - 3.00 credits to include:

1. 1.00 credits from the following list of courses:

| | 0 | |
|-----------|--------|-------------------------------------------------|
| ENGL*2090 | [0.50] | Studies in Shakespeare |
| ENGL*2360 | [0.50] | Medieval Literature |
| ENGL*3080 | [0.50] | History and Linguistics of the English Language |
| ENGL*3220 | [0.50] | Representing Britain: 18th- & 19th- Century |
| | | Literature |
| ENGL*3240 | [0.50] | Studies in Early Modern Literature and Culture |
| ENGL*3300 | [0.50] | Restoration to Romanticism: Forging the Nation |
| ENGL*3320 | [0.50] | Romanticism to Victorianism: Culture and |
| | | Conformity |
| ENGL*3340 | [0.50] | British Imperial Culture |
| ENGL*3380 | [0.50] | Studies in the History of Literary Production |
| ENGL*3540 | [0.50] | Writing the United States |
| ENGL*3570 | [0.50] | Chaucer in Context |
| ENGL*3630 | [0.50] | Writing Canada: Forging the Nation |
| | | |

2. 2.00 credits from any other ENGL lecture or seminar course. At least 1.00 credits in ENGL must be at the 3000 level.

Major (Honours Program)

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

English core - 3.00 credits as follows:

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

English electives - 5.50 credits to include:

| 1.2.00 | credits | from | the | following | list | of | courses. |
|---------|---------|------|-----|-----------|-------|----|----------|
| 1. 2.00 | cicuito | nom | une | ionowing | 11.50 | oı | courses. |

| | ENGL*2090 | [0.50] | Studies in Shakespeare |
|--------|--------------------|-------------|-------------------------------------------------|
| | ENGL*2360 | [0.50] | Medieval Literature |
| | ENGL*3080 | [0.50] | History and Linguistics of the English Language |
| | ENGL*3220 | [0.50] | Representing Britain: 18th- & 19th- Century |
| | | | Literature |
| | ENGL*3240 | [0.50] | Studies in Early Modern Literature and Culture |
| | ENGL*3300 | [0.50] | Restoration to Romanticism: Forging the Nation |
| | ENGL*3320 | [0.50] | Romanticism to Victorianism: Culture and |
| | | | Conformity |
| | ENGL*3340 | [0.50] | British Imperial Culture |
| | ENGL*3380 | [0.50] | Studies in the History of Literary Production |
| | ENGL*3540 | [0.50] | Writing the United States |
| | ENGL*3570 | [0.50] | Chaucer in Context |
| | ENGL*3630 | [0.50] | Writing Canada: Forging the Nation |
| 2. 1.0 | 00 credits from EN | GL 4000 lev | el courses |
| | | | |

3. 2.50 credits from any other ENGL lecture or seminar courses

A maximum of 2.00 credits at the 4000 level may be counted towards a major in English. Honours students interested in a more concentrated program or contemplating graduate work in English are strongly advised to:

· attain a good reading knowledge of another language, such as French

• take ENGL*3380 (Studies in the History of Literary Production), ENGL*3690 (History of Literary Criticism), ENGL*4890 (Contemporary Literary Theory)

• take 2.00 credits from 4000-level seminars (2 seminars at 1.00 credits each)

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

Minor (Honours Program)

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

Environmental Governance (EGOV)

Department of Geography, Environment and Geomatics, College of Social and **Applied Human Sciences**

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

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

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

Major (Honours Program)

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

| ECON*1050 | [0.50] | Introductory Microeconomics | | |
|----------------------|---------------------------------------------------------------------------------------------|------------------------------------------------|--|--|
| EDRD*2650 | [0.50] | Introduction to Planning and Environmental Law | | |
| GEOG*1220 | [0.50] | Human Impact on the Environment | | |
| GEOG*1350 | [0.50] | Earth: Hazards and Global Change | | |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment | | |
| GEOG*2210 | [0.50] | Environment and Resources | | |
| GEOG*3020 | [0.50] | Global Environmental Change | | |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment | | |
| GEOG*4210 | [0.50] | Environmental Governance | | |
| GEOG*4220 | [0.50] | Local Environmental Management | | |
| GEOG*4230 | [0.50] | Environmental Impact Assessment | | |
| MGMT*3020 | [0.50] | Corporate Social Responsibility | | |
| POLS*1150 | [0.50] | Understanding Politics | | |
| POLS*2250 | [0.50] | Public Administration and Governance | | |
| POLS*3250 | [0.50] | Public Policy: Challenges and Prospects | | |
| POLS*3370 | [0.50] | Environmental Politics and Governance | | |
| One of: | | | | |
| GEOG*2030 | [0.50] | Environment and Development | | |
| GEOG*2230 | [0.50] | Commodity Chains and Cultures of Consumption | | |
| One of: | | | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality | | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics | | |
| One of: | | | | |
| HIST*2250 | [0.50] | Environment and History | | |
| PHIL*2070 | [0.50] | Philosophy of the Environment | | |
| SOC*3380 | [0.50] | Society and Nature | | |
| One of: | | | | |
| ECON*2740 | [0.50] | Economic Statistics | | |
| GEOG*2460 | [0.50] | Analysis in Geography | | |
| STAT*2040 | [0.50] | Statistics I | | |
| One of: | | | | |
| FARE*3170 | [0.50] | Cost-Benefit Analysis | | |
| POLS*3210 | [0.50] | The Constitution and Canadian Federalism | | |
| POLS*3270 | [0.50] | Local Government in Ontario | | |
| POLS*3470 | [0.50] | Business-Government Relations in Canada | | |
| POLS*3790 | [0.50] | International Political Economy | | |
| One of: | | | | |
| FARE*4290 | [0.50] | Land Economics | | |
| FARE*4310 | [0.50] | Resource Economics | | |
| At least 0.50 additi | At least 0.50 additional credits at the 4000 level from Geography; Political Science; Food, | | | |

Agricultural and Resource Economics (FARE); or Economics. Students are advised to contact an Environmental Governance Faculty Advisor for a list of recommended 4000 level courses.

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

European Culture and Civilization (ECC)

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

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

Minor (Honours Program)

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

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

| 1. | EURO*1100 | [0.50] | European Cinema |
|------|------------------------|------------|-----------------------------------------|
| | EURO*2200 | [0.50] | Towards European Modernism |
| | EURO*3300 | [0.50] | Violence and Culture |
| 2. 2 | 2.00 credits in one la | nguage cho | sen from the following list: |
| | FREN*1200 | [0.50] | French Language I |
| | FREN*1300 | [0.50] | French Language II |
| | FREN*2020 | [0.50] | France: Literature and Society |
| | FREN*2500 | [0.50] | French Translation I |
| | FREN*2520 | [0.50] | French Composition I |
| | FREN*2550 | [0.50] | Contemporary France |
| | FREN*3090 | [0.50] | Classics of French Literature |
| | FREN*3500 | [0.50] | French Translation II |
| | FREN*3520 | [0.50] | French Composition II |
| | OR | | |
| | GERM*1100 | [0.50] | Introductory German I |
| | GERM*1110 | [0.50] | Introductory German II |
| | GERM*2010 | [0.50] | Intermediate Language Practice |
| | GERM*2490 | [0.50] | Intermediate German |
| | GERM*3150 | [0.50] | Interactive German Language and Culture |
| | OR | | |
| | HUMN*2020 | [0.50] | The Criminal Mind in Italian Cinema |
| | ITAL*1060 | [0.50] | Introductory Italian I |
| | ITAL*1070 | [0.50] | Introductory Italian II |
| | ITAL*2090 | [0.50] | Intermediate Italian |
| | ITAL*3400 | [0.50] | Renaissance Lovers and Fools |
| | ITAL*3700 | [0.50] | Experiential Learning and Language |
| | OR | | |
| | SPAN*1100 | [0.50] | Introductory Spanish I |
| | SPAN*1110 | [0.50] | Introductory Spanish II |
| | SPAN*2000 | [0.50] | Intermediate Spanish I |
| | SPAN*2010 | [0.50] | Intermediate Spanish II |
| | SPAN*2040 | [0.50] | Culture of Spain |
| | SPAN*2990 | [0.50] | Hispanic Literary Studies |
| | SPAN*3220 | [0.50] | Literature and Arts I: Spain |
| | SPAN*3500 | [0.50] | Advanced Spanish I |

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

| | 0 | |
|------|-----|----|
| G | rou | рA |

| _ | | |
|-----------|--------|------------------------------------------------|
| HIST*1010 | [0.50] | Early Modern Europe |
| HIST*2200 | [0.50] | The Medieval World |
| HIST*2510 | [0.50] | Modern Europe Since 1789 |
| HIST*2820 | [0.50] | Modern France Since 1750 |
| HIST*3230 | [0.50] | Spain and Portugal, 1085 to 1668 |
| HIST*3350 | [0.50] | Modern Germany |
| HIST*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 B | | |
| PHIL*2140 | [0.50] | Ancient Greek Philosophy |
| PHIL*2160 | [0.50] | Early Modern Philosophy: Reason vs. Experience |
| PHIL*3060 | [0.50] | Medieval Philosophy |
| PHIL*3100 | [0.50] | Kant and His Legacy |
| PHIL*3200 | [0.50] | Continental Philosophy |
| PHIL*3360 | [0.50] | Nineteenth Century Philosophy |
| POLS*2000 | [0.50] | Political Theory |
| POLS*2100 | [0.50] | Comparative Politics |
| POLS*2200 | [0.50] | International Relations |

| CLAS*1000 | [0.50] | Introduction to Classical Culture | | | |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------|--|--|--|
| CLAS*2000 | [0.50] | Classical Mythology | | | |
| CLAS*2350 | [0.50] | The Classical Tradition | | | |
| EURO*3000 | [0.50] | Revolution and the Fantastic in European Culture | | | |
| EURO*4050 | [0.50] | Contemporary Europe. New Landscapes in the | | | |
| | | Post-Cold War Era | | | |
| FREN*3030 | [0.50] | Good and Evil | | | |
| FREN*3110 | [0.50] | Storytelling in the Francophone World | | | |
| FREN*3140 | [0.50] | Women in Literature, Art and Film | | | |
| FREN*3160 | [0.50] | Songs, Lyrics and Poetry in French | | | |
| FREN*3170 | [0.50] | Fictions of Childhood | | | |
| HIST*2850 | [0.50] | Ancient Greece and Rome | | | |
| HUMN*1030 | [0.50] | What Makes a Literary Classic? | | | |
| HUMN*3000 | [0.50] | Narratives of Migration | | | |
| HUMN*3020 | [0.50] | Myth and Fairy Tales in Germany | | | |
| HUMN*3400 | [0.50] | Renaissance Lovers and Fools | | | |
| HUMN*3470 | [0.50] | Holocaust & WWII in German Lit. & Film | | | |
| Note: Other S | panish literature | e courses may be counted in this section provided | | | |
| the course-con | tent is European | -centered. Please see the ESP coordinator for further | | | |
| information. | | | | | |
| Group D | | | | | |
| ARTH*1510 | [0.50] | Art Historical Studies I | | | |
| ARTH*1520 | [0.50] | Art Historical Studies II | | | |
| ARTH*2550 | [0.50] | The Italian Renaissance | | | |
| ARTH*2580 | [0.50] | Late Modern Art: 1900-1950 | | | |
| ARTH*2600 | [0.50] | Early Modern Art | | | |
| ARTH*3320 | [0.50] | Lives: Aspects of Western Art | | | |
| ARTH*3330 | [0.50] | Display: Visual Culture in Western Europe | | | |
| ARTH*3340 | [0.50] | Studies in Renaissance and Baroque Art | | | |
| MUSC*1060 | [0.50] | Amadeus to Zeppelin: Music and Culture I | | | |
| MUSC*2010 | [0.50] | The Musical Avant-Garde | | | |
| Note: other N | fusic history co | urses may be counted if students with knowledge of | | | |
| music are grar | ited waivers by i | instructor. The substitution(s) must also be approved | | | |
| by the ESP co | ordinator. | | | | |
| European Studi | es (EURS) | | | | |
| Interdisciplinary Pr | ogram | | | | |
| The European Studie | s program is des | igned for students who seek a career in International | | | |
| Palations aspecially | in International | Business and Administration between Canada and | | | |
| Europe It offers a c | ombination of 1 | anguages, specially designed courses in European | | | |
| thought letters and k | vistory and spec | ialization in either European Business or European | | | |
| Culture and Civilizat | istory and spee | anzation in child European Busiless of European | | | |
| | | | | | |
| Successful completio | n of the Europe | an Studies major requires proficiency in one of the | | | |
| tollowing languages (French, German, Italian or Spanish). In order to demonstrate language | | | | | |
| pronciency, 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*4 | studying at a European university in the country where their chosen core language is | | | | |
| southing at a Europe | southing at a European university, in the country where then chosen core failinguage is | | | | |
| poken. The benefits of such an experience are considerable, both academically and | | | | | |

European Governments and Politics

POLS*3450

Group C

1.

[0.50]

have spent one year studying at a European university in a country where their chosen core language is spoken, a course taken in that year involving a major academic paper or exam in the core language will, upon approval of the Co-ordinator of European Studies, be substituted for EURO*4740. See the Coordinator for the European Studies program for more information. See also the course description for EURO*4740. Major (Honours Program) A minimum of 12.00 credits is required, including: 5.00 credits in the three components of the European Studies core, 2.50 credits in one language, and 4.50 credits in either the European Culture and Civilization or the European Business Studies area of emphasis **Core Requirements**

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

| EURO*1100 | [0.50] | European Cinema |
|-----------|--------|--------------------------------------------------|
| EURO*2200 | [0.50] | Towards European Modernism |
| EURO*3000 | [0.50] | Revolution and the Fantastic in European Culture |
| EURO*3300 | [0.50] | Violence and Culture |
| EURO*4050 | [0.50] | Contemporary Europe. New Landscapes in the |
| | | Post-Cold War Era |
| EURO*4740 | [0.50] | Research Project in European Studies |
| HIST*2510 | [0.50] | Modern Europe Since 1789 |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| POLS*2200 | [0.50] | International Relations |
| POLS*3450 | [0.50] | European Governments and Politics |
| | | |

2019-2020 Undergraduate Calendar

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.

HIST*2200

HIST*2820

HIST*3230

HIST*3350

HIST*3570

HIST*3750

HIST*3820

HIST*4090

HIST*4470

HIST*4580

Group B PHIL*2140

PHIL*2160

PHIL*3060

PHIL*3100

PHIL*3200

PHIL*3360

POLS*1400

POLS*1500

POLS*2000

POLS*2100

POLS*3230

POLS*3250

POLS*3370

POLS*3670

POLS*3790

POLS*4340

CLAS*2000

CLAS*2350

FREN*3030

FREN*3110

FREN*3140

FREN*3160

FREN*3170

HIST*2850

HUMN*1030

HUMN*3000

HUMN*3020

HUMN*3400

HUMN*3470

Group C CLAS*1000 [0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[1.00]

[0.50]

[1.00]

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[0.50]

The Medieval World

Modern Germany

The Reformation

Early Modern France

Modern France Since 1750

Women in Modern Europe

Modern European History

Ancient Greek Philosophy

The French Revolution

Medieval Philosophy

Kant and His Legacy

World Politics

Political Theory

Comparative Politics

Classical Mythology

Good and Evil

The Classical Tradition

Fictions of Childhood

Ancient Greece and Rome

Narratives of Migration

Note: Other Spanish and Hispanic literature courses may be counted in this section

Continental Philosophy

Nineteenth Century Philosophy

Issues in Canadian Politics

Modern Political Thought

Public Policy: Challenges and Prospects

Environmental Politics and Governance

Nationalism, State-building and Identity

Storytelling in the Francophone World

Women in Literature, Art and Film

Songs, Lyrics and Poetry in French

What Makes a Literary Classic?

Myth and Fairy Tales in Germany

Holocaust & WWII in German Lit. & Film

Renaissance Lovers and Fools

International Political Economy

Introduction to Classical Culture

Comparative Public Policy and Administration

Spain and Portugal, 1085 to 1668

Special History Project Seminar I

Early Modern Philosophy: Reason vs. Experience

2. 2.50 credits in one language:

| o creatts in one rang | guage. | |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FREN*1200 | [0.50] | French Language I |
| FREN*1300 | [0.50] | French Language II |
| FREN*2020 | [0.50] | France: Literature and Society |
| FREN*2500 | [0.50] | French Translation I |
| FREN*2520 | [0.50] | French Composition I |
| FREN*2550 | [0.50] | Contemporary France |
| FREN*3090 | [0.50] | Classics of French Literature |
| FREN*3500 | [0.50] | French Translation II |
| FREN*3520 | [0.50] | French Composition II |
| OR | | - |
| GERM*1100 | [0.50] | Introductory German I |
| GERM*1110 | [0.50] | Introductory German II |
| GERM*2010 | [0.50] | Intermediate Language Practice |
| GERM*2490 | [0.50] | Intermediate German |
| GERM*3000 | [0.50] | Narratives of Migration |
| GERM*3020 | [0.50] | Myth and Fairy Tales in Germany |
| GERM*3150 | [0.50] | Interactive German Language and Culture |
| GERM*3470 | [0.50] | Holocaust & WWII in German Lit. & Film |
| OR | | |
| HUMN*2020 | [0.50] | The Criminal Mind in Italian Cinema |
| ITAL*1060 | [0.50] | Introductory Italian I |
| ITAL*1070 | [0.50] | Introductory Italian II |
| ITAL*2090 | [0.50] | Intermediate Italian |
| ITAL*3700 | [0.50] | Experiential Learning and Language |
| OR | | |
| SPAN*1100 | [0.50] | Introductory Spanish I |
| SPAN*1110 | [0.50] | Introductory Spanish II |
| SPAN*2000 | [0.50] | Intermediate Spanish I |
| SPAN*2010 | [0.50] | Intermediate Spanish II |
| SPAN*2040 | [0.50] | Culture of Spain |
| SPAN*2990 | [0.50] | Hispanic Literary Studies |
| SPAN*3220 | [0.50] | Literature and Arts I: Spain |
| SPAN*3500 | [0.50] | Advanced Spanish I |
| | FREN*1200 FREN*1200 FREN*1300 FREN*2500 FREN*2500 FREN*2500 FREN*2500 FREN*2500 FREN*3500 FREN*3500 FREN*3500 FREN*3520 OR GERM*1100 GERM*1110 GERM*2490 GERM*2490 GERM*3020 GERM*3020 GERM*3150 GERM*3150 GERM*3150 GERM*3150 GERM*3470 OR HUMN*2020 ITAL*1060 ITAL*1070 ITAL*2090 ITAL*3700 OR SPAN*11100 SPAN*11100 SPAN*11100 SPAN*2010 SPAN*2040 SPAN*2200 SPAN*3220 SPAN*3200 | FREN*1200 [0.50] FREN*1200 [0.50] FREN*1300 [0.50] FREN*2500 [0.50] FREN*2500 [0.50] FREN*2500 [0.50] FREN*2520 [0.50] FREN*2520 [0.50] FREN*2520 [0.50] FREN*2520 [0.50] FREN*3520 [0.50] FREN*3520 [0.50] FREN*3520 [0.50] GERM*1100 [0.50] GERM*2010 [0.50] GERM*2010 [0.50] GERM*2010 [0.50] GERM*3000 [0.50] GERM*3020 [0.50] GERM*3150 [0.50] GERM*3150 [0.50] GERM*3150 [0.50] ITAL*1060 [0.50] ITAL*1070 [0.50] ITAL*3700 [0.50] SPAN*1110 [0.50] SPAN*2000 [0.50] SPAN*2010 [0.50] SPAN*2040 [0.50] SP |

Areas of Emphasis

European Business

| [0.50] | Introductory Financial Accounting |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [0.50] | Management Accounting |
| [0.50] | Introductory Microeconomics |
| [0.50] | Introductory Macroeconomics |
| [0.50] | Financial Management |
| [0.50] | Strategic Management |
| n from: | |
| [0.50] | Intermediate Microeconomics |
| [0.50] | Intermediate Macroeconomics |
| [0.50] | Introduction to Finance |
| [0.50] | Investments |
| [0.50] | The Origins of International Inequality |
| [0.50] | Operations Management |
| [0.50] | Food & Agri Marketing Management |
| [0.50] | Labour Relations |
| [0.50] | Human Resources Management |
| [0.50] | Responsible Tourism Policy and Planning |
| [0.50] | Beverage Management |
| [0.50] | Destination Management and Marketing |
| [0.50] | Wine and Oenology |
| [0.50] | International Tourism |
| [0.50] | Introductory Marketing |
| [0.50] | Personal Financial Management |
| [0.50] | Fundamentals of Consumer Behaviour |
| [0.50] | Advanced Marketing |
| [0.50] | Business and Consumer Law |
| [0.50] | Statistics for Business Decisions |
| | [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] |

European Culture and Civilization

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

Group A

| Group II | | |
|---------------|--------------|---------------------|
| HIST*1010 | [0.50] | Early Modern Europe |
| 2019-2020 Und | ergraduate C | alendar |

| provided the cou | rse-content | is European-centered. Please see the ESP coordinator for |
|----------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------|
| further information | on. | |
| Group D | | |
| ARTH*1510 | [0.50] | Art Historical Studies I |
| ARTH*1520 | [0.50] | Art Historical Studies II |
| ARTH*2550 | [0.50] | The Italian Renaissance |
| ARTH*2580 | [0.50] | Late Modern Art: 1900-1950 |
| ARTH*2600 | [0.50] | Early Modern Art |
| ARTH*3320 | [0.50] | Lives: Aspects of Western Art |
| ARTH*3330 | [0.50] | Display: Visual Culture in Western Europe |
| ARTH*3340 | [0.50] | Studies in Renaissance and Baroque Art |
| MUSC*1060 | [0.50] | Amadeus to Zeppelin: Music and Culture I |
| MUSC*2010 | [0.50] | The Musical Avant-Garde |
| Note: Other mus | sic history c | courses may be counted if students with knowledge of music |
| are granted waive | ers by instru | actor. The substitution(s) must also be approved by the ESP |
| coordinator. | | |
| Study Abroa | d | |
| Year 3 or year 4 w | vill provide | students with the opportunity to continue their studies abroad. |
| Students will sele | ect up to 6. | 00 credits which can be included in the area of emphasis, as |
| electives, or both | h. They are | e subject to approval by the program coordinator and the |
| departmental adv | visor. Cours | es taken in Europe will not count towards the specialization |
| average. | | · · · |
| Practicum O | pportun | ity: |
| EURO*3700 is av | vailable for 1 | hose students wishing to participate in a practicum experience |
| as part of the year abroad. The practicum must be a job or volunteer experience that | | |
| contributes to the student's area of study and intended career. It must be approved in | | |
| advance by the C | oordinator. | A final report, written in the student's chosen language, is a |

Family and Child Studies (FCS)

requirement of this course.

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

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

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

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

| Human Development |
|-----------------------------------------------|
| Couple and Family Relationships |
| Development in Early and Middle Childhood |
| Parenting and Intergenerational Relationships |
| Introduction to Nutrition |
| |

A further 2.50 credits offered by the Department of Family Relations and Applied Nutrition (FRHD or NUTR*2050 or NUTR*3150 or NUTR*4070), of which at least 1.00 must be at the 3000 level or above.

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

Food, Agricultural and Resource Economics (FARE)

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

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

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

Major (Honours Program)

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

| ACCT*1220 | [0.50] | Introductory Financial Accounting |
|-------------|--------|---------------------------------------|
| AGR*1110 | [1.00] | Introduction to the Agri-Food Systems |
| FARE*1300 | [0.50] | Poverty, Food & Hunger |
| FARE*1400 | [1.00] | Economics of the Agri-Food System |
| FARE*2410 | [0.50] | Agrifood Markets and Policy |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| FARE*3030 | [0.50] | The Firm and Markets |
| FARE*4000 | [0.50] | Agricultural and Food Policy |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| ECON*2740 | [0.50] | Economic Statistics |
| ECON*2770 | [0.50] | Introductory Mathematical Economics |
| ECON*3740 | [0.50] | Introduction to Econometrics |
| One of: | | |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| FARE*4360 | [0.50] | Marketing Research |
| FARE*4500 | [0.50] | Decision Science |
| One of: | | |
| MATH*1030 | [0.50] | Business Mathematics |
| MATH*1080 | [0.50] | Elements of Calculus I |
| MATH*1200 | [0.50] | Calculus I |
| 4 50 1 11 1 | | |

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

Food and Agribusiness Management:

| FARE*4220 | [0.50] | Advanced Agribusiness Management |
|------------------------|-------------|-----------------------------------------------|
| FARE*4240 | [0.50] | Futures and Options Markets |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| MGMT*3320 | [0.50] | Financial Management |
| International Agri | cultural De | evelopment Economics: |
| ECON*2650 | [0.50] | Introductory Development Economics |
| FARE*3250 | [0.50] | Food and International Development |
| FARE*4210 | [0.50] | World Agriculture, Food Security and Economic |
| | | Development |
| Resource Econom | ics: | - |
| ECON*4930 | [0.50] | Environmental Economics |

| LCOIT 175 | .0 | | [0.50] |
|---------------|--------|----|--------|
| Last Revision | : July | 4, | 2019 |

| FARE*4290 | [0.50] | Land Economics |
|-----------|--------|-----------------|
| EADE*/310 | [0 50] | Perource Econor |

[0.50] Resource Economics

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

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

French Studies (FREN)

School of Languages and Literatures, College of Arts

All language courses carry 0.50 credits. Please note that students with Ontario Grade 12 credit or its equivalent in French are not normally admitted into FREN*1090, FREN*1100 or FREN*1150. Francophone students usually start the program with second-year courses conditional upon approval by the Faculty Advisor. Students who are exempt from FREN*1200 and/or FREN*1300 will need to substitute higher level French course(s) in order to complete the required number of credits for their program. Under certain circumstances, 0.50 credits from other courses offered in the School of Languages and Literatures which contain material related to French Studies may be counted. Please see the faculty advisor for French Studies for more information. Students majoring in French are advised to take elective courses in another Romance language and in Latin.

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

Area of Concentration (General Program)

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

| FREN*1200 | [0.50] | French Language I |
|-------------------|---------------|--------------------------------|
| FREN*1300 | [0.50] | French Language II |
| FREN*2020 | [0.50] | France: Literature and Society |
| FREN*2060 | [0.50] | Quebec: Literature and Society |
| FREN*2520 | [0.50] | French Composition I |
| 2.50 additional c | redits in Fre | nch |

Major (Honours Program)

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

| | | e i | |
|-----------------------------------------|--------|--------------------------------|--|
| FREN*1200 | [0.50] | French Language I | |
| FREN*1300 | [0.50] | French Language II | |
| FREN*2020 | [0.50] | France: Literature and Society | |
| FREN*2060 | [0.50] | Quebec: Literature and Society | |
| FREN*2520 | [0.50] | French Composition I | |
| at least 1.50 credits at the 4000 level | | | |
| 4.00 additional credits in French | | | |

Minor (Honours Program)

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

| FREN*1200 | [0.50] | French Language I |
|--------------------|----------------|--------------------------------|
| FREN*1300 | [0.50] | French Language II |
| FREN*2020 | [0.50] | France: Literature and Society |
| FREN*2060 | [0.50] | Quebec: Literature and Society |
| FREN*2520 | [0.50] | French Composition I |
| 2.50 additional of | credits in Fre | ench |

Notes:

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

Studies in Quebec or Abroad

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

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, Environment and Geomatics, College of Social and Applied Human Sciences

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

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

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

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

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

Area of Concentration (General Program)

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

| I I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII | o ereans m | Geography is required, merading. |
|----------------------------------------|------------|----------------------------------------------|
| GEOG*1200 | [0.50] | Society and Space |
| GEOG*1220 | [0.50] | Human Impact on the Environment |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| Two of: | | |
| GEOG*2000 | [0.50] | Geomorphology |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| GEOG*2230 | [0.50] | Commodity Chains and Cultures of Consumption |
| GEOG*2260 | [0.50] | Applied Human Geography |
| One of: | | |
| GEOG*2460 | [0.50] | Analysis in Geography |
| GEOG*2480 | [0.50] | Mapping and GIS |
| 2.00 credits at the | 3000 level | or above |
| | | |

Major (Honours Program)

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

| GEOG*1200 | [0.50] | Society and Space |
|------------|----------|----------------------------------------------|
| GEOG*1220 | [0.50] | Human Impact on the Environment |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| GEOG*2000 | [0.50] | Geomorphology |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| GEOG*2230 | [0.50] | Commodity Chains and Cultures of Consumption |
| 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 |
| 2 00 111.1 | 1. · · · | |

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

Minor (Honours Program)

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

| GEOG*1200 | [0.50] | Society and Space |
|-----------|--------|---------------------------------------------|
| GEOG*1220 | [0.50] | Human Impact on the Environment |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| Two of: | | |
| GEOG*2000 | [0.50] | Geomorphology |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*2210 | [0.50] | Environment and Resources |

| GEOG*2230 | [0.50] | Commodity Chains and Cultures of Consumption |
|---------------------|--------------|---------------------------------------------------------|
| One of: | | |
| GEOG*2260 | [0.50] | Applied Human Geography |
| GEOG*2460 | [0.50] | Analysis in Geography |
| GEOG*2480 | [0.50] | Mapping and GIS |
| 2.50 credits in Geo | graphy at th | e 3000 or 4000 level, 0.50 of which must be at the 4000 |
| level | | |

German (GERM)

School of Languages and Literatures, College of Arts

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

Study Abroad

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

Minor (Honours Program)

A minimum of 5.00 credits in German is required from the following courses:

| GERM*1100 | [0.50] | Introductory German I | | | |
|-------------------------------------------------------------------------------------|------------|-----------------------------------------|--|--|--|
| GERM*1110 | [0.50] | Introductory German II | | | |
| GERM*2010 | [0.50] | Intermediate Language Practice | | | |
| GERM*2490 | [0.50] | Intermediate German | | | |
| GERM*3000 | [0.50] | Narratives of Migration | | | |
| GERM*3020 | [0.50] | Myth and Fairy Tales in Germany | | | |
| GERM*3150 | [0.50] | Interactive German Language and Culture | | | |
| GERM*3470 | [0.50] | Holocaust & WWII in German Lit. & Film | | | |
| GERM*3600 | [0.50] | Directed Readings in German Studies | | | |
| GERM*3700 | [0.50] | Experiential Learning and Language | | | |
| GERM*4940 | [0.50] | Research Paper in German Studies | | | |
| Upon passing both the German designation and its Humanities co-requisites, students | | | | | |
| may count HUMN*3000, HUMN*3020 and HUMN*3470 toward the German minor. | | | | | |
| Students may also | count 0.50 |) credit toward the German minor from: | | | |
| ARTH*2950 | [0.50] | Baroque Art | | | |
| HIST*3350 | [0.50] | Modern Germany | | | |
| HUMN*1030 | [0.50] | What Makes a Literary Classic? | | | |
| LING*1000 | [0.50] | Introduction to Linguistics | | | |
| PHIL*3100 | [0.50] | Kant and His Legacy | | | |
| PHIL*3360 | [0.50] | Nineteenth Century Philosophy | | | |
| Students enrolled in the German program must contact the School of Languages and | | | | | |
| Literatures for an up-to-date sequence of course offerings. | | | | | |

History (HIST)

Department of History, College of Arts

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

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

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

Core Requirements

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

While not required to do so, students are advised to take both HIST*2100 and HIST*2600.

0.50 credits from each of a) Pre-Modern and b) Global. Course lists available in the Department of History and at:<u>http://www.uoguelph.ca/history/</u>.

Area of Concentration (General Program)

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

| a. | HIST*1050 | [0.50] | Invitation to History |
|------|-------------------------|-------------|-------------------------------------------------|
| | HIST*2450 | [0.50] | The Practising Historian |
| b. (| One of: | | |
| | HIST*1010 | [0.50] | Early Modern Europe |
| | HIST*1150 | [0.50] | The Modern World |
| | HIST*1250 | [0.50] | Science and Technology in a Global Context |
| с. а | at least 1.50 credits i | n History n | nust be at the 3000 level (excluding HIST*3470) |

2.00 additional credits in History

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

Major (Honours Program)

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

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

While not required to do so, students are advised to take both HIST*2100 and HIST*2600. 0.50 credits from each of a) Pre-Modern and b) Global. Course lists available in the Department of History and at:<u>http://www.uoguelph.ca/history/</u>.

5.50 additional credits in History including 2.00 at the 4000 level

Minor (Honours Program)

| A minimum | of 5.00 | credits in | n History is | required | including |
|-----------|---------|------------|--------------|----------|-----------|
| | | | | | |

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

While not required to do so, students are advised to take both HIST*2100 and HIST*2600. 0.50 credits from each of a) Pre-Modern and b) Global. Course lists available in the Department of History and at:<u>http://www.uoguelph.ca/history/</u>.

2.00 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*4050.

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

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

Human Resources (HR)

Department of Management, Gordon S. Lang School of Business and Economics

The Minor in Human Resources focuses on developing the broad set of knowledge and skills expected of human resources professionals. The courses are unique, varied and relevant to student who are interested in pursuing careers in business, management, psychology, industrial relations, law or other related fields.

In addition to the general overview, students develop the following nine competency areas:

- Human Resource Management
- Organizational Behaviour
- Finance and Accounting
- Human Resources Planning
- · Occupational Health and Safety
- Training and Development
- Labour Relations
- Recruitment and Selection

Compensation

The courses in the Minor in HR satisfy the course requirements for the Certified Human Resources Leader ("CHRL") designation.

Minor (Honours Program)

| A minimum of 5.00 credits is required, including: | | | |
|---------------------------------------------------|--------|-----------------------------------------|--|
| ACCT*1220 | [0.50] | Introductory Financial Accounting | |
| ACCT*2230 | [0.50] | Management Accounting | |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations | |
| HROB*2200 | [0.50] | Labour Relations | |
| HROB*2290 | [0.50] | Human Resources Management | |
| 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 Resource Planning | |
| ~ | | | |

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.

International Development Studies (IDS)

Interdisciplinary Program

International Development Studies, College of Social and Applied Human Sciences

The program in International Development Studies (IDS) explores the nature and impacts of economic and social development, in Canada and across the globe, from an interdisciplinary perspective. It equips students with the theoretical understanding and analytical and practical skills needed to bring about positive and inclusive change in the world. Students completing a degree in IDS have the skills to tackle complex global problems as needed to promote social justice as citizens and in careers across the public and private sectors and in civil society organizations.

The IDS program provides students with the opportunity to engage with international development practitioners in Canada and internationally. Furthermore, they are equipped with the skills needed for effective engagement whilst as students and in their life beyond university.

Students select an area of emphasis that enables them to explore an issue of particular interest using the skills they develop in the core part of the program. This area of emphasis is selected by the end of the 4th academic semester of study.

International Development Studies students are encouraged to learn another language and to participate in relevant learning experiences beyond the IDS program, including study, work or volunteering in Canada and internationally. In addition to the required core courses and the chosen area of emphasis, students are encouraged to take electives that complement their degree and enhance their analytical and communication skills. See the <u>GIDS website</u> for more information on these opportunities and students can get more information from their academic advisor.

Students with a minimum cumulative average of 80% in courses that constitute the IDS major may complete a thesis (IDEV*4190 and IDEV*4150) under the supervision of an ID-affiliated faculty member.

Major (Honours Program)

A minimum of 10.50 credits is required, including:

8.00 core course requirements

2.50 credits in one of four areas of emphasis

Core Requirements - 8.00 credits

| ECON*1050 | [0.50] | Introductory Microeconomics | |
|-----------|--------|-------------------------------------------------------|--|
| ECON*1100 | [0.50] | Introductory Macroeconomics | |
| IDEV*1000 | [0.50] | Understanding Development and Global Inequalities | |
| IDEV*2000 | [0.50] | The Development Landscape: Actors and Institutions | |
| IDEV*2100 | [0.50] | Research in International Development | |
| IDEV*2300 | [0.50] | Theoretical Perspectives on Development | |
| IDEV*2400 | [0.50] | Development, Social Justice and Human Rights | |
| IDEV*3000 | [0.50] | Poverty and Inequality | |
| IDEV*3100 | [0.50] | Achieving Sustainable Development | |
| IDEV*3300 | [0.50] | Engaging in Development Practice | |
| IDEV*3400 | [0.50] | Managing and Evaluating Change in Development | |
| IDEV*4000 | [1.00] | Development in Action | |
| IDEV*4600 | [0.50] | Advocating and Effecting Change in Development Policy | |
| | | and Practice | |
| Two of: | | | |
| ECON*2650 | [0.50] | Introductory Development Economics | |
| GEOG*3050 | [0.50] | Development and the City | |
| POLS*3320 | [0.50] | Politics of Aid & Development | |

- POLS*3790 [0.50] International Political Economy
- SOAN*3680 [0.50] Perspectives on Development

Areas of Emphasis - 2.50 credits

Choose one of the following four Area of Emphasis:

Agriculture and Food Security

Development in the Canadian Context

Development in Fragile Contexts

Environment and Sustainable Development

Agriculture and Food Security

This area of emphasis focuses on the nature of food security from the local to global levels. It explores the role of agriculture and the wider agri-food system in promoting food security towards the eradication of hunger and improved nutrition and health. Throughout, this area of emphasis reflects critically on the role of diverse actors and alternative approaches through which food security can be enhanced, empowering students to bring about positive, inclusive and sustainable change in agri-food systems locally and globally.

| AGR*2150 | [0.50] | Plant Agriculture for International Development |
|---------------------|--------------|-----------------------------------------------------|
| FARE*1300 | [0.50] | Poverty, Food & Hunger |
| 1.50 credits from t | he following | g: |
| AGR*2500 | [0.50] | Field Course in International Agriculture |
| ANTH*4550 | [0.50] | Topics in the Anthropology of Health |
| ENVS*2130 | [0.50] | Eating Sustainably in Ontario |
| FARE*3250 | [0.50] | Food and International Development |
| FARE*4210 | [0.50] | World Agriculture, Food Security and Economic |
| | | Development |
| GEOG*3320 | [0.50] | Food Systems: Issues in Security and Sustainability |
| HIST*3240 | [0.50] | Food History |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I |
| IDEV*4150 | [0.50] | Thesis in International Development Studies II |
| SOC*4420 | [0.50] | Sociology of Food |
| | ~ | ~ |

Development in the Canadian Context

This area focuses on development predominantly through the case of Canada. Issues that might be explored include: poverty, global migration, inequality, Indigenous-settler relations and food insecurity. It reflects the fact that development problems are found in all parts of the world and solutions to them must recognize the ways in which they are interconnected and distinctive. This area of emphasis aims to empower students to bring about positive, inclusive and sustainable change within Canada, and the rest of the affluent world.

| ANTH*2660 | [0.50] | Contemporary Indigenous Peoples in Canada | | |
|----------------------------------|--------|-------------------------------------------|--|--|
| POLS*2300 | [0.50] | Canadian Government and Politics | | |
| 1.50 credits from the following: | | | | |

| GEOG*2510 | [0.50] | Canada: A Regional Synthesis |
|-----------|--------|--------------------------------------------------|
| HIST*2090 | [0.50] | Indigenous Peoples of the Americas |
| HIST*3390 | [0.50] | Governments and Indigenous Spaces |
| HIST*3660 | [0.50] | Canadian Social History |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I |
| IDEV*4150 | [0.50] | Thesis in International Development Studies II |
| POLS*3140 | [0.50] | Canadian Charter of Rights and Freedoms |
| SOAN*4210 | [0.50] | Indigenous-Settler Relations in Canadian Society |
| SOAN*4220 | [0.50] | Gender and Change in Rural Canada |
| SOAN*4260 | [0.50] | Migration, Inequality and Social Change |
| | | |

Development in Fragile Contexts

This area focuses on development in the context of institutionally weak and/or unstable countries and regions. It explores issues associated with state fragility and failure, institutional development, post-conflict rebuilding and social insecurity. It also considers issues of migration, conflict, social change, and post colonialism. An overarching theme is the need for, and role of, distinct development strategies in fragile contexts, with the aim of empowering students to bring about positive, inclusive and sustainable change in some of the most challenging development contexts globally.

| POLS*3490 | [0.50] | Conflict and Conflict Resolution |
|-------------------|--------------|------------------------------------------------|
| One of: | | |
| POLS*2100 | [0.50] | Comparative Politics |
| POLS*2200 | [0.50] | International Relations |
| 1.50 credits from | the followin | g: |
| ANTH*4440 | [0.50] | Culture, Rights and Development |
| HIST*3270 | [0.50] | Revolution in the Modern World |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I |
| IDEV*4150 | [0.50] | Thesis in International Development Studies II |
| POLS*3000 | [0.50] | Politics of Africa |
| POLS*3060 | [0.50] | Politics of the Middle East and North Africa |
| POLS*3080 | [0.50] | Politics of Latin America |
| POLS*4340 | [1.00] | Nationalism, State-building and Identity |
| SOAN*3130 | [0.50] | Protest, Resistance, and Collective Action |
| SOAN*4260 | [0.50] | Migration, Inequality and Social Change |

Environment and Sustainable Development

This area of emphasis focuses on the relations between environmental change and natural resources and sustainable development. It explores the ways in which the environment and natural resources impact development, and the development challenges posed by environmental change and natural resource use locally and globally. Topics might include urbanization, erosion, natural disasters, water, natural resource, land use and climate change. Particular focus is put on approaches to development that are sustainable and address challenges associated with environmental change and natural resource use. This area of emphasis aims to empower students to bring about positive change that promotes inclusive and sustainable development locally and globally.

| GEOG*2030 | [0.50] | Environment and Development |
|-------------------|-----------------|----------------------------------------------------|
| SOC*2280 | [0.50] | Society and Environment |
| 1.50 credits from | n the followi | ng: |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| ENVS*2120 | [0.50] | Introduction to Environmental Stewardship |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| GEOG*3020 | [0.50] | Global Environmental Change |
| GEOG*3090 | [0.50] | Gender and Environment |
| HIST*3460 | [0.50] | Natural Disasters in Global History |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I |
| IDEV*4150 | [0.50] | Thesis in International Development Studies II |
| POLS*3370 | [0.50] | Environmental Politics and Governance |
| SOAN*4250 | [0.50] | Energy and Society |
| Area of Conce | ntration (| General Program) |
| A minimum of 5.00 | 0 credits is re | equired, including: |
| ECON*1050 | [0.50] I | introductory Microeconomics |
| ECON*1100 | [0.50] I | introductory Macroeconomics |
| IDEV*1000 | [0.50] U | Understanding Development and Global Inequalities |
| IDEV*2000 | [0.50] | The Development Landscape: Actors and Institutions |
| IDEV*2300 | [0.50] | Theoretical Perspectives on Development |
| Two of: | | |
| IDEV*2400 | [0.50] | Development, Social Justice and Human Rights |
| IDEV*3000 | [0.50] | Poverty and Inequality |
| IDEV*3100 | [0.50] | Achieving Sustainable Development |
| IDEV*3400 | [0.50] | Managing and Evaluating Change in Development |
| IDEV*4600 | [0.50] | Advocating and Effecting Change in Development |
| | | Policy and Practice |
| One of: | | |
| ECON*2650 | [0.50] | Introductory Development Economics |
| GEOG*3050 | [0.50] | Development and the City |
| POLS*3320 | [0.50] | Politics of Aid & Development |
| POLS*3790 | [0.50] | International Political Economy |
| SOAN*3680 | [0.50] | Perspectives on Development |

A minimum of 1.00 credits taken from any of the four areas of emphasis of the Major, at least 0.50 being at the 3000 or 4000 levels.

Minor (Honours Program)

| A minimum of 5.00 credits is required, including: | | | |
|---------------------------------------------------|---------------|-------------------------------------------------------------|--|
| ECON*1050 | [0.50] | Introductory Microeconomics | |
| ECON*1100 | [0.50] | Introductory Macroeconomics | |
| IDEV*1000 | [0.50] | Understanding Development and Global Inequalities | |
| IDEV*2000 | [0.50] | The Development Landscape: Actors and Institutions | |
| IDEV*2300 | [0.50] | Theoretical Perspectives on Development | |
| Two of: | | | |
| IDEV*2400 | [0.50] | Development, Social Justice and Human Rights | |
| IDEV*3000 | [0.50] | Poverty and Inequality | |
| IDEV*3100 | [0.50] | Achieving Sustainable Development | |
| IDEV*3400 | [0.50] | Managing and Evaluating Change in Development | |
| IDEV*4600 | [0.50] | Advocating and Effecting Change in Development | |
| | | Policy and Practice | |
| One of: | | | |
| ECON*2650 | [0.50] | Introductory Development Economics | |
| GEOG*3050 | [0.50] | Development and the City | |
| POLS*3320 | [0.50] | Politics of Aid & Development | |
| POLS*3790 | [0.50] | International Political Economy | |
| SOAN*3680 | [0.50] | Perspectives on Development | |
| A minimum of 1.0 | 0 credits tal | ken from any of the four areas of emphasis of the Major, at | |
| least 0.50 being at | the 3000 or | 4000 levels. | |

International Development Studies (Co-op) (IDS:C)

Interdisciplinary Program

International Development Studies, College of Social and Applied Human Sciences

The program in International Development Studies (IDS) explores the nature and impacts of economic and social development, in Canada and across the globe, from an interdisciplinary perspective. It equips students with the theoretical understanding and analytical and practical skills needed to bring about positive and inclusive change in the world. Students completing a degree in IDS have the skills to tackle complex global problems as needed to promote social justice as citizens and in careers across the public and private sectors and in civil society organizations.

The IDS program provides students with the opportunity to engage with international development practitioners in Canada and internationally. Furthermore, they are equipped with the skills needed for effective engagement whilst as students and in their life beyond university.

Students select an area of emphasis that enables them to explore an issue of particular interest using the skills they develop in the core part of the program. This area of emphasis is selected by the end of the 4th academic semester of study.

International Development Studies students are encouraged to learn another language and to participate in relevant learning experiences beyond the IDS program, including study, work or volunteering in Canada and internationally. In addition to the required core courses and the chosen area of emphasis, students are encouraged to take electives that complement their degree and enhance their analytical and communication skills. See the GIDS website for more information on these opportunities or talk to your academic advisor.

Students with a minimum cumulative average of 80% in courses that constitute the IDS major may complete a thesis (IDEV*4100 and IDEV*4150) under the supervision of an ID-affiliated faculty member.

Program Requirements

The Co-op program in International Development is a four and a half year program, including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Internati | onal Development Academ | nc and Co-op Work Term S | Schedule |
|-----------|----------------------------------|----------------------------|---------------------------|
| Year | Fall | Winter | Summer |
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | Academic Semester 6 |
| 4 | Academic Semester 7 | COOP*3000 Work Term III | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |
| | | | |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

- 8.00 Required Core Courses
- 2.50 Credits in one of four areas of emphasis
- 9.50 Electives
- 1.50 Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00

The recommended program sequence is outlined below.

Major (Honours Program)

A minimum of 10.50 credits is required, including:

8.00 core course requirements

2.50 credits in one of four areas of emphasis

Agriculture and Food (Area of Emphasis)

ANTH*4550

ENVS*2130

FARE*3250

[0.50]

[0.50]

[0.50]

| Semester 1 - Fall | | |
|---------------------------|---------------|-------------------------------------------------------|
| ECON*1050 | [0.50] | Introductory Microeconomics |
| DEV*1000 | [0.50] | Understanding Development and Global Inequalities |
| 1.50 electives or r | estricted ele | ectives |
| Semester 2 - Win | ter | |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| FARE*1300 | [0.50] | Poverty, Food & Hunger |
| 1.50 electives or r | estricted ele | ectives |
| Summer Semeste | r | |
| No academic sem | ester or wor | k term. |
| Semester 3 - Fall | | |
| AGR*2150 | [0 50] | Plant Agriculture for International Development |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| DEV*2000 | [0.00] | The Development Landscape: Actors and Institutions |
| DEV 2000 | [0.50] | Research in International Development |
| DL V 2100 | estricted ele | Actives |
| Semester 4 - Win | ter | |
| DEV*2300 | [0 50] | Theoretical Perspectives on Development |
| DEV*2300 | [0.50] | Development Social Justice and Human Rights |
| 50 electives or r | estricted ele | bevelopment, Social Justice and Human Rights |
| Summer Semeste | r | |
| COOD*1000 | IO 501 | Co. on Work Term I |
| Fall Somester | [0.50] | co-op work term r |
| | [0.50] | Co. on Work Tome II |
| COOP*2000 | [0.50] | Co-op work term II |
| Semester 5 - win | ter | |
| DEV*3100 | [0.50] | Achieving Sustainable Development |
| 2.00 electives or r | estricted ele | ectives |
| semester 6 - Sum | imer | |
| DEV*3300 | [0.50] | Engaging in Development Practice |
| DEV*3400 | [0.50] | Managing and Evaluating Change in Development |
| 1.50 electives or r | estricted ele | ectives |
| Semester 7 - Fall | | |
| DEV*3000 | [0.50] | Poverty and Inequality |
| 2.00 electives or r | estricted ele | ectives |
| Winter Semester | | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Summer Semeste | r | |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| Semester 8 - Fall | | |
| DEV*4000 | [1.00] | Development in Action |
| DEV*4600 | [0.50] | Advocating and Effecting Change in Development Policy |
| | . , | and Practice |
| 1.00 electives or r | estricted ele | octives |
| Restricted Electiv | ves | |
| 1.00 credits from | the followin | g (core): |
| FCON*2650 | [0 50] | Introductory Development Economics |
| GEOG*3050 | [0.50] | Development and the City |
| POI \$*3320 | [0.50] | Politics of Aid & Development |
| POLS*3790 | [0.50] | International Political Economy |
| SOAN*3680 | [0.50] | Perspectives on Development |
| 50 credits from | the followin | or (Area of Emphasis): |
| AGR*2500 | [0 50] | Field Course in International Agriculture |
| 101 4JUU | 10.501 | I ICIG COULSE IN INCENTATIONAL ASTICULTURE |

Topics in the Anthropology of Health

Food and International Development

Eating Sustainably in Ontario

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| FARE*4210 | [0.50] | World Agriculture, Food Security and Economic | 1.50 electives or r | estricted ele | ectives |
|-----------------------|-------------------------|-------------------------------------------------------|---------------------|---------------|------------|
| GEOG*3320 | [0 50] | Food Systems: Issues in Security and Sustainability | ECON*1100 | ICI 501 | Turkura |
| HIST*3240 | [0.50] | Food History | ECON*1100 | [U.SU] | Intro |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I | 2.00 electives of f | surficted ele | ectives |
| IDEV*4150 | [0.50] | Thesis in International Development Studies I | Summer Semeste | ar . | |
| SOC*4420 | [0.50] | Sociology of Food | No academic sem | ester or wor | rk tern |
| Development in | the Cana | adian Context (Area of Emphasis) | Semester 3 - Fall | | |
| Somostor 1 - Fall | | ······ | COOP*1100 | [0.00] | Intro |
| ECON*1050 | [0.50] | Introductory Micrococonomics | IDEV*2000 | [0.50] | The |
| ECON*1050 | [0.50] | Introductory Microeconomics | IDEV*2100 | [0.50] | Rese |
| DEV ⁺ 1000 | [U.JU] estricted ele | Olderstanding Development and Global mequalities | 1.50 electives or r | estricted ele | ectives |
| Semester 2 - Wint | fer | clives | Semester 4 - Win | ter | |
| ECON*1100 | IO 501 | Introductory Macrosconomics | IDEV*2300 | [0.50] | Theo |
| ECON*1100 | [U.50] | Introductory Macroeconomics | IDEV*2400 | [0.50] | Deve |
| 2.00 electives of re | r | cuves | 1.50 electives or r | estricted ele | ectives |
| Summer Semeste | 1 , | 1.4 | Summer Semeste | r | |
| No academic seme | ester or wor | k term. | COOP*1000 | [0.50] | Co-c |
| Semester 3 - Fall | | | Fall Semester | | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | COOP*2000 | [0.50] | Co-c |
| IDEV*2000 | [0.50] | The Development Landscape: Actors and Institutions | Semester 5 - Win | ter | |
| IDEV*2100 | [0.50] | Research in International Development | IDEV*3100 | [0.50] | Ach |
| POLS*2300 | [0.50] | Canadian Government and Politics | 2.00 electives or r | estricted ele | ectives |
| 1.00 electives or re | estricted ele | ctives | Semester 6 - Sun | imer | |
| Semester 4 - Wint | ter | | IDEV*3300 | [0.50] | Eng |
| ANTH*2660 | [0.50] | Contemporary Indigenous Peoples in Canada | IDEV*3400 | [0.50] | Man |
| IDEV*2300 | [0.50] | Theoretical Perspectives on Development | 1.50 electives or r | estricted ele | ectives |
| IDEV*2400 | [0.50] | Development, Social Justice and Human Rights | Semester 7 - Fall | | |
| 1.00 electives or re | estricted ele | ctives | IDEV*3000 | [0.50] | Pov |
| Summer Semeste | r | | POLS*3490 | [0.50] | Con |
| COOP*1000 | [0.50] | Co-op Work Term I | 1.50 electives or r | estricted ele | ectives |
| Fall Semester | | | Winter Semester | | |
| COOP*2000 | [0.50] | Co-op Work Term II | COOP*3000 | [0 50] | Co-(|
| Semester 5 - Wint | ter | 1 | Summer Semeste | [0.50] | 0-0 |
| IDEV*3100 | [0 50] | Achieving Sustainable Development | | 1 501 | C - |
| 2.00 electives or re | estricted ele | actives | COOP*4000 | [0.50] | C0-0 |
| Semester 6 - Sum | mer | | Semester o - ran | F1 003 | |
| IDEV*3300 | [0 50] | Engaging in Development Practice | IDEV*4000 | [1.00] | Deve |
| IDEV*3400 | [0.50] | Managing and Evaluating Change in Development | IDEV*4600 | [0.50] | Adv |
| 1 50 electives or re | stricted ele | interactives | 1.00 1 | | and |
| Semester 7 - Fall | Surreted ere | | 1.00 electives of F | | ectives |
| IDEV*3000 | [0 50] | Poverty and Inequality | Kestricted Electr | | , |
| 2 00 electives or re | estricted ele | roverty and mequality | 1.00 credits from | he followin | ng (coi |
| Winter Semester | Surreted ere | | ECON*2650 | [0.50] | In |
| | [0 50] | Co. on Work Term III | GEOG*3050 | [0.50] | D |
| Summer Semeste | [0.50] r | co-op work renn m | POLS*3320 | [0.50] | P |
| COOD*4000 | I IO 501 | Co. on Work Torne W | POLS*3790 | [0.50] | lr |
| COOP*4000 | [0.50] | Co-op work term iv | SOAN*3680 | [0.50] | P |
| Semester 8 - Fall | | | One of: | | |
| IDEV*4000 | [1.00] | Development in Action | POLS*2100 | [0.50] | C |
| IDEV*4600 | [0.50] | Advocating and Effecting Change in Development Policy | POLS*2200 | [0.50] | Ir |
| 1 00 1 | | and Practice | 1.50 credits from | the following | ng (Ar |
| 1.00 electives of re | estricted ele | ctives | ANTH*4440 | [0.50] | C |
| Restricted Electiv | es | | HIST*3270 | [0.50] | R |
| 1.00 credits from t | he followin | g (core): | IDEV*4100 | [0.50] | Т |
| ECON*2650 | [0.50] | Introductory Development Economics | IDEV*4150 | [0.50] | Т |
| GEOG*3050 | [0.50] | Development and the City | POLS*3000 | [0.50] | Р |
| POLS*3320 | [0.50] | Politics of Aid & Development | POLS*3060 | [0.50] | Р |
| POLS*3790 | [0.50] | International Political Economy | POLS*3080 | [0.50] | Р |
| SOAN*3680 | [0.50] | Perspectives on Development | POLS*4340 | [1.00] | N |
| 1.50 credits from t | he followin | g (Area of Emphasis): | SOAN*3130 | [0.50] | P |
| GEOG*2510 | [0.50] | Canada: A Regional Synthesis | SOAN*4260 | [0.50] | N |
| HIST*2090 | [0.50] | Indigenous Peoples of the Americas | Environment a | nd Sustai | nable |
| HIST*3390 | [0.50] | Governments and Indigenous Spaces | Semester 1 - Fall | | |
| HIST*3660 | [0.50] | Canadian Social History | ECON*1050 | [0.50] | Intro |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I | IDEV*1000 | [0.50] | Und |
| IDEV*4150 | [0.50] | Thesis in International Development Studies II | 1.50 electives or r | estricted ele | ectives |
| POLS*3140 | [0.50] | Canadian Charter of Rights and Freedoms | Semester 2 - Win | ter | |
| SOAN*4210 | [0.50] | Indigenous-Settler Relations in Canadian Society | FCON*1100 | [0 50] | Intro |
| SOAN*4220 | [0.50] | Gender and Change in Rural Canada | 2.00 electives or n | estricted el | ectives |
| SOAN*4260 | [0.50] | Migration, Inequality and Social Change | Summer Semeste | r | |
| Development in | Fragile (| Contexts (Area of Emphasis) | No acadomia arm | - | rk tom |
| Semester 1 - Fall | 2 | • | no academic sem | ster or woi | ı k tern |
| ECON*1050 | [0 50] | Introductory Microeconomics | Semester 3 - Fall | | |
| IDEV*1000 | [0.50] | Understanding Development and Global Inequalities | COOP*1100 | [0.00] | Intro |
| 1000 | [0.50] | enserstanding bevelopment and Giobal mequanties | GEOG*2030 | [0.50] | Envi |

| ON*1100 | [0.50] | Introductory Macroeconomics |
|------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0 electives or re | stricted ele | ctives |
| mmer Semester | r | |
| academic seme | ster or wor | k term. |
| mester 3 - Fall | | |
| OOP*1100 | [0.00] | Introduction to Co-operative Education |
| EV*2000 | [0.50] | The Development Landscape: Actors and Institutions |
| EV*2100 | [0.50] | Research in International Development |
| mostor 4 - Wint | stricted ele | cuves |
| | IO 501 | Theoretical Descretives on Development |
| EV*2300 EV*2400 | [0.50] | Development Social Justice and Human Pights |
| 0 electives or re | stricted ele | ctives |
| mmer Semester | r | |
| OP*1000 | [0.50] | Co-op Work Term I |
| ll Semester | [0.00] | er of the second s |
| OOP*2000 | [0.50] | Co-op Work Term II |
| mester 5 - Wint | er | |
| EV*3100 | [0.50] | Achieving Sustainable Development |
| 0 electives or re | stricted ele | ctives |
| mester 6 - Sum | mer | |
| EV*3300 | [0.50] | Engaging in Development Practice |
| EV*3400 | [0.50] | Managing and Evaluating Change in Development |
| 0 electives or re | stricted ele | ctives |
| mester 7 - Fall | | |
| EV*3000 | [0.50] | Poverty and Inequality |
| LS*3490 | [0.50] | Conflict and Conflict Resolution |
| 0 electives of re | stricted ele | ctives |
| op*2000 | 10 501 | Color Words Towns III |
| DOP*3000 mmor Somostor | [0.50] | Co-op work term III |
| DD*4000 | I IO 501 | Co on Work Town IV |
| DOP*4000 mester 8 - Fall | [0.30] | Co-op work term iv |
| | [1.00] | Development in Action |
| EV*4000 EV*4600 | [1.00] | Advocating and Effecting Change in Development Policy |
| L1 4000 | [0.50] | and Practice |
| 0 electives or re | stricted ele | ctives |
| stricted Electiv | es | |
| 0 credits from the | he followin | g (core): |
| ECON*2650 | [0.50] | Introductory Development Economics |
| GEOG*3050 | [0.50] | Development and the City |
| POLS*3320 | [0.50] | Politics of Aid & Development |
| POLS*3790 | [0.50] | International Political Economy |
| SOAN*3680 | [0.50] | Perspectives on Development |
| e of: | | |
| POLS*2100 | [0.50] | Comparative Politics |
| POLS*2200 | [0.50] | International Relations |
| | | g (Area of Emphasis): |
| ANIH*4440 | [0.50] | Culture, Rights and Development |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I |
| IDEV*4150 | [0.50] | Thesis in International Development Studies I |
| POLS*3000 | [0.50] | Politics of Africa |
| POLS*3060 | [0.50] | Politics of the Middle East and North Africa |
| POLS*3080 | [0.50] | Politics of Latin America |
| POLS*4340 | [1.00] | Nationalism, State-building and Identity |
| SOAN*3130 | [0.50] | Protest, Resistance, and Collective Action |
| SOAN*4260 | [0.50] | Migration, Inequality and Social Change |
| wironment ar | id Sustaii | table Development (Area of Emphasis) |
| mester 1 - Fall | | |
| CON*1050 | [0.50] | Introductory Microeconomics |
| EV*1000 | [0.50] | Understanding Development and Global Inequalities |
| mester 2 - Wint | stricted ele | cuves |
| VON*1100 | IO 501 | Introductory Magroaconomics |
| ONTITUU 0 electives or re | [U.JU] stricted ala | ctives |
| mmer Semester | r | |
| academic seme | ster or wor | k term. |
| mester 3 - Fall | | |
| OP*1100 | [0 00] | Introduction to Co-operative Education |
| EOG*2030 | [0.50] | Environment and Development |
| 2030 | [0.50] | La a similar una Development |
| | | Last Revision: July 4, 2019 |
| | | |

| IDEV*2000 | [0.50] | The Development Landscape: Actors and Institutions | | |
|------------------------|----------------|-------------------------------------------------------|--|--|
| IDEV*2100 | [0.50] | Research in International Development | | |
| SOC*2280 | [0.50] | Society and Environment | | |
| 0.50 electives or re | estricted ele | ctives | | |
| Semester 4 - Wint | ter | | | |
| IDEV*2300 | [0.50] | Theoretical Perspectives on Development | | |
| IDEV*2400 | [0.50] | Development, Social Justice and Human Rights | | |
| 1.50 electives or re | estricted ele | ctives | | |
| Summer Semeste | r | | | |
| COOP*1000 | [0.50] | Co-op Work Term I | | |
| Fall Semester | | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | | |
| Semester 5 - Wint | ter | L | | |
| IDEV*3100 | [0.50] | Achieving Sustainable Development | | |
| 2.00 electives or re | estricted ele | ctives | | |
| Semester 6 - Sum | mer | | | |
| IDEV*3300 | [0 50] | Engaging in Development Practice | | |
| IDEV*3400 | [0.50] | Managing and Evaluating Change in Development | | |
| 1 50 electives or re | estricted ele | ctives | | |
| Semester 7 - Fall | | | | |
| IDEV*3000 | [0 50] | Poverty and Inequality | | |
| 2 00 electives or re | stricted ele | ctives | | |
| Winter Semester | Surfected cite | | | |
| COOP*3000 | [0 50] | Co-on Work Term III | | |
| Summer Semester | r | | | |
| COOP*/000 | 10 501 | Co-on Work Term IV | | |
| Semester 8 - Fall | [0.50] | | | |
| IDEV*4000 | [1.00] | Development in Action | | |
| IDEV*4600 | [0.50] | Advocating and Effecting Change in Development Policy | | |
| IDEV 1000 | [0.50] | and Practice | | |
| 1 00 electives or re | estricted ele | ctives | | |
| Restricted Electives | | | | |
| 1 00 credits from t | he followin | g (core): | | |
| ECON*2650 | 10 501 | Introductory Development Economics | | |
| GEOG*3050 | [0.50] | Development and the City | | |
| DOI \$*3320 | [0.50] | Politics of Aid & Development | | |
| POL \$*3790 | [0.50] | International Political Economy | | |
| SOAN*3680 | [0.50] | Perspectives on Development | | |
| 1 50 credits from t | he followin | g (Area of Emphasis): | | |
| ECON*2100 | 10 501 | Economic Crowth and Environmental Quality | | |
| ECON 2100 ENVS*2120 | [0.50] | Introduction to Environmental Stewardship | | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics | | |
| GEOG*3020 | [0.50] | Global Environmental Change | | |
| GEOG*3090 | [0.50] | Gender and Environment | | |
| HIST*3460 | [0.50] | Natural Disasters in Global History | | |
| IDEV*4100 | [0.50] | Thesis in International Development Studies I | | |

| POLS*3370 |
|----------------|
| SOAN*4250 |
| Italian (ITAL) |

IDEV*4150

School of Languages and Literatures, College of Arts

[0.50]

[0.50]

[0.50]

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

Energy and Society

Thesis in International Development Studies II

Environmental Politics and Governance

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)

| | C | | | |
|---------------------------------------------------|--------|-------------------------------------|--|--|
| A minimum of 5.00 credits is required, including: | | | | |
| HUMN*2020 | [0.50] | The Criminal Mind in Italian Cinema | | |
| ITAL*1060 | [0.50] | Introductory Italian I | | |
| ITAL*1070 | [0.50] | Introductory Italian II | | |

| | HIST*3750 | [0.50] | The Reformation |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | HUMN*1030 | [0.50] | What Makes a Literary Classic? |
| ent | HUMN*3000 | [0.50] | Narratives of Migration |
| | LAT*1100 | [0.50] | Preliminary Latin I |
| | LAT*1110 | [0.50] | Preliminary Latin II |
| | LAT*2000 | [0.50] | Latin Literature |
| | LING*1000 | [0.50] | Introduction to Linguistics |
| | PHIL*2140 | [0.50] | Ancient Greek Philosophy |
| | PHIL*3060 | [0.50] | Medieval Philosophy |
| | Marketing (| MKTG) | |
| | Department of M and Economics | Marketing a | nd Consumer Studies, Gordon S. Lang School of Business |
| The minor in Marketing is designed for students who wish to better understand of marketing and potentially integrate this with their primary field of study. Th develops a core knowledge of contemporary theory and principles of mar consumer behaviour of particular relevance to the non-specialist. Note: th Marketing is not open to students enrolled in the Marketing Management n Bachelor of Commerce degree. | | | signed for students who wish to better understand the subject integrate this with their primary field of study. The program of contemporary theory and principles of marketing and ticular relevance to the non-specialist. Note: the minor in idents enrolled in the Marketing Management major in the ee. |
| | Minor (Hone | ours Prog | gram) |
| | A minimum of 5 | .00 credits i | s required, including: |
| | ECON*1050 | [0.50] | Introductory Microeconomics |
| | HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| | MCS*1000 | [0.50] | Introductory Marketing |
| | MCS*2600 | [0.50] | Fundamentals of Consumer Behaviour |
| y | MCS*3000 | [0.50] | Advanced Marketing |
| | PSYC*1000 | [0.50] | Introduction to Psychology |

ITAL*2090

ITAL*3060

ITAL*3400

ITAL*3700

ITAL*4900

ARTH*2550

ARTH*2950

ARTH*3150

ARTH*3320

ARTH*3340

CLAS*1000

CLAS*2000

HIST*2200

HIST*2850

1.00 Credits from: ARTH*2540

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

Intermediate Italian

Renaissance Lovers and Fools

Experiential Learning and Language

Research Project in Italian Studies

Space: Roman Art and Urbanism

Introduction to Classical Culture

Studies in Renaissance and Baroque Art

Lives: Aspects of Western Art

Advanced Italian

Medieval Art

Baroque Art

The Italian Renaissance

Classical Mythology

The Medieval World

Ancient Greece and Rome

Restricted Electives 2.00 restricted Electives:

| 2.00 Testricted E | lectives. | |
|-------------------|-----------|------------------------------------------------|
| ECON*2740 | [0.50] | Economic Statistics |
| MCS*3010 | [0.50] | Quality Management |
| MCS*3030 | [0.50] | Research Methods |
| MCS*3500 | [0.50] | Marketing Analytics |
| MCS*3600 | [0.50] | Consumer Information Processes |
| MCS*3620 | [0.50] | Marketing Communications |
| MCS*4040 | [0.50] | Management in Product Development |
| MCS*4300 | [0.50] | Marketing and Society |
| MCS*4400 | [0.50] | Pricing Management |
| MCS*4600 | [0.50] | International Marketing |
| PSYC*1010 | [0.50] | Making Sense of Data in Psychological Research |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| | | |

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

Mathematical Economics (MAEC)

Department of Economics and Finance, Gordon S. Lang School of Business and Economics

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

Major (Honours Program)

Semester 1

| CIS*1500 ECON*1050 MATH*1200 1.00 electives Semester 2 | [0.50] [0.50] [0.50] | Introduction to Programming Introductory Microeconomics Calculus I |
|--------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------------|
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| MATH*1210 | [0.50] | Calculus II |

Last Revision: July 4, 2019

| 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 r | estricted ele | ctives* |
| Semester 5 | | |
| ECON*3710 | [0.50] | Advanced Microeconomics |
| 2.00 electives or r | estricted ele | ctives* |
| Semester 6 | | |
| ECON*3100 | [0.50] | Game Theory |
| ECON*3810 | [0.50] | Advanced Macroeconomics |
| 1.50 electives or r | estricted ele | ctives* |
| Semester 7 | | |
| ECON*4640 | [0.50] | Advanced Econometrics |
| ECON*4710 | [0.50] | Advanced Topics in Microeconomics |
| ECON*4700 | [0.50] | Advanced Mathematical Economics |
| 1.00 electives or r | estricted ele | ctives* |
| Semester 8 | | |
| ECON*4810 | [0.50] | Advanced Topics in Macroeconomics |
| One of: | | |
| ECON*4840 | [0.50] | Financial Econometrics |
| 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 Ec | onomics at t | he 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, Gordon S. Lang School of Business and Economics

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

Program Requirements

The Co-op program in Mathematical Economics is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Mathematica | l Economics | Academic | and | Co-op | Work | Term | Schedule |
|-------------|-------------|----------|-----|-------|------|------|----------|
|-------------|-------------|----------|-----|-------|------|------|----------|

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

13.00 - Required Core Courses

1.50 - Humanities credits from at least two subject areas (BA distribution requirement)

0.50 - Social Science credit outside of ECON (BA distribution requirement)

5.00 – Electives 2.00 - Co-op Work Te

2.00 - Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 22.50

The recommended program sequence is outlined below.

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 [0.50] Co-op Work Term I Fall COOP*2000 [0.50] 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 [0.50] Co-op Work Term III Semester 6 - Fall ECON*3710 [0.50] Advanced Microeconomics 2.00 electives or restricted electives* Winter COOP*4000 [0.50] Co-op Work Term IV Spring/Summer COOP*5000 [0.50] Co-op Work Term V Semester 7 - Fall ECON*4640 [0.50] Advanced Econometrics 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] **Financial Econometrics** MATH*3200 [0.50] Real Analysis STAT*4080 Data Analysis [0.50] STAT*4340 [0.50] Statistical Inference STAT*4350 [0.50] Applied Multivariate Statistical Methods STAT*4360 [0.50] Applied Time Series Analysis

0.50 credits at the 4000 level Economics

1.00 electives

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

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

Mathematical Science (MSCI)

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

Major (Honours Program)

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

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

Note: Students majoring in Mathematical Science cannot minor in Mathematics or Statistics.

Semester 1

| MATH*1160 | [0.50] | Linear Algebra I |
|--------------------|-------------------|---------------------------------------------------------------|
| MATH*1200 | [0.50] | Calculus I |
| 1.50 credits selec | ted from the | College of Arts and the College of Social and Applied |
| Note:MATH*109 | " 80 or IPS*15 | 00 can be taken in place of MATH*1200 |
| Semester 2 | 50 01 11 5 15 | to can be taken in place of WATTI 1200 |
| MATH*1210 | [0.50] | Calculus II |
| STAT*2040 | [0.50] | Statistics I |
| 1.50 electives** | (PHIL*2110 | is recommended) |
| Note: MATH*10 | 90 or IPS*15 | 10 can be taken in place of MATH*1210 |
| Semester 3 | | |
| MATH*2200 | [0.50] | Advanced Calculus I |
| STAT*3100 | [0.50] | Introductory Mathematical Statistics I |
| One of: | | |
| CIS*1300 | [0.50] | Programming |
| CIS*1500 | [0.50] | Introduction to Programming |
| 1.00 electives or | restricted ele | ctives |
| Semester 4 | | |
| MATH*2130 | [0.50] | Numerical Methods |
| STAT*2050 | [0.50] | Statistics II |
| 1.50 electives or | restricted ele | ctives (CIS*2500 is recommended) |
| Semester 5 | | |
| 2.50 electives or | restricted ele | ctives |
| Semester 6 | | |
| 2.50 electives or | restricted ele | ctives |
| Semester 7 | | |
| 2.50 electives or | restricted ele | ctives |
| Semester 8 | | |
| MATH*4440 | [0.50] | Case Studies in Mathematics and Statistics |
| 2.00 electives or | restricted ele | ctives |
| *These courses s | hould be cho | sen from the list of Semester 1 requirements as listed in the |
| Program Regulat | ions for the H | BA. |
| **Students are re | eminded that | they must meet the BA distribution requirements of 1.50 |
| credits in the hun | nanities and | 1.50 credits in the social sciences. |
| Students are requ | ired to comp | lete 5.50 credits from either the Mathematics Stream or the |
| Statistics Stream | as follows: | |
| Mathematics St | ream | |
| MATH*2000 | [0.50] | Proofs Sets and Numbers |

| MATH*2000 | [0.50] | Proofs, Sets, and Numbers | | |
|------------------------------------------------------------------------------------|--------|--------------------------------|--|--|
| MATH*2210 | [0.50] | Advanced Calculus II | | |
| MATH*2270 | [0.50] | Applied Differential Equations | | |
| MATH*3160 | [0.50] | Linear Algebra II | | |
| MATH*3200 | [0.50] | Real Analysis | | |
| 3.00 additional credits in MATH or STAT at 3000 level or above of which at least 1 | | | | |
| credits must be MATH at the 4000 level | | | | |

Statistics Stream

| STAT*3110 | [0.50] | Introductory Mathematical Statistics II | | |
|----------------------------------------------------------------|---------------|-----------------------------------------|--|--|
| STAT*3240 | [0.50] | Applied Regression Analysis | | |
| 0.50 additional | credits in MA | TH at 2000 level or above | | |
| 1.00 additional gradits in MATH or STAT at 2000 level or shows | | | | |

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

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

Areas of Emphasis

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

Each Area of Emphasis is 2.50 credits from a single field of study.

COMPUTER SCIENCE (CS)***

| The following of | credits must b | be taken: | |
|---------------------------------------------|----------------|-------------------------------------------------------|--|
| CIS*2430 | [0.50] | Object Oriented Programming | |
| CIS*2500 | [0.50] | Intermediate Programming | |
| CIS*2520 | [0.50] | Data Structures | |
| at least 1.00 cre | edits from: | | |
| CIS*3110 | [0.50] | Operating Systems I | |
| CIS*3190 | [0.50] | Software for Legacy Systems | |
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms | |
| CIS*3530 | [0.50] | Data Base Systems and Concepts | |
| Note: CIS*275 | 0 is recomme | nded in addition to the Area of Emphasis requirements | |
| for students interested in Computer Science | | | |

ECONOMICS (ECON)***

| The following credits must be taken: | | | | |
|--------------------------------------|--------|-----------------------------------|--|--|
| ECON*1050 | [0.50] | Introductory Microeconomics | | |
| ECON*1100 | [0.50] | Introductory Macroeconomics | | |
| ECON*2310 | [0.50] | Intermediate Microeconomics | | |
| at least 1.00 credits from: | | | | |
| ECON*3100 | [0.50] | Game Theory | | |
| ECON*3710 | [0.50] | Advanced Microeconomics | | |
| ECON*4710 | [0.50] | Advanced Topics in Microeconomics | | |
| | | | | |

INDIVIDUALIZED (IND)***

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

Students declaring an Individualized Area of Emphasis must have their choice of 2.50 credits approved by an academic advisor.

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

Mathematics (MATH)

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

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

Area of Concentration (General Program)

A minimum of 5.00 Mathematics credits is required, including:

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

Minor (Honours Program)

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

(MATH*1080 or MATH*1200)*

(MATH*1090 or MATH*1210)**

| MATH*1160 | [0.50] | Linear Algebra I |
|-------------------|--------------------|-------------------------------------|
| MATH*2000 | [0.50] | Proofs, Sets, and Numbers |
| MATH*2200 | [0.50] | Advanced Calculus I |
| STAT*2040 | [0.50] | Statistics I |
|).50 additional N | Mathematics | credits at the 2000 level or above. |
| | | |

1.50 additional Mathematics credits at the 3000 or 4000 level

* IPS*1500 can count toward this 0.50 credit

** IPS*1510 can count toward this 0.50 credit

Note: Students majoring in Mathematical Science cannot minor in Mathematics.

Media & Cinema Studies (MCST)

College of Arts

.50

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

Minor (Honours Program)

| A minimum of 5.00 credits is required, include | ing: |
|------------------------------------------------|------|
|------------------------------------------------|------|

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

At least 0.50 credits from Media Studies: THST*2450 Approaches to Media Studies [0.50] THST*2650 History of Communication [0.50] At least 0.50 credits from Cinema Studies: EURO*1100 [0.50] European Cinema HIST*3260 [0.50] Cinema and the Moving Image THST*2500 [0.50] Contemporary Cinema THST*3530 [0.50] Canadian Cinema At least 0.50 credits from Computing and Information Science: CIS*1200 [0.50] Introduction to Computing CIS*1500 [0.50] Introduction to Programming 2.50 additional credits from: ARTH*2290 [0.50] History of Photographic Media CIS*1200 [0.50] Introduction to Computing CIS*1500 [0.50] Introduction to Programming CIS*2170 User Interface Design [0.75] EURO*1100 [0.50] European Cinema HIST*2020 [0.50]Film as History HIST*3260 [0.50] Cinema and the Moving Image HIST*4170 Exploration of Digital Humanities [1.00] HUMN*2020 [0.50] The Criminal Mind in Italian Cinema HUMN*3190 [0.50] Experiential Learning Holocaust & WWII in German Lit. & Film HUMN*3470 [0.50] HUMN*4190 [0.50] **Experiential Learning** MUSC*2100 [0.50] Creating Music on the Computer MUSC*2150 [0.50]Music and Popular Culture MUSC*2220 Electronica: Music in the Digital Age [0.50] MUSC*2380 [0.50] Classical Music from Concert Hall to Cinema SART*1150 [0.50] Contemporary Artistic Practice SART*2610 [0.50] Photography I SART*2700 [0.50] Digital Media I: Using Vector and Raster Images SART*2710 [0.50] Digital Media II: Animation SART*3750 [0.50] Photography II Digital Media III: Creating Content for the Web SART*3480 [0.50] THST*1040 [0.50] Introduction to Performance THST*2450 [0.50] Approaches to Media Studies THST*2500 [0.50] Contemporary Cinema THST*2650 History of Communication [0.50] THST*3530 [0.50] Canadian Cinema

At least 1.00 credits must be at 3000 level or higher

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

Museum Studies (MS)

School of Fine Art and Music, College of Arts

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

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

Minor (Honours Program)

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

A minimum of 5.00 credits is required, including:

| • | ARTH*1510 | [0.50] | Art Historical Studies I |
|------------------------------------------------------------|-----------|--------|-------------------------------------------|
| | ARTH*1520 | [0.50] | Art Historical Studies II |
| | ARTH*2120 | [0.50] | Introduction to Museology |
| | ARTH*2480 | [0.50] | Introduction to Art Theory and Criticism |
| | ARTH*3330 | [0.50] | Display: Visual Culture in Western Europe |
| | ARTH*3620 | [0.50] | Museum Studies |
| 2.00 additional credits in Art History | | | |
| | | | |

Music (MUSC)

School of Fine Art and Music, College of Arts

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

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

Applied Music

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

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

Core Requirements

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

| MUSC*1060 | [0.50] | Amadeus to Zeppelin: Music and Culture I |
|---------------|-------------|--------------------------------------------------------|
| MUSC*1180 | [0.50] | Musicianship I |
| MUSC*2100 | [0.50] | Creating Music on the Computer |
| MUSC*2140 | [0.50] | History of Jazz |
| MUSC*2150 | [0.50] | Music and Popular Culture |
| MUSC*2180 | [0.50] | Musicianship II |
| MUSC*2270 | [0.50] | World Music |
| MUSC*2330 | [0.50] | Beethoven to Broadway: Music and Culture II |
| MUSC*2660 | [0.50] | Materials of Music I |
| MUSC*3010 | [0.50] | Materials of Music II |
| MUSC*3630 | [0.50] | Tragedy, Technology, and Torture: Music Post 1900 |
| Notes MUSC#11 | 20 deas not | count toward aithoutha Maion (Hangung) Minon (Hangung) |

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*3010 (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*4460 and MUSC*4470) or MUSC*4450
- d. 2.00 additional credits of upper-level topics courses (MUSC*3730, MUSC*3740, MUSC*3800, MUSC*3820, MUSC*3860, MUSC*3880)

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

Music majors are advised to take MUSC*1180 in Fall Year 1, followed by MUSC*2180 in Winter Year 1.

Minor (Honours Program)

A minimum of 5.00 Music credits is required, including:

| MUSC*1060 | [0.50] | Amadeus to Zeppelin: Music and Culture I |
|-----------|--------|------------------------------------------|
| MUSC*1180 | [0.50] | Musicianship I |
| | | |

| One | of: |
|-----|-------|
| 00 | · · · |

| . 01. | | |
|-----------|--------|---------------------------------------|
| MUSC*2030 | [0.50] | Music in Canada |
| 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*2220 | [0.50] | Electronica: Music in the Digital Age |
| MUSC*2270 | [0.50] | World Music |
| | | |

At least 1.50 Music credits at the 3000 or 4000 level

Note: Students should be aware that courses at the 3000 or 4000 level may require additional prerequisites.

2.00 additional credits in Music

Philosophy (PHIL)

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

Our programs are designed to educate students about philosophical discussions of central questions in ethics, political philosophy, theory of knowledge, metaphysics and philosophy of science, among other areas. This includes learning the history of these subjects as well as understanding current debates. In gaining this knowledge students develop crucial skills of articulation, critical thinking, intellectual independence and the ability to understand others' viewpoints and assumptions. It is important that students discuss their programs with a Faculty Advisor (https://www.uoguelph.ca/uaic/facultyadvisors-ba) 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, PHIL*1030 and PHIL*1050 but only two may be counted towards the minimum number of Philosophy courses required for a degree.

Area of Concentration (General Program)

| 5.00 Philosophy cr | edits are re | quired, as follows: |
|--------------------|--------------|--------------------------------------|
| PHIL*2240 | [0.50] | Knowledge and Belief |
| PHIL*2370 | [0.50] | Metaphysics and Mind |
| One of: | | |
| PHIL*2120 | [0.50] | Ethics |
| PHIL*2280 | [0.50] | Key Concepts in Political Philosophy |
| One of: | | |
| PHIL*2100 | [0.50] | Critical Thinking |
| PHIL*2110 | [0.50] | Formal Logic |
| 1.50 IV. 1 DI 1 | 1 | |

1.50 credits in Philosophy

Note: Students may only count 1.00 credits at the 1000 level towards this requirement. 1.50 credits in Philosophy at the 3000 level or higher. PSYC*3280 may be used as a 3000 level Philosophy course.

Major (Honours Program)

8.50 Philosophy credits are required, as follows

| PHIL*2120 | [0.50] | Ethics |
|-----------|--------|------------------------------------------------|
| PHIL*2140 | [0.50] | Ancient Greek Philosophy |
| PHIL*2160 | [0.50] | Early Modern Philosophy: Reason vs. Experience |
| PHIL*2280 | [0.50] | Key Concepts in Political Philosophy |
| PHIL*2370 | [0.50] | Metaphysics and Mind |
| PHIL*3100 | [0.50] | Kant and His Legacy |
| PHIL*4820 | [0.50] | Philosophy Research Presentation |
| One of: | | |
| PHIL*2100 | [0.50] | Critical Thinking |
| PHIL*2110 | [0.50] | Formal Logic |
| One of: | | |
| PHIL*2180 | [0.50] | Philosophy of Science |
| PHIL*2240 | [0.50] | Knowledge and Belief |
| | | |

1.50 credits in Philosophy

Note: Students may only count 1.00 credits at the 1000 level towards this requirement. 1.50 credits in Philosophy at the 3000 level or higher. PSYC*3280 may be used as a 3000 level Philosophy course.

1.00 credits in Philosophy at the 4000 level

Minor (Honours Program)

| 5.00 Philosophy credits are required, as follows: | | | |
|---------------------------------------------------|--------|--------------------------------------|--|
| PHIL*2240 | [0.50] | Knowledge and Belief | |
| PHIL*2370 | [0.50] | Metaphysics and Mind | |
| One of: | | | |
| PHIL*2120 | [0.50] | Ethics | |
| PHIL*2280 | [0.50] | Key Concepts in Political Philosophy | |
| One of: | | | |
| PHIL*2100 | [0.50] | Critical Thinking | |
| PHIL*2110 | [0.50] | Formal Logic | |
| 1.00 credits in Philosophy | | | |

2.00 credits in Philosophy at the 3000 level or higher. PSYC*3280 may be used as a 3000 level Philosophy course.

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*2650 and POLS*3650. Students in the honours program minor are required to take POLS*2650.

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

Core Requirements

| POLS*1150 | [0.50] | Understanding Politics | |
|-----------------------------------------|--------|------------------------------------------|--|
| POLS*2300 | [0.50] | Canadian Government and Politics | |
| One of: | | | |
| PHIL*2280 | [0.50] | Key Concepts in Political Philosophy | |
| POLS*2000 | [0.50] | Political Theory | |
| One of: | | | |
| POLS*2080 | [0.50] | Development and Underdevelopment | |
| POLS*2100 | [0.50] | Comparative Politics | |
| POLS*2200 | [0.50] | International Relations | |
| One of: | | | |
| POLS*2150 | [0.50] | Gender and Politics | |
| POLS*2250 | [0.50] | Public Administration and Governance | |
| POLS*2350 | [0.50] | Law from a Political Science Perspective | |
| Area of Concentration (General Program) | | | |

A minimum of 5.00 credits is required, including:

| Traininani of 5100 eredits is required, incruding. | | | |
|----------------------------------------------------|----------------|----------------------------------------------------|--|
| POLS*1150 | [0.50] | Understanding Politics | |
| POLS*2300 | [0.50] | Canadian Government and Politics | |
| One of: | | | |
| PHIL*2280 | [0.50] | Key Concepts in Political Philosophy | |
| POLS*2000 | [0.50] | Political Theory | |
| One of: | | | |
| POLS*2080 | [0.50] | Development and Underdevelopment | |
| POLS*2100 | [0.50] | Comparative Politics | |
| POLS*2200 | [0.50] | International Relations | |
| One of: | | | |
| POLS*2150 | [0.50] | Gender and Politics | |
| POLS*2250 | [0.50] | Public Administration and Governance | |
| POLS*2350 | [0.50] | Law from a Political Science Perspective | |
| 2.50 additional cr | edits, at leas | t 1.50 of which must be at the 3000 level or above | |
| Major (Hono | urs Prog | ram) | |
| A minimum of 9. | 00 credits is | required, including: | |

| [0.50] | Understanding Politics |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [0.50] | Canadian Government and Politics |
| [0.50] | Political Inquiry and Research Methods |
| [0.50] | Quantitative Methods of Data Analysis |
| | |
| [0.50] | Key Concepts in Political Philosophy |
| [0.50] | Political Theory |
| | |
| [0.50] | Development and Underdevelopment |
| [0.50] | Comparative Politics |
| [0.50] | International Relations |
| | |
| [0.50] | Gender and Politics |
| [0.50] | Public Administration and Governance |
| [0.50] | Law from a Political Science Perspective |
| | $\begin{matrix} [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \end{matrix}$ |

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

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

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

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

| POLS*4050 | [1.00] | Advanced Topics in Law and Politics |
|-----------|--------|------------------------------------------|
| POLS*4070 | [1.00] | Courts and Parliament |
| POLS*4100 | [1.00] | Women, Justice and Public Policy |
| POLS*4140 | [1.00] | Conceptions of Canada |
| POLS*4160 | [1.00] | Multi-Level Governance in Canada |
| POLS*4200 | [1.00] | International Political Economy |
| POLS*4250 | [1.00] | Topics in Public Management |
| POLS*4260 | [1.00] | Topics in Public Policy |
| POLS*4300 | [1.00] | Human Rights, Ethics, and Development |
| POLS*4340 | [1.00] | Nationalism, State-building and Identity |
| POLS*4710 | [1.00] | Topics in Comparative Politics |
| POLS*4720 | [1.00] | Topics in International Relations |

| POLS*4730 | [1.00] | International Relations of the Middle East |
|-------------------|-----------------|---------------------------------------------|
| POLS*4740 | [1.00] | Advanced Topics in Rights and Liberties |
| POLS*4900 | [1.00] | Special Topics Seminar in Political Science |
| an additional 2.5 | 50 credits from | n courses in Political Science. |

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

Minor (Honours Program)

A minimum of 5.00 credits is required, including:

| POLS*1150 | [0.50] | Understanding Politics | |
|------------------------------------------------------------|--------|------------------------------------------|--|
| POLS*2300 | [0.50] | Canadian Government and Politics | |
| POL S*2650 | [0.50] | Political Inquiry and Research Methods | |
| One of: | [0.50] | rondear inquiry and research methods | |
| PHIL*2280 | [0.50] | Key Concepts in Political Philosophy | |
| POLS*2000 | [0.50] | Political Theory | |
| One of: | | - | |
| POLS*2080 | [0.50] | Development and Underdevelopment | |
| POLS*2100 | [0.50] | Comparative Politics | |
| POLS*2200 | [0.50] | International Relations | |
| One of: | | | |
| POLS*2150 | [0.50] | Gender and Politics | |
| POLS*2250 | [0.50] | Public Administration and Governance | |
| POLS*2350 | [0.50] | Law from a Political Science Perspective | |
| 1.00 credits from Political Science at 3000-level or above | | | |

1.00 additional credits from courses in Political Science

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

Political Thought

| POLS*3230 | [0.50] | Modern Political Thought |
|------------------------|---------------|------------------------------------------------------------|
| POLS*3710 | [0.50] | Politics and Sexuality |
| Canadian Poli | tics | |
| HIST*3160 | [0.50] | Canadian Political History |
| POLS*3050 | [0.50] | Canadian Campaigns & Elections |
| POLS*3140 | [0.50] | Canadian Charter of Rights and Freedoms |
| 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 , | Governa | nce and Law |
| POLS*3130 | [0.50] | Law, Politics and Judicial Process |
| POLS*3140 | [0.50] | Canadian Charter of Rights and Freedoms |
| POLS*3210 | [0.50] | The Constitution and Canadian Federalism |
| POLS*3250 | [0.50] | Public Policy: Challenges and Prospects |
| POLS*3300 | [0.50] | Governing Criminal Justice |
| POLS*3370 | [0.50] | Environmental Politics and Governance |
| POLS*3440 | [0.50] | Corruption, Scandal and Political Ethics |
| POLS*3470 | [0.50] | Business-Government Relations in Canada |
| POLS*3670 | [0.50] | Comparative Public Policy and Administration |
| Comparative | Politics | |
| POLS*3000 | [0.50] | Politics of Africa |
| POLS*3060 | [0.50] | Politics of the Middle East and North Africa |
| POLS*3080 | [0.50] | Politics of Latin America |
| POLS*3160 | [0.50] | Global Gender Justice |
| 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] | Politics of China |
| International | Relation | s and Global Studies |
| POLS*3160 | [0.50] | Global Gender Justice |
| POLS*3320 | [0.50] | Politics of Aid & Development |
| POLS*3490 | [0.50] | Conflict and Conflict Resolution |
| POLS*3790 | [0.50] | International Political Economy |
| The Department of | f Political S | cience offers an academic advising service for students in |
| Political Science. | | |

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

Political Science (Co-op) (POLS:C)

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.

Program Requirements

The Co-op program in Political Science is a four and a half year program, including three work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Political Science Academic and Co-op Wo | ork Term Schedule |
|-----------------------------------------|-------------------|
|-----------------------------------------|-------------------|

| Year | Fall | Winter | Summer |
|------|----------------------------------|----------------------------|--------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | Academic Semester 6 |
| 4 | Academic Semester 7 | COOP*3000 Work Term III | Off |
| 5 | Academic Semester 8 | N/A | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

9.00 - Required Core Courses

- 1.50 Humanities credits from at least two areas (BA distribution requirement)
- 0.50 Social Science credit outside of POLS (BA distribution requirement)
- 1.00 Natural Science credits (BA distribution requirement)

8.00 - Electives

1.50 - Co-op Work Terms

Note: Three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement.

The recommended program sequence is outlined below.

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Major (Honours Program)
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Semester 1 - Fall

POLS*1150 Understanding Politics [0.50]

2.00 electives*

Semester 2 - Winter 2.50 electives*

Semester 3 or 4 - Fall or Winter

| COOP*1100 | [0.00] | Introduction to Co-operative Education |
|--------------------|--------------|---------------------------------------------------------------|
| POLS*2300 | [0.50] | Canadian Government and Politics |
| POLS*2650 | [0.50] | Political Inquiry and Research Methods |
| One of: | | |
| PHIL*2280 | [0.50 |)] Key Concepts in Political Philosophy |
| POLS*2000 | [0.50 | D] Political Theory |
| One of: | | |
| POLS*2080 | [0.50 |)] Development and Underdevelopment |
| POLS*2100 | [0.50 | 0] Comparative Politics |
| POLS*2200 | [0.50 | 0] International Relations |
| One of: | | |
| POLS*2150 | [0.50 |)] Gender and Politics |
| POLS*2250 | [0.50 |)] Public Administration and Governance |
| POLS*2350 | [0.50 |)] Law from a Political Science Perspective |
| 2.50 electives * | | |
| *Note: These may | include ele | ctives required to complete the Humanities, Social Science, |
| Natural and Mather | natical Scie | ence distribution requirements, or POLS restricted electives. |
| Summer Semes | ter | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Fall Semester | | |

| COOP*1000 | [0.50] | Co-op Work Term I |
|-------------------|----------------|---------------------------------------|
| Fall Semester | | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Semester 5 - W | /inter | |
| POLS*3650 | [0.50] | Quantitative Methods of Data Analysis |
| 1 50 POLS restric | rted electives | |

| 0.50 electiv | /es | 5 | |
|--------------|-----|---|--------|
| Semester | 6 | - | Summer |

| Two | of: |
|-----|-------|
| 10 | · · · |

0.50 1 ...

| 100 011 | | |
|-----------------------|------------|------------------------------------------|
| POLS*3130 | [0.50] | Law, Politics and Judicial Process |
| POLS*3140 | [0.50] | Canadian Charter of Rights and Freedoms |
| POLS*3320 | [0.50] | Politics of Aid & Development |
| POLS*3370 | [0.50] | Environmental Politics and Governance |
| POLS*3210*DE | [0.50] | The Constitution and Canadian Federalism |
| POLS*3300*DE | [0.50] | Governing Criminal Justice |
| 1.50 electives, which | may includ | e: |

[0.50]

POLS*3850 Experiential Learning in Political Science

POLS*3960 [0.50] Selected Topics in Political Science

Note: POLS*3850 and POLS*3960 are subject to faculty availability and departmental approval.

Semester 7 - Fall and Semester 8 - Fall

A minimum of 1.50 and a maximum of 2.00 credits of 4000-level POLS courses are required in semesters 7 and 8. At least 1.00 credits must come from either a 1.00 credit fourth-year seminar or the Honours Thesis sequence (POLS*4970 and POLS*4980).

Option A

1.50 POLS credits 4000-level 1.50 POLS electives 2.00 electives

Option B

2.00 POLS credits 4000-level 1.00 POLS electives 2.00 electives

Winter Semester

COOP*3000 [0.50] Co-op Work Term III

Summer Semester

No academic semester or work term.

Restricted Electives

1. At least 0.50 credits at the 3000 level in three of the five fields in the department (see field lists below).

Political Thought

| POLS*3230 | [0.50] | Modern Political Thought |
|-----------------------|-------------|----------------------------------------------|
| POLS*3710 | [0.50] | Politics and Sexuality |
| Canadian Polit | ics | 2 |
| HIST*3160 | [0 50] | Canadian Political History |
| POL S*3050 | [0.50] | Canadian Campaigns & Elections |
| POLS*3140 | [0.50] | Canadian Charter of Rights and Freedoms |
| 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, (| Fovernanc | e and Law |
| POI \$*3130 | [0 50] | I aw Politics and Indicial Process |
| POL \$*3140 | [0.50] | Canadian Charter of Rights and Freedoms |
| POL S*3210 | [0.50] | The Constitution and Canadian Federalism |
| POL S*3250 | [0.50] | Public Policy: Challenges and Prospects |
| POLS*3300 | [0.50] | Governing Criminal Justice |
| POLS*3370 | [0.50] | Environmental Politics and Governance |
| POLS*3440 | [0.50] | Corruption, Scandal and Political Ethics |
| POLS*3470 | [0.50] | Business-Government Relations in Canada |
| POLS*3670 | [0.50] | Comparative Public Policy and Administration |
| Comparative P | olitics | |
| POL \$*3000 | [0 50] | Politics of Africa |
| POL \$*3060 | [0.50] | Politics of the Middle East and North Africa |
| POLS*3080 | [0.50] | Politics of Latin America |
| POLS*3160 | [0.50] | Global Gender Justice |
| 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] | Politics of China |
| International R | Relations a | nd Global Studies |
| POLS*3160 | [0.50] | Global Gender Justice |
| POLS*3320 | [0.50] | Politics of Aid & Development |
| POLS*3490 | [0.50] | Conflict and Conflict Resolution |
| POLS*3790 | [0.50] | International Political Economy |
| | | • |
| | | |

2. 1.50 credits at the 4000 level, two of which must include either one course from the 1.00 credit-weighted research and writing intensive seminar courses or two courses which comprise the POLS*4970/POLS*4980 Honours Thesis sequence. A maximum of 2.00 credits at the 4000 level may be counted towards a major in Political Science.

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

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

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.

3. An additional 2.50 credits from courses in Political Science. Note: If 2.00 credits of 4000 level POLS courses are being completed then only an additional 2.00 credits from courses in Political Science are required.

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 and minor and a B.A. General program area of concentration, all of which are described below, as well as a B.A. Honours program Co-op major (PSYC:C).

Through its different undergraduate programs, the Psychology Department provides: a) a broad general education emphasizing psychological theory and methodology, with an empirical basis in course work (e. g., experiments and projects); b) an appropriate background in psychology for those who leave the University with an undergraduate degree to embark on careers in related areas; and c) a sound preparation for graduate study in Psychology. Students intending to apply to Psychology graduate programs, and those who want a structured, intensive research experience, may apply to enrol in the Honours Thesis courses (See Option B - Honours Thesis Stream). In addition, students intending to apply for admission to graduate programs in Psychology should note most graduate programs require the applicant to have at least an A- average in order to be considered for admission.

Note on Honours Courses

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

Advising Note

We advise students to take PSYC*1000 In their first semester and PSYC*1010 and PSYC*1500 in their second semester

The maximum number of PSYC credits students can take at each level is as follows:

- 1000 level courses: no cap
- 2000 level courses: 3.50 credits
- 3000 level courses: 3.50 credits 4000 level courses: 3.00 credits

Area of Concentration (General Program)

A total of 6.00 credits are required for the Psychology Area of Concentration. Year 1

| Students must som | alata 1 50 | anadita at the | 1000 laval : | Daviahalaari | including |
|-------------------|------------|----------------|---------------|--------------|------------|
| Students must com | piete 1.50 | credits at the | 1000 level in | Psychology, | including: |

| PSYC*1000 PSYC*1010 PSYC*1500 | [0.50] [0.50] [0.50] | Introduction to Psychology Making Sense of Data in Psychological Research Foundational Skills for Psychology |
|-------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------|
| Year 2 | [0.00] | |
| Students must com | plete 2.50 cr | edits at the 2000 level in Psychology, including: |
| PSYC*2070 | [0.50] | Teams, Leadership, and Professional Behaviour |
| PSYC*2360 | [0.50] | Psychological Methods and Statistics |
| One of: | | |

| PSYC*2330 | [0.50] | Principles of Learning |
|-----------|--------|----------------------------|
| PSYC*2390 | [0.50] | Sensation and Perception |
| PSYC*2410 | [0.50] | Behavioural Neuroscience I |
| PSYC*2650 | [0.50] | Cognitive Psychology |
| Two of: | | |
| PSYC*2020 | [0.50] | Abnormal Psychology |
| PSYC*2310 | [0.50] | Social Psychology |
| PSYC*2450 | [0.50] | Developmental Psychology |
| PSYC*2740 | [0.50] | Personality |
| | | |

Year 3

Students must complete 1.50 credits at the 3000 level in Psychology, including:

PSYC*3470 [0.50] Putting Psychology to Work

1.00 additional credit in PSYC at the 3000 level.

Finally, students are required to take an additional 0.50 credit in PSYC at the 2000 level or above.

Major (Honours Program)

A total of 9.00 credits are required for the Psychology major BAH.

Year 1

| Students must com | plete 1.50 ci | redits at the 1000 level in Psychology, including: |
|-------------------|---------------|----------------------------------------------------|
| PSYC*1000 | [0.50] | Introduction to Psychology |
| PSYC*1010 | [0.50] | Making Sense of Data in Psychological Research |
| PSYC*1500 | [0.50] | Foundational Skills for Psychology |
| Year 2 | | |
| Students must com | plete 3.00 cr | redits at the 2000 level in Psychology, including: |
| PSYC*2070 | [0.50] | Teams, Leadership, and Professional Behaviour |

| PSYC*2360 | [0.50] | Psychological Methods and Statistics |
|-----------|--------|--------------------------------------|
| Two of: | | |
| PSYC*2330 | [0.50] | Principles of Learning |
| PSYC*2390 | [0.50] | Sensation and Perception |
| PSYC*2410 | [0.50] | Behavioural Neuroscience I |
| PSYC*2650 | [0.50] | Cognitive Psychology |
| Two of: | | |
| PSYC*2020 | [0.50] | Abnormal Psychology |
| PSYC*2310 | [0.50] | Social Psychology |
| PSYC*2450 | [0.50] | Developmental Psychology |
| PSYC*2740 | [0.50] | Personality |
| | | |

OPTION A - HONOURS REGULAR STREAM

Year 3

Students must complete 3.00 credits at the 3000 level in Psychology, including:

PSYC*3000 [0.50] Historical and Critical Perspectives on Psychology

| 151C 5250 [0.50] 1 Sychological Measurement | PSYC*3250 | [0.50] | Psychological Measurement |
|---------------------------------------------|-----------|--------|---------------------------|
|---------------------------------------------|-----------|--------|---------------------------|

PSYC*3290 [0.50] Conducting Statistical Analyses in Psychology

1.50 additional credit in Psychology at 3000 level.

Year 4

Students must complete 1.50 credits at the 4000 level in Psychology, including

PSYC*4540 [1.00] Practical Applications of Psychology

0.50 additional credit in Psychology at 4000 level.

OPTION B – HONOURS THESIS STREAM

The Honours Thesis stream is recommended for students considering graduate work, as most graduate programs in Psychology expect that students will have completed an undergraduate thesis or equivalent. The two honours thesis courses (PSYC*4870 and 4880) are normally taken in a Fall-Winter sequence. Registration for these courses requires Department approval, which is normally granted to those students whose academic performance meets the minimum admission requirements of Psychology graduate programs. **Year 3**

Year :

Students must complete 2.50 credits at the 3000 level in Psychology, including:

| PSYC*3000 | [0.50] | Historical and Critical Perspectives on Psychology |
|-----------|--------|----------------------------------------------------|
| PSYC*3250 | [0 50] | Psychological Measurement |

| | | , , | | | |
|-------------------|---------------|----------------|---------------|----------------|---------|
| PSYC*3290 | [0.50] | Conducting | Statistical A | nalyses in Psy | chology |
| 1.0 additional cr | edit in Psych | nology at 3000 | level. | | |

Year 4

Students must complete 2.00 credits at the 4000 level in Psychology, comprised of:

PSYC*4780 [0.50] Advanced Research Methods and Statistics

PSYC*4870 [0.50] Honours Thesis I

PSYC*4880 [1.00] Honours Thesis II

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

Minor (Honours Program)

(May not be taken in combination with a Psychology Honours Major) A total of 5.00 credits are required for the Psychology Minor, including:

| PSYC*1000 | [0.50] | Introduction to Psychology |
|--------------------|--------------------|------------------------------------------------|
| PSYC*1010 | [0.50] | Making Sense of Data in Psychological Research |
| PSYC*2360 | [0.50] | Psychological Methods and Statistics |
| An additional 2.00 |) credits selected | ed from the following: |
| PSYC*2020 | [0.50] | Abnormal Psychology |
| PSYC*2310 | [0.50] | Social Psychology |
| PSYC*2330 | [0.50] | Principles of Learning |
| PSYC*2390 | [0.50] | Sensation and Perception |
| PSYC*2410 | [0.50] | Behavioural Neuroscience I |
| PSYC*2450 | [0.50] | Developmental Psychology |
| PSYC*2650 | [0.50] | Cognitive Psychology |
| PSYC*2740 | [0.50] | Personality |

An additional 1.50 credits at the 3000 level in Psychology.

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

Psychology (Co-op) (PSYC:C)

Department of Psychology, College of Social and Applied Human Sciences

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 and minor and a B.A. General program area of concentration, all of which are described below, as well as a B.A. Honours program Co-op major (PSYC:C).

Through its different undergraduate programs, the Psychology Department provides: a) a broad general education emphasizing psychological theory and methodology, with an empirical basis in course work (e. g., experiments and projects); b) an appropriate background in psychology for those who leave the University with an undergraduate degree to embark on careers in related areas; and c) a sound preparation for graduate study in Psychology.

Program Requirements

The Co-op program in Psychology is a four and a half year program, including three work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Psychology Academic and Co-op W | Vork Term Schedule |
|---------------------------------|--------------------|
| | |

| Year | Fall | Winter | Summer |
|------|---------------------------|----------------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | Academic Semester 8 |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

9.00 - Required Core Courses

- 1.50 Humanities credits from at least two areas (BA distribution requirement)
- 0.50 Social Science credit outside of PSYC (BA distribution requirement)
- 1.00 Natural Science credits (BA distribution requirement)
- 8.00 Electives
- 1.50 Co-op Work Terms

Note: Three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement.

The recommended program sequence is outlined below.

Major (Honours Program)

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

Note on Honours Courses

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

A total of 9.00 credits are required for the Psychology Co-op BAH. Students must complete 1.50 credits at the 1000 level and 3.00 credits at the 2000 level in Psychology. For those in the Honours Regular Stream, students must complete 3.00 credits at the 3000 level and 1.50 credits at the 4000 level in Psychology. For those in the Honours Thesis Stream, students must complete 2.50 credits at the 3000 level and 2.00 credits at the 4000 level in Psychology.

The maximum number of PSYC credits that students can take at each level is as follows:

1000 level courses: no cap

2000 level courses: 3.50 credits

3000 level courses: 3.50 credits

4000 level courses: 3.00 credits

Students wanting to move more quickly through the program are recommended to take two DE courses in the summer of their first year and/or one DE course during each work term. If they do so, the number of electives required in Semester 8 will depend on how many additional courses the student has taken throughout the program to meet the 20.00 credit requirement.

Graduate Studies Advisory Note: Most graduate programs require the student to have at least an A- average in order to be considered for admission. They also require students follow the Honours Thesis Stream. Students planning on applying to graduate school in Psychology will need to take the following courses in the semesters outlined below: PSYC*3250, PSYC*3290, PSYC*4780, PSYC*4870, and PSYC*4880.

Major (Honours Program)

A total of 9.00 credits are required for the Psychology major BAH.

Year 1

Semester 1 - Fall Students should complete: PSYC*1000 [0.50]Introduction to Psychology 2.00 additional credits Semester 2 - Winter Students should complete: COOP*1100 [0.00]Introduction to Co-operative Education PSYC*1010 [0.50] Making Sense of Data in Psychological Research PSYC*1500 [0.50] Foundational Skills for Psychology One of: PSYC*2390 [0.50] Sensation and Perception PSYC*2650 [0.50] Cognitive Psychology One of: PSYC*2020 [0.50] Abnormal Psychology PSYC*2740 [0.50] Personality 0.50 additional credits

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Summer Semester
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If students want to progress more quickly through the program or plan to apply to graduate school, they should complete: 1.00 PSYC credits at the 2000 level. If not taken in the summer semester, they must be completed by the end of semester 4.

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Year 2
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| Semester 3 - Fall | | |
|---------------------|---------------|-----------------------------------------------|
| Students should co | mplete: | |
| PSYC*2070 | [0.50] | Teams, Leadership, and Professional Behaviour |
| PSYC*2360 | [0.50] | Psychological Methods and Statistics |
| One of | | |
| PSYC*2330 | [0.50] | Principles of Learning |
| PSYC*2410 | [0.50] | Behavioural Neuroscience I |
| One of: | | |
| PSYC*2310 | [0.50] | Social Psychology |
| PSYC*2450 | [0.50] | Developmental Psychology |
| 0.50 additional | credits | |
| Winter Semester | | |
| COOP*1000 | [0.50] C | o-op Work Term I |
| Semester 4 - Sum | mer | |
| 0.50 credits in PSY | C at the 3000 | level |
| 2.00 additional cre | dits | |

OPTION A – HONOURS REGULAR STREAM

Year 3

Fall Semester COOP*2000 Co-op Work Term II [0.50] Semester 5 - Winter PSYC*3000 [0.50] Historical and Critical Perspectives on Psychology PSYC*3290 [0.50] Conducting Statistical Analyses in Psychology 1.00 additional credits in PSYC at the 3000 level 0.50 additional credits Summer Semester COOP*3000 [0.50] Co-op Work Term III Year 4 Semester 6 - Fall PSYC*3250 [0.50] Psychological Measurement 0.50 additional credits in PSYC at the 4000 level 1.50 additional credits Semester 7 - Winter PSYC*4540 [1.00] Practical Applications of Psychology 1.50 additional credits Semester 8 - Summer 2.50 credits **OPTION B – HONOURS THESIS STREAM** Year 3 Fall Semester COOP*2000 Co-op Work Term II [0.50] Semester 5 - Winter PSYC*3000 Historical and Critical Perspectives on Psychology [0.50]PSYC*3250 [0.50] Psychological Measurement PSYC*3290 [0.50] Conducting Statistical Analyses in Psychology 1.00 additional credits Summer Semester COOP*3000 [0.50] Co-op Work Term III Year 4 Semester 6 - Fall PSYC*4780 [0.50] Advanced Research Methods and Statistics PSYC*4870 [0.50] Honours Thesis I 0.50 additional credits in PSYC at the 3000 level 1.00 additional credits at the 3000 or 4000 level Semester 7 - Winter PSYC*4880 [1.00] Honours Thesis II 1.50 additional credits Semester 8 - Summer 2.50 credits Sociology (SOC)

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

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

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

| FRHD*3060 | [0.50] | |
|------------|--------|--|
| PHII *2180 | [0 50] | |

Principles of Social Gerontology 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 they wish to work. Please note, a student is allowed a total of 1.00 credits only for reading courses.

SOAN courses will be used towards the Sociology specializations.

Area of Concentration (General Program)

| A minimum of 5.00 credits in Sociology and Anthropology is required, including: | | | |
|---------------------------------------------------------------------------------|--------|------------------------------|--|
| ANTH*1150 | [0.50] | Introduction to Anthropology | |
| SOAN*2111/2 | [1.00] | Classical Theory | |
| SOAN*2120 | [0.50] | Introductory Methods | |

SOC*1100 [0.50] Sociology 2.50 additional credits in SOC and SOAN courses, including at least 1.00 credits at the 3000 level

Major (Honours Program)

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

| ANTH*1150 | [0.50] | Introduction to Anthropology | | |
|----------------------------------------------------------------------|--------------|------------------------------------------------------------|--|--|
| SOAN*2111/2 | [1.00] | Classical Theory | | |
| SOAN*2120 | [0.50] | Introductory Methods | | |
| SOAN*3070 | [0.50] | Qualitative and Observational Methods | | |
| SOAN*3120 | [0.50] | Quantitative Methods | | |
| SOC*1100 | [0.50] | Sociology | | |
| SOC*3310 | [0.50] | Contemporary Theory | | |
| 4.00 additional cr | edits in SO | C and SOAN courses, including at least 1.50 credits at the | | |
| 4000 level | | | | |
| The following co | urses may l | be used toward a sociology specialization: | | |
| FRHD*3060 | [0.50] | Principles of Social Gerontology | | |
| PHIL*2180 | [0.50] | Philosophy of Science | | |
| Minor (Honours Program) | | | | |
| A minimum of 5. | 00 credits i | n Sociology and Anthropology is required, including: | | |
| ANTH*1150 | [0.50] | Introduction to Anthropology | | |
| SOAN*2111/2 | [1.00] | Classical Theory | | |
| SOAN*2120 | [0.50] | Introductory Methods | | |
| SOC*1100 | [0.50] | Sociology | | |
| 2.50 additional cr | edits in SO | C and SOAN courses, including at least 1.00 credits at the | | |
| 3000 level or abo | ve | | | |
| The following courses may be used toward a sociology specialization: | | | | |
| FRHD*3060 | [0.50] | Principles of Social Gerontology | | |

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

Spanish and Hispanic Studies (SPAH)

School of Languages and Literatures, College of Arts

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

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

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

Study Abroad

The Spanish and Hispanic Studies program encourages its students to take advantage of the University of Guelph's exchange programs and the semester abroad opportunities. We offer exchange programs with the University of Málaga and the University of Alcalá de Henares in Spain the Instituto Tecnológico y de Estudios Superiores de Monterrey (ITESM) and the University of Guadalajara (with over 30 campuses) in Mexico and the University of San Andrés in Argentina. Students also enjoy the semester abroad opportunity every second winter in Guatemala. It is recommended that students go on exchange in their third year. In order to be eligible for an exchange, students should have completed at least SPAN*2010, SPAN*2090, SPAN*2040 and SPAN*3080. Credits successfully completed at the host university are applied towards University of Guelph degree requirements. Please see the International Study section of the undergraduate calendar and consult the Head of Spanish and Hispanic Studies for more information.

Area of Concentration (General Program)

A minimum of 5.00 credits in Spanish and Hispanic Studies is required, including: 2.00 credits from Group A:

| SPAN*2040 | [0 50] | Culture of Spain |
|----------------------|--------|---------------------------------------|
| SPAN*2990 | [0.50] | Hispanic Literary Studies |
| SPAN*3080 | [0.50] | Spanish American Culture |
| One of: | [0.50] | Spanish / merican Culture |
| SDA N*3220 | [0 50] | Literature and Arts I: Spain |
| 51 AN 5220 | [0.50] | Enterature and Arts I. Span |
| SPAN*3230 | [0.50] | Literature and Arts II: Latin America |
| 3.00 credits from Gr | oup B: | |
| SPAN*1100 | [0.50] | Introductory Spanish I |
| SPAN*1110 | [0.50] | Introductory Spanish II |
| SPAN*2000 | [0.50] | Intermediate Spanish I |
| SPAN*2010 | [0.50] | Intermediate Spanish II |
| SPAN*3210 | [0.50] | Topics in Hispanic Studies |
| SPAN*3230 | [0.50] | Literature and Arts II: Latin America |
| SPAN*3240 | [0.50] | Topics in Hispanic Linguistics |
| SPAN*3500 | [0.50] | Advanced Spanish I |

| SPAN*3700 | [0.50] | Experiential Learning and Language |
|-------------------|----------------|----------------------------------------------------|
| SPAN*3800 | [0.50] | Directed Readings in Hispanic Studies |
| SPAN*3810 | [0.50] | Directed Readings in Hispanic Studies |
| SPAN*4100 | [1.00] | Seminar in Hispanic Studies |
| SPAN*4410 | [1.00] | Senior Seminar on Latin American |
| SPAN*4420 | [1.00] | Senior Seminar on Spain or Africa |
| SPAN*4500 | [1.00] | Spanish Translation - Theory and Practice |
| SPAN*4840 | [1.00] | Research Paper in Hispanic Studies |
| A maximum of 0.50 |) credits from | n Group B may be substituted with courses from the |
| following: | | |
| ARTH*2050 | [0.50] | Modern Latin American Art |
| CLAS*2000 | [0.50] | Classical Mythology |
| ENGL*2040 | [0.50] | Latina/o Literature and Cultural Production: Intro |
| EURO*1100 | [0.50] | European Cinema |
| EURO*2200 | [0.50] | Towards European Modernism |
| EURO*3300 | [0.50] | Violence and Culture |
| HIST*2920 | [0.50] | Republican Latin America |
| HIST*3150 | [0.50] | History and Culture of Mexico |
| HIST*3230 | [0.50] | Spain and Portugal, 1085 to 1668 |
| HUMN*1030 | [0.50] | What Makes a Literary Classic? |
| HUMN*3000 | [0.50] | Narratives of Migration |
| LAT*1100 | [0.50] | Preliminary Latin I |
| LAT*1110 | [0.50] | Preliminary Latin II |
| LING*1000 | [0.50] | Introduction to Linguistics |
| LING*2400 | [0.50] | Phonetics |
| | | |

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

Major (Honours Program)

A minimum of 8.00 credits in Spanish and Hispanic Studies is required, including: 3.50 credits from Group A:

| J., | o cleans nom Gio | up A. | |
|-----|---------------------|-------------|----------------------------------------------------|
| | SPAN*2040 | [0.50] | Culture of Spain |
| | SPAN*2990 | [0.50] | Hispanic Literary Studies |
| | SPAN*3080 | [0.50] | Spanish American Culture |
| | SPAN*3220 | [0.50] | Literature and Arts I: Spain |
| | SPAN*3230 | [0.50] | Literature and Arts II: Latin America |
| | One of: | | |
| | SPAN*4410 | [1.00] | Senior Seminar on Latin American |
| | SPAN*4420 | [1.00] | Senior Seminar on Spain or Africa |
| 4.5 | 50 credits from Gro | up B: | |
| | SPAN*1100 | [0.50] | Introductory Spanish I |
| | SPAN*1110 | [0.50] | Introductory Spanish II |
| | SPAN*2000 | [0.50] | Intermediate Spanish I |
| | SPAN*2010 | [0.50] | Intermediate Spanish II |
| | SPAN*3210 | [0.50] | Topics in Hispanic Studies |
| | SPAN*3240 | [0.50] | Topics in Hispanic Linguistics |
| | SPAN*3500 | [0.50] | Advanced Spanish I |
| | SPAN*3700 | [0.50] | Experiential Learning and Language |
| | SPAN*3800 | [0.50] | Directed Readings in Hispanic Studies |
| | SPAN*3810 | [0.50] | Directed Readings in Hispanic Studies |
| | SPAN*4100 | [1.00] | Seminar in Hispanic Studies |
| | SPAN*4410 | [1.00] | Senior Seminar on Latin American |
| | SPAN*4420 | [1.00] | Senior Seminar on Spain or Africa |
| | SPAN*4500 | [1.00] | Spanish Translation - Theory and Practice |
| | SPAN*4840 | [1.00] | Research Paper in Hispanic Studies |
| A | maximum of 1.00 c | redits from | Group B may be substituted with courses from the |
| fol | lowing: | | |
| | ARTH*2050 | [0.50] | Modern Latin American Art |
| | CLAS*2000 | [0.50] | Classical Mythology |
| | ENGL*2040 | [0.50] | Latina/o Literature and Cultural Production: Intro |
| | EURO*1100 | [0.50] | European Cinema |
| | EURO*2200 | [0.50] | Towards European Modernism |
| | EURO*3300 | [0.50] | Violence and Culture |
| | HIST*2920 | [0.50] | Republican Latin America |
| | HIST*3150 | [0.50] | History and Culture of Mexico |
| | HIST*3230 | [0.50] | Spain and Portugal, 1085 to 1668 |
| | HUMN*1030 | [0.50] | What Makes a Literary Classic? |
| | HUMN*3000 | [0.50] | Narratives of Migration |
| | LAT*1100 | [0.50] | Preliminary Latin I |
| | LAT*1110 | [0.50] | Preliminary Latin II |
| | LING*1000 | [0.50] | Introduction to Linguistics |
| | LING*2400 | [0.50] | Phonetics |
| | | | |

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

Minor (Honours Program)

A minimum of 5.00 credits in Spanish and Hispanic Studies is required, including: 2.50 credits from Group A:

| SPAN*2040 | [0.50] | Culture of Spain |
|---------------------|----------------|----------------------------------------------------|
| SPAN*2990 | [0.50] | Hispanic Literary Studies |
| SPAN*3080 | [0.50] | Spanish American Culture |
| SPAN*3220 | [0.50] | Literature and Arts I: Spain |
| SPAN*3230 | [0.50] | Literature and Arts II: Latin America |
| 2.50 additional cre | dits from Gro | oup B: |
| SPAN*1100 | [0.50] | Introductory Spanish I |
| SPAN*1110 | [0.50] | Introductory Spanish II |
| SPAN*2000 | [0.50] | Intermediate Spanish I |
| SPAN*2010 | [0.50] | Intermediate Spanish II |
| SPAN*3210 | [0.50] | Topics in Hispanic Studies |
| SPAN*3230 | [0.50] | Literature and Arts II: Latin America |
| SPAN*3240 | [0.50] | Topics in Hispanic Linguistics |
| SPAN*3500 | [0.50] | Advanced Spanish I |
| SPAN*3700 | [0.50] | Experiential Learning and Language |
| SPAN*3800 | [0.50] | Directed Readings in Hispanic Studies |
| SPAN*3810 | [0.50] | Directed Readings in Hispanic Studies |
| SPAN*4100 | [1.00] | Seminar in Hispanic Studies |
| SPAN*4410 | [1.00] | Senior Seminar on Latin American |
| SPAN*4420 | [1.00] | Senior Seminar on Spain or Africa |
| SPAN*4500 | [1.00] | Spanish Translation - Theory and Practice |
| SPAN*4840 | [1.00] | Research Paper in Hispanic Studies |
| A maximum of 0.5 | 0 credits from | m Group B may be substituted with courses from the |
| following | | |

| 6 | | |
|-----------|--------|----------------------------------------------------|
| ARTH*2050 | [0.50] | Modern Latin American Art |
| CLAS*2000 | [0.50] | Classical Mythology |
| ENGL*2040 | [0.50] | Latina/o Literature and Cultural Production: Intro |
| EURO*1100 | [0.50] | European Cinema |
| EURO*2200 | [0.50] | Towards European Modernism |
| EURO*3300 | [0.50] | Violence and Culture |
| HIST*2920 | [0.50] | Republican Latin America |
| HIST*3150 | [0.50] | History and Culture of Mexico |
| HIST*3230 | [0.50] | Spain and Portugal, 1085 to 1668 |
| HUMN*1030 | [0.50] | What Makes a Literary Classic? |
| HUMN*3000 | [0.50] | Narratives of Migration |
| LAT*1100 | [0.50] | Preliminary Latin I |
| LAT*1110 | [0.50] | Preliminary Latin II |
| LING*1000 | [0.50] | Introduction to Linguistics |
| LING*2400 | [0.50] | Phonetics |

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

Statistics (STAT)

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

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

Area of Concentration (General Program)

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

- a. no more than 1.00 credits from courses at the 1000 level
- b. 3.00 credits in statistics (STAT), 2.00 of which must be from courses at the 3000 level or above

Recommended Courses

| MATH*1200 | [0.50] | Calculus I |
|--------------------|---------------|-----------------------------------------|
| MATH*1210 | [0.50] | Calculus II |
| STAT*2040 | [0.50] | Statistics I |
| STAT*2050 | [0.50] | Statistics II |
| STAT*3100 | [0.50] | Introductory Mathematical Statistics I |
| STAT*3110 | [0.50] | Introductory Mathematical Statistics II |
| STAT*3240 | [0.50] | Applied Regression Analysis |
| 0.50 additional of | redits in Sta | tistics |

0.50 additional credits in Statistics or Mathematics

Honours Programs

Minor (Honours Program)

A total of 5.00 credits is required to complete the minor, including: (MATH*1080 or MATH*1200)* (MATH*1090 or MATH*1210)**

| (MAIII 1090 01 MAIII 1210) | | | |
|----------------------------|--------|-----------------------------------------|--|
| MATH*1160 | [0.50] | Linear Algebra I | |
| STAT*2040 | [0.50] | Statistics I | |
| STAT*2050 | [0.50] | Statistics II | |
| STAT*3100 | [0.50] | Introductory Mathematical Statistics I | |
| STAT*3110 | [0.50] | Introductory Mathematical Statistics II | |
| | | | |

STAT*3240 [0.50] Applied Regression Analysis

0.50 additional credits in Statistics

0.50 additional credits in Statistics or Mathematics at the 2000 level or above

* IPS*1500 can count toward this 0.50 credit

** IPS*1510 can count toward this 0.50 credit

Note: Students majoring in Mathematical Science cannot minor in Statistics.

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 experimental studio. Studio Art majors must also take a selection of courses in art history. Specific requirements are listed below.

Cost of Studio Supplies

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

Student Counselling

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

Minor

Students wishing to declare the SART minor must have a cumulative average of 70% or higher in the following courses:

| SART*1050 | [0.50] | Fo | undation Studio |
|-----------|--------|-----|--------------------------|
| SART*1060 | [0.50] | Co | re Studio |
| One of: | | | |
| ARTH*1510 | [0.5 | [0] | Art Historical Studies I |
| ARTH*1520 | [0.5 | 01 | Art Historical Studies I |

[0.50] Art Historical Studies II Students who have not been admitted directly into the major must also meet these requirements in order to declare a SART major.

Major (Honours Program)

A minimum of 9.00 credits is required, including:

| SART*1050 | [0.50] | Foundation Studio |
|-----------|--------|---------------------------------------------------|
| SART*1060 | [0.50] | Core Studio |
| One of: | | |
| ARTH*1510 | [0.50 |] Art Historical Studies I |
| ARTH*1520 | [0.50 |] Art Historical Studies II |
| One of: | | |
| ARTH*2220 | [0.50 |] The Visual Arts Today |
| ARTH*2480 | [0.50 |] Introduction to Art Theory and Criticism |
| One of: | | |
| SART*2090 | [0.50 |] Drawing I |
| SART*2200 | [0.50 |] Painting I |
| SART*2460 | [0.50 |] Printmaking I |
| SART*2610 | [0.50 |] Photography I |
| SART*2700 | [0.50 |] Digital Media I: Using Vector and Raster Images |
| SART*2710 | [0.50 |] Digital Media II: Animation |
| One of: | | |
| SART*2300 | [0.50 |] Sculpture I |
| SART*2800 | [0.50 |] Experimental Studio I |
| | | |

4.00 additional credits in Studio Art including 1.50 credits at the 4000 level. 2.00 additional credits in Art History including at least 0.50 credits at the 3000 level or above.

Minor (Honours Program)

| A minimum of 5.00 | 0 credits is requir | red, including: |
|-------------------|---------------------|---------------------------|
| SART*1050 | [0.50] Four | idation Studio |
| SART*1060 | [0.50] Core | Studio |
| One of: | | |
| ARTH*1510 | [0.50] | Art Historical Studies I |
| ARTH*1520 | [0.50] | Art Historical Studies II |
| One of: | | |
| SART*2090 | [0.50] | Drawing I |
| SART*2200 | [0.50] | Painting I |
| SART*2460 | [0.50] | Printmaking I |

SART*2610 [0.50] Photography I SART*2700 [0.50] Digital Media I: Using Vector and Raster Images SART*2710 [0.50] Digital Media II: Animation One of: SART*2300 [0.50] Sculpture I SART*2800 [0.50] Experimental Studio I

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

1.00 additional credits in Studio Art including at least 0.50 credits at the 3000 level or above.

0.50 additional credits in either Studio Art (SART) or Art History (ARTH) courses.

Notes:

1. A cumulative average of at least 70% in all course attempts in Studio Arts and Art History is required in order to enter or continue in the Honours Studio Arts program.

Theatre Studies (THST)

School of English and Theatre Studies, College of Arts

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

Notes:

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

Certain approved Dramatic Literature courses from the English Program within the School of English and Theatre Studies or other departments may be counted towards a degree in Theatre Studies. A list of approved courses may be obtained from the School's website: <u>http://www.arts.uoguelph.ca/sets/</u>.

- 2. In connection with THST*1040 and some upper-level courses, students are required as part of the course to attend various specified theatre performances in cities such as Toronto, Stratford, Niagara-on-the-Lake, and London. A special fee is charged for travel to these performances and students will be notified during the first week of classes of the amount of this fee and the dates of the performances.
- 3. In any given semester, a student may not enroll in more than ONE production-related course at a time. These include: THST*2190, THST*3190, THST*4280.

Area of Concentration (General Program)

A minimum of 5.00 credits in Theatre Studies is required, including : THST*1040 [0.50] Introduction to Performance THST*1190 [0.50] Theatre Workshop I THST*1270 [0.50] Theatre Research I THST*2050 [0.50] Devising THST*2270 [0.50] Theatre Research II THST*3170 [0.50] Special Topics 1.00 additional credit in THST at the 2000 level or above 1.00 additional credit in THST at the 3000 level or above

Major (Honours Program)

A minimum of 8.50 credits in Theatre Studies is required, including: THST*1040 [0.50] Introduction to Performance THST*1190 [0.50] Theatre Workshop I THST*1270 [0.50] Theatre Research I THST*2050 [0.50] Devising THST*2190 [1.00] Theatre Workshop II THST*2270 [0.50] Theatre Research II THST*3170 [0.50] Special Topics THST*4270 [0.50] Research Seminar I THST*4280 [1.00] Ensemble Project 1.00 additional credit in THST at the 2000 level or above 2.00 additional credits in THST at the 3000 level or above

Minor (Honours Program)

A minimum of 5.00 credits in Theatre Studies is required, including :THST*1040[0.50]THST*1190[0.50]Theatre Workshop I

THST*1270 [0.50] Theatre Research I

THST*2050[0.50]DevisingTHST*2270[0.50]Theatre Research II

THST*3170[0.50]Special Topics1.00 additional credit in THST at the 2000 level or above1.00 additional credit in THST at the 3000 level or above

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

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

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

Program Information

Academic Counselling

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

Counselling on Minors

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

Continuation of Study

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

Conditions for Graduation

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

Distribution Requirements

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

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.

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

1. Science Core - 2.00 credits

When choosing their courses in the science core, students are advised to keep prerequisites for their BAS Science Minor in mind. For a list of suggested core science courses for each specific BAS Science Minor, please consult the BAS website (https://www.uoguelph.ca/bas/)

| 2.00 | credits | from: | |
|------|---------|-------|--|
|------|---------|-------|--|

| BIOC*2580 | [0.50] | Introduction to Biochemistry |
|-----------|--------|------------------------------------------------|
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1040 | [0.50] | General Chemistry I |
| CHEM*1050 | [0.50] | General Chemistry II |
| CIS*1300 | [0.50] | Programming |
| CIS*2500 | [0.50] | Intermediate Programming |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| GEOG*2460 | [0.50] | Analysis in Geography |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II |

| MATH*1080 | [0.50] | Elements of Calculus I |
|-------------|--------|------------------------------|
| MATH*1200 | [0.50] | Calculus I |
| MATH*1210 | [0.50] | Calculus II |
| MATH*1090 | [0.50] | Elements of Calculus II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| PHYS*1300 | [0.50] | Fundamentals of Physics |
| STAT*2040 | [0.50] | Statistics I |
| STAT*2050 | [0.50] | Statistics II |
| • • • • • • | | |

2. Arts and Social Science Core - 2.00 credits

- a. 1.00 credits over at least 2 different subject areas in the College of Arts: ARTH Art History; CHIN - Mandarin; CLAS - Classical Studies; ENGL - English; EURO -European Studies; FREN - French Studies; GERM - German Studies; GREK - Greek; HIST - History; HUMN - Humanities; ITAL - Italian Studies; LAT - Latin Studies; LING - Linguistics; MUSC - Music; PHIL - Philosophy; PORT - Portuguese; SART - Studio Art; SPAN- Spanish and Hispanic Studies; THST - Theatre Studies.
- b. 1.00 credits over at least 2 different subject areas (listed below) in the College of Social and Applied Human Sciences or Gordon S. Lang School of Business and Economics: ANTH - Anthropology; ECON - Economics; FRHD - Family Relations and Human Development; GEOG - Geography; IDEV - International Development Studies; ISS - Interdisciplinary Social Science; POLS - Political Science; PSYC -Psychology; SOAN - Sociology and Anthropology; SOC - Sociology; UNIV -Interdisciplinary University; WMST - Women Studies.

3. Subject Area Core (ASCI) - 3.00 credits

| 1.50 credits from: | | |
|----------------------------------------|--------|-------------------------------------------------|
| ASCI*1110 | [0.50] | Society and Inquiry I |
| ASCI*1120 | [0.50] | Society and Inquiry II |
| ASCI*2050 | [0.50] | Uses of Knowledge |
| • 0.50 credits from: | | |
| ASCI*3000 | [0.50] | Arts and Sciences Community Project |
| ASCI*3100 | [0.50] | Case Studies in Arts and Sciences Research |
| ASCI*3700 | [0.50] | Independent Studies in Arts/Sciences |
| • 1.00 credits from: | | |
| ASCI*4010 | [1.00] | Arts and Sciences Honours Research Seminar |
| ASCI*4020 | [0.50] | Topics in Arts and Sciences Research |
| ASCI*4030 | [0.50] | Topics in Arts and Sciences Research |
| ASCI*4700 | [0.50] | Independent Studies in Arts/Sciences |
| ASCI*4710 | [0.50] | Independent Studies in Arts/Sciences |
| A | | $= 0.0 \dots 1.4 \dots (3.4^{1} \dots 1.4^{1})$ |

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

Minors available in the Arts/ Social Sciences core (see B.A. program descriptions): Anthropology Art History Business **Business Economics Classical Studies** Criminal Justice & Public Policy Economics English European Culture and Civilization Family & Child Studies French Studies Geography German History International Development Italian Marketing Media and Cinema Studies Museum Studies Music Philosophy Political Science Psychology Sociology Spanish and Hispanic Studies Theatre Studies

5. Science Minor - 5.00 credits (Minimum)

Minors available in the Science core (see B.Sc. program descriptions): Agriculture (see B.Sc.(Agr.) program description) Biochemistry

Biology Biotechnology Chemistry Computing & Information Science Ecology GIS* & Environmental Analysis Mathematics Mathematical Science Microbiology Molecular Biology and Genetics Neuroscience Nutritional and Nutraceutical Sciences Physics Plant Science Statistics Zoology * Geographic Information Systems Note: Students cannot select Psychology or Mathematics for both their B.Sc. and B.A. minors.

6. Free Electives - 3.00 credits

The program includes 3.00 free electives. Electives may be completed in any subject area.

Double Counting Rule

A maximum of 3.00 credits may be double-counted:

- a. 1.00 credits may be double-counted between minors.
- b. Up to 1.00 credits may be double-counted between the science core and a minor; and up to 1.00 credits may be double-counted between the arts and social science core and a minor.

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

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

The University of Guelph offers a 20.00 credit program, normally completed over 8 semesters, leading to a Bachelor of Bio-Resource Management degree (B.B.R.M.). This degree is a unique blend of applied and theoretical learning, with an emphasis on

experiential learning opportunities. This degree offers three majors: Environmental Management, Equine Management and Food Industry Management.

Program Information

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

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

Academic Advising and Counselling

Program Counselling

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

Departmental Advising

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

Continuation of Study

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

Conditions for Graduation

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

Schedule of Studies

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

B.B.R.M. Program Regulations

Recommendations

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

Environmental Management Major (EM)

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

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

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

Semester 1

| BIOL*1070[0.50]Discovering BiodiversityCHEM*1040[0.50]General Chemistry I | ENVS 3230 ENVS*3270 ENVS*4070 |
|---------------------------------------------------------------------------|-------------------------------------|
|---------------------------------------------------------------------------|-------------------------------------|

| MGMT*2150 | [0.50] | Introduction to Canadian Business Management |
|-------------------|--------------|------------------------------------------------|
| Semester 2 | | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| Semester 3 | | |
| BIOL*2060 | [0.50] | Ecology |
| ENVS*2060 | [0.50] | Soil Science |
| ENVS*2230 | [0.50] | Communications in Environmental Science |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| GEOG*2480 | [0.50] | Mapping and GIS |
| Semester 4 | | |
| ENVM*3500 | [1.00] | Environmental Management Integrated Project |
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| ENVS*2080 | [0.50] | Introduction to Environmental Microbiology |
| 0.50 electives or | restricted e | lectives |
| Semester 5 | | |
| GEOG*2420 | [0.50] | The Earth From Space |

Introduction to Environmental Sciences

| GEOG*2420 | [0.50] | The Earth From Space |
|---------------------|---------------|-----------------------------------|
| One of: | | |
| GEOG*2460 | [0.50] | Analysis in Geography |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| 1.50 electives or r | estricted ele | ctives |

Semester 6

ENVS*1030

[1.00]

ENVS*3020 [0.50] Pesticides and the Environment ENVS*3060 [0.50] Groundwater 1.50 electives or restricted electives

Semester 7

2.50 electives or restricted electives **Semester 8**

2.50 electives or restricted electives

Restricted Electives

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

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

Students should consult with a faculty advisor before Semester 4 in planning their restricted elective choices. Students are advised to pay particular attention to prerequisite requirements when choosing individual courses and seek advice as needed.

1. Students must select a minimum of 6.50 credits from the following lists of restricted electives.

List A

Students must select a minimum of 3.50 credits from any of the following courses without regard to group of which at least 1.00 credits must be at the 4000 level:

| Aquatic Scienc | e: | |
|----------------|--------------|------------------------------------------|
| BIOL*3450 | [0.50] | Introduction to Aquatic Environments |
| CHEM*3360 | [0.50] | Environmental Chemistry and Toxicology |
| EDRD*3450 | [0.50] | Watershed Planning Practice |
| ENVS*3220 | [0.50] | Terrestrial Chemistry |
| ENVS*4370 | [0.50] | Environmental Organic Chemistry |
| GEOG*3610 | [0.50] | Environmental Hydrology |
| Atmospheric S | cience: | |
| ENVS*2030 | [0.50] | Meteorology and Climatology |
| ENVS*2310 | [0.50] | Introduction to Biogeochemistry |
| ENVS*3340 | [0.50] | Use and Management of Environmental Data |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| Conservation a | nd Biodivers | sity Science: |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems |
| BIOL*3130 | [0.50] | Conservation Biology |
| ENVS*2210 | [0.50] | Apiculture and Honey Bee Biology |
| ENVS*2330 | [0.50] | Current Issues in Ecosystem Science and |
| | | Biodiversity |
| ENVS*3000 | [0.50] | Nature Interpretation |
| ENVS*3010 | [0.50] | Climate Change Biology |
| ENVS*3090 | [0.50] | Insect Diversity and Biology |
| ENVS*3230 | [0.50] | Agroforestry Systems |
| ENVS*3250 | [0.50] | Forest Health and Disease |
| ENVS*3270 | [0.50] | Forest Biodiversity |
| ENVS*4070 | [0.50] | Pollinator Conservation |
| | | |

| ENVS*4230 | [0.50] | Biology of Aquatic Insects |
|-----------------|-------------|-----------------------------------------------------|
| ENVS*4260 | [0.50] | Field Entomology |
| ENVS*4350 | [0.50] | Forest Ecology |
| GEOG*3320 | [0.50] | Food Systems: Issues in Security and Sustainability |
| Ecosystem and | Resource M | lanagement: |
| BIOL*4500 | [0.50] | Natural Resource Policy Analysis |
| ENVS*2120 | [0.50] | Introduction to Environmental Stewardship |
| ENVS*2240 | [0.50] | Fundamentals of Environmental Geology |
| ENVS*3030 | [0.50] | Conservation Field Course |
| ENVS*4000 | [0.50] | Toxicological Risk Assessment |
| ENVS*4390 | [1.00] | Soil Variability and Land Evaluation |
| GEOG*2210 | [0.50] | Environment and Resources |
| GEOG*3020 | [0.50] | Global Environmental Change |
| GEOG*3110 | [0.50] | Biotic and Natural Resources |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment |
| GEOG*3420 | [0.50] | Remote Sensing of the Environment |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| GEOG*4110 | [1.00] | Environmental Systems Analysis |
| GEOG*4220 | [0.50] | Local Environmental Management |
| GEOG*4230 | [0.50] | Environmental Impact Assessment |
| Plant Health: | | |
| ENVS*3040 | [0.50] | Natural Chemicals in the Environment |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests |
| ENVS*4180 | [0.50] | Insecticide Biological Activity and Resistance |
| ENVS*4190 | [0.50] | Biological Activity of Herbicides |
| PBIO*4530 | [0.50] | Plants and Environmental Pollution |
| Soil and Nutrie | ent Managem | ient: |
| ENVS*3080 | [0.50] | Soil and Water Conservation |
| ENVS*3310 | [0.50] | Soil Biodiversity and Ecosystem Function |
| ENVS*4090 | [0.50] | Soil Management |
| ENVS*4160 | [0.50] | Soil and Nutrient Management |
| ENVS*4320 | [1.00] | Laboratory and Field Methods in Soil Biodiversity |
| | | |

List B

Accounting

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

| U | | |
|---------------------|---------------|---------------------------------------------------|
| ACCT*2230 | [0.50] | Management Accounting |
| ACCT*3230 | [0.50] | Intermediate Management Accounting |
| ACCT*1240 | [0.50] | Applied Financial Accounting |
| ACCT*4230 | [0.50] | Advanced Management Accounting |
| Business and N | lanagement | : |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| Food, Agricult | ural and Res | source Economics: |
| FARE*2410 | [0.50] | Agrifood Markets and Policy |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| FARE*3310 | [0.50] | Operations Management |
| FARE*4290 | [0.50] | Land Economics |
| FARE*4310 | [0.50] | Resource Economics |
| FARE*4360 | [0.50] | Marketing Research |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| Leadership and | l Communic | cations: |
| EDRD*2020 | [0.50] | Interpersonal Communication |
| EDRD*3140 | [0.50] | Organizational Communication |
| EDRD*3400 | [0.50] | Sustainable Communities |
| EDRD*4120 | [0.50] | Leadership Development in Small Organizations |
| HROB*2010 | [0.50] | Foundations of Leadership |
| HROB*4010 | [0.50] | Leadership Certificate Capstone |
| List C | | |
| Students may also s | select any of | f the following courses as* restricted electives: |

AGR*3450** [0.50] Research Methods in Agricultural Science AGR*3500 [0.50] Experiential Education I AGR*4450** [1.00]Research Project I Research Project II AGR*4460** [1.00] AGR*4600 [1.00] Agriculture and Food Issues Problem Solving BIOC*2580 [0.50] Introduction to Biochemistry CHEM*1050 [0.50] General Chemistry II ECON*1100 [0.50] Introductory Macroeconomics ENVS*4410** [0.50]Introduction to Advanced Independent Research ENVS*4420** [0.50] Advanced Independent Research ENVS*4430** [1.00] Advanced Independent Research FARE*4550** [0.50] Independent Studies I FARE*4560** [0.50] Independent Studies II GEOG*1300 [0.50] Introduction to the Biophysical Environment

| GEOG*1350 | [0.50] | Earth: Hazards and Global Change |
|-----------|--------|----------------------------------|
|-----------|--------|----------------------------------|

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

Equine Management Major (EOM)

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

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

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

Semester 1 - Fall BIOL*1050 [0.50]Biology of Plants & Animals in Managed Ecosystems BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology ECON*1050 [0.50] Introductory Microeconomics EON*1010 [1.00] Introduction to Equine Management Semester 2 - Winter ACCT*1220 [0.50] Introductory Financial Accounting ANSC*1210 [1.00] Principles of Animal Care and Welfare EQN*2040 [0.50] Equine Anatomy and Physiology One of: CHEM*1040 [0.50] General Chemistry I CHEM*1100 [0.50] Chemistry Today Semester 3 - Fall Management Accounting ACCT*2230 [0.50] ENVS*2060 [0.50] Soil Science EQN*2060 [0.50] Equine Event Management I EQN*2200 [0.50] Equine Industry Trends and Issues I 0.50 electives or restricted electives Semester 4 - Winter EON*2050 [0.50] Introduction to Equine Nutrition EQN*2070 [0.50] Equine Event Management II EQN*2150 [0.50] Equine Facility Management and Design 1.00 electives or restricted electives Semester 5 - Fall ANSC*3080 [0.50] Agricultural Animal Physiology CROP*3340 [0.50] Managed Grasslands EON*3070 [0.50] Equine Health Management STAT*2060 [0.50] Statistics for Business Decisions 0.50 electives or restricted electives Semester 6 - Winter EON*3050 [0.50] Equine Exercise Physiology EQN*3150 [0.50] Equine Exercise Physiology Laboratory 1.50 electives or restricted electives

Semester 7 - Fall

| EQN*4400 | [0.50] | Equine Industry Trends and Issues II |
|-------------------|-----------------|--------------------------------------|
| EQN*4500 | [1.00] | Equine Integrated Project |
| 1.00 electives or | r restricted el | ectives |

Semester 8 - Winter

| EQN*3060 | [0.50] | Equine Reproduction |
|-------------------|--------------|---------------------------|
| EQN*4020 | [0.50] | Advanced Equine Nutrition |
| 1.50 electives or | restricted e | lectives |

Restricted Electives

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

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

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

| Animal Biology: | | |
|----------------------|----------|---------------------------------------------------|
| AGR*2350 | [0.50] | Animal Production Systems, Health and Industry |
| ANSC*4090 | [0.50] | Applied Animal Behaviour |
| ANSC*4100 | [0.50] | Applied Environmental Physiology and Animal |
| | | Housing |
| ANSC*4490 | [0.50] | Applied Endocrinology |
| ANSC*4650 | [0.50] | Comparative Immunology |
| POPM*4230 | [0.50] | Animal Health |
| Genetics: | | |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| MBG*3060 | [0.50] | Quantitative Genetics |
| MBG*4020 | [0.50] | Genetics of Companion Animals |
| MBG*4030 | [0.50] | Animal Breeding Methods and Applications |
| Pasture and Turf | Manageme | nt: |
| ENVS*3080 | [0.50] | Soil and Water Conservation |
| ENVS*3140 | [0.50] | Management of Turfgrass Diseases |
| One of: | | |
| ENVS*4090 | [0.50] | Soil Management |
| ENVS*4160 | [0.50] | Soil and Nutrient Management |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science |
| HORT*3050 | [0.50] | Management of Turfgrass Insect Pests and Weeds |
| HORT*4450 | [0.50] | Advanced Turfgrass Science |
| Advanced Nutriti | ion: | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| CHEM*1050 | [0.50] | General Chemistry II |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| Students must select | a minimu | m of 1.50 credits from any of the following lists |

(grouped by topic areas): Accounting

2.

| Accounting. | | |
|-------------------------|--------------|------------------------------------------------|
| ACCT*3230 | [0.50] | Intermediate Management Accounting |
| ACCT*4230 | [0.50] | Advanced Management Accounting |
| Business and M | anagement: | |
| HROB*2010 | [0.50] | Foundations of Leadership |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| HROB*4010 | [0.50] | Leadership Certificate Capstone |
| MGMT*2150 | [0.50] | Introduction to Canadian Business Management |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| Food, Agricultu | ral and Reso | purce Economics : |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| FARE*3310 | [0.50] | Operations Management |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |
| FARE*4360 | [0.50] | Marketing Research |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| FARE*4290 | [0.50] | Land Economics |
| FARE*4550 | [0.50] | Independent Studies I |
| Marketing: | | |
| MCS*1000 | [0.50] | Introductory Marketing |
| MCS*2020 | [0.50] | Information Management |
| MCS*2600 | [0.50] | Fundamentals of Consumer Behaviour |
| MCS*3000 | [0.50] | Advanced Marketing |
| MCS*3040 | [0.50] | Business and Consumer Law |
| MCS*3620 | [0.50] | Marketing Communications |
| 3. Students must select | t a minimun | n of 1.00 credits from: |
| AGR*3010 | [0.50] | Special Studies in Agricultural Science I |
| AGR*4010 | [0.50] | Special Studies in Agricultural Science II |
| AGR*4600 | [1.00] | Agriculture and Food Issues Problem Solving |
| AGR*4450 | [1.00] | Research Project I |
| AGR*4460 | [1.00] | Research Project II |
| ANSC*4610 | [0.50] | Critical Analysis in Animal Science |
| 4. Students may also c | ount any of | the following courses as restricted electives: |
| AGR*3500 | [0,50] | Experiential Education I |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| EDRD*2020 | [0.50] | Interpersonal Communication |
| EDRD*3050 | [0.50] | Agricultural Communication I |
| EDRD*3140 | [0.50] | Organizational Communication |
| EDRD*3400 | [0.50] | Sustainable Communities |
| EDRD*4120 | [0.50] | Leadership Development in Small Organizations |
| EON*2500 | [0.50] | Equine Field Course |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| ood Industry Ma | nogomor | t (FIM) |
| | | |

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

This major focuses on the development of leaders in the areas of Food Industry Innovation and Operations. The program combines a solid background in food science, economics and business, using a mix of theoretical and applied study. Students in this major will be able to create a curriculum uniquely tailored to their career goals. The flexibility provided in semesters 5 through 8 enables students to develop their understanding of specific areas of food science and business. Student participation in international exchanges and international summer research programs is encouraged and supported through academic advising on course selection and substitution. Students have the opportunity to incorporate a variety of field trips, experiential learning in the workplace and independent research projects into their program. The combination of a solid understanding of food science and current business practice with specialized skills and experience provided by this program is unique and greatly valued by prospective employers in this important sector of the Canadian and global economies. This major will require the completion of 20.00 credits: 14.50 credits of required courses,

3.00 credits from restricted electives, and 2.50 credits of free electives. Of these credits, a minimum of 6.00 credits are required at the 3000 level or higher, of which at least 3.00 credits must be at the 4000 level.

Semester 1

| ACCT*1220 | [0.50] | Introductory Financial Accounting |
|----------------------|----------------|------------------------------------------------------------|
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| CHEM*1040 | [0.50] | General Chemistry I |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MATH*1030 | [0.50] | Business Mathematics |
| Semester 2 | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| FARE*1400 | [1.00] | Economics of the Agri-Food System |
| 0.50 electives | | |
| Semester 3 | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| FOOD*2150 | [0.50] | Introduction to Nutritional and Food Science |
| MCS*2020 | [0.50] | Information Management |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| Semester 4 | | |
| ACCT*2230 | [0.50] | Management Accounting |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| FOOD*2100 | [0.50] | Communication in Food Science |
| FOOD*2620 | [0.50] | Food Engineering Principles |
| 0.50 electives or r | estricted ele | ctives |
| Semester 5 | | |
| FARE*3310 | [0.50] | Operations Management |
| FOOD*3140 | [0.50] | Food Processing I |
| FOOD*3240 | [0.50] | Food Microbiology |
| 1.00 electives or r | estricted ele | ctives |
| Semester 6 | | |
| FOOD*3170 | [0.50] | Food Processing II |
| HROB*2010 | [0.50] | Foundations of Leadership |
| One of: | | • |
| PHIL*2120 | [0.50] | Ethics |
| PHIL*2600 | [0.50] | Business and Professional Ethics |
| 1.00 electives or r | estricted ele | ctives |
| Semester 7 | | |
| FARE*3320 | [0.50] | Supply and Value Chain Management |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| 1.50 electives or r | estricted ele | ctives |
| Semester 8 | | |
| FARE*4330 | [0.50] | Advanced Operations Management |
| FARE*4380 | [0.50] | Retailing. Merchandising and Sales |
| FOOD*4310 | [0.50] | Food Safety Management Systems |
| 1.00 electives or r | estricted ele | ctives |
| Restricted El | ectives | |
| Students should r | note that sor | ne restricted electives require other courses not included |
| among the require | ed courses f | or the major as prerequisites. Students should consult the |
| most recent unde | rgraduate c | alendar for specific requirements. Students must take a |
| minimum of 3.00 | credits from | restricted electives. |
| A minimum of 1.0 | 00 credits fro | om the following list: |
| FOOD*4070 | [0.50] | Food Packaging |
| FOOD*4110 | [0.50] | Meat and Poultry Processing |
| | | · · · · |

| FOOD*40/0 | [0.50] | Food Packaging |
|------------------|----------------|---------------------------------------------|
| FOOD*4110 | [0.50] | Meat and Poultry Processing |
| FOOD*4400 | [0.50] | Dairy Processing |
| FOOD*4520 | [0.50] | Utilization of Cereal Grains for Human Food |
| A minimum of 1.0 | 0 credits fron | n the following list: |
| FARE*3000 | [0.50] | Food Industry Analysis and Policy |
| | | |

| FARE*3170 | [0.50] | Cost-Benefit Analysis | | |
|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------|--|--|
| FARE*4360 | [0.50] | Marketing Research | | |
| FARE*4500 | [0.50] | Decision Science | | |
| FOOD*4020 | [0.50] | Quality Management in the Food Industry | | |
| POLS*3470 | [0.50] | Business-Government Relations in Canada | | |
| Students may also | count any of t | the courses from the following list as restricted electives: | | |
| FOOD*3050 | [0.50] | Food Chemistry I | | |
| FOOD*3700 | [0.50] | Sensory Evaluation of Foods | | |
| FOOD*4090 | [0.50] | Functional Foods and Nutraceuticals | | |
| FOOD*4260 | [0.50] | Food Product Development I | | |
| FOOD*4270 | [0.50] | Food Product Development II | | |
| Students may also count any of the research/experiential learning/independent study | | | | |
| courses from the following list as restricted electives: | | | | |
| AGR*3010 | [0.50] | Special Studies in Agricultural Science I | | |
| AGR*3500 | [0.50] | Experiential Education I | | |
| FARE*4550 | [0.50] | Independent Studies I | | |
| FARE*4560 | [0.50] | Independent Studies II | | |
| FOOD*4220 | [0.50] | Topics in Food Science | | |
| FOOD*4230 | [0.50] | Research in Food Science | | |
| Food Industry | Food Industry Management (Co-op) (FIM:C) | | | |

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

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

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

Program Requirements

The Co-op program in Food Industry Management is a five year program, including 4 work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

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

| | | * | |
|------|----------------------------------|---------------------------|---------------------------|
| Year | Fall | Winter | Summer |
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | Academic Semester 6 | COOP*2000 Work Term II |
| 4 | COOP*3000 Work Term III | COOP*4000 Work Term IV | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

Food Industry Management Academic and Co-op Work Term Schedule

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 web site.

Credit Summary (21.50 Total Credits)*

14.50 - Required Core Courses

3.00 - Restricted Electives

2.50 - Free Electives

1.50 - Co-op Work Terms

Students should note that a minimum of 6.00 credits of their BBRM degree are required at the 3000 level or higher, of which at least 3.00 credits must be at the 4000 level.

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth work term is optional and if completed the total number of credits will equal 22.00.

Semester 1 - Fall

| Semester 1 - 1 | all | |
|------------------------|---------------|-----------------------------------------------------|
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| CHEM*1040 | [0.50] | General Chemistry I |
| HKOB*2090 MATH*1020 | [0.50] | Individuals and Groups in Organizations |
| Semester 2 - V | Vintor | Business Mathematics |
| DIOL *1000 | 10 501 | Inter de stien te Mele selen en d'Oelleden Diele se |
| BIOL*1090 | [0.50] | Conoral Chamistry II |
| FARE*1400 | [0.30] | Economics of the Agri-Food System |
| 0.50 electives | [1.00] | Leonomies of the right food System |
| Summer Seme | ester | |
| Off | | |
| Semester 3 - F | all | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| FOOD*2150 | [0.50] | Introduction to Nutritional and Food Science |
| MCS*2020 | [0.50] | Information Management |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| Semester 4 - V | Vinter | |
| ACCT*2230 | [0.50] | Management Accounting |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| FOOD*2100 | [0.50] | Communication in Food Science |
| FOOD*2620 | [0.50] | Food Engineering Principles |
| Summer Semi | stricted ele | cuves |
| | 50 CO1 | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 5 - F | an | |
| FARE*3310 | [0.50] | Operations Management |
| FOOD*3140 | [0.50] | Food Processing I |
| FOOD*3240 | [U.50] | Food Microbiology |
| Somester 6 - V | Vintor | cuves |
| Semester 0 - V | 50 501 | |
| FOOD*31/0 | [0.50] | Food Processing II Foundations of Londorship |
| One of: | [0.30] | Foundations of Leadership |
| PHIL*2120 | [0,50] | Ethics |
| PHIL*2600 | [0.50] | Business and Professional Ethics |
| 1.00 electives or re | estricted ele | ctives |
| Summer Seme | ester | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Fall Semester | | • |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Winter Semes | ter | |
| | [0 50] | Co. on Work Term IV |
| Summer Some | [0.50] | |
| Summer Sem | ester | |
| | - 11 | |
| Semester / - F | an | |
| FARE*3320 | [0.50] | Supply and Value Chain Management |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| 1.50 electives or re | | ctives |
| Semester 8 - V | vinter | |
| FARE*4330 | [0.50] | Advanced Operations Management |
| FARE*4380 | [0.50] | Retailing, Merchandising and Sales |
| FOOD*4310 | [0.50] | Food Safety Management Systems |
| 1.00 electives of re | stricted ele | cuves |
| Restricted Ele | cuves | |
| Students should n | ote that sor | ne restricted electives require other courses not |
| among the require | u courses fo | or the major as prerequisites. Students should c |

Stude ot included consult the amon most recent undergraduate calendar for specific requirements. Students must take a minimum of 3.00 credits from restricted electives.

A minimum of 1.00 credits from the following list:

| | | 0 |
|-----------|--------|---------------------------------------------|
| FOOD*4070 | [0.50] | Food Packaging |
| FOOD*4110 | [0.50] | Meat and Poultry Processing |
| FOOD*4400 | [0.50] | Dairy Processing |
| FOOD*4520 | [0.50] | Utilization of Cereal Grains for Human Food |
| | | |

| A minimum of 1.00 credits from the following list: | | | |
|----------------------------------------------------|-----------------|-------------------------------------------------------------|--|
| FARE*3000 | [0.50] | Food Industry Analysis and Policy | |
| FARE*3170 | [0.50] | Cost-Benefit Analysis | |
| FARE*4360 | [0.50] | Marketing Research | |
| FARE*4500 | [0.50] | Decision Science | |
| FOOD*4020 | [0.50] | Quality Management in the Food Industry | |
| POLS*3470 | [0.50] | Business-Government Relations in Canada | |
| Students may also | count any of t | he courses from the following list as restricted electives: | |
| FOOD*3050 | [0.50] | Food Chemistry I | |
| FOOD*3700 | [0.50] | Sensory Evaluation of Foods | |
| FOOD*4090 | [0.50] | Functional Foods and Nutraceuticals | |
| FOOD*4260 | [0.50] | Food Product Development I | |
| FOOD*4270 | [0.50] | Food Product Development II | |
| Students may also | count any of | the research/experiential learning/independent study | |
| courses from the f | ollowing list a | s restricted electives: | |
| AGR*3010 | [0.50] | Special Studies in Agricultural Science I | |
| AGR*3500 | [0.50] | Experiential Education I | |
| FARE*4550 | [0.50] | Independent Studies I | |
| FARE*4560 | [0.50] | Independent Studies II | |
| FOOD*4220 | [0.50] | Topics in Food Science | |

Research in Food Science

FOOD*4230

[0.50]

Bachelor of Commerce (B.Comm.)

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

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

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

Bachelor of Commerce Majors

All majors in the Bachelor of Commerce program are also available in the Co-operative Education (Co-op) option. Co-operative Education is not available in Undeclared.

Undeclared (only available in semesters one and two)

Accounting

Food and Agricultural Business

Hospitality and Tourism Management

Management

Management Economics and Finance

Marketing Management

Public Management

Real Estate and Housing

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

The B.Comm. Core includes:

| Year 1 | | |
|-----------|--------|-----------------------------------------|
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| MATH*1030 | [0.50] | Business Mathematics |
| MCS*1000 | [0.50] | Introductory Marketing |
| MGMT*1000 | [1.00] | Introduction to Business |
| Year 2 | | |
| ACCT*2230 | [0.50] | Management Accounting |
| ECON*2560 | [0.50] | Introduction to Finance |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*2020 | [0.50] | Information Management |
| MGMT*1100 | [0.00] | Business Career Preparation |
| Year 3 | | |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| Year 4 | | |

MGMT*4000 [0.50] Strategic Management

* MGMT*1100 is part of the Career Development Program which is designed to provide students with knowledge and tools to enhance their career readiness skills.

Students who have successfully completed COOP*1100 will be exempted from MGMT*1100.

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

• Law

HROB*3050, MCS*3040, REAL*4840

Operations

FARE*3310, HTM*3120

Statistics

ECON*2740, PSYC*1010, STAT*2060

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.

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.

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

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 <u>Undergraduate Academic Information Centre website: http://www.uoguelph.ca/uaic/students_advisors.shtml</u> or contact the B.Comm. Counselling Office for further information.

Special Expenses

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

Study at Other Universities

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

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

The total limit of credits taken on a Letter of Permission is 2.50 based on the University of Guelph's credit system.

Study Abroad

Global understanding and perspectives are regarded as being of central importance among the university's learning objectives, as they are, also, in understanding the international business environment. On both of these accounts, students enrolled in the B.Comm. program are urged to participate in one of the several exchange and study abroad programs specifically designed for the Commerce program. Planning for such participation is best undertaken quite early in the course of studies. For more specific information on possible opportunities refer to Section V -- International Study of the calendar or contact the B.Comm. program counsellor.

Continuation of Studies

Students are advised to consult the regulations for Continuation of Study within the program which are outlined in detail in Section VIII -- Undergraduate Degree Regulations and Procedures.

Conditions of Graduation

To qualify for a Bachelor of Commerce degree, the student must satisfy the following conditions:

- The student must successfully complete 1.50 credits from the Liberal Education Requirement list.
- The student must successfully complete a minimum of 20.00 approved credits, in accordance with the Schedule of Studies for the specified major, including the Liberal Education Requirement.
- The student must successfully pass Business Career Preparation [MGMT*1100] or Introduction to Co-operative Education [COOP*1100]
- Students will not be eligible to graduate while on probationary or required-to-withdraw status.

Career Development Program

The Career Development Program provides students with knowledge and tools to enhance their career readiness skills, leading to a greater level of confidence and success when approaching the career search process. Through a series of activities that would span over each year of the Bachelor of Commerce Program, including a mandatory Business Career Preparation Course [MGMT*1100]*, students will be guided through a framework for career management and steps to create a personal "career toolkit".

*Students who have successfully completed [COOP*1100] will be exempted from [MGMT*1100]

Liberal Education Requirement

The Liberal Education Requirement is designed to provide the student with exposure to and some understanding of a range of disciplines in the Arts, Humanities, Social Sciences, and Mathematical and Natural Sciences.

The Liberal Education Requirement consists of 1.50 credits. The course prefixes listed below **<u>cannot</u>** be used to satisfy the Liberal Education Requirement:

ACCT Accounting

BUS Business

ECON Economics

FARE Food, Agricultural and Resource Economics

HROB Human Resources and Organizational Behaviour

HTM Hospitality and Tourism Management

MGMT Management

MCS Marketing and Consumer Studies

REAL Real Estate and Housing

Free Electives

Free Electives allow students to select courses that support or complement their primary field of study. Students may select undergraduate courses from any department, including Commerce/Business related courses, provided any individual course restrictions and prerequisites are satisfied. These courses can be at any year level.

The total number of Free Electives allowed varies by major (refer to the Schedule of Studies for details). Free Electives cannot be used to fulfill Required Core courses, Restricted Electives or Liberal Education Electives, but they could contribute to the total number of credits required for graduation.

Honours Minor

A minor is a group of courses which provide exposure to and mastery of the fundamental principles of a subject. A minor consists of a minimum of 5.00 credits (normally 10 courses). It may also require certain other courses from other areas to be taken along with the specified courses of the minor. A minor is taken in conjunction with a major. Students cannot earn a minor in the same subject area as their major. Additionally, students in the BComm program are not permitted to earn a minor in Business or Business Economics. For a list of Minors, please see Specializations and Their Degrees.

Given the professional and applied nature of the B.Comm program, there are no double majors associated with the degree.

Double Counting of Credits

A maximum of 2.50 credits required in a major program may be applied to meet the requirements of a minor. Courses used to meet the Liberal Education requirement may not double-count toward the requirements of their major but may double-count towards the completion of a minor.

Schedule of Studies

Courses specified in the schedule of studies are required courses and must be completed successfully. A full course load normally involves 2.50 credits per semester. Part-time study is also possible although students should discuss this option with their Program Counsellor or Faculty Advisor.

Undeclared (UND)

Gordon S. Lang School of Business and Economics

Applicants to the B.Comm program who want a flexible introduction to business studies should consider entering as an unspecialized student. Students must declare one of the eight majors in order to gain access to required courses. This must be done no later than the end of semester two.

Liberal Education Requirement

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

Major

Semester 1

| FCON*1050 | [0 50] | Introductory Microeconomics |
|--------------------|---------------|-------------------------------------------|
| | [0.50] | introductory whereeconomics |
| MATH*1030 | [0.50] | Business Mathematics |
| MGMT*1000 | [1.00] | Introduction to Business |
| One of: | | |
| HTM*1070 | [0.50] | Responsible Tourism Policy and Planning * |
| HTM*1700 | [0.50] | Foodservice Management * |
| MATH*1200 | [0.50] | Calculus I * |
| POLS*1400 | [0.50] | Issues in Canadian Politics * |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| REAL*1820 | [0.50] | Real Estate and Housing * |
| 0.50 elective | | - |
| * These courses an | re offered in | the Fall semester only |
| Semester 2 | | - |
| ACCT*1220 | [0.50] | Introductory Einspecial Accounting |

| ACCT*1220 | [0.50] | Introductory Financial Accounting |
|----------------|--------|-----------------------------------------|
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*1000 | [0.50] | Introductory Marketing |
| 0.50 electives | | |

Notes:

- 1. Students interested in choosing the ACCT major should take ACCT*1220 during the Fall semester instead of the 0.50 elective. ACCT*1240 Applied Financial Accounting will then be taken in the Winter semester.
- 2. Students interested in choosing the FAB Major should take FARE*1400 Economics of the Agri-Food System instead of HROB*2090 and the 0.50 electives during the Winter Semester.
- 3. Students interested in choosing the MGMT major should take MGMT*1200 Principles of Management instead of ACCT*1220 in the Winter semester.
- 4. Students who select MATH*1200 do not also need to complete MATH*1030.

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

Accounting (ACCT)

Department of Management, Gordon S. Lang School of Business and Economics

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

The program provides a strong foundation of accounting and general business knowledge while allowing significant opportunity to develop breadth and depth of knowledge in related areas of study.

Students pursuing a professional accounting designation should visit the Department of Management website for links to the requirements.

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

Degree Requirements (20.00 Total Credits)

13.00 - Required Core Courses

1.00 - Restricted Electives (see semester 7 & 8)

0.00 - MGMT*1100 (Business Career Preparation)

1.50 - Liberal Education Electives

4.50 - Free Electives

The recommended program sequence is outlined below.

Major Semester 1

| Semester 1 | | | |
|-----------------|-----------|-----------------------------------------|--|
| ACCT*1220 | [0.50] | Introductory Financial Accounting | |
| ECON*1050 | [0.50] | Introductory Microeconomics | |
| MATH*1030 | [0.50] | Business Mathematics | |
| MGMT*1000 | [1.00] | Introduction to Business | |
| Semester 2 | | | |
| ACCT*1240 | [0.50] | Applied Financial Accounting | |
| ECON*1100 | [0.50] | Introductory Macroeconomics | |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations | |
| MCS*1000 | [0.50] | Introductory Marketing | |
| 0.50 electives | | | |
| Semester 3 | | | |
| ACCT*2230 | [0.50] | Management Accounting | |
| MCS*2020 | [0.50] | Information Management | |
| MGMT*1100 | [0.00] | Business Career Preparation | |
| STAT*2060 | [0.50] | Statistics for Business Decisions | |
| 1.00 electives | | | |
| Semester 4 | | | |
| ACCT*3330 | [0.50] | Intermediate Financial Accounting I | |
| ECON*2560 | [0.50] | Introduction to Finance | |
| MCS*3040 | [0.50] | Business and Consumer Law | |
| MGMT*3320 | [0.50] | Financial Management | |
| 0.50 electives | | | |
| Semester 5 | | | |
| ACCT*3280 | [0.50] | Auditing I | |
| ACCT*3340 | [0.50] | Intermediate Financial Accounting II | |
| ACCT*3350 | [0.50] | Taxation | |
| HROB*2290 | [0.50] | Human Resources Management | |
| 0.50 electives | | | |
| Semester 6 | | | |
| ACCT*3230 | [0.50] | Intermediate Management Accounting | |
| FARE*3310 | [0.50] | Operations Management | |
| MGMT*3020 | [0.50] | Corporate Social Responsibility | |
| 1.00 electives | | | |
| Semester 7 - Fa | .11 | | |
| ACCT*4220 | [0.50] | Advanced Financial Accounting | |
| Semester 8 - W | inter | | |
| ACCT*4230 | [0.50] | Advanced Management Accounting | |
| Semester 7 or 8 | - Fall or | Winter | |
| MGMT*4000 | [0.50] | Strategic Management | |
| Two of: | | | |
| ACCT*4270 | [0.50] | Auditing II | |
| ACCT*4290 | [0.50] | IT Auditing and Data Analytics | |
| ACCT*4340 | [0.50] | Accounting Theory | |

2.50 electives Note: ACCT*4270 and ACCT*4350 are offered in the Fall only. ACCT*4290, ACCT*4340 and ACCT*4440 are offered in the Winter only. Students may take MGMT*4000 in either Fall or Winter.

Accounting (Co-op) (ACCT:C)

Department of Management, Gordon S. Lang School of Business and Economics

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

The program provides a strong foundation of accounting and general business knowledge while allowing significant opportunity to develop breadth and depth of knowledge in related areas of study.

Students pursuing a professional accounting designation should visit the Department of Management website for links to the requirements.

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

The Co-op program in Accounting is designed to facilitate the transition of students from academic studies to a professional career by enhancing the integration of theory and practice.

Program Requirements

The Co-op program in Accounting is a five year program including four work terms. Students must complete a Fall and Winter work term, and must follow the academic work schedule (also found on the Co-operative Education website: https://www.recruitguelph.ca/ cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Accounti | ing Academic a | nd Co-op V | Work Term | Schedule |
|----------|----------------|------------|-----------|----------|
| | | | | |

| Year | Fall | Winter | Summer |
|------|----------------------------|----------------------------------|---------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | Academic Semester 6 |
| 4 | COOP*3000 Work Term III | COOP*4000 Work Term IV | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)

13.00 - Required Core Courses

- 1.00 Restricted Electives (see semester 7 & 8)
- 1.50 Liberal Education Electives
- 4.50 Free Electives
- 1.50 Co-op work terms

Note: A minimum of three Co-op work terms including a Fall and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00

The recommended program sequence is outlined below.

Major

Semester 1 -- Fall

| ACCT*1220 | [0.50] | Introductory Financial Accounting |
|----------------|----------|-----------------------------------------|
| ECON*1050 | [0.50] | Introductory Microeconomics |
| MATH*1030 | [0.50] | Business Mathematics |
| MGMT*1000 | [1.00] | Introduction to Business |
| Semester 2 - | - Winter | |
| ACCT*1240 | [0.50] | Applied Financial Accounting |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| 1.00 electives | | |
| | | |

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

| Semester 3 Fa | all | |
|---------------------|---------------|----------------------------------------------------------------|
| ACCT*2230 | [0.50] | Management Accounting |
| ACCT*3330 | [0.50] | Intermediate Financial Accounting I |
| MCS*1000 | [0.50] | Introductory Marketing |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| 0.50 electives | | |
| Winter Semeste | er | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 4 S | ummer | I I I I I I I I I I I I I I I I I I I |
| ACCT*3280 | [0 50] | Auditing I |
| ACCT*3340 | [0.50] | Intermediate Financial Accounting II |
| ACCT*3350 | [0.50] | Taxation |
| MCS*2020 | [0.50] | Information Management |
| 0.50 electives | [0.50] | Information Management |
| Semester 5 F | all | |
| Semester 5 Fa | all 50 503 | |
| ECON*2560 | [0.50] | Introduction to Finance |
| FARE*3310 | [0.50] | Operations Management |
| HROB*2290 | [0.50] | Human Resources Management |
| 1.00 electives | | |
| Winter Semeste | er | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Semester 6 St | ummer | |
| ACCT*3230 | [0.50] | Intermediate Management Accounting |
| MCS*3040 | [0.50] | Business and Consumer Law |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| 0.50 electives | | - |
| Fall Semester | | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| (Eight month work | term in co | njunction with COOP*4000) |
| Winter Semeste | er | <u>.</u> |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| (Eight month work | term in co | niunction with COOP*3000) |
| Semester 7 - Fa | 11 | - j |
| ACCT*4220 | IO 501 | Advanced Financial Accounting |
| Somester 8 - Wi | inter | Advanced Financial Accounting |
| ACCET 4220 | | |
| ACC1*4230 | [0.50] | Advanced Management Accounting |
| Semester 7 or 8 | - Fall or | Winter |
| MGMT*4000 | [0.50] | Strategic Management |
| Two of: | | |
| ACCT*4270 | [0.50] | Auditing II |
| ACCT*4290 | [0.50] | IT Auditing and Data Analytics |
| ACCT*4340 | [0.50] | Accounting Theory |
| ACCT*4350 | [0.50] | Income Taxation II |
| ACCT*4440 | [0.50] | Integrated Cases in Accounting |
| 2.50 electives | | |
| INDED ALL $(\pi/2)$ | LI and A((" | ΔT_{1} and are othered in the Hall only ΔC_{1} |

ACCT*4270 and ACCT*4350 are offered in the Fall only. ACCT*4290, ACCT*4340 and ACCT*4440 are offered in the Winter only. Students may take MGMT*4000 in either Fall or Winter.

Food and Agricultural Business (FAB)

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

In this major, students will acquire the management education needed to succeed in the dynamic and innovative food and agribusiness industries. Building on an understanding of economic theory and applied methods in both the Canadian and the global context, the program prepares graduates with technical, entrepreneurial and leadership skills for a variety of professional opportunities in industry, government agencies and non-governmental organizations. The major provides a complete foundation for further studies leading to a graduate degree or professional accounting designation.

The major is administered by the Department of Food, Agricultural and Resource Economics in the Ontario Agricultural College and students are urged to consult the faculty advisor.

Degree Requirements (20.00 Total Credits)

15.50 - Required Core Courses

- 1.00 Restricted Electives (from lists) 0.00 - MGMT*1100 (Business Career Preparation)
- 1.50 Liberal Education Electives

2.00 - Free Electives

Major

5 N

> Semester 1 ECON*1050 [0.50]

Introductory Microeconomics

| MATH*1030 | [0.50] | Business Mathematics |
|------------------------|-------------------------|-----------------------------------------------|
| MCS*1000 | [0.50] | Introductory Marketing |
| MGMT*1000 | [1.00] | Introduction to Business |
| Semester 2 | 10 501 | |
| ACC1*1220 ECON*1100 | [0.50] | Introductory Financial Accounting |
| FARE*1400 | [0.30] | Economics of the Agri-Food System |
| 0.50 electives or r | restricted ele | ectives |
| Semester 3 | | |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| ECON*2740 | [0.50] | Economic Statistics |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*2020 | [0.50] | Information Management |
| MGM1*1100 | [0.00] estricted als | Business Career Preparation |
| Semester 4 | estricted ele | cuves |
| ACCT*2230 | [0 50] | Management Accounting |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| ECON*2770 | [0.50] | Introductory Mathematical Economics |
| FARE*2410 | [0.50] | Agrifood Markets and Policy |
| 0.50 electives or r | estricted ele | octives |
| Semester 5 | | |
| ECON*2560 | [0.50] | Introduction to Finance |
| ECON*3740 | [0.50] | Introduction to Econometrics |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| Semester 6 | | - |
| FARE*4240 | [0.50] | Futures and Options Markets |
| 2.00 electives or r | estricted ele | ectives |
| Semester 7 | | |
| FARE*3030 | [0.50] | The Firm and Markets |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| MGM1*4000 One of: | [0.50] | Strategic Management |
| HROB*3050 | [0.50] | Employment Law |
| MCS*3040 | [0.50] | Business and Consumer Law |
| REAL*4840 | [0.50] | Housing and Real Estate Law |
| 0.50 electives or r | estricted ele | octives |
| Semester 8 | | |
| AGR*4600 | [1.00] | Agriculture and Food Issues Problem Solving |
| FARE*4000 | [0.50] | Agricultural and Food Policy |
| 0 50 electives or r | estricted ele | Advanced Agribusiness Management |
| Restricted Elec | ctives | |
| A minimum of 1. | 00 credits fr | om the following list: |
| FARE*1300 | [0.50] | Poverty, Food & Hunger |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| FARE*3250 | [0.50] | Food and International Development |
| FARE*4210 | [0.50] | World Agriculture, Food Security and Economic |
| EARE*/200 | [0 50] | Land Economics |
| FARE*4310 | [0.50] | Resource Economics |
| FARE*4360 | [0.50] | Marketing Research |
| FARE*4500 | [0.50] | Decision Science |
| FARE*4550 | [0.50] | Independent Studies I |
| FARE*4560 | [0.50] | Independent Studies II |
| Food and Ag | ricultura | Business (Co-op) (FAB:C) |
| Department of L | lood Agrig | ultural and Pasauraa Faanamias Ontaria Agri |

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

In this major, students will acquire the management education needed to succeed in the dynamic and innovative food and agribusiness industries. Building on an understanding of economic theory and applied methods in both the Canadian and the global context, the program prepares graduates with technical, entrepreneurial and leadership skills for a variety of professional opportunities in industry, government agencies and non-governmental organizations. The major provides a complete foundation for further studies leading to a graduate degree or professional accounting designation.

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 major is administered by the Department of Food, Agricultural and Resource Economics in the Ontario Agricultural College and students are urged to consult the faculty advisor.

Program Requirements

The Co-op program in Food and Agricultural Business is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Food and Agricultural | Business Ac | ademic and | Co-op ' | Work Term | Schedule |
|-----------------------|--------------------|------------|---------|------------------------------------------------|----------|
| ood and i give areara | 10 000 1 10 | advine and | 00 OP | THOMAS AND | Denedane |

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

15.50 - Required Core Courses

1.00 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

2.00 - Free Electives

2.00 Co-op Work Terms

Maior

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

| j | | |
|-------------------|--------------|-----------------------------------------|
| Semester 1 - F | all | |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| MATH*1030 | [0.50] | Business Mathematics |
| MCS*1000 | [0.50] | Introductory Marketing |
| MGMT*1000 | [1.00] | Introduction to Business |
| Semester 2 - V | Vinter | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| FARE*1400 | [1.00] | Economics of the Agri-Food System |
| 0.50 electives or | restricted e | lectives |
| Semester 3 - F | all | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| ECON*2740 | [0.50] | Economic Statistics |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*2020 | [0.50] | Information Management |
| 0.50 electives or | restricted e | lectives |
| Semester 4 - V | Vinter | |
| ACCT*2230 | [0.50] | Management Accounting |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| ECON*2770 | [0.50] | Introductory Mathematical Economics |
| FARE*2410 | [0.50] | Agrifood Markets and Policy |
| 0.50 electives or | restricted e | lectives |
| Summer Seme | ester | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Fall Semester | | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| (Eight month wo | rk term Sui | nmer/Fall) |
| Semester 5 - V | Vinter | |
| ECON*2560 | [0.50] | Introduction to Finance |
| ECON*3740 | [0.50] | Introduction to Econometrics |
| FARE*3310 | [0.50] | Operations Management |

| FARE*4240 | [0.50] | Futures and Options Markets |
|----------------------|---------------|-----------------------------------------------|
| MGMT*3320 | [0.50] | Financial Management |
| Summer Semes | ter | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 6 - Fa | 11 | |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| 2.00 electives or re | estricted ele | ctives |
| Winter Semeste | er | |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| (Eight month work | c term in co | njunction with COOP*5000) |
| Summer Semes | ter | |
| COOP*5000 | [0.50] | Co-op Work Term V |
| (Eight month work | c term in co | njunction with COOP*4000) |
| Semester 7 - Fa | 11 | |
| FARE*3030 | [0.50] | The Firm and Markets |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| MGMT*4000 | [0.50] | Strategic Management |
| One of: | | |
| HROB*3050 | [0.50] | Employment Law |
| MCS*3040 | [0.50] | Business and Consumer Law |
| REAL*4840 | [0.50] | Housing and Real Estate Law |
| 0.50 electives or re | estricted ele | ctives |
| Semester 8 - Wi | inter | |
| AGR*4600 | [1.00] | Agriculture and Food Issues Problem Solving |
| FARE*4000 | [0.50] | Agricultural and Food Policy |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |
| 0.50 electives or re | estricted ele | ctives |
| Restricted Elec | tives | |
| A minimum of 1.0 | 0 credits fr | om the following list: |
| FARE*1300 | [0.50] | Poverty, Food & Hunger |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| FARE*3250 | [0.50] | Food and International Development |
| FARE*4210 | [0.50] | World Agriculture, Food Security and Economic |
| | | Development |
| FARE*4290 | [0.50] | Land Economics |
| FARE*4310 | [0.50] | Resource Economics |
| FARE*4360 | [0.50] | Marketing Research |
| FARE*4500 | [0.50] | Decision Science |
| FARE*4550 | [0.50] | Independent Studies I |
| FARE*4560 | [0.50] | Independent Studies II |
| | | |

Hospitality and Tourism Management (HTM)

School of Hospitality, Food and Tourism Management, Gordon S. Lang School of **Business and Economics**

The Hospitality and Tourism Management (HTM) major prepares students to assume positions of responsibility within the world's largest industry.

In the first two years of study, students are introduced to foundational business skills and knowledge; and provided with an in-depth overview of the industry's three sectors: hotel and lodging; restaurant and foodservice; and tourism.

By the end of the second year, students must choose one of those sectors as their area of emphasis. For the remainder of the program, the courses and learning opportunities that students encounter have one goal: to help them cultivate the knowledge, skills and understanding required of a managerial leader in their chosen area.

Topics of study for all three areas of emphasis includes:

- human resources management;
- marketing;
- accounting;
- communications

The hotel and lodging area includes:

- operations;
- event management;
- design

The restaurant and foodservice area includes:

- food systems;
- · restaurant management;
- · beverage management
- The tourism area includes:
 - planning and development;
 - sustainability;
 - international tourism

An integral part of the HTM major is experiential learning, which means that theory is balanced with practice. Students are encouraged to participate in guided learning opportunities outside the conventional classroom, such as independent study courses, study abroad, and numerous networking events with industry leaders.

Additional information:

- 1200 hours of verified work experience in the hospitality and tourism industry is required for students to be eligible for graduation.
- 700 hours of hospitality and tourism work experience must be completed before a student enters Semester 7.

Elective options enable students to select courses that support or complement their area of emphasis. Examples:

- 1. Students may use a combination of courses from their major, liberal education and free electives to earn the Certificate in Leadership. For information about this certificate and its course requirements, see http://www.leadershipcertificate.com/
- 2. Students interested in languages and/or participating in study abroad programs may use a combination of their liberal education or free electives to study one or more of the various languages taught at the University or to take courses while abroad.
- 3. Students interested in independent study courses (e.g. HTM*4130, HTM*4140, HTM*4150, HTM*4500) may use a combination of their restricted or free electives to study one or more of these special topic courses. For more information regarding current offerings, students should consult the Faculty Advisor.

Degree Requirements (20.00 Total Credits)

13.50 - Required Core Courses 3.50 - Area of Emphasis (Restricted Electives) 0.00 - MGMT*1100 (Business Career Preparation)

- 1.50 Liberal Education Electives
- 1.50 Free Electives

Major

Somostor 1

| Semester 1 | | |
|---------------------|---------------|---------------------------------------------------------|
| ECON*1050 | [0.50] | Introductory Microeconomics |
| HTM*1700 | [0.50] | Foodservice Management |
| MCS*1000 | [0.50] | Introductory Marketing |
| MGMT*1000 | [1.00] | Introduction to Business |
| Semester 2 | | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| HTM*1160 | [0.50] | Lodging Operations |
| MATH*1030 | [0.50] | Business Mathematics |
| 0.50 electives or a | reas of emp | hasis |
| Semester 3 | | |
| HTM*1070 | [0.50] | Responsible Tourism Policy and Planning |
| MCS*3040 | [0.50] | Business and Consumer Law |
| One of: | | |
| ECON*2740 | [0.50] | Economic Statistics |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| Semester 4 | | |
| MCS*2020 | [0.50] | Information Management |
| MGMT*1100 | [0.00] | Business Career Preparation |
| Semester 3 or 4 | ļ | |
| ACCT*2230 | [0.50] | Management Accounting |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| HTM*2010 | [0.50] | Hospitality and Tourism Business Communications |
| HTM*2030 | [0.50] | Control Systems in the Hospitality Industry |
| 1.00 electives o | or areas of e | mphasis |
| Semester 5 or 6 | 5 | |
| ECON*2560 | [0.50] | Introduction to Finance |
| HROB*2290 | [0.50] | Human Resources Management |
| HTM*3080 | [0.50] | Marketing Strategy for Hospitality Managers |
| HTM*3120 | [0.50] | Service Operations Analysis |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| 2.00 electives or a | reas of emp | hasis |
| Semester 7 or 8 | 3 | |
| HTM*4080 | [0.50] | Experiential Learning and Leadership in the Hospitality |
| | | and Tourism Industry |
| HTM*4190 | [0.50] | Hospitality and Tourism Industry Consultation |
| HTM*4250 | [0.50] | Hospitality Revenue Management |
| MGMT*4000 | [0.50] | Strategic Management |
| 3.00 electives or a | reas of emp | hasis |

Areas of Emphasis

Students in the Hospitality and Tourism Management (HTM) major choose one of the three areas of emphasis: Hotel and Lodging; Restaurant and Foodservice; or Tourism. Students should declare an area of emphasis by semester 4 in order to facilitate course selection for their chosen area. See the HTM Academic Advisor to declare your area of emphasis.

Hotel and Lodging

| Semester 4, 6 or 8 | | |
|--------------------|------------|----------------------------------------------------|
| HTM*2070 | [0.50] | Event Management |
| Semester 5 or 7 | | |
| HTM*3060 | [0.50] | Lodging Management |
| Semester 7 | L | |
| HTM*4090 | [0 50] | Hospitality Development, Design and Sustainability |
| Semester 8 | [0.50] | Hospitanty Development, Design and Sustainability |
| UTM*40C0 | FO 501 | A deserved I a dain a Managament |
| HIM*4060 | [0.50] | Advanced Lodging Management |
| 1.50 credits of: | 10 501 | |
| EDKD*3100 | [0.50] | International Communication |
| FARE*4360 | [0.50] | Marketing Research |
| HROB*2200 | [0.50] | Labour Relations |
| HIM*3160 | [0.50] | Destination Management and Marketing |
| HTM*3180 | [0.50] | Casino Operations Management |
| MGM1*4260 | [0.50] | International Business |
| 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 |
| Restaurant and F | oodservice | |
| Semester 4, 5 or 6 | | |
| HTM*2700 | [0.50] | Understanding Foods |
| Semester 5 or 6 | | - |
| HTM*3090 | [1.00] | Restaurant Operations Management |
| Semester 8 | [] | |
| HTM*/110 | [0 50] | Advanced Food Service Operations |
| 1 50 credits of: | [0.50] | Advanced 1 ood Service Operations |
| FOOD*3700 | [0 50] | Sensory Evaluation of Foods |
| HPOR*3010 | [0.50] | Compensation Systems |
| HROD 3010 | [0.50] | Pacewitment and Selection |
| HROD 3070 | [0.50] | Training and Davalopment |
| HROD 5090 | [0.50] | Human Basourea Dianning |
| HKOD 4000 | [0.50] | Fuent Management |
| HTM*2070 | [0.50] | Cultural Aspects of Food |
| HTM*2020 | [0.50] | Reverses Management |
| HTM*2790 | [0.50] | Managing Food in Canada |
| HTM*4050 | [0.50] | Wine and Oenelogy |
| MCS*2010 | [0.50] | Quality Management |
| NUTD*1010 | [0.50] | Introduction to Nutrition |
| Tourism | [0.50] | |
| | | |
| Semester 6 | | |
| GEOG*3490 | [0.50] | Tourism and Environment |
| HTM*3160 | [0.50] | Destination Management and Marketing |
| Semester 8 | | |
| FARE*4360 | [0.50] | Marketing Research |
| HTM*4170 | [0.50] | International Tourism |
| 1.50 credits of: | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| ECON*2650 | [0.50] | Introductory Development Economics |
| ECON*4830 | [0.50] | Economic Development |
| EDRD*3400 | [0.50] | Sustainable Communities |
| EDRD*3500 | [0.50] | Recreation and Tourism Planning |
| EDRD*4010 | [0.50] | Tourism Planning in the Less Developed World |
| GEOG*1220 | [0.50] | Human Impact on the Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| HTM*2070 | [0.50] | Event Management |
| HTM*3180 | [0.50] | Casino Operations Management |
| LARC*2820 | [0.50] | Urban and Regional Planning |
| MCS*3030 | [0.50] | Research Methods |
| Hosnitality an | d Touris | m Management Co-on (HTM:C) |

School of Hospitality, Food and Tourism Management, Gordon S. Lang School of Business and Economics

The Hospitality and Tourism Management (HTM) major prepares students to assume positions of responsibility within the world's largest industry. In the first two years of study, students are introduced to foundational business skills and knowledge; and provided with an in-depth overview of the industry's three sectors: hotel and lodging; restaurant and foodservice; and tourism.

By the end of the second year, students must choose one of those sectors as their area of emphasis. For the remainder of the program, the courses and learning opportunities that students encounter have one goal: to help them cultivate the knowledge, skills and understanding required of a managerial leader in their chosen area.

Topics of study for all three areas of emphasis includes:

- human resources management;
 - marketing;
 - accounting;
 - communications

The hotel and lodging area includes:

- operations;
- event management;
- design

The restaurant and foodservice area includes:

- · food systems;
- restaurant management;
- beverage management

The tourism area includes:

- planning and development;
- sustainability;
- international tourism

The principal aim of the Hospitality and Tourism Management Co-op program is to facilitate the transition of students from academic studies to a professional work life by enhancing the integration of theory and practice. The focus on experiential learning means that theory is balanced with practice. Students are encouraged to participate in guided learning opportunities outside the conventional classroom, such as independent study courses, study abroad and numerous networking events with industry leaders. Team work is a significant part of the core courses.

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

1) Students may use a combination of courses from their major, liberal education and free electives to earn the Certificate in Leadership. For information about this certificate and its course requirements, see http://www.leadershipcertificate.com/

2) Students interested in languages and/or participating in study abroad programs may use a combination of their liberal education or free electives to study one or more of the various languages taught at the University or to take courses while abroad.

3) Students interested in independent study courses (e.g. HTM*4500, HTM*4130, HTM*4140, HTM*4150) may use a combination of their restricted or free electives to study one or more of these special topic courses. For more information regarding current offerings, students should consult the Faculty Advisor.

Program Requirements

The Co-op program in Hospitality and Tourism Management is a five year program, including three work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|----------------------------|--------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | COOP*3000 Work Term III | Off |
| 4 | Academic Semester 5 | Academic Semester 6 | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

Hospitality and Tourism Management Academic and Co-op Work Term Schedule

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)

13.50 - Required Core Courses

3.50 - Area of Emphasis (Restricted Electives)

1.50 - Liberal Education Electives

Note: Three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement.

The recommended program sequence is outlined below.

Major Semester 1 - Fall ECON*1050 [0.50] Introductory Microeconomics HTM*1700 [0.50]Foodservice Management MCS*1000 [0.50] Introductory Marketing MGMT*1000 [1.00] Introduction to Business Semester 2 - Winter ACCT*1220 Introductory Financial Accounting [0.50]ECON*1100 [0.50] Introductory Macroeconomics HTM*1160 [0.50]Lodging Operations MATH*1030 [0.50] **Business Mathematics** 0.50 electives or areas of emphasis Semester 3 - Fall COOP*1100 [0.00] Introduction to Co-operative Education Responsible Tourism Policy and Planning HTM*1070 [0.50] MCS*3040 [0.50] Business and Consumer Law One of: ECON*2740 [0.50]Economic Statistics STAT*2060 [0.50] Statistics for Business Decisions Semester 4 - Winter MCS*2020 [0.50] Information Management Semester 3 or 4 - Fall or Winter ACCT*2230 [0.50]Management Accounting Individuals and Groups in Organizations HROB*2090 [0.50] HTM*2010 [0.50]Hospitality and Tourism Business Communications HTM*2030 [0.50] Control Systems in the Hospitality Industry 1.00 electives or areas of emphasis Summer Semester COOP*1000 [0.50]Co-op Work Term I Fall Semester COOP*2000 Co-op Work Term II [0.50] Winter Semester COOP*3000 [0.50] Co-op Work Term III

Semester 5 or 6 - Fall or Winte

| Semester 5 of | 0 - Fall 01 | winter |
|-------------------------------------|-------------|---------------------------------------------------------|
| ECON*2560 | [0.50] | Introduction to Finance |
| HROB*2290 | [0.50] | Human Resources Management |
| HTM*3080 | [0.50] | Marketing Strategy for Hospitality Managers |
| HTM*3120 | [0.50] | Service Operations Analysis |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| 2.00 electives or | areas of em | phasis |
| Semester 7 or | 8 - Fall or | ·Winter |
| HTM*4080 | [0.50] | Experiential Learning and Leadership in the Hospitality |
| | | and Tourism Industry |
| HTM*4190 | [0.50] | Hospitality and Tourism Industry Consultation |
| HTM*4250 | [0.50] | Hospitality Revenue Management |
| MGMT*4000 | [0.50] | Strategic Management |
| 3.00 electives or areas of emphasis | | |

Areas of Emphasis

Students in the Hospitality and Tourism Management (HTM) major choose one of the three areas of emphasis: Hotel and Lodging; Restaurant and Foodservice; or Tourism. Students should declare an area of emphasis by semester 4 in order to facilitate course selection for their chosen area. See the HTM Academic Advisor to declare your area of emphasis.

Hotel and Lodging

| Semester 4, 6 or 8 - Winter | | | |
|-----------------------------|--------|----------------------------------------------------|--|
| HTM*2070 | [0.50] | Event Management | |
| Semester 5 or 7 - | Fall | | |
| HTM*3060 | [0.50] | Lodging Management | |
| Semester 7 - Fall | | | |
| HTM*4090 | [0.50] | Hospitality Development, Design and Sustainability | |
| Semester 8 - Winter | | | |
| HTM*4060 | [0.50] | Advanced Lodging Management | |
| 1.50 credits of: | | | |
| EDRD*3160 | [0.50] | International Communication | |
| FARE*4360 | [0.50] | Marketing Research | |
| HROB*2200 | [0.50] | Labour Relations | |

| HTM*3160 | [0.50] | Destination Management and Marketing |
|--------------------|---------------|----------------------------------------------|
| HTM*3180 | [0.50] | Casino Operations Management |
| MGMT*4260 | [0.50] | International Business |
| 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 |
| Restaurant and H | Foodservice | : |
| Semester 4, 5 or (| 6 - Fall or V | Vinter |
| HTM*2700 | [0.50] | Understanding Foods |
| Semester 5 or 6 - | Fall or Wi | nter |
| HTM*3090 | [1.00] | Restaurant Operations Management |
| Semester 8 - Win | ter | |
| HTM*4110 | [0.50] | Advanced Food Service Operations |
| 1.50 credits of: | | |
| FOOD*3700 | [0.50] | Sensory Evaluation of Foods |
| HROB*3010 | [0.50] | Compensation Systems |
| HROB*3070 | [0.50] | Recruitment and Selection |
| HROB*3090 | [0.50] | Training and Development |
| HROB*4060 | [0.50] | Human Resource Planning |
| HTM*2070 | [0.50] | Event Management |
| HTM*2740 | [0.50] | Cultural Aspects of Food |
| HTM*3030 | [0.50] | Beverage Management |
| HTM*3780 | [0.50] | Managing Food in Canada |
| HTM*4050 | [0.50] | Wine and Oenology |
| MCS*3010 | [0.50] | Quality Management |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| Fourism | | |
| Semester 6 - Win | ter | |
| GEOG*3490 | [0.50] | Tourism and Environment |
| HTM*3160 | [0.50] | Destination Management and Marketing |
| Semester 8 - Win | ter | |
| FARE*4360 | [0.50] | Marketing Research |
| HTM*4170 | [0.50] | International Tourism |
| 1.50 credits of: | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| ECON*2650 | [0.50] | Introductory Development Economics |
| ECON*4830 | [0.50] | Economic Development |
| EDRD*3400 | [0.50] | Sustainable Communities |
| EDRD*3500 | [0.50] | Recreation and Tourism Planning |
| EDRD*4010 | [0.50] | Tourism Planning in the Less Developed World |
| GEOG*1220 | [0.50] | Human Impact on the Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| HTM*2070 | [0.50] | Event Management |
| HTM*3180 | [0.50] | Casino Operations Management |
| LARC*2820 | [0.50] | Urban and Regional Planning |
| MCS*3030 | [0.50] | Research Methods |
| | | |

Management (MGMT)

Department of Marketing, Gordon S. Lang School of Business and Economics

The major in Management provides a balanced foundation of management knowledge and strategic leadership skills that will enable graduates to one day work as professional managers and organizational leaders. The major focuses on broad, transferrable competencies within the academic discipline of management (i.e., planning and goal setting, strategy development and execution, managerial decision making, designing organizational structure, managing change and innovation, motivating individuals and teams, managerial communication, negotiation and conflict management), while simultaneously providing the flexibility to explore a wide range of courses in other business disciplines. This major is well suited to students with a strong interest in the core skills of management who wish to develop a broad understanding and expertise in business management.

Courses extend beyond the traditional lecture based format to include community based group projects, guest lecturers, in-class simulations and case-based learning to help link academic expertise and theory with industry practice. Experiential learning is an integral part of the major, and occurs through the integration of industry examples in the classroom, and a required management capstone course that takes a consulting perspective to address real-world and simulated organizational challenges.

Graduates of the Management major will leave the University of Guelph equipped with a range of knowledge and skills which prepare them to meet management needs of the future in such roles as management consultant, business analyst, talent management specialist or as future general managers.

Degree Requirements (20.00 Total Credits)

13.50 - Required Core Courses

2019-2020 Undergraduate Calendar

1.50 - Liberal Education Electives

5.00 - Free Electives

The recommended program sequence is outlined below.

Major

| Semester 1 | | |
|----------------|--------|---------------------------------------------------|
| ECON*1050 | [0.50] | Introductory Microeconomics |
| MCS*1000 | [0.50] | Introductory Marketing |
| MGMT*1000 | [1.00] | Introduction to Business |
| 0.50 electives | | |
| Semester 2 | | |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MATH*1030 | [0.50] | Business Mathematics |
| MGMT*1200 | [0.50] | Principles of Management |
| 0.50 electives | | |
| Semester 3 | | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| HROB*2010 | [0.50] | Foundations of Leadership |
| HROB*2290 | [0.50] | Human Resources Management |
| MGMT*1100 | [0.00] | Business Career Preparation |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| 0.50 electives | | |
| Semester 4 | | |
| ACCT*2230 | [0.50] | Management Accounting |
| ECON*2560 | [0.50] | Introduction to Finance |
| MCS*2020 | [0.50] | Information Management |
| 1.00 electives | | |
| Semester 5 | | |
| MCS*3040 | [0.50] | Business and Consumer Law |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3140 | [0.50] | Business Analytics |
| MGMT*3200 | [0.50] | Negotiation and Conflict Management |
| 0.50 electives | | |
| Semester 6 | | |
| FARE*3310 | [0.50] | Operations Management |
| HROB*3100 | [0.50] | Developing Management and Leadership Competencies |
| MGMT*3300 | [0.50] | Project Management |
| MGMT*3320 | [0.50] | Financial Management |
| 0.50 electives | | |
| Semester 7 | | |
| MGMT*4000 | [0.50] | Strategic Management |
| MGMT*4100 | [0.50] | Management Decision Making |
| 1.50 electives | | |
| Semester 8 | | |
| MGMT*4040 | [0.50] | Advanced Topics in Management |
| MGMT*4200 | [0.50] | Management Capstone |
| 1.50 electives | | |

Management (Co-op) (MGMT:C)

Department of Management, Gordon S. Lang School of Business and Economics

The major in Management provides a balanced foundation of management knowledge and strategic leadership skills that will enable graduates to one day work as professional managers and organizational leaders. The major focuses on broad, transferrable competencies within the academic discipline of management (i.e., planning and goal setting, strategy development and execution, managerial decision making, designing organizational structure, managing change and innovation, motivating individuals and teams, managerial communication, negotiation and conflict management), while simultaneously providing the flexibility to explore a wide range of courses in other business disciplines. This major is well suited to students with a strong interest in the core skills of management who wish to develop a broad understanding and expertise in business management.

Courses extend beyond the traditional lecture based format to include community based group projects, guest lecturers, in-class simulations and case-based learning to help link academic expertise and theory with industry practice. Experiential learning is an integral part of the major, and occurs through the integration of industry examples in the classroom, and a required management capstone course that takes a consulting perspective to address real-world and simulated organizational challenges.

Graduates of the Management major will leave the University of Guelph equipped with a range of knowledge and skills which prepare them to meet management needs of the future in such roles as management consultant, business analyst, talent management specialist or as future general managers.

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

Program Requirements

The Co-op program in Management is a five-year program, including 4 four work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Management Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|--------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | Academic Semester 6 |
| 4 | COOP*3000 Work Term III | COOP*4000 Work Term IV | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

13.50 - Required Core Courses

1.50 - Liberal Education Electives

5.00 - Free Electives

Semester 5 - Fall

Winter Semester COOP*2000

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

FARE*3310

HROB*3100

MGMT*3200

MGMT*3300

0.50 electives

1.50 Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00

The recommended program sequence is outlined below.

Major

Semester 1 - Fall ECON*1050 [0.50] Introductory Microeconomics MCS*1000 [0.50] Introductory Marketing MGMT*1000 [1.00] Introduction to Business 0.50 electives Semester 2 - Winter ECON*1100 [0.50]Introductory Macroeconomics HROB*2090 [0.50] Individuals and Groups in Organizations MATH*1030 [0.50] **Business Mathematics** MGMT*1200 [0.50] Principles of Management 0.50 electives Semester 3 - Fall ACCT*1220 [0.50] Introductory Financial Accounting COOP*1100 [0.00] Introduction to Co-operative Education HROB*2010 [0.50] Foundations of Leadership HROB*2290 [0.50] Human Resources Management STAT*2060 [0.50] Statistics for Business Decisions 0.50 electives Semester 4 - Winter ACCT*2230 [0.50] Management Accounting ECON*2560 [0.50] Introduction to Finance MCS*2020 [0.50] Information Management 1.00 electives Summer Semester COOP*1000 [0.50]

Co-op Work Term I

Operations Management Developing Management and Leadership Competencies Negotiation and Conflict Management Project Management

Co-op Work Term II

1.50 electives or restricted electives

2.00 electives or restricted electives

2.50 electives or restricted electives

2.00 electives or restricted electives

advisor to declare an area of emphasis. **FINANCE Area of Emphasis**

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

1.50 credits from the following Finance courses:

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

without regard to the categories, which are intended to be suggestive.

1.50 Economics credits at the 3000 or 4000 level

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

Semester 6 FARE*3310

Semester 7

Semester 8 MGMT*4000

Areas of Emphasis

ECON*3710

ECON*3810

ECON*4560

ECON*3360

ECON*3660

ECON*3760

ECON*3860

ECON*3960

ACCT*3330

ACCT*3340

ECON*3660

ECON*3760

ECON*4660

ECON*4760

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

Note: ECON*3810 is required for the Finance Area of Emphasis

Operations Management

Strategic Management

Students choose either Finance or Management as an area of emphasis in the MEF major. This choice should be made by semester 5. See the Economics and Finance departmental

Advanced Microeconomics

Advanced Macroeconomics

Advanced Topics in Finance

International Finance

Fundamentals of Derivatives

Intermediate Financial Accounting I

Investments

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

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

The Strategy of Mergers and Acquisitions

Money, Credit and the Financial System

Semester 6 - Summer

| MCS*3040 | [0.50] | Business and Consumer Law |
|-----------------|--------------|---------------------------------|
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3140 | [0.50] | Business Analytics |
| MGMT*3320 | [0.50] | Financial Management |
| 0.50 electives | | |
| Fall Semester | | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| (Eight month wo | rk term in c | conjunction with COOP*4000) |
| Winter Semest | ter | |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| (Eight month wo | rk term in c | conjunction with COOP*3000) |
| Semester 7 - F | all | |
| MGMT*4000 | [0.50] | Strategic Management |
| MGMT*4100 | [0.50] | Management Decision Making |
| 1.50 electives | | |
| Semester 8 - W | /inter | |
| MGMT*4040 | [0.50] | Advanced Topics in Management |
| MGMT*4200 | [0.50] | Management Capstone |
| 1.50 electives | | |

Management Economics and Finance (MEF)

Department of Economics and Finance, Gordon S. Lang School of Business and Economics

The Management Economics and Finance major is designed to offer students an appreciation of business and economic problems particularly in the area of finance.

The major provides a suitable education for a career in the business world or in the public service. It also constitutes a useful preparation for more advanced studies, including graduate studies in Economics, Finance, Business Administration, Accounting, Industrial Relations, Law, and Public Policy. The major is administered by the Department of Economics and Finance and students are urged to consult the faculty advisor.

Degree Requirements (20.00 Total Credits)

10.50 - Required Core Courses

6.00 - Restricted Electives (from lists)

0.00 - MGMT*1100 (Business Career Preparation)

1.50 - Liberal Education Electives

2.00 - Free Electives

Major

Semester 1

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

0.50 electives

*Note: MATH*1200 is recommended for the Finance Area of Emphasis. Semester 2 Introductory Financial Accounting ACCT*1220 [0.50] ECON*1100 [0.50] Introductory Macroeconomics [0.50] Individuals and Groups in Organizations HROB*2090 MCS*1000 [0.50] Introductory Marketing 0.50 electives Semester 3 ACCT*2230 [0.50] Management Accounting ECON*2310 [0.50] Intermediate Microeconomics ECON*2740 [0.50] **Economic Statistics** ECON*2770 [0.50] Introductory Mathematical Economics MCS*2020 [0.50] Information Management [0.00] MGMT*1100 **Business Career Preparation** Note: Students who wish to take the Statistics courses listed under the Finance Area of Emphasis may select STAT*2040 in place of ECON*2740.

Semester 4

| ECON*2410 | [0.50] | Intermediate Macroeconomics | |
|---------------------------------------------------------------|--------|------------------------------|--|
| ECON*2560 | [0.50] | Introduction to Finance | |
| MCS*3040 | [0.50] | Business and Consumer Law ** | |
| MGMT*3320 | [0.50] | Financial Management | |
| 0.50 electives or restricted electives in an area of emphasis | | | |

*Note: Students may select REAL*4840 in place of MCS*3040. This is a Fall semester course and can be completed in any Fall semester, provided the prerequisites are completed. Semester 5

ECON*3740 [0.50]Introduction to Econometrics [0.50] Corporate Social Responsibility MGMT*3020

Intermediate Financial Accounting II Investments Fundamentals of Derivatives Risk Management in Finance and Insurance Topics in Monetary Economics **Courses in Quantitative Finance** Game Theory

| ECON*3100 | [0.50] | Game Theory |
|----------------------|----------------|-----------------------------------------------------------|
| ECON*4640 | [0.50] | Advanced Econometrics |
| ECON*4700 | [0.50] | Advanced Mathematical Economics |
| ECON*4840 | [0.50] | Financial Econometrics |
| MATH*1160 | [0.50] | Linear Algebra I |
| MATH*1210 | [0.50] | Calculus II |
| STAT*3100 | [0.50] | Introductory Mathematical Statistics I |
| STAT*3110 | [0.50] | Introductory Mathematical Statistics II |
| Courses in prepa | ration for po | st-graduate work in Economics (MA) |
| ECON*4640 | [0.50] | Advanced Econometrics |
| ECON*4710 | [0.50] | Advanced Topics in Microeconomics |
| ECON*4810 | [0.50] | Advanced Topics in Macroeconomics |
| Community Eng | agement Cou | irses |
| MGMT*4050 | [0.50] | Business Consulting |
| MGMT*4350 | [0.50] | Business Case Competition Preparation |
| MGMT*4350 | [0.50] | Business Case Competition Preparation |
| Courses for Com | putational F | inance |
| CIS*1910 | [0.50] | Discrete Structures in Computing I |
| CIS*2500 | [0.50] | Intermediate Programming |
| CIS*2520 | [0.50] | Data Structures |
| CIS*2750 | [0.75] | Software Systems Development and Integration |
| CIS*3750 | [0.75] | System Analysis and Design in Applications |
| MANAGEMENT | Γ Area of Em | phasis |
| ECON*4400 | [0.50] | Managerial Economics |
| 1.50 credits from | the following | Finance courses: |
| ECON*3360 | [0.50] | The Strategy of Mergers and Acquisitions |
| ECON*3660 | [0.50] | Investments |
| ECON*3760 | [0.50] | Fundamentals of Derivatives |
| ECON*3860 | [0.50] | International Finance |
| ECON*3960 | [0.50] | Money, Credit and the Financial System |
| 2.50 additional cr | edits in econo | mics of which at least 0.50 must be at the 4000 level and |

at most 0.50*** may be at the 2000 level.

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

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

Courses toward a professional accounting designation Chartered Professional Accountants (CPA)

See http://www.business.uoguelph.ca/accounting.shtml for additional information.

| Courses to | prepare for | the Certified Human Resource Professional | (CHRP) |
|------------|-------------|-------------------------------------------|--------|
| ACCT*4440 | [0.50] | Integrated Cases in Accounting | |
| ACCT*4350 | [0.50] | Income Taxation II | |
| ACCT*4340 | [0.50] | Accounting Theory | |
| ACCT*4290 | [0.50] | IT Auditing and Data Analytics | |
| ACCT*4270 | [0.50] | Auditing II | |
| ACCT*4230 | [0.50] | Advanced Management Accounting | |
| ACCT*4220 | [0.50] | Advanced Financial Accounting | |
| ACCT*3350 | [0.50] | Taxation | |
| ACCT*3340 | [0.50] | Intermediate Financial Accounting II | |
| ACCT*3330 | [0.50] | Intermediate Financial Accounting I | |
| ACCT*3280 | [0.50] | Auditing I | |
| ACCT*3230 | [0.50] | Intermediate Management Accounting | |
| | | | |

designation:

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

| HROB*2200 | [0.50] | Labour Relations |
|-----------------------|--------------|--------------------------------------------------------|
| HROB*2290 | [0.50] | Human Resources Management |
| 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 Resource Planning |
| Courses to prep | oare for a p | ost-graduate program in Industrial Relations: |
| ECON*3400 | [0.50] | The Economics of Personnel Management |
| ECON*3520 | [0.50] | Labour Economics |
| ECON*3620 | [0.50] | International Trade |
| ECON*4790 | [0.50] | Topics in Labour Market Theory |
| HROB*2200 | [0.50] | Labour Relations |
| HROB*2290 | [0.50] | Human Resources Management |
| 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 Resource Planning |
| Courses toward | l the Leade | rship Certificate: |
| (see http://www. | leadershipc | ertificate.com/ for more information) |
| HROB*2010 | [0.50] | Foundations of Leadership |
| HROB*4010 | [0.50] | Leadership Certificate Capstone |
| POLS*2250 | [0.50] | Public Administration and Governance |
| POLS*3440 | [0.50] | Corruption, Scandal and Political Ethics |
| Courses in Pub | lic Adminis | tration: |
| 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 Rea | l Estate and | l 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 course | s count towa | rds the Post Graduate Valuation Certificate offered by |

y UBC, part of the requirements to obtain an Accredited Appraiser Canadian Institute designation

Courses in Corporate Social Responsibility:

| BUS*4550 | [0.50] | Applied Business Project I |
|-----------------------|---------|---------------------------------------|
| BUS*4560 | [0.50] | Applied Business Project II |
| ECON*2650 | [0.50] | Introductory Development Economics |
| ECON*3300 | [0.50] | Economics of Health and the Workplace |
| ECON*4930 | [0.50] | Environmental Economics |
| HROB*3030 | [0.50] | Occupational Health and Safety |
| REAL*2850 | [0.50] | Service Learning in Housing |
| MGMT*4050 | [0.50] | Business Consulting |
| MGMT*4060 | [0.50] | Business Consulting |
| Courses in Mar | keting: | |

| MCS*2600 | [0.50] | Fundamentals of Consumer Behaviour |
|----------------|--------------|------------------------------------|
| MCS*3000 | [0.50] | Advanced Marketing |
| MCS*3010 | [0.50] | Quality Management |
| MCS*3620 | [0.50] | Marketing Communications |
| MCS*4400 | [0.50] | Pricing Management |
| Courses in Foo | od and Agrib | usiness: |
| FARE*2410 | [0.50] | Agrifood Markets and Policy |
| FARE*3030 | [0.50] | The Firm and Markets |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| FARE*4000 | [0.50] | Agricultural and Food Policy |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |
| 3.6 | (T | |

Management Economics and Finance (Co-op) (MEF:C)

Department of Economics and Finance, Gordon S. Lang School of Business and Economics

The Management Economics and Finance major is designed to offer students an appreciation of business and economic problems particularly in the area of finance.

The major provides a suitable education for a career in the business world or in the public service. It also constitutes a useful preparation for more advanced studies, including graduate studies in Economics, Finance, Business Administration, Accounting, Industrial Relations, Law, and Public Policy. The major is administered by the Department of Economics and Finance and students are urged to consult the faculty advisor.

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

Program Requirements

The Co-op program in Management Economics and Finance is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Management Economics and Finance Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)

- 10.50 Required Core Courses
- 6.00 Restricted Electives (from lists)
- 1.50 Liberal Education Electives

2.00 - Free Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

Major

Semester 1 - Fall

| ECON*1050 | [0.50] | Introductory Microeconomics | |
|-------------------------------------------------------------------|--------|-----------------------------|--|
| MGMT*1000 | [1.00] | Introduction to Business | |
| One of: | | | |
| MATH*1030 | [0.50] | Business Mathematics | |
| MATH*1200 | [0.50] | Calculus I | |
| 0.50 electives | | | |
| *Note: MATH*1200 is recommended for the Finance Area of Emphasis. | | | |
| Semester 2 - Winter | | | |

| ACCT*1220 | [0.50] | Introductory Financial Accounting |
|-----------|--------|-----------------------------------------|
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| | | 2019-2020 Undergraduate Calendar |

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| 0.50 electives ECON*3100 [0.50] Game Theory Semester 3 - Fall ECON*4640 [0.50] Advanced Econome ECON*4700 [0.50] Advanced Mathema | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Semester 5 - Fail ECON*4640 [0.50] Advanced Econome | 4 |
| | etrical Economics |
| ACCT*2230 [0.50] Management Accounting Econv 4700 [0.50] Advanced Matterna | rics |
| COOP*1100 [0.00] Introduction to Co-operative Education MATH*1160 [0.50] Linear Algebra I | |
| ECON*2510 [0.50] Internetiate Microeconomics MATH*1210 [0.50] Calculus II | |
| ECON 2740 [0.50] Economics STAT*3100 [0.50] Introductory Mathematical Economics STAT*3100 [0.50] Introductory Mathematical | matical Statistics I |
| MCS*2020 [0.50] Information Management STAT*3110 [0.50] Introductory Mather | matical Statistics II |
| Note: Students who wish to take the Statistics courses listed under the Finance Area of Courses in preparation for post-graduate work in 1 | Economics (MA): |
| Emphasis may select STAT*2040 in place of ECON*2740. ECON*4640 [0.50] Advanced Econome | etrics |
| Semester 4 - Winter [0.50] Advanced Topics in | Microeconomics |
| ECON*2410 [0.50] Intermediate Macroeconomics | Macroeconomics |
| ECON*2560 [0.50] Introduction to Finance MGMT*4050 [0.50] Business Consulting | T |
| MCS*3040 [0.50] Business and Consumer Law * MGMT*4350 [0.50] Business Case Com | petition Preparation |
| MGMT*3320 [0.50] Financial Management MGMT*4350 [0.50] Business Case Com | petition Preparation |
| 0.50 electives or restricted electives in an area of emphasis Courses for Computational Finance | I · · · · · · · · · |
| * Note: Students may select REAL*4840 in place of MCS*3040. This is a Fall semester CIS*1910 [0.50] Discrete Structures i | in Computing I |
| course and can be completed in any Fall semester, provided the prerequisites are completed. CIS*2500 [0.50] Intermediate Progra | mming |
| Summer Semester CIS*2520 [0.50] Data Structures | |
| COOP*1000 [0.50] Co-op Work Term I CIS*2750 [0.75] Software Systems D | Development and Integration |
| Fall Semester CIS*3750 [0.75] System Analysis and | d Design in Applications |
| COOP*2000 [0.50] Co-op Work Term II MANAGEMENT Area of Emphasis | |
| Semester 5 - Winter ECON*4400 [0.50] Managerial Economics | 3 |
| ECON*3740 [0.50] Introduction to Econometrics 1.50 credits from the following Finance courses: | rears and Acquisitions |
| FARE*3310 [0.50] Operations Management ECON*3500 [0.50] The Strategy of Met | igers and Acquisitions |
| 1.50 electives Deconversion for the second s | rivatives |
| Note: ECON*3810 is required for the Finance Area of Emphasis ECON*3860 [0.50] International Finance | ce |
| Summer Semester ECON*3960 [0.50] Money, Credit and t | he Financial System |
| COOP*3000 [0.50] Co-op Work Term III 2.50 additional credits in economics of which at least | 0.50 must be at the 4000 level and |
| Semester 6 - Fall at most 0.50** may be at the 2000 level. | |
| MGMT*3020 [0.50] Corporate Social Responsibility ** May be replaced with a 4000 level 0.50 credits in A | Accounting. |
| 2.00 electives or restricted electives In addition to the economics credits listed above, stud | lents must take a minimum of 1.50 |
| Note: If in the Finance Area of Emphasis take ECON*3710. credits in restricted electives listed below. These courses in the second seco | urses have been grouped in major |
| Winter Semester topical areas which are related to various professional | l interests. Students may, however, |
| COOP*4000 [0.50] Co-op Work Term IV choose restricted electives from any of those listed with | thout regard to the categories. |
| (Eight month work term in conjunction with COOP*5000) Courses toward a professional accounting desig | gnation Chartered Professional |
| Summer Semester Accountants (CPA) | |
| | al for additional information |
| COOP*5000 [0.50] Co-op Work Term V See <u>http://www.business.uoguelph.ca/accounting.shtm</u> | |
| COOP*5000 [0.50] Co-op Work Term V See http://www.business.uoguelph.ca/accounting.shtm (Eight month work term in conjunction with COOP*4000) ACCT*3230 [0.50] Intermediate Managem | nent Accounting |
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HROB*3090

[0.50]

Training and Development

| HROB*4060 | [0.50] | Human Resource Planning |
|------------------------|------------|--------------------------------------------------------------|
| Courses toward | the Leade | rship Certificate: |
| (see http://www.le | eadershipc | ertificate.com/ for more information) |
| HROB*2010 | [0.50] | Foundations of Leadership |
| HROB*4010 | [0.50] | Leadership Certificate Capstone |
| POLS*2250 | [0.50] | Public Administration and Governance |
| POLS*3440 | [0.50] | Corruption, Scandal and Political Ethics |
| Courses in Publi | c Adminis | tration: |
| 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 | l 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 towa | ards the Post Graduate Valuation Certificate offered by UBC. |
| part of the require | ments to o | btain an Accredited Appraiser Canadian Institute designation |
| Courses in Corp | orate Soci | al Responsibility: |
| BUS*4550 | [0.50] | Applied Business Project I |
| BUS*4560 | [0.50] | Applied Business Project II |
| ECON*2650 | [0.50] | Introductory Development Economics |
| ECON*3300 | [0.50] | Economics of Health and the Workplace |
| ECON*4930 | [0.50] | Environmental Economics |
| HROB*3030 | [0.50] | Occupational Health and Safety |
| REAL*2850 | [0.50] | Service Learning in Housing |
| MGMT*4050 | [0.50] | Business Consulting |
| MGMT*4060 | [0.50] | Business Consulting |
| Courses in Mark | ceting: | 6 |
| MCS*2600 | [0.50] | Fundamentals of Consumer Behaviour |
| MCS*3000 | [0.50] | Advanced Marketing |
| MCS*3010 | [0.50] | Quality Management |
| MCS*3620 | [0.50] | Marketing Communications |
| MCS*4400 | [0.50] | Pricing Management |
| Courses in Food | and Agril | ousiness: |
| FARE*2410 | [0.50] | Agrifood Markets and Policy |
| FARE*3030 | [0.50] | The Firm and Markets |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| FARE*4000 | [0.50] | Agricultural and Food Policy |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |

Marketing Management (MKMN)

Department of Management, Gordon S. Lang School of Business and Economics

The Marketing Management major is interdisciplinary, follows a liberal education philosophy, and is built on the Department's expertise in the field of marketing and consumer research.

The Department of Marketing and Consumer Studies prepares students for a career in marketing but also for educating them so that they can be active and engaged citizens. This is achieved from a balanced curriculum of marketing and liberal education courses that provide students with an understanding of the world they will work and live in. Students will gain knowledge in creating, communicating, and delivering product offerings to create value to stakeholders in a global and connected economy. Students completing this major will be prepared to pursue a variety of marketing career paths and diverse leadership roles.

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

Degree Requirements (20.00 Total Credits)

13.00 - Required Core Courses

2.50 - Restricted Electives (from lists)

0.00 - MGMT*1100 (Business Career Preparation)

1.50 - Liberal Education Electives

3.00 - Free Electives

| Major | | |
|--------------------|--------------|------------------------------------------------|
| Semester 1- Fall | l | |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| MGMT*1000 | [1.00] | Introduction to Business |
| Semester 2 - Wi | nter | |
| ACCT*1220 | [0 50] | Introductory Financial Accounting |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| MCS*1000 | [0.50] | Introductory Marketing |
| Semesters 1 or 2 | 2 - Fall or | Winter |
| MATH*1030 | [0 50] | Business Mathematics |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| 0.50 Marketing En | vironment | electives (see List E1) |
| 0.50 electives | | |
| Semester 3 - Fal | 1 | |
| ACCT*2230 | [0 50] | Management Accounting |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*2000 | [0.50] | Business Communication in a Changing World |
| Semester 4 - Wi | nter | Business communeation in a changing world |
| MCMT*1100 | 10.001 | Dusings Conser Proportion |
| One of: | [0.00] | Business Career Preparation |
| ECON*2740 | [0 50] | Economic Statistics |
| DSVC*1010 | [0.50] | Making Sansa of Data in Psychological Pasaarch |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| Semesters 3 or 4 | l - Fall or | Winter |
| MCS*2020 | 10 501 | Information Management |
| MCS*2600 | [0.50] | Fundamentals of Consumer Behaviour |
| MCS*3040 | [0.50] | Business and Consumer Law |
| 0 50 History/Globa | l Persnecti | ve electives (see List E?) |
| 1.00 electives | a i enspecta | |
| Semesters 5 or 6 | 5 - Fall or | Winter |
| ECON*2560 | 10 501 | Introduction to Finance |
| ECON 2500 | [0.50] | Operations Management |
| MCS*3030 | [0.50] | Research Methods |
| MCS*3500 | [0.50] | Marketing Analytics |
| MCS*3620 | [0.50] | Marketing Communications |
| MGMT*3320 | [0.50] | Financial Management |
| 0.50 Leadership/Pr | ofessionali | sm electives (see List E3) |
| 1.50 electives | 010001011411 | |
| Semesters 7 or 8 | 3 - Fall or | Winter |
| MCS*3600 | [0.50] | Consumer Information Processes |
| MCS*4370 | [0.50] | Marketing Strategy |
| MCS*4600 | [0.50] | International Marketing |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*4000 | [0.50] | Strategic Management |
| 0.50 Advanced Ma | rketing ele | ctives (see List E4) |

0.50 Experiential Learning Capstone electives (see List E5)

1.50 electives **Restricted Electives for the Marketing Management Major**

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

Marketing Environment Elective - List E1

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

| ANTH*1150 | [0.50] | Introduction to Anthropology |
|-----------|--------|--------------------------------------|
| EDRD*1400 | [0.50] | Introduction to Design |
| FRHD*1010 | [0.50] | Human Development |
| GEOG*1200 | [0.50] | Society and Space |
| GEOG*1220 | [0.50] | Human Impact on the Environment |
| GEOG*2510 | [0.50] | Canada: A Regional Synthesis |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| PHIL*2070 | [0.50] | Philosophy of the Environment |
| POLS*1400 | [0.50] | Issues in Canadian Politics |
| POLS*2250 | [0.50] | Public Administration and Governance |
| POLS*2300 | [0.50] | Canadian Government and Politics |
| SOC*1100 | [0.50] | Sociology |

History/Global Elective - List E2

To help marketing majors develop a sense of the fundamental relativity of knowledge and understanding over time and/or to help them gain the global perspective needed in senior marketing courses, marketing management majors must take one [0.50 credits] of: ARTH*2490 [0.50] History of Canadian Art

| BIOL*1500 | [0.50] | Humans in the Natural World |
|----------------|--------------|--------------------------------------------|
| GEOG*2030 | [0.50] | Environment and Development |
| HIST*1150 | [0.50] | The Modern World |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| HIST*2070 | [0.50] | World Religions |
| 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*2910 | [0.50] | Modern Asia |
| HIST*2930 | [0.50] | Women and Cultural Change |
| HIST*3070 | [0.50] | Modern India |
| HIST*3150 | [0.50] | History and Culture of Mexico |
| ISS*2000 | [0.50] | Asia |
| POLS*1500 | [0.50] | World Politics |
| POLS*2080 | [0.50] | Development and Underdevelopment |
| POLS*2200 | [0.50] | International Relations |
| Leadershin/Pro | fessionalist | n Elective - List E3 |

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

| ECON*2310 | [0.50] | Intermediate Microeconomics |
|----------------|---------------|-----------------------------------------------|
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| EDRD*3160 | [0.50] | International Communication |
| EDRD*4120 | [0.50] | Leadership Development in Small Organizations |
| HROB*2010 | [0.50] | Foundations of Leadership |
| MGMT*4260 | [0.50] | International Business |
| PHIL*2100 | [0.50] | Critical Thinking |
| PHIL*2120 | [0.50] | Ethics |
| PHIL*2600 | [0.50] | Business and Professional Ethics |
| Adama and Mari | - dia - Fland | I:-4 F4 |

Advanced Marketing Elective - List E4

To address the University Learning Objective of "Depth and Breadth of Learning" and to enhance the knowledge of product development, placement strategies, and the integration of societal influences on thinking, senior marketing management majors must take one [0.5 credits] of:

| MCS*3010 | [0.50] | Quality Management | |
|----------------------------------------------------|--------|---------------------------------------|--|
| MCS*4020 | [0.50] | Research in Consumer Studies | |
| MCS*4040 | [0.50] | Management in Product Development | |
| MCS*4060 | [0.50] | Retail Management | |
| MCS*4300 | [0.50] | Marketing and Society | |
| MCS*4400 | [0.50] | Pricing Management | |
| MCS*4910 | [0.50] | Topics in Consumer Studies | |
| MGMT*4350 | [0.50] | Business Case Competition Preparation | |
| Experiential Learning Capstone Electives - List E5 | | | |

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

| HROB*4010 | [0.50] | Leadership Certificate Capstone |
|-----------|--------|-----------------------------------------------|
| MCS*4100 | [0.50] | Entrepreneurship |
| MCS*4920 | [0.50] | Topics in Consumer Studies |
| MCS*4950 | [0.50] | Consumer Studies Practicum |
| MGMT*4020 | [0.50] | Interdisciplinary Food Product Development I |
| MGMT*4030 | [0.50] | Interdisciplinary Food Product Development II |
| MGMT*4050 | [0.50] | Business Consulting |
| MGMT*4060 | [0.50] | Business Consulting |
| | - | |

Marketing Management (Co-op) (MKMN:C) Department of Marketing and Consumer Studies, Gordon S. Lang School of Business

and Economics

The Marketing Management major is interdisciplinary, follows a liberal education philosophy, and is built on the Department's expertise in the field of marketing and consumer research.

The Department of Marketing and Consumer Studies prepares students for a career in marketing but also for educating them so that they can be active and engaged citizens. This is achieved from a balanced curriculum of marketing and liberal education courses that provide students with an understanding of the world they will work and live in. Students will gain knowledge in creating, communicating, and delivering product offerings to create value to stakeholders in a global and connected economy. Students completing this major will be prepared to pursue a variety of marketing career paths and diverse leadership roles.

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.

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

Program Requirements

The Co-op program in Marketing Management is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Marketing Management | Academic and Co-op | Work Term Schedule |
|----------------------|--------------------|--------------------|
|----------------------|--------------------|--------------------|

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

13.00 - Required Core Courses

2.50 - Restricted Electives (from lists)

1.50 - Liberal Education Electives

3.00 - Free Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

Major

Semester 1- Fall

| [0.50] | Introductory Microeconomics | |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| [1.00] | Introduction to Business | |
| Vinter | | |
| [0.50] | Introductory Financial Accounting | |
| [0.50] | Introductory Macroeconomics | |
| [0.50] | Introductory Marketing | |
| 2 - Fall or | Winter | |
| [0.50] | Business Mathematics | |
| [0.50] | Introduction to Psychology | |
| Environment | electives (see List E1) | |
| | | |
| all | | |
| [0.50] | Management Accounting | |
| [0.00] | Introduction to Co-operative Education | |
| [0.50] | Individuals and Groups in Organizations | |
| [0.50] | Business Communication in a Changing World | |
| | | |
| [0.50] | Economic Statistics | |
| [0.50] | Making Sense of Data in Psychological Research | |
| [0.50] | Statistics for Business Decisions | |
| | | |
| Winter | | |
| | [0.50] [1.00] Vinter [0.50] [0.50] 2 - Fall or [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | |

MCS*2020 [0.50] Information Management MCS*2600 [0.50] Fundamentals of Consumer Behaviour MCS*3030 [0.50] Research Methods MCS*3040 [0.50] Business and Consumer Law 0.50 History/Global Perspective electives (see List E2)

| Summer Semest | ter | | |
|-------------------------------------------------------------|--------------|-------------------------------------------------------------|--|
| COOP*1000 | [0.50] | Co-op Work Term I | |
| Fall Semester | | | |
| COOP*2000 | [0,50] | Co-on Work Term II | |
| Semester 5 - Wi | nter | | |
| The following 5.00 | credits mu | st be completed over semesters 5 and 6. Select 2.50 credits | |
| in Winter Semester | 5 and the r | remaining 2.50 in Fall Semester 6: | |
| ECON*2560 | [0.50] | Introduction to Finance | |
| FARE*3310 | [0.50] | Operations Management | |
| MCS*3500 | [0.50] | Marketing Analytics | |
| MCS*3620 | [0.50] | Marketing Communications | |
| MGMT*3320 | [0.50] | Financial Management | |
| 0.50 Leadership/Pr | ofessionalis | sm electives (see List E3) | |
| 2.00 electives | | | |
| Summer Semest | ter | | |
| COOP*3000 | [0.50] | Co-op Work Term III | |
| Semester 6 - Fal | 1 | | |
| Select 2.50 credits | from the lis | st below that were not taken in Winter Semester 5: | |
| ECON*2560 | [0.50] | Introduction to Finance | |
| FARE*3310 | [0.50] | Operations Management | |
| MCS*3500 | [0.50] | Marketing Analytics | |
| MCS*3620 | [0.50] | Marketing Communications | |
| MGMT*3320 | [0.50] | Financial Management | |
| 0.50 Leadership/Pr | ofessionalis | sm electives (see List E3) | |
| 2.00 electives | | | |
| Winter Semester | r | | |
| COOP*4000 | [0.50] | Co-op Work Term IV | |
| (Eight month work | term in con | njunction with COOP*5000) | |
| Summer Semest | ter | | |
| COOP*5000 | [0.50] | Co-op Work Term V | |
| (Eight month work | term in con | njunction with COOP*4000) | |
| Semesters 7 or 8 - Fall or Winter | | | |
| MCS*3600 | [0.50] | Consumer Information Processes | |
| MCS*4370 | [0.50] | Marketing Strategy | |
| MCS*4600 | [0.50] | International Marketing | |
| MGMT*3020 | [0.50] | Corporate Social Responsibility | |
| MGMT*4000 | [0.50] | Strategic Management | |
| 0.50 Advanced Marketing electives (see List E4) | | | |
| 0.50 Experiential Learning Capstone electives (see List E5) | | | |
| 1.50 electives | | | |
| Restricted Electives for the Marketing Management Major | | | |

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

Marketing Environment Elective - List E1

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

| ANTH*1150 | [0.50] | Introduction to Anthropology |
|-----------|--------|--------------------------------------|
| EDRD*1400 | [0.50] | Introduction to Design |
| FRHD*1010 | [0.50] | Human Development |
| GEOG*1200 | [0.50] | Society and Space |
| GEOG*1220 | [0.50] | Human Impact on the Environment |
| GEOG*2510 | [0.50] | Canada: A Regional Synthesis |
| NUTR*1010 | [0.50] | Introduction to Nutrition |
| PHIL*2070 | [0.50] | Philosophy of the Environment |
| POLS*1400 | [0.50] | Issues in Canadian Politics |
| POLS*2250 | [0.50] | Public Administration and Governance |
| POLS*2300 | [0.50] | Canadian Government and Politics |
| SOC*1100 | [0.50] | Sociology |

History/Global Elective - List E2

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

| ARTH*2490 | [0.50] | History of Canadian Art |
|-----------|--------|--------------------------------------------|
| BIOL*1500 | [0.50] | Humans in the Natural World |
| GEOG*2030 | [0.50] | Environment and Development |
| HIST*1150 | [0.50] | The Modern World |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| HIST*2070 | [0.50] | World Religions |
| 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*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 |
| ts | POLS*1500 | [0.50] | World Politics |
| | POLS*2080 | [0.50] | Development and Underdevelopment |
| | POLS*2200 | [0.50] | International Relations |
| | Leadership/Pro | fessionalisr | n Elective - List E3 |
| | To help prepare | e senior m | arketing management majors for leadership positions in |
| | organizations, the | ey must tak | e one [0.50 credits] of: |
| | ECON*2310 | [0.50] | Intermediate Microeconomics |
| | ECON*2410 | [0.50] | Intermediate Macroeconomics |
| | EDRD*3160 | [0.50] | International Communication |
| | EDRD*4120 | [0.50] | Leadership Development in Small Organizations |
| | HROB*2010 | [0.50] | Foundations of Leadership |
| | MGMT*4260 | [0.50] | International Business |
| | PHIL*2100 | [0.50] | Critical Thinking |
| | PHIL*2120 | [0.50] | Ethics |
| | PHIL*2600 | [0.50] | Business and Professional Ethics |
| | Advanced Mark | teting Elect | tive - List E4 |
| | To address the U | Iniversity L | earning Objective of "Depth and Breadth of Learning" and |
| | to enhance the kn | owledge of | product development, placement strategies, and the integration |
| | of societal influe | nces on thi | nking, senior marketing management majors must take one |
| | [0.5 credits] of: | | |
| | MCS*3010 | [0.50] | Quality Management |
| | MCS*4020 | [0.50] | Research in Consumer Studies |
| | MCS*4040 | [0.50] | Management in Product Development |
| | MCS*4060 | [0.50] | Retail Management |
| | MCS*4300 | [0.50] | Marketing and Society |
| | MCS*4400 | [0.50] | Pricing Management |
| | MCS*4910 | [0.50] | Topics in Consumer Studies |
| | MGMT*4350 | [0.50] | Business Case Competition Preparation |
| | Experiential Le | arning Cap | ostone Electives - List E5 |
| | To enhance their | understand | ling of marketing in terms of application, senior marketing |
| | management maj | jors must ta | ke one [0.50 credits] of: |
| | HROB*4010 | [0.50] | Leadership Certificate Capstone |
| | MCS*4100 | [0.50] | Entrepreneurship |
| | MCS*4920 | [0.50] | Topics in Consumer Studies |
| | MCS*4950 | [0.50] | Consumer Studies Practicum |
| | MGMT*4020 | [0.50] | Interdisciplinary Food Product Development I |
| | MGMT*4030 | [0.50] | Interdisciplinary Food Product Development II |
| es | MGMT*4050 | [0.50] | Business Consulting |
| 's | MGMT*4060 | [0.50] | Business Consulting |

Public Management (PMGT)

HIST*2510

[0 50]

Department of Economics and Finance, Gordon S. Lang School of Business and Economic

The Public Management program is designed to lead to an understanding of public sector administration and management from the "inside" - as an integrated enterprise - as well as from the outside - as a series of policy decisions and outcomes. Characterized by a multi-disciplinary approach employing political, economic and business-oriented analysis, students will confront questions of why politicians and public servants behave the way they do, and how their policy choices and processes can be optimized. Management of public entities features a unique set of challenges that arise from and interact with basic political issues like democracy, accountability, equity, fairness, and justice. At the same time it necessarily faces concerns common to all organizations, such as efficiency, human and capital resource management, morale, planning, and adaptation to change.

The program will appeal to students interested in the public service, public sector businesses or business-government relations.

Students enrolled in the PMGT major can choose to complete three of the five required courses for the Certificate in Leadership as part of their requirements for the program if they choose the appropriate restricted electives. If you would like to graduate both with a BComm degree and the Certificate in Leadership you should use two of your free electives to enroll in HROB*2010 in either semester 3 or 6 and HROB*4010 in semester 8. In addition to the five degree-credit courses selected from the above list, 120 hours of leadership practice are required to obtain the undergraduate Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements.

Degree Requirements (20.00 Total Credits)

12.50 - Required Core Courses

- 4.50 Restricted Electives (from lists)
- 0.00 MGMT*1100 (Business Career Preparation)
- 1.50 Liberal Education Electives

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| 1.50 - Free Electives | | | |
|------------------------------------|----------------------------|-----------------------------------------------------------------------------------|--|
| Major | | | |
| Semester 1 | | | |
| ECON*1050 MCS*1000 MGMT*1000 | [0.50] [0.50] [1.00] | Introductory Microeconomics Introductory Marketing Introduction to Business | |
| POLS*1400 Semester 2 | [0.50] | issues in Canadian Politics | |
| ECON*1100 | [0 50] | Introductory Macroaconomics | |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations | |
| MATH*1030 | [0.50] | Business Mathematics | |
| POLS*2300 | [0.50] | Canadian Government and Politics | |
| 0.50 electives | | | |
| Semester 3 | FO 701 | T . 1 . TT . 1 | |
| ACC1*1220 ECON*2310 | [0.50] | Introductory Financial Accounting | |
| ECON*2740 | [0.50] | Economic Statistics | |
| POLS*3250 | [0.50] | Public Policy: Challenges and Prospects | |
| One of: | | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality | |
| ECON*2650 ECON*2720 | [0.50] | Business History | |
| Semester 4 | [0.50] | Dusiness mistory | |
| ACCT*2230 | [0.50] | Management Accounting | |
| ECON*2410 | [0.50] | Intermediate Macroeconomics | |
| MGMT*1100 | [0.00] | Business Career Preparation | |
| POLS*2250 | [0.50] | Public Administration and Governance | |
| One of: PHII *2120 | [0 50] | Ethics | |
| PHIL*2600 | [0.50] | Business and Professional Ethics | |
| PHIL*3040 | [0.50] | Philosophy of Law * | |
| 0.50 electives | | | |
| * This course may | be offered | in the fall and can be taken later in the program. | |
| Semester 5 | FO 501 | | |
| ECON*2560 | [0.50] | Introduction to Finance | |
| MGMT*3320 | [0.50] | Financial Management | |
| One of: | [] | | |
| MCS*3040 | [0.50] | Business and Consumer Law | |
| REAL*4840 | [0.50] | Housing and Real Estate Law | |
| Semester 6 | | | |
| FCON*3610 | [0 50] | Public Economics | |
| MCS*2020 | [0.50] | Information Management | |
| One of: | | C | |
| ECON*3300 | [0.50] | Economics of Health and the Workplace | |
| ECON*3400 | [0.50] | The Economics of Personnel Management | |
| ECON*3520 ECON*3580 | [0.30] | Economics of Regulation | |
| ECON*3620 | [0.50] | International Trade | |
| ECON*3730 | [0.50] | The Origins of International Inequality | |
| One of: | [0 50] | The Constitution and Considian Endersliam | |
| POLS*3210 POLS*3130 | [0.30] | Law Politics and Judicial Process | |
| POLS*3270 | [0.50] | Local Government in Ontario | |
| POLS*3670 | [0.50] | Comparative Public Policy and Administration | |
| 0.50 electives | | | |
| Semester 7 | | | |
| MGM1*3020 POI \$*3470 | [0.50] | Corporate Social Responsibility Business-Government Relations in Canada | |
| One of: | [0.50] | Business-Government Relations in Canada | |
| ECON*3300 | [0.50] | Economics of Health and the Workplace | |
| ECON*3400 | [0.50] | The Economics of Personnel Management | |
| ECON*3520 | [0.50] | Labour Economics | |
| ECON*3580 ECON*3620 | [0.50] [0.50] | Economics of Regulation International Trade | |
| ECON*3730 | [0.50] | The Origins of International Inequality | |
| One of **: | | | |
| POLS*4160 | [1.00] | Multi-Level Governance in Canada | |
| POLS*4250 | [1.00] | Topics in Public Management | |
| POLS*4270 POLS*4970 | [0.50] [0.50] | Advanced Lecture in Public Management Honours Political Science Research I | |
| 0.50 credits at th | ne 3000 or | 4000 level in Economics or Political Science | |
| 0.50 electives*** | | | |

| Semester o | | |
|-------------------|-------------|----------------------------------------------|
| ECON*4400 | [0.50] | Managerial Economics |
| MGMT*4000 | [0.50] | Strategic Management |
| One of **: | | |
| POLS*4160 | [1.00] | Multi-Level Governance in Canada |
| POLS*4250 | [1.00] | Topics in Public Management |
| POLS*4980 | [0.50] | Honours Political Science Research II |
| 0.50 credits at t | he 4000 lev | el in Economics |
| One of: | | |
| POLS*3130 | [0.50] | Law, Politics and Judicial Process |
| POLS*3210 | [0.50] | The Constitution and Canadian Federalism |
| POLS*3270 | [0.50] | Local Government in Ontario |
| POLS*3670 | [0.50] | Comparative Public Policy and Administration |
| 0.50 electives*** | | |

** If a 1.00 credit POLS is taken in either semester 7 or 8 this will meet the restricted elective requirement for both semesters POLS*4250 is recommended

*** The number of electives will change if a 1.00 credit POLS course is taken in semester 7 or 8

Public Management (Co-op) (PMGT:C)

Somostor 8

Department of Economics and Finance, Gordon S. Lang School of Business and Economics

The Public Management program is designed to lead to an understanding of public sector administration and management from the "inside" - as an integrated enterprise - as well as from the outside - as a series of policy decisions and outcomes. Characterized by a multi-disciplinary approach employing political, economic and business-oriented analysis, students will confront questions of why politicians and public servants behave the way they do, and how their policy choices and processes can be optimized. Management of public entities features a unique set of challenges that arise from and interact with basic political issues like democracy, accountability, equity, fairness, and justice. At the same time it necessarily faces concerns common to all organizations, such as efficiency, human and capital resource management, morale, planning, and adaptation to change.

The program will appeal to students interested in the public service, public sector businesses or business-government relations.

Students enrolled in the PMGT major can choose to complete three of the five required courses for the Certificate in Leadership as part of their requirements for the program if they choose the appropriate restricted electives. If you would like to graduate both with a BComm degree and the Certificate in Leadership you should use two of your free electives to enroll in HROB*2010 in either semester 3 or 6 and HROB*4010 in semester 8. In addition to the five degree-credit courses selected from the above list, 120 hours of leadership practice are required to obtain the undergraduate Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements.

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.

Program Requirements

The Co-op program in Public Management is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

Public Management Academic and Co-op Work Term Schedule

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

12.50 - Required Core Courses

4.50 - Restricted Electives (from lists)

| 1.50 - Liberal H | Education | Electives |
|------------------|-----------|-----------|
|------------------|-----------|-----------|

1.50 - Free Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

Major

| Semester 1 | | | |
|-------------------------------------------------------|------------------------|----------------------------------------------------|--|
| ECON*1050 | [0.50] | Introductory Microeconomics | |
| MCS*1000 | [0.50] | Introductory Marketing | |
| MGMT*1000 | [1.00] | Introduction to Business | |
| POLS*1400 | [0.50] | Issues in Canadian Politics | |
| Semester 2 | FO F O3 | · · · · · | |
| ECON*1100 | [0.50] | Introductory Macroeconomics | |
| HKOB*2090 MATH*1020 | [0.50] | Individuals and Groups in Organizations | |
| POLS*2300 | [0.50] | Canadian Government and Politics | |
| 0.50 elective | [0.000] | | |
| Semester 3 | | | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | |
| ECON*2310 | [0.50] | Intermediate Microeconomics | |
| ECON*2740 | [0.50] | Economic Statistics | |
| POLS*3250 | [0.50] | Public Policy: Challenges and Prospects | |
| Une of: ECON*2100 | [0 50] | Economic Growth and Environmental Quality | |
| ECON*2100 ECON*2650 | [0.50] | Introductory Development Economics | |
| ECON*2720 | [0.50] | Business History | |
| Semester 4 - Wi | inter | | |
| ACCT*2230 | [0.50] | Management Accounting | |
| ECON*2410 | [0.50] | Intermediate Macroeconomics | |
| ECON*2560 | [0.50] | Introduction to Finance | |
| POLS*2250 | [0.50] | Public Administration and Governance | |
| 0.50 electives | | | |
| Summer Semes | ter | | |
| COOP*1000 | [0.50] | Co-op Work Term I | |
| Fall Semester | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | |
| Semester 5 - Wi | inter | | |
| ECON*3610 | [0.50] | Public Economics | |
| FARE*3310 | [0.50] | Operations Management | |
| MCS*2020 | [0.50] | Information Management | |
| MGM1*3320 One of: | [0.50] | Financial Management | |
| PHIL*2120 | [0,50] | Ethics | |
| PHIL*2600 | [0.50] | Business and Professional Ethics | |
| PHIL*3040 | [0.50] | Philosophy of Law | |
| * This course may | be offered | in the fall and can be taken later in the program. | |
| Summer Semes | ter | | |
| COOP*3000 | [0.50] | Co-op Work Term III | |
| Semester 6 - Fa | 11 | | |
| MGMT*3020 | [0.50] | Corporate Social Responsibility | |
| POLS*3470 | [0.50] | Business-Government Relations in Canada | |
| One of: | 10 501 | | |
| ECON*3300 ECON*3400 | [0.50] | Economics of Health and the Workplace | |
| ECON*3400 ECON*3520 | [0.50] | Labour Economics | |
| ECON*3580 | [0.50] | Economics of Regulation | |
| ECON*3620 | [0.50] | International Trade | |
| ECON*3730 | [0.50] | The Origins of International Inequality | |
| One of: | | | |
| MCS*3040 | [0.50] | Business and Consumer Law | |
| REAL*4840 | [0.50] | Housing and Real Estate Law | |
| Winter Semest | r | | |
| | 10 503 | | |
| (Fight month world | [U.SU] c term in co | CO-OP WORK IERM IV | |
| Summer Semester | | | |
| COOP*5000 | IO 501 | Co-on Work Term V | |
| (Eight month work term in conjunction with COOP*4000) | | | |
| (Eight month work term in conjunction with COOP*4000) | | | |

Somester 7 - Fall

| Semester 7 - Fa | a11 | |
|-------------------|-------------|------------------------------------------------------------|
| MGMT*4000 | [0.50] | Strategic Management |
| One of: | | |
| ECON*3300 | [0.50] | Economics of Health and the Workplace |
| ECON*3400 | [0.50] | The Economics of Personnel Management |
| ECON*3520 | [0.50] | Labour Economics |
| ECON*3580 | [0.50] | Economics of Regulation |
| ECON*3620 | [0.50] | International Trade |
| ECON*3730 | [0.50] | The Origins of International Inequality |
| One of **: | | |
| POLS*4160 | [1.00] | Multi-Level Governance in Canada |
| POLS*4250 | [1.00] | Topics in Public Management |
| POLS*4270 | [0.50] | Advanced Lecture in Public Management |
| POLS*4970 | [0.50] | Honours Political Science Research I |
| 0.50 credits at | the 3000 or | 4000 level in Economics or 4000 level in Political Science |
| 1.00 electives*** | | |
| Semester 8 - W | inter | |
| ECON*4400 | [0.50] | Managerial Economics |
| - | | - |

| IWO OI: | | |
|--------------------|--------------|----------------------------------------------|
| POLS*3130 | [0.50] | Law, Politics and Judicial Process |
| POLS*3210 | [0.50] | The Constitution and Canadian Federalism |
| POLS*3270 | [0.50] | Local Government in Ontario |
| POLS*3670 | [0.50] | Comparative Public Policy and Administration |
| One of **: | | |
| POLS*4160 | [1.00] | Multi-Level Governance in Canada |
| POLS*4250 | [1.00] | Topics in Public Management |
| POLS*4980 | [0.50] | Honours Political Science Research II |
| 0.50 credits at th | ne 4000 leve | l in Economics |
| | | |

0.50 electives***

** If a 1.00 credit POLS is taken in either semester 7 or 8 this will meet the restricted elective requirement for both semesters POLS*4250 is recommended

*** The number of electives will change if a 1.00 credit POLS course is taken in semester 7 or 8

Real Estate and Housing (REH)

Department of Marketing and Consumer Studies, Gordon S. Lang School of Business and Economics

The Real Estate and Housing major in the B.Comm. program is one of only a few undergraduate programs in Canada that specialize in the real estate sector. It takes a multi-disciplinary approach to the study of residential and commercial/investment real estate. Topics such as the development, financing, valuation, market analysis and management of real estate are taught in the context of economic, legal, political and social factors affecting this large and growing field of business in Canada and the world.

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

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

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

Introductory Financial Accounting

Degree Requirements (20.00 Total Credits)

16.00 - Required Core Courses 0.00 - MGMT*1100 (Business Career Preparation) 1.50 - Liberal Education Electives 2.50 - Free Electives Major Semester 1 ECON*1050 [0.50] Introductory Microeconomics REAL*1820 [0.50] Real Estate and Housing MGMT*1000 [1.00] Introduction to Business 0.50 electives Semester 2

[0.50]

ACCT*1220

| 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 |
| MGMT*1100 | [0.00] | Business Career Preparation |
| 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] | Introduction to Finance |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| MCS*2020 | [0.50] | Information Management |
| REAL*2820 | [0.50] | Real Estate Finance |
| 0.50 electives | | |
| Semester 5 | | |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| FARE*3310 | [0.50] | Operations Management |
| REAL*4820 | [0.50] | Real Estate Appraisal |
| REAL*4840 | [0.50] | Housing and Real Estate Law |
| 0.50 electives | | |
| Semester 6 | | |
| ECON*3960 | [0.50] | Money, Credit and the Financial System |
| LARC*2820 | [0.50] | Urban and Regional Planning |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| REAL*3890 | [0.50] | Property Management |
| Semester 7 | | |
| ECON*3500 | [0.50] | Urban Economics |
| MGMT*4000 | [0.50] | Strategic Management |
| REAL*3810 | [0.50] | Real Estate Market Analysis |
| REAL*4870 | [0.50] | Sustainable Real Estate |
| 0.50 electives | | |
| Semester 8 | | |
| POLS*3270 | [0.50] | Local Government in Ontario |
| REAL*4830 | [1.00] | Real Estate Development Project |
| 1.00 electives | | |

Real Estate and Housing (Co-op) (REH:C)

Department of Marketing and Consumer Studies, Gordon S. Lang School of Business and Economics

The Real Estate and Housing major in the B.Comm. program is one of only a few undergraduate programs in Canada that specialize in the real estate sector. It takes a multi-disciplinary approach to the study of residential and commercial/investment real estate.

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

Elective options enable students to select courses which support or complement their primary field of study. Examples: (1) students can use Liberal Education and free electives to earn the Certificate in Leadership. See http://www.leadershipcertificate.com/ for information regarding this Certificate and its course requirements; (2) students interested in languages and/or going on exchange can use their Liberal Education and free electives to study one or more of the various languages taught at the University. (3) Students interested in obtaining their Accredited Appraiser Canadian Institute (AACI) designation should consider taking some of the additional four 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.

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.

Program Requirements

The Co-op program in Real Estate and Housing is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

16.00 - Required Core Courses

1.50 - Liberal Education Electives

2.50 - Free Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

Major

Semester 1 - Fall

| ECON*1050 | [0.50] | Introductory Microeconomics |
|------------------|--------|-----------------------------------------|
| REAL*1820 | [0.50] | Real Estate and Housing |
| MGMT*1000 | [1.00] | Introduction to Business |
| 0.50 electives | | |
| Semester 2 - Wi | nter | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| MCS*1000 | [0.50] | Introductory Marketing |
| MATH*1030 | [0.50] | Business Mathematics |
| 0.50 electives | | |
| Semester 3 - Fal | 1 | |
| ACCT*2230 | [0.50] | Management Accounting |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| REAL*2850 | [0.50] | Service Learning in Housing |
| One of: | | |
| ECON*2740 | [0.50] | Economic Statistics |
| STAT*2060 | [0.50] | Statistics for Business Decisions |
| 0.50 electives | | |
| Semester 4 - Wi | nter | |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| ECON*2560 | [0.50] | Introduction to Finance |
| HROB*2090 | [0.50] | Individuals and Groups in Organizations |
| REAL*2820 | [0.50] | Real Estate Finance |
| 0.50 electives | | |
| Summer Semest | ter | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Fall Semester | | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Semester 5 - Wi | nter | |
| ECON*3960 | [0.50] | Money, Credit and the Financial System |
| FARE*3310 | [0.50] | Operations Management |
| REAL*3890 | [0.50] | Property Management |
| MCS*2020 | [0.50] | Information Management |
| 0.50 electives | | C C |
| Summer Semest | er | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 6 - Fal | l | 1 |
| MGMT*3020 | [0.50] | Corporate Social Responsibility |
| MGMT*3320 | [0.50] | Financial Management |
| REAL*4820 | [0.50] | Real Estate Appraisal |
| REAL*4840 | [0.50] | Housing and Real Estate Law |

| 0.50 electives | | | |
|---------------------|--------------|---------------------------------|--|
| Winter Semest | er | | |
| COOP*4000 | [0.50] | Co-op Work Term IV | |
| (Eight month wor | k term in co | onjunction with COOP*5000) | |
| Summer Semes | ster | | |
| COOP*5000 | [0.50] | Co-op Work Term V | |
| (Eight month wor | k term in co | onjunction with COOP*4000) | |
| Semester 7 - Fall | | | |
| ECON*3500 | [0.50] | Urban Economics | |
| MGMT*4000 | [0.50] | Strategic Management | |
| REAL*3810 | [0.50] | Real Estate Market Analysis | |
| REAL*4870 | [0.50] | Sustainable Real Estate | |
| 0.50 electives | | | |
| Semester 8 - Winter | | | |
| LARC*2820 | [0.50] | Urban and Regional Planning | |
| POLS*3270 | [0.50] | Local Government in Ontario | |
| REAL*4830 | [1.00] | Real Estate Development Project | |

0.50 electives

Students graduating from this program obtain a solid foundation in the theory and application of all aspects of computing and information science. Core subjects, combined with in-depth study in an area of application, give students the freedom to combine their interests in computing with other areas of study and application.

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

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

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

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

Program Information

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

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

The program requires 6.00 Computing and Information Science credits at the 3000 level or above, which must include 2.00 credits at the 4000 level. The area of application requires an additional 1.00 credits at the 3000 level or above. The Area of Application is a graduation requirement and must be approved by Semester 4 by the faculty advisor.

- b. Obtain a cumulative average at least 70% in CIS courses and a 60% cumulative average in all courses.
- c. An Area of Application normally consists of 4.00 credits (normally 8 courses) of a minor. Minors are described under the B.A. and B.Sc. programs. Access to some courses may be limited. Minors are listed in Section X of the Calendar. A student may complete a minor should they decide to do so.

Students must consult the faculty advisor for approval of their Area of Application by semester 4. Not all disciplines or courses may be available as areas of application. Students failing to meet the graduation requirements of the honours program may apply to graduate with a general degree if the requirements for the general degree are met.

Continuation of Study

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

General Program

School of Computer Science, College of Engineering and Physical Sciences

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:

| cessiuny complete the following creates. | | | |
|-----------------------------------------------------------------|--------|----------------------------------------------|--|
| CIS*1300 | [0.50] | Programming | |
| CIS*1910 | [0.50] | Discrete Structures in Computing I | |
| CIS*2430 | [0.50] | Object Oriented Programming | |
| CIS*2500 | [0.50] | Intermediate Programming | |
| CIS*2520 | [0.50] | Data Structures | |
| CIS*2750 | [0.75] | Software Systems Development and Integration | |
| CIS*2910 | [0.50] | Discrete Structures in Computing II | |
| CIS*3530 | [0.50] | Data Base Systems and Concepts | |
| 0.50 additional CIS or STAT credits at the 2000 level or higher | | | |
| | | | |

1.00 additional CIS credits at 3000 level or higher

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

Computer Science (CS)

School of Computer Science, College of Engineering and Physical Sciences

Major (Honours Program)

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

| Semester 1 | | | |
|------------------------------------------------------|-------------|------------------------------------------------|--|
| CIS*1300 | [0.50] | Programming | |
| CIS*1910 | [0.50] | Discrete Structures in Computing I | |
| MATH*1200 | [0.50] | Calculus I | |
| 1.00 credits in the | Area of App | plication or electives | |
| Semester 2 | | | |
| CIS*2500 | [0.50] | Intermediate Programming | |
| CIS*2910 | [0.50] | Discrete Structures in Computing II | |
| MATH*1160 | [0.50] | Linear Algebra I | |
| 1.00 credits in the | Area of App | plication or electives | |
| Semester 3 | | | |
| CIS*2030 | [0.50] | Structure and Application of Microcomputers | |
| CIS*2430 | [0.50] | Object Oriented Programming | |
| CIS*2520 | [0.50] | Data Structures | |
| 1.00 credits in the | Area of App | plication or electives | |
| Semester 4 | | | |
| CIS*2750 | [0.75] | Software Systems Development and Integration | |
| CIS*3110 | [0.50] | Operating Systems I | |
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms | |
| 0.75 credits in the | Area of App | plication or elective | |
| Semester 5 | | | |
| CIS*3150 | [0.50] | Theory of Computation | |
| CIS*3750 | [0.75] | System Analysis and Design in Applications | |
| STAT*2040 | [0.50] | Statistics I | |
| 0.75 credits in the Area of Application or electives | | | |
| Semester 6 | | | |
| CIS*3760 | [0.75] | Software Engineering | |
| 0.50 CIS electives at the 3000 level or above | | | |
| 1.25 credits in the | Area of App | plication or electives | |
| Semester 7 | | | |
| 1.00 credits in the Area of Application or electives | | | |
| 0.50 credits in CIS | at 3000 lev | vel or above | |
| 1.00 credits in CIS at the 4000 level | | | |

Semester 8

CIS*4650 [0.50] Compilers 1.00 credits in the Area of Application or electives 0.50 credits in CIS at the 3000 level or above 0.50 credits in CIS at the 4000 level

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

Computing and Information Science, College of Engineering and Physical Sciences Program Requirements

The Co-op program in Computer Science is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Computer Science Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

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.

Credit Summary (22.00 Total Credits)*

12.25 - Required Core Courses

4.00 - Area of Application

3.75 - Free electives

2.00 - Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

Major Co-op (Honours Program)

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

Semester 1 - Fall

| CIS*1300 | [0.50] | Programming |
|--------------------|--------------|------------------------------------|
| CIS*1910 | [0.50] | Discrete Structures in Computing I |
| MATH*1200 | [0.50] | Calculus I |
| 1.00 credits in th | he Area of A | pplication or electives |
| Semester 2 - V | Vinter | |
| GTG #2500 | FO 501 | T . I' . D . |

| CIS*2500 | [0.50] | Intermediate Programming |
|--------------------|-------------|-------------------------------------|
| CIS*2910 | [0.50] | Discrete Structures in Computing II |
| MATH*1160 | [0.50] | Linear Algebra I |
| 1.00 credits in th | e Area of A | pplication or electives |

Summer Semester - Off

Semester 3 - Fall

| CIS*2030 | [0.50] | Structure and Application of Microcomputers |
|--------------------|-------------|----------------------------------------------|
| CIS*2430 | [0.50] | Object Oriented Programming |
| CIS*2520 | [0.50] | Data Structures |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| 1.00 credits in th | e Area of A | pplication or electives |
| Semester 4 - V | Vinter | |
| CIS*2750 | [0.75] | Software Systems Development and Integration |

| CIS 2750 | [0.75] | Software Systems Development and Integration |
|----------|--------|------------------------------------------------|
| CIS*3110 | [0.50] | Operating Systems I |
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms |

0.75 credits in the Area of Application or elective

Summer Semester

COOP*1000 Work Term 1

Fall Semester

COOP*2000 Work Term 2

Semester 5 - Winter

CIS*3750 [0.75] System Analysis and Design in Applications 0.50 CIS 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 - Fail | | | | |
|-------------------|--------|-----------------------|--|--|
| CIS*3150 | [0.50] | Theory of Computation | | |
| CIS*3760 | [0.75] | Software Engineering | | |
| CTAT*2040 | FO 501 | | | |

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

1.00 credits in the Area of Application or electives

0.50 credits in CIS at 3000 level or above

0.50 credits in CIS at the 4000 level

Software Engineering (SENG)

School of Computer Science, College of Engineering and Physical Sciences

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.

a -4---- 1

| Semester 1 | | |
|--------------------|---------------|----------------------------------------------------------|
| CIS*1250 | [0.50] | Software Design I |
| CIS*1300 | [0.50] | Programming |
| CIS*1910 | [0.50] | Discrete Structures in Computing I |
| 1.00 credits in th | ne Area of A | pplication or electives |
| Semester 2 | | |
| CIS*2250 | [0.50] | Software Design II |
| CIS*2500 | [0.50] | Intermediate Programming |
| MATH*1160 | [0.50] | Linear Algebra I |
| 1.00 credits in th | ne Area of A | pplication or electives |
| Semester 3 | | |
| CIS*2030 | [0.50] | Structure and Application of Microcomputers |
| CIS*2430 | [0.50] | Object Oriented Programming |
| CIS*2520 | [0.50] | Data Structures |
| CIS*3250 | [0.50] | Software Design III |
| 0.50 credits in th | ne Area of A | application or electives |
| Semester 4 | | |
| CIS*2750 | [0.75] | Software Systems Development and Integration |
| CIS*3110 | [0.50] | Operating Systems I |
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms |
| 0.75 credits in th | ne Area of A | application or elective |
| Semester 5 | | |
| CIS*3750 | [0.75] | System Analysis and Design in Applications |
| STAT*2040 | [0.50] | Statistics I |
| 0.50 credits CIS | at the 3000 | level or above |
| 0.75 credits in th | ne Area of A | application or electives |
| Semester 6 | | |
| CIS*3760 | [0.75] | Software Engineering |
| 0.50 CIS electiv | es at the 300 | 00 level or above |
| 1.25 credits in th | ne Area of A | pplication or electives |
| Semester 7 | | |
| CIS*3260 | [0.50] | Software Design IV |
| CIS*4150 | [0.50] | Software Reliability and Testing |
| CIS*4300 | [0.50] | Human Computer Interaction |
| 1.00 credits in th | ne Area of A | pplication or electives |
| Semester 8 | | |
| CIS*4250 | [0.50] | Software Design V |
| 1.50 credits in th | ne Area of A | pplication or electives |
| 0.50 credits in C | CIS at the 40 | 00 level |
| Software En | gineering | g (Co-op) (SENG:C) |
| a it is | | |
| Computing and | l Informati | on Science, College of Engineering and Physical Sciences |

Program Requirements

The Co-op program in Software Engineering is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Software Engineering Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

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.

Credit Summary (22.00 Total Credits)*

12.25 - Required Core Courses

4.00 - Area of Application

3.75 - Free electives

2.00 - Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

Major (Honours Program) Co-op

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

Semester 1 - Fall

| Semester 1 - | r an | |
|-------------------|----------------|------------------------------------------------|
| CIS*1250 | [0.50] | Software Design I |
| CIS*1300 | [0.50] | Programming |
| CIS*1910 | [0.50] | Discrete Structures in Computing I |
| 1.00 credits in t | he Area of A | pplication or electives |
| Semester 2 - | Winter | |
| CIS*2250 | [0.50] | Software Design II |
| CIS*2500 | [0.50] | Intermediate Programming |
| MATH*1160 | [0.50] | Linear Algebra I |
| 1.00 credits in t | he Area of A | pplication or electives |
| Summer Sem | lester - Off | |
| Semester 3 - | Fall | |
| CIS*2030 | [0.50] | Structure and Application of Microcomputers |
| CIS*2430 | [0.50] | Object Oriented Programming |
| CIS*2520 | [0.50] | Data Structures |
| CIS*3250 | [0.50] | Software Design III |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| 0.50 credits in t | he Area of A | pplication or electives |
| Semester 4 - | Winter | |
| CIS*2750 | [0.75] | Software Systems Development and Integration |
| CIS*3110 | [0.50] | Operating Systems I |
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms |
| 0.75 credits in t | he Area of A | pplication or elective |
| Summer Sem | lester | |
| COOP*1000 W | ork Term 1 | |
| Fall Semester | r | |
| COOP*2000 W | ork Term 2 | |
| Semester 5 - | Winter | |
| CIS*3750 | [0 75] | System Analysis and Design in Applications |
| 0.50 CIS electiv | ves at the 300 | 0 level or above |
| 1.25 credits in t | he Area of A | pplication or electives |
| Summer Sem | nester | |
| COOP*3000 W | ork Term 3 | |
| COOL 3000 W | | |
| Semester 6 - | rall | |
| CIS*3760 | [0.75] | Software Engineering |
| STAT*2040 | [0.50] | Statistics I |
| 0.50 credits in C | 21S at 3000 l | evel or above |
| 0.75 credits in t | ne Area of A | pplication or electives |
| winter Seme | ster | |
| COOP*4000 | Work Term | 4 |
| Summer Sem | lester | |
| COOP*5000 W | ork Term 5 | |
| Semester 7 - | Fall | |
| CIS*3260 | [0.50] | Software Design IV |
| CIS*4150 | [0.50] | Software Reliability and Testing |
| CIS*4300 | [0.50] | Human Computer Interaction |
| 1.00 credits in t | he Area of A | pplication or electives |
| Semester 8 - 7 | Winter | |
| CIS*4250 | [0.50] | Software Design V |
| 1.50 credits in t | he Area of A | pplication or electives |
| 0.50 credits in C | CIS at the 40 | 00 level |
| | | |
| | | |
| 2019-2020 Und | ergraduate C | alendar |
| | | |
Bachelor of Engineering [B.Eng.]

Program Information

Objectives of the Program

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

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

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

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

Accreditation

The baccalaureate degree programs in all engineering programs are accredited by the Canadian Engineering Accreditation Board of Engineers Canada. Graduates from accredited engineering programs have the educational requirements to apply for membership in the Professional Engineers Ontario (PEO) and other provinces after a number of years of acceptable engineering experience and successful completion of a PEO examination in engineering law and ethics.

Requirements of the Program

Students combine their required courses in mathematics, physical sciences and engineering with additional credits providing the opportunity for specialization in: one of the programs; complementary studies courses; and elective subjects. Complementary studies, 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, so students are free to select their programs of choice. Students wanting to make a switch in majors after the above dates are free to do so with prior approval, but will be off sequence and may be required to take additional courses.

The available programs are:

Undeclared First Year: Students selecting this entry point are required to select one of the B.Eng. Majors at the time of course selection in Semester II.

Biological Engineering - the application of engineering to the control and management of biological processes, environments, and human factors in engineering design.

Biomedical Engineering - the application of engineering to health and medicine.

Computer Engineering - the application of engineering to the design, fabrication, and testing of computing machines and computer systems.

Engineering Systems and Computing - the application of engineering to the design, operation and management of data sensing, transmission and processing systems, and of control systems.

Environmental Engineering - the application of engineering to protect and restore the environment, through the prevention and treatment of gaseous, liquid and solid wastes. Mechanical Engineering - The application of engineering to the design, manufacturing and control of mechanical and electro-mechanical equipment, systems and devices.

Water Resources Engineering - the application of engineering to the control and management of water and soil resources to meet human needs while sustaining the natural environment.

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

Additional Course Requirements

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

Continuation of Study

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

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

Conditions for Graduation

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

Co-operative Education

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

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

Successful applicants will:

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

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

B. Eng. Co-op Work Term Schedule

| 0 1 | | | | | |
|----------|-------|-------|-------|-------|-------|
| Semester | Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 |
| Fall | 1 | 3 | 5 | 6 | work |
| Winter | 2 | 4 | work | 7 | 8 |
| Summer | | work | work | work | |

All candidates must complete a minimum of 4 of the preceding 5 work terms with at least one work-term in each of a Fall, Winter and Summer semester. Students are eligible to participate in a maximum of two (2) work terms commencing in the summer and must follow the academic work schedule as outlined in the Co-operative Education & Career Services website.

Undeclared First Year Entry - B.Eng. Program

School of Engineering, College of Engineering and Physical Sciences

Semester 1 - Fall

| CHEM*1040 | [0.50] | General Chemistry I | |
|-----------|--------|-----------------------------|--|
| ENGG*1100 | [0.75] | Engineering and Design I | |
| MATH*1200 | [0.50] | Calculus I | |
| PHYS*1130 | [0.50] | Physics with Applications | |
| One of: | | | |
| CIS*1300 | [0.50] | Programming | |
| CIS*1500 | [0.50] | Introduction to Programming | |

Note: Students planning to declare one of Computer Engineering or Engineering Systems and Computing should take CIS*1300. This course is required for progression into CIS*2500 in Semester 2

Semester 2 - Winter

(for students planning to declare one of: Biological Engineering, Biomedical Engineering, Environmental Engineering, Water Resources Engineering)

| ,, | | in Engineering, water resources Engineering) |
|--------------|--------|----------------------------------------------|
| CHEM*1050 | [0.50] | General Chemistry II |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| Semester 2 - | Winter | |

(for students planning to declare one of: Computer Engineering, Engineering Systems

| and Computing | g) | |
|------------------|-------------|----------------------------------------|
| CIS*2500 | [0.50] | Intermediate Programming |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| Semester 2 - | Winter | |
| (for students pl | anning to d | eclare Mechanical Engineering) |
| ENGG*1210 | [0 50] | Engineering Mechanics I |

| ENGG*1210 | [0.30] | Engineering Mechanics I |
|--------------------|---------|----------------------------------------|
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| 0.50 restricted el | ectives | |

Biological Engineering Program (BIOE)

School of Engineering, College of Engineering and Physical Sciences

Students interested in problems requiring the application of knowledge from both the biological sciences and engineering will find a challenge as a Biological Engineer. This field of engineering is the application of principles, methods and concepts of biology to systems and tools, ranging in scale from molecular to ecosystem level. This field combines engineering principles with life sciences to design creative solutions for biological systems, with applications ranging from pharmaceutical and food manufacturing, bioconversions to reduce waste, and production of sustainable, bio-based materials. For example, a Biological Engineer concentrating on biotechnology might design and manage bioreactors to improve their productivity. A Biological Engineering graduate can pursue a career in a number of exciting fields, including food safety, bio-instrumentation, diagnostics and sensorics in bio-systems, biomechanics and ergonomics.

Major (Honours Program)

| major (mone | uis 1105 | (am) |
|---------------------|----------|------------------------------------------------|
| Semester 1 | | |
| CHEM*1040 | [0.50] | General Chemistry I |
| ENGG*1100 | [0.75] | Engineering and Design I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1200 | [0.50] | Calculus I |
| PHYS*1130 | [0.50] | Physics with Applications |
| Semester 2 | | |
| CHEM*1050 | [0.50] | General Chemistry II |
| CIS*1500 | [0.50] | Introduction to Programming |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| Semester 3 | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| ENGG*2230 | [0.50] | Fluid Mechanics |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| MATH*2270 | [0.50] | Applied Differential Equations |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| Semester 4 | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2120 | [0.50] | Material Science |
| ENGG*2450 | [0.50] | Electric Circuits |
| ENGG*2660 | [0.50] | Biological Engineering Systems I |
| MATH*2130 | [0.50] | Numerical Methods |
| Semester 5 | | |
| ENGG*3160 | [0.50] | Biological Engineering Systems II |
| ENGG*3260 | [0.50] | Thermodynamics |
| ENGG*3450 | [0.50] | Electronic Devices |
| ENGG*3830 | [0.50] | Bio-Process Engineering |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| 0.50 restricted ele | ectives | |

| Semester 6 | | |
|-------------------|----------|------------------------------------|
| ENGG*3100 | [0.75] | Engineering and Design III |
| ENGG*3170 | [0.50] | Biomaterials |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| ENGG*3430 | [0.50] | Heat and Mass Transfer |
| 1.00 restricted e | lectives | |
| Semester 7 | | |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| ENGG*4380 | [0.75] | Bioreactor Design |
| ENGG*4390 | [0.75] | Bio-instrumentation Design |
| 1.00 restricted e | lectives | - |
| Semester 8 | | |
| ENGG*4110 | [1.00] | Biological Engineering Design IV |
| 1.75 restricted e | lectives | |

Restricted Electives (see Program Guide for more information)

The Engineering Program requires Biological Engineering students to complete the following combination of elective credits to complete their program:

- 1.00 credits from the BIOE-1 Biological Engineering electives
- 0.75 credits from the BIOE-2 Biological Engineering design electives
- 2.00 credits from Complementary Studies electives
- 0.50 credits in Free Electives

Consult the Program Guide for further information on the prerequisite requirements specific to each elective. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

Biological Engineering Program Co-op (BIOE:C)

School of Engineering, College of Engineering and Physical Sciences

Students interested in problems requiring the application of knowledge from both the biological sciences and engineering will find a challenge as a Biological Engineer. This field of engineering is the application of principles, methods and concepts of biology to systems and tools, ranging in scale from molecular to ecosystem level. This field combines engineering principles with life sciences to design creative solutions for biological systems, with applications ranging from pharmaceutical and food manufacturing, bioconversions to reduce waste, and production of sustainable, bio-based materials. For example, a Biological Engineer concentrating on biotechnology might design and manage bioreactors to improve their productivity. A Biological Engineering graduate can pursue a career in a number of exciting fields, including food safety, bio-instrumentation, diagnostics and sensorics in bio-systems, biomechanics and ergonomics.

Program Requirements

The Co-op program in Biological Engineering is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

Biological Engineering Academic and Co-op Work Term Schedule

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (25.50 Total Credits)*

19.25 - Required Core Courses

- 1.00 BIOE-1 Biological Engineering Electives
- 0.75 BIOE-2 Biological Engineering Design Electives
- 2.00 Complementary Studies Electives
- 0.50 Free Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 26.00.

See Program Guide for more information on restricted electives and their prerequisite requirements. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| 501105001 1 10 | | |
|---------------------|-----------|------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| ENGG*1100 | [0.75] | Engineering and Design I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1200 | [0.50] | Calculus I |
| PHYS*1130 | [0.50] | Physics with Applications |
| Semester 2 - W | inter | |
| CHEM*1050 | [0.50] | General Chemistry II |
| CIS*1500 | [0.50] | Introduction to Programming |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| Semester 3 - Fa | all | |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| ENGG*2230 | [0.50] | Fluid Mechanics |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| MATH*2270 | [0.50] | Applied Differential Equations |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| Semester 4 - W | inter | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2120 | [0.50] | Material Science |
| ENGG*2450 | [0.50] | Electric Circuits |
| ENGG*2660 | [0.50] | Biological Engineering Systems I |
| MATH*2130 | [0.50] | Numerical Methods |
| Summer Seme | ster | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 5 - Fa | all | |
| ENGG*3160 | [0.50] | Biological Engineering Systems II |
| ENGG*3260 | [0.50] | Thermodynamics |
| ENGG*3450 | [0.50] | Electronic Devices |
| ENGG*3830 | [0.50] | Bio-Process Engineering |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| 0.50 restricted ele | ectives | |
| Winter Semest | er | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Summer Seme | ster | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 6 - Fa | all | 1 |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*4380 | [0.75] | Bioreactor Design |
| ENGG*4390 | [0.75] | Bio-instrumentation Design |
| 1.00 restricted ele | ctives | Ũ |
| Semester 7 - W | inter | |
| ENGG*3100 | [0.75] | Engineering and Design III |
| ENGG*3170 | [0.50] | Biomaterials |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| ENGG*3430 | [0.50] | Heat and Mass Transfer |
| 1.00 restricted ele | ctives | |
| Summer Seme | ster | |
| COOP*4000 | [0 50] | Co-on Work Term IV |
| Fall Semester | [0.50] | |
| COOD*5000 | [0 50] | Co. on Work Town V |
| ENGG*/000 | [0.50] | Proposal for Engineering Design IV |
| Semester 8 - W | (0.00) | roposarior Engineering Design IV |
| ENCC+4110 | [1.00] | Distant Engineering D. '. W |
| ENGG*4110 | [1.00] | Biological Engineering Design IV |
| 1.75 restricted ele | vuves | |
| BIOMEDICAL E | ngineerii | ng Program (BNIE) |

School of Engineering, College of Engineering and Physical Sciences

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 | | | |
|-----------------------------------------------------------------------------------------|--------------|-----------------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| ENGG*1100 | [0.75] | Engineering and Design I | |
| ENGG*1500 | [0.50] | Engineering Analysis | |
| MATH*1200 | [0.50] | Calculus I | |
| PHYS*1130 | [0.50] | Physics with Applications | |
| Semester 2 | | | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| CIS*1500 | [0.50] | Introduction to Programming | |
| ENGG*1210 | [0.50] | Engineering Mechanics I | |
| MATH*1210 | [0.50] | Calculus II | |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism | |
| Semester 3 | | | |
| ENGG*2160 | [0.50] | Engineering Mechanics II | |
| ENGG*2230 | [0.50] | Fluid Mechanics | |
| ENGG*2400 | [0.50] | Engineering Systems Analysis | |
| MATH*2270 | [0.50] | Applied Differential Equations | |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers | |
| 0.50 restricted elec | ctives | | |
| Semester 4 | | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | |
| BIOM*2000 | [0.50] | Concepts in Human Physiology | |
| ENGG*2100 | [0.75] | Engineering and Design II | |
| ENGG*2120 | [0.50] | Material Science | |
| ENGG*2450 | [0.50] | Electric Circuits | |
| MATH*2130 | [0.50] | Numerical Methods | |
| Note: Students put | rsuing the p | harmaceutical series of electives may select ENGG*2660 | |
| in Semester 4. If E | NGG*2660 |) is selected, students must select BIOM*2000 in semester | |
| 7 in place of a 0.50 |) restricted | elective. | |
| Semester 5 | | | |
| BIOM*3010 | [0.50] | Biomedical Comparative Anatomy | |
| ENGG*3260 | [0.50] | Thermodynamics | |
| ENGG*3390 | [0.50] | Signal Processing | |
| ENGG*3450 | [0.50] | Electronic Devices | |
| HIST*1250 | [0.50] | Science and Technology in a Global Context | |
| 0.50 restricted elec | cuves | | |
| Semester o | | | |
| ENGG*3100 | [0.75] | Engineering and Design III | |
| ENGG*3170 | [0.50] | Biomaterials | |
| ENGG*3410 | [0.50] | Systems and Control Theory | |
| ENGG*3430 | [0.50] | Heat and Mass Transfer | |
| PATH*3610 | [0.50] | Principles of Disease | |
| 0.50 restricted elec | cuves | | |
| Semester / | | | |
| ENGG*3240 | [0.50] | Engineering Economics | |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV | |
| ENGG*4390 | [0.75] | Bio-instrumentation Design | |
| 2.00 restricted elec | cuves | | |
| Semester 8 | | | |
| ENGG*4180 | [1.00] | Biomedical Engineering Design IV | |
| 1./5 restricted elec | tives | Due succes (Curide for more information) | |
| Restricted Elec | lives (see | Program Guide for more information) | |
| The Engineering | Program re | quires Biomedical Engineering students to complete the | |
| onowing combination of elective credits to complete their program: | | | |
| • 2.50 creats from the BME-1 Biomedical Engineering electives | | | |
| 0.75 credits from the BME-2 Biomedical Engineering design electives | | | |
| 2.00 credits from Complementary Studies electives | | | |

Consult the Program Guide for further information on the prerequisite requirements specific to each elective. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

Biomedical Engineering Program Co-op (BME:C)

School of Engineering, College of Engineering and Physical Sciences

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.

Program Requirements

The Co-op program in Biomedical Engineering is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (25.75 Total Credits)*

18.50 - Required Core Courses

2.50 - BME-1 Biomedical Engineering Electives

0.75 - BME-2 Biomedical Engineering Design Electives

2.00 - Complementary Studies Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 26.25.

See Program Guide for more information on restricted electives and their prerequisite requirements. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| | | | | jui 5 I I Už | 51 an |
|----------------|---------|-----------------------------------------|------------|--------------|----------|
| CHEM*1040 | [0.50] | General Chemistry I | Semester 1 | | |
| ENGG*1100 | [0.75] | Engineering and Design I | Semester 1 | | |
| ENGG*1500 | [0.50] | Engineering Analysis | CHEM*1040 | [0.50] | Ge |
| MATH*1200 | [0.50] | Calculus I | CIS*1300 | [0.50] | Pro |
| PHYS*1130 | [0.50] | Physics with Applications | ENGG*1100 | [0.75] | En |
| Semester 2 - V | Vinter | | MATH*1200 | [0.50] | Ca |
| CHEM#1050 | [0 50] | Conoral Chamistery II | PHYS*1130 | [0.50] | Ph |
| CHENI*1050 | [0.30] | | Semester 2 | | |
| CIS*1500 | [0.50] | Introduction to Programming | CIG*2500 | FO 501 | . |
| ENGG*1210 | [0.50] | Engineering Mechanics I | CIS*2500 | [0.50] | Int |
| MATH*1210 | [0.50] | Calculus II | ENGG*1210 | [0.50] | En |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism | ENGG*1500 | [0.50] | En |
| Semester 3 - F | all | | MATH*1210 | [0.50] | Ca |
| COOP*1100 | 100.001 | Introduction to Co. operative Education | PHYS*1010 | [0.50] | Int |
| ENCC*2100 | [0.00] | | Semester 3 | | |
| ENGG*2100 | [0.75] | Engineering and Design II | CIG*2 420 | 10 501 | 01 |
| ENGG*2120 | [0.50] | Material Science | CIS*2430 | [0.50] | Ot |
| ENGG*2160 | [0.50] | Engineering Mechanics II | CIS*2520 | [0.50] | Da |
| ENGG*2400 | [0.50] | Engineering Systems Analysis | ENGG*2400 | [0.50] | En |

| MATH*2270 | [0.50] | Applied Differential Equations | | |
|----------------------|---------------------|---------------------------------------------------------|--|--|
| 0.50 restricted elec | tives | | | |
| Semester 4 - Wi | Semester 4 - Winter | | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | | |
| BIOM*2000 | [0.50] | Concepts in Human Physiology | | |
| ENGG*2230 | [0.50] | Fluid Mechanics | | |
| ENGG*2450 | [0.50] | Electric Circuits | | |
| MATH*2130 | [0.50] | Numerical Methods | | |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers | | |
| Note: Students purs | suing the pl | harmaceutical series of electives may select ENGG*2660 | | |
| in Semester 4. If El | NGG*2660 | is selected, students must select BIOM*2000 in semester | | |
| 6 in place of a 0.50 | restricted e | elective. | | |
| Summer Semest | ter | | | |
| COOP*1000 | [0.50] | Co-op Work Term I | | |
| Semester 5 - Fal | 1 | | | |
| BIOM*3010 | [0.50] | Biomedical Comparative Anatomy | | |
| ENGG*3260 | [0.50] | Thermodynamics | | |
| ENGG*3390 | [0.50] | Signal Processing | | |
| ENGG*3450 | [0.50] | Electronic Devices | | |
| HIST*1250 | [0.50] | Science and Technology in a Global Context | | |
| 0.50 restricted elec | tives | | | |
| Winter Semester | r | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | | |
| Summer Semest | ter | - | | |
| COOP*3000 | [0.50] | Co-op Work Term III | | |
| Semester 6 - Wi | nter | | | |
| ENGG*3240 | [0.50] | Engineering Economics | | |
| ENGG*4390 | [0.75] | Bio-instrumentation Design | | |
| 2.00 restricted elec | tives | C | | |
| Semester 7 - Wi | nter | | | |
| ENGG*3100 | [0.75] | Engineering and Design III | | |
| ENGG*3170 | [0.50] | Biomaterials | | |
| ENGG*3410 | [0.50] | Systems and Control Theory | | |
| ENGG*3430 | [0.50] | Heat and Mass Transfer | | |
| PATH*3610 | [0.50] | Principles of Disease | | |
| 0.50 restricted elec | tives | • | | |
| Summer Semest | ter | | | |
| COOP*4000 | [0.50] | Co-op Work Term IV | | |
| Fall Semester | | * | | |
| COOP*5000 | [0.50] | Co-op Work Term V | | |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV | | |
| Semester 8 - Wi | nter | | | |
| ENGG*4180 | [1.00] | Biomedical Engineering Design IV | | |
| 1.75 restricted elec | tives | | | |

Computer Engineering Program (CENG)

School of Engineering, College of Engineering and Physical Sciences

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)

| emester 1 | | |
|-----------|--------|----------------------------------------|
| HEM*1040 | [0.50] | General Chemistry I |
| IS*1300 | [0.50] | Programming |
| NGG*1100 | [0.75] | Engineering and Design I |
| IATH*1200 | [0.50] | Calculus I |
| HYS*1130 | [0.50] | Physics with Applications |
| emester 2 | | |
| IS*2500 | [0.50] | Intermediate Programming |
| NGG*1210 | [0.50] | Engineering Mechanics I |
| NGG*1500 | [0.50] | Engineering Analysis |
| IATH*1210 | [0.50] | Calculus II |
| HYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| emester 3 | | |
| IS*2430 | [0.50] | Object Oriented Programming |
| IS*2520 | [0.50] | Data Structures |
| NGG*2400 | [0.50] | Engineering Systems Analysis |

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| ENGG*2410 | [0.50] | Digital Systems Design Using Descriptive Languages |
|----------------------|-------------|----------------------------------------------------------|
| MATH*2270 | [0.50] | Applied Differential Equations |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| Semester 4 | | |
| CIS*2910 | [0.50] | Discrete Structures in Computing II |
| ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2450 | [0.50] | Electric Circuits |
| ENGG*3380 | [0.50] | Computer Organization and Design |
| MATH*2130 | [0.50] | Numerical Methods |
| 0.50 restricted elec | tives (CIS* | 2750 recommended for students interested in the software |
| engineering stream | I) | |
| Semester 5 | | |
| ENGG*2120 | [0.50] | Material Science |
| ENGG*3390 | [0.50] | Signal Processing |
| ENGG*3450 | [0.50] | Electronic Devices |
| ENGG*3640 | [0.50] | Microcomputer Interfacing |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| 0.50 restricted elec | tives | |
| Semester 6 | | |
| CIS*3110 | [0.50] | Operating Systems I |
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms |
| ENGG*3100 | [0.75] | Engineering and Design III |
| ENGG*3210 | [0.50] | Communication Systems |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| 0.50 restricted elec | tives | |
| Semester 7 | | |
| ENGG*3050 | [0.50] | Embedded Reconfigurable Computing Systems |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| ENGG*4420 | [0.75] | Real-time Systems Design |
| ENGG*4450 | [0.50] | Large-Scale Software Architecture Engineering |
| 1.00 restricted elec | tives | |
| Semester 8 | | |
| ENGG*4170 | [1.00] | Computer Engineering Design IV |
| ENGG*4540 | [0.50] | Advanced Computer Architecture |
| ENGG*4550 | [0.50] | VLSI Digital Design |
| 1.00 electives | | - |

Restricted Electives (see Program Guide for more information)

The Engineering Program requires Computer Engineering students to complete the following combination of elective credits to complete their program:

- 1.50 credits from the CENG-1 Computer Engineering electives
- · 2.00 credits from Complementary Studies electives

Consult the Program Guide for further information on the prerequisite requirements specific to each elective. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

Computer Engineering Program Co-op (CENG:C)

School of Engineering, College of Engineering and Physical Sciences

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.

Program Requirements

The Co-op program in Computer Engineering is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Computer | Engineering | Academic and | Co-op | Work Term | Schedul |
|----------|-------------|--------------|-------|-----------|---------|
| | 0 0 | | | | |

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |

| Year | Fall | Winter | Summer |
|------|---------------------|---------------------|--------|
| 5 | COOP*5000 Work Term | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (26.00 Total Credits)*

20.50 - Required Core Courses

1.50 - CENG-1 Computer Engineering Electives

2.00 - Complementary Studies Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 26.50.

See Program Guide for more information on restricted electives and their prerequisite requirements. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

1.00 restricted electives

| Semester 1 | Lan | |
|-------------------|-----------------------|------------------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| CIS*1300 | [0.50] | Programming |
| ENGG*1100 | [0.75] | Engineering and Design I |
| MATH*1200 | [0.50] | Calculus I |
| PHYS*1130 | [0.50] | Physics with Applications |
| Semester 2 - | Winter | |
| CIS*2500 | [0.50] | Intermediate Programming |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| Semester 3 - | Fall | |
| CIS*2430 | [0.50] | Object Oriented Programming |
| CIS*2520 | [0.50] | Data Structures |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| ENGG*2410 | [0.50] | Digital Systems Design Using Descriptive Languages |
| MATH*2270 | [0.50] | Applied Differential Equations |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| Semester 4 - | Winter | |
| CIS*2910 | [0 50] | Discrete Structures in Computing II |
| ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2450 | [0.50] | Electric Circuits |
| ENGG*3380 | [0.50] | Computer Organization and Design |
| MATH*2130 | [0.50] | Numerical Methods |
| 0.50 restricted e | electives (CIS | 5*2750 recommended for students interested in the software |
| engineering stre | eam) | |
| Summer Sem | nester | |
| COOP*1000 | [0 50] | Co-on Work Term I |
| Semester 5 - | Fall | |
| ENCC*2120 | [0 50] | Material Calence |
| ENGG*2120 | [0.50] | Naterial Science |
| ENGC*3390 | [0.50] | Flastronia Davias |
| ENGC*3430 | [0.50] | Microcomputer Interfacing |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| 0.50 restricted e | lectives | Science and recimology in a Global Context |
| Winter Seme | ster | |
| | IO 501 | Co. on Work Term II |
| Summer Sem | [0.30] | co-op work term in |
| | 10 501 | Co. on Work Town III |
| COOP*5000 | [0.30] Fall | Co-op work term m |
| Semester 0 - | rall | |
| ENGG*3050 | [0.50] | Embedded Reconfigurable Computing Systems |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*4420 | [0.75] | Keal-time Systems Design |
| ENGG*4450 | [0.50] | Large-Scale Software Architecture Engineering |

Semester 7 - Winter -

| CIS*3110 | [0.50] | Operating Systems I |
|-------------------|-----------|------------------------------------------------|
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms |
| ENGG*3100 | [0.75] | Engineering and Design III |
| ENGG*3210 | [0.50] | Communication Systems |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| 0.50 restricted e | electives | |
| Summer Sem | lester | |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| Fall Semester | r | |
| COOP*5000 | [0.50] | Co-op Work Term V |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| Semester 8 - Y | Winter | |
| ENGG*4170 | [1.00] | Computer Engineering Design IV |
| ENGG*4540 | [0.50] | Advanced Computer Architecture |
| ENGG*4550 | [0.50] | VLSI Digital Design |
| 1.00 electives | | |
| | | |

Engineering Systems and Computing Program (ESC)

School of Engineering, College of Engineering and Physical Sciences

In the last quarter century, the computer has grown so rapidly in importance that engineering, science, business and industry could not function without it. With this growth, a need has evolved for specialists who can incorporate computers and information into complex industrial processes. The Engineering Systems and Computing program has been conceived to satisfy this need. Graduates from this program will have, in addition to the basic engineering skills, the ability to identify application areas where computer technology represents the optimum solution, specify appropriate software for process control, data reduction and/or expert system implementation and integrate the computer into the overall system application.

Major (Honours Program)

| Semester 1 | | |
|---------------------|---------|----------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| CIS*1300 | [0.50] | Programming |
| ENGG*1100 | [0.75] | Engineering and Design I |
| MATH*1200 | [0.50] | Calculus I |
| PHYS*1130 | [0.50] | Physics with Applications |
| Semester 2 | | |
| CIS*2500 | [0.50] | Intermediate Programming |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| Semester 3 | | |
| CIS*2430 | [0.50] | Object Oriented Programming |
| CIS*2520 | [0.50] | Data Structures |
| ENGG*2230 | [0.50] | Fluid Mechanics |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| ENGG*2410 | [0.50] | Digital Systems Design Using Descriptive Languages |
| MATH*2270 | [0.50] | Applied Differential Equations |
| Semester 4 | | |
| ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2120 | [0.50] | Material Science |
| ENGG*2450 | [0.50] | Electric Circuits |
| MATH*2130 | [0.50] | Numerical Methods |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| 0.50 restricted ele | ectives | |
| Semester 5 | | |
| ENGG*3260 | [0.50] | Thermodynamics |
| ENGG*3390 | [0.50] | Signal Processing |
| ENGG*3450 | [0.50] | Electronic Devices |
| ENGG*3640 | [0.50] | Microcomputer Interfacing |
| 1.00 restricted ele | ectives | |
| Semester 6 | | |
| ENGG*3100 | [0.75] | Engineering and Design III |
| ENGG*3130 | [0.50] | Modelling Complex Systems |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| ENGG*3430 | [0.50] | Heat and Mass Transfer |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| 0.50 restricted ele | ectives | |
| Semester 7 | | |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| ENGG*4420 | [0.75] | Real-time Systems Design |
| | | |

| ENGG*4450 | [0.50] | Large-Scale Software Architecture Engineering |
|-------------------|----------------|-----------------------------------------------|
| 1.00 or 1.25 rest | ricted electiv | ves |
| Semester 8 | | |

| ENGG*4120 | [1.00] | Engineering Systems and Computing Design IV |
|-------------------|--------|---------------------------------------------|
| ENGG*4280 | [0.75] | Digital Process Control Design |
| 1.00 or 1.25 elec | ctives | |

Restricted Electives (see Program Guide for more information)

The Engineering Program requires Engineering Systems and Computing students to complete the following combination of elective credits to complete their program:

- 1.50 credits from the ESC-1 Engineering Systems and Computing electives
- 0.75 credits from the ESC-2 Engineering Systems and Computing electives
- 2.00 credits from Complementary Studies electives

Consult the Program Guide for further information on the prerequisite requirements specific to each elective. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

Engineering Systems and Computing Program Co-op (ESC:C)

School of Engineering, College of Engineering and Physical Sciences

In the last quarter century, the computer has grown so rapidly in importance that engineering, science, business and industry could not function without it. With this growth, a need has evolved for specialists who can incorporate computers and information into complex industrial processes. The Engineering Systems and Computing program has been conceived to satisfy this need. Graduates from this program will have, in addition to the basic engineering skills, the ability to identify application areas where computer technology represents the optimum solution, specify appropriate software for process control, data reduction and/or expert system implementation and integrate the computer into the overall system application.

Program Requirements

The Co-op program in Engineering Systems and Computing is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

Engineering Systems and Computing Academic and Co-op Work Term Schedule

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (25.50 Total Credits)*

19.25 - Required Core Courses

- 1.50 ESC-1 Engineering Systems and Computing Electives
- 0.75 ESC-2 Engineering Systems and Computing Electives
- 2.00 Complementary Studies Electives

2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 26.00.

See Program Guide for more information on restricted electives and their prerequisite requirements. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| CHEM*1040 | [0.50] | General Chemistry I |
|-----------|--------|--------------------------|
| CIS*1300 | [0.50] | Programming |
| ENGG*1100 | [0.75] | Engineering and Design I |
| MATH*1200 | [0.50] | Calculus I |

| PHYS*1130 | [0.50] | Physics with Applications | CIS*1500 | [0.50] | Introduction to Programming |
|-------------------------------------------------------------------|-----------------|----------------------------------------------------|---------------------|----------------|-------------------------------------------------------------|
| Semester 2 - V | Vinter | | ENGG*1210 | [0.50] | Engineering Mechanics I |
| CIS*2500 | [0 50] | Intermediate Programming | MATH*1210 | [0.50] | Calculus II |
| ENGG*1210 | [0.50] | Engineering Mechanics I | PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| ENGG*1500 | [0.50] | Engineering Analysis | Semester 3 | | |
| MATH*1210 | [0.50] | Calculus II | ENGG*2100 | [0.75] | Engineering and Design II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism | ENGG*2120 | [0.50] | Material Science |
| Semester 3 - F | all | | ENGG*2130 | [0.50] | Introduction to Environmental Engineering |
| CIS*2430 | [0,50] | Object Oriented Programming | ENGG*2400 | [0.50] | Engineering Systems Analysis |
| CIS*2520 | [0.50] | Data Structures | MATH*2270 | [0.50] | Applied Differential Equations |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | One of: | | |
| ENGG*2230 | [0.50] | Fluid Mechanics | BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| ENGG*2400 | [0.50] | Engineering Systems Analysis | MICR*2420 | [0.50] | Introduction to Microbiology |
| ENGG*2410 | [0.50] | Digital Systems Design Using Descriptive Languages | Semester 4 | | |
| MATH*2270 | [0.50] | Applied Differential Equations | ENGG*2230 | [0.50] | Fluid Mechanics |
| Semester 4 - V | Vinter | | ENGG*2560 | [0.50] | Environmental Engineering Systems |
| ENGG*2100 | [0.75] | Engineering and Design II | HIST*1250 | [0.50] | Science and Technology in a Global Context |
| ENGG*2120 | [0.50] | Material Science | MATH*2130 | [0.50] | Numerical Methods |
| ENGG*2450 | [0.50] | Electric Circuits | STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| MATH*2130 | [0.50] | Numerical Methods | 0.50 restricted ele | ectives | |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers | Semester 5 | | |
| 0.50 restricted el | ectives | riobuolity and Statistics for Eligneers | ENGG*3180 | [0,50] | Air Quality |
| Summer Seme | ster | | ENGG*3240 | [0.50] | Engineering Economics |
| | 10 CO1 | | ENGG*3260 | [0.50] | Thermodynamics |
| COOP*1000 | [0.50] | Co-op work Term I | ENGG*3590 | [0.50] | Water Quality |
| Semester 5 - F | all | | ENGG*3650 | [0.50] | Hydrology |
| ENGG*3260 | [0.50] | Thermodynamics | ENGG*3670 | [0.50] | Soil Mechanics |
| ENGG*3390 | [0.50] | Signal Processing | Semester 6 | [0.00] | |
| ENGG*3450 | [0.50] | Electronic Devices | ENGC*2100 | 10 751 | |
| ENGG*3640 | [0.50] | Microcomputer Interfacing | ENGG*3100 | [0.75] | Engineering and Design III |
| 1.00 restricted el | ectives | | ENGG*3220 | [0.50] | Groundwater Engineering |
| Winter Semes | ter | | ENGG*3410 | [0.50] | Systems and Control Theory |
| COOP*2000 | [0.50] | Co-op Work Term II | ENGG*3430 | [0.50] | Mass Transfer Operations |
| Summer Seme | ester | • | 0.50 restricted al | [0.30] | Mass fransfer Operations |
| COOP*3000 | [0 50] | Co-op Work Term III | Somester 7 | ecuves | |
| Semester 6 - F | [0.50] [a]] | co-op work renn m | Semester / | | |
| Elicence of the | an 10 501 | | ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| ENGG*3240 | [0.50] | Engineering Economics | ENGG*4340 | [0.50] | Solid and Hazardous Waste Management |
| ENGG*4420 | [0.75] | Real-time Systems Design | ENGG*4370 | [0.75] | Urban Water Systems Design |
| ENGG*4450 | [0.50] | Large-Scale Software Architecture Engineering | 1.50 restricted el | ectives | |
| 1.00 or 1.25 restr | ricted electiv | /es | Semester 8 | | |
| Semester 7 - V | Vinter | | ENGG*4130 | [1.00] | Environmental Engineering Design IV |
| ENGG*3100 | [0.75] | Engineering and Design III | 2.00 restricted ele | ectives | |
| ENGG*3130 | [0.50] | Modelling Complex Systems | Restricted Ele | ctives (see | Program Guide for more information) |
| ENGG*3410 | [0.50] | Systems and Control Theory | The Engineering | Program rec | uires Environmental Engineering students to complete the |
| ENGG*3430 | [0.50] | Heat and Mass Transfer | following combin | ation of elec | ctive credits to complete their program: |
| HIST*1250 | [0.50] | Science and Technology in a Global Context | • 1.00 credits f | From the ENV | VE 1 Environmental Engineering electives |
| 0.50 restricted el | ectives | | | | VE-1 Environmental Engineering electives |
| Summer Seme | ester | | • 2.00 credits 1 | rom the EN | vE-2 Environmental Engineering electives |
| COOP*4000 | [0.50] | Co-op Work Term IV | • 1.50 credits f | rom Comple | ementary Studies electives |
| Fall Semester | | | Consult the Prog | gram Guide | for further information on the prerequisite requirements |
| COOP*5000 | [0,50] | Co-op Work Term V | specific to each e | elective. Stud | lents can take a maximum of 1.50 credits at the 1000 level |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV | from the above li | st of elective | ·S. |
| Semester 8 - V | Vinter | Toposa for Englisoring Design 14 | Minor (Hono | ours Prog | ram) |
| ENCC*4120 [1.00] Engineering Systems and Commutine Design W. Stud | | | | e registered | in a B Eng degree program specialization other than |
| ENGG*4120 | [1.00] | Digital Process Control Design IV | Environmental E | noineering to | apply for a Minor in Environmental Engineering A Minor |
| 1 00 or 1 25 aloos | [U./J] tives | Digital Process Control Design | in Environmental | Engineering | consists of at least 5.00 course credits. A maximum of 2.50 |
| | 11760 | | | | , |

Environmental Engineering Program (ENVE)

School of Engineering, College of Engineering and Physical Sciences

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 | | | | |
|-----------------------------|--------|---------------------------|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | |
| ENGG*1100 | [0.75] | Engineering and Design I | | |
| ENGG*1500 | [0.50] | Engineering Analysis | | |
| MATH*1200 | [0.50] | Calculus I | | |
| PHYS*1130 | [0.50] | Physics with Applications | | |
| Semester 2 | | | | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| Last Revision: July 4, 2019 | | | | |

course credits taken as part of the Environmental Engineering Minor may also be applied

General Chemistry II

Organic Chemistry I

Site Remediation

Air Quality

Water Quality

Environmental Engineering Systems

Environmental Chemistry and Toxicology

Life Cycle Assessment for Sustainable Design

Solid and Hazardous Waste Management

Assessment & Management of Risk

Energy Resources & Technologies

Energy Management & Utilization

Introduction to Biochemistry

Mass Transfer Operations

toward the requirements of the B.Eng. Major specialization.

At least 2.00 credit must be selected from the following courses:

The following courses (2.00 credits) are required:

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

CHEM*1050

ENGG*2560

ENGG*3180

ENGG*3590

BIOC*2580

CHEM*2700

CHEM*3360

ENGG*3080

ENGG*3250

ENGG*3470

ENGG*4070

ENGG*4240

ENGG*4340

ENGG*4510

| ENGG*4760 | [0.50] | Biological Wastewater Treatment Design | | |
|--------------------|-----------------|----------------------------------------------------|--|--|
| ENGG*4770 | [0.50] | Physical & Chemical Water and Wastewater Treatment | | |
| | | Design | | |
| ENGG*4810 | [0.50] | Control of Atmospheric Particulates | | |
| ENGG*4820 | [0.50] | Atmospheric Emission Control: Combustion Systems | | |
| ENVS*2030 | [0.50] | Meteorology and Climatology | | |
| At least 1.00 cred | it must be sele | cted from the following courses: | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality | | |
| EDRD*2650 | [0.50] | Introduction to Planning and Environmental Law | | |
| ENVS*2270 | [0.50] | Impacts of Climate Change | | |
| GEOG*1220 | [0.50] | Human Impact on the Environment | | |
| GEOG*2210 | [0.50] | Environment and Resources | | |
| GEOG*3020 | [0.50] | Global Environmental Change | | |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment | | |
| PHIL*2070 | [0.50] | Philosophy of the Environment | | |
| POLS*3370 | [0.50] | Environmental Politics and Governance | | |
| SOC*2280 | [0.50] | Society and Environment | | |
| - • | | | | |

Environmental Engineering Program Co-op (ENVE:C)

School of Engineering, College of Engineering and Physical Sciences

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.

Program Requirements

The Co-op program in Environmental Engineering is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Environmental | Engineering | Academic | and Co-op | Work Term | Schedule |
|---------------|-------------|----------|-----------|-----------|----------|
| | | | | | |

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (25.50 Total Credits)*

- 19.00 Required Core Courses
- 1.00 ENVE-1 Environmental Engineering Electives
- 2.00 ENVE-2 Environmental Engineering Electives
- 1.50 Complementary Studies Electives
- 2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 26.00

See Program Guide for more information on restricted electives and their prerequisite requirements. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

The recommended program sequence is outlined below.

Major (Honours Program)

| Semester 1 - I |
|----------------|
|----------------|

| CHEM*1040 | [0.50] | General Chemistry I |
|-----------|--------|---------------------------|
| ENGG*1100 | [0.75] | Engineering and Design I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1200 | [0.50] | Calculus I |
| PHYS*1130 | [0.50] | Physics with Applications |

| Semester 2 - W | inter | |
|------------------------|------------------|---------------------------------------------|
| CHEM*1050 | [0.50] | General Chemistry II |
| CIS*1500 | [0.50] | Introduction to Programming |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| Semester 3 - Fa | ıll | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| ENGG*2130 | [0.50] | Introduction to Environmental Engineering |
| ENGG*2230 | [0.50] | Fluid Mechanics |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| MATH*2270 | [0.50] | Applied Differential Equations |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| One of: | IO 501 | Inter de clien te Meleculen en d'Oelleden D |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular B |
| MICK*2420 | [0.30] | Introduction to Microbiology |
| Semester 4 - w | inter | |
| ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2120 | [0.50] | Material Science |
| ENGG*2500 | [0.50] | Environmental Engineering Systems |
| HIS1*1250 MATH*2130 | [0.50] | Science and Technology in a Global Contex |
| 0.50 restricted ele | [0.30] ctives | Numerical Methods |
| Summer Semes | ster | |
| | [0 50] | Co-op Work Term I |
| Semester 5 - Fa | [0.50] | |
| ENGG*3180 | [0 50] | Air Quality |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*3260 | [0.50] | Thermodynamics |
| ENGG*3590 | [0.50] | Water Ouality |
| ENGG*3650 | [0.50] | Hydrology |
| ENGG*3670 | [0.50] | Soil Mechanics |
| Winter Semest | er | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Summer Semes | ster | I |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 6 - Fa | | I III |
| FNGG*4340 | [0 50] | Solid and Hazardous Waste Management |
| ENGG*4370 | [0.30] | Urban Water Systems Design |
| 1.50 restricted ele | ctives | Croun Water Systems Design |
| Semester 7 - W | inter | |
| ENGG*3100 | [0.75] | Engineering and Design III |
| ENGG*3220 | [0.50] | Groundwater Engineering |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| ENGG*3430 | [0.50] | Heat and Mass Transfer |
| ENGG*3470 | [0.50] | Mass Transfer Operations |
| 0.50 restricted ele | ctives | |
| Summer Semes | ster | |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| Fall Semester | | |
| COOP*5000 | [0.50] | Co-op Work Term V |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| Semester 8 - W | inter | |
| ENGG*4130 | [1.00] | Environmental Engineering Design IV |
| 2.00 restricted ele | ctives | |
| Food Enginee | ering (FE | NG) |
| School of Engine | ering, Colle | ege of Engineering and Physical Sciences |
| Minor (Hono | urs Prog | ram) |

fferential Equations and Statistics for Engineers ction to Molecular and Cellular Biology ction to Microbiology ng and Design II cience ental Engineering Systems d Technology in a Global Context Methods rk Term I

ng and Design III ter Engineering nd Control Theory Mass Transfer sfer Operations

| | [0.50] | Co-op work term IV |
|---|--------|------------------------------------|
| r | | |
| | [0.50] | Co-op Work Term V |
| | [0.00] | Proposal for Engineering Design IV |
| W | inter | |

neering and Physical Sciences

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

| Lingineering. | | | |
|------------------------------------------------------------------------|--------|----------------------------------------------|--|
| The minor can be satisfied by taking the following additional courses: | | | |
| ACCT*1220 | [0.50] | Introductory Financial Accounting | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | |
| ENGG*2660 | [0.50] | Biological Engineering Systems I | |
| ENGG*3830 | [0.50] | Bio-Process Engineering | |
| FOOD*2150 | [0.50] | Introduction to Nutritional and Food Science | |
| MICR*1020 | [0.50] | Fundamentals of Applied Microbiology | |
| One of: | | | |
| ENGG*4300 | [0.75] | Food Processing Engineering Design | |
| ENGG*4380 | [0.75] | Bioreactor Design | |
| Two of: | | | |
| FOOD*4070 | [0.50] | Food Packaging | |
| | | Last Pavision | |

X. Degree Programs, Bachelor of Engineering [B.Eng.]

| 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 ince | rnorate a fo | od engineering application as part of their canstone des |

*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 (MECH)

School of Engineering, College of Engineering and Physical Sciences

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 | | |
|----------------------|--------|--------------------------------------------|
| 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 |
| PHYS*1130 | [0.50] | Physics with Applications |
| Semester 2 | | |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1210 | [0.50] | Calculus II |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| 0.50 restricted elec | ctives | |
| Semester 3 | | |
| ENGG*1070 | [0.25] | Occupational Health and Safety |
| ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2120 | [0.50] | Material Science |
| ENGG*2160 | [0.50] | Engineering Mechanics II |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| MATH*2270 | [0.50] | Applied Differential Equations |
| Semester 4 | | |
| ENGG*2180 | [0.50] | Introduction to Manufacturing Processes |
| 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 |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| Semester 5 | | |
| ENGG*3240 | [0.50] | Engineering Economics |
| ENGG*3260 | [0.50] | Thermodynamics |
| ENGG*3280 | [0.75] | Machine Design |
| ENGG*3510 | [0.50] | Electromechanical Devices |
| HIST*1250 | [0.50] | Science and Technology in a Global Context |
| 0.50 restricted elec | ctives | |
| Semester 6 | | |
| ENGG*3100 | [0.75] | Engineering and Design III |
| ENGG*3370 | [0.50] | Applied Fluids and Thermodynamics |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| ENGG*3430 | [0.50] | Heat and Mass Transfer |
| 1.00 restricted elec | ctives | |
| Semester 7 | | |
| ENGG*3140 | [0.50] | Mechanical Vibration |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| 2.50 restricted elec | ctives | |
| Semester 8 | | |
| ENGG*4160 | [1.00] | Mechanical Engineering Design IV |
| 1.75 restricted elec | rtives | |

Restricted Electives (see Program Guide for more information)

The Engineering Program requires Mechanical Engineering students to complete the following combination of elective credits to complete their program:

- 3.50 credits from the MECH-1 Mechanical Engineering electives
- 0.75 credits from the MECH-2 Mechanical Engineering design electives
- 2.00 credits from Complementary Studies electives

Consult the Program Guide for further information on the prerequisite requirements specific to each elective. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

Mechanical Engineering Program Co-op (MECH:C)

School of Engineering, College of Engineering and Physical Sciences

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.

Program Requirements

The Co-op program in Mechanical Engineering s a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

Mechanical Engineering Academic and Co-op Work Term Schedule

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (25.50 Total Credits)*

- 17.25 Required Core Courses
- 3.50 MECH-1 Mechanical Engineering Electives
- 0.75 MECH-2 Mechanical Engineering Design Electives
- 2.00 Complementary Studies Electives
- 2.00 Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 26.00.

See Program Guide for more information on restricted electives and their prerequisite requirements. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| 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 |
| PHYS*1130 | [0.50] | Physics with Applications |
| Semester 2 - V | Vinter | |
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*1500 | [0.50] | Engineering Analysis |
| MATH*1210 | [0.50] | Calculus II |

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| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism | Semester 3 | | |
|--------------------|------------|--------------------------------------------|---------------------|-----------------|------------------------------------------------------------|
| 0.50 restricted el | ectives | | ENGG*2230 | [0.50] | Fluid Mechanics |
| Semester 3 - F | all | | ENGG*2400 | [0.50] | Engineering Systems Analysis |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | GEOG*2000 | [0.50] | Geomorphology |
| ENGG*1070 | [0.25] | Occupational Health and Safety | MATH*2270 | [0.50] | Applied Differential Equations |
| ENGG*2100 | [0.75] | Engineering and Design II | STAT*2120 | [0.50] | Probability and Statistics for Engineers |
| ENGG*2120 | [0.50] | Material Science | One of: | | |
| ENGG*2160 | [0.50] | Engineering Mechanics II | BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| ENGG*2400 | [0.50] | Engineering Systems Analysis | MICR*2420 | [0.50] | Introduction to Microbiology |
| MATH*2270 | [0.50] | Applied Differential Equations | Semester 4 | | |
| Semester 4 - V | Vinter | | ENGG*2100 | [0.75] | Engineering and Design II |
| ENGG*2180 | [0.50] | Introduction to Manufacturing Processes | ENGG*2120 | [0.50] | Material Science |
| ENGG*2230 | [0.50] | Fluid Mechanics | ENGG*2550 | [0.50] | Water Management |
| ENGG*2340 | [0.50] | Kinematics and Dynamics | ENGG*2560 | [0.50] | Environmental Engineering Systems |
| ENGG*2450 | [0.50] | Electric Circuits | MATH*2130 | [0.50] | Numerical Methods |
| MATH*2130 | [0.50] | Numerical Methods | 0.50 restricted el | ectives | |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers | Semester 5 | | |
| Summer Seme | ester | | ENGG*3240 | [0.50] | Engineering Economics |
| COOP*1000 | [0.50] | Co-op Work Term I | ENGG*3260 | [0.50] | Thermodynamics |
| Semester 5 - F | all | r r | ENGG*3590 | [0.50] | Water Quality |
| ENGG*3240 | [0 50] | Engineering Economics | ENGG*3650 | [0.50] | Hydrology |
| ENGG*3260 | [0.50] | Thermodynamics | ENGG*3670 | [0.50] | Soil Mechanics |
| ENGG*3280 | [0.50] | Machine Design | 0.50 restricted ele | ectives | |
| ENGG*3510 | [0.70] | Electromechanical Devices | Semester 6 | | |
| HIST*1250 | [0.50] | Science and Technology in a Global Context | ENGG*3100 | [0.75] | Engineering and Design III |
| 0.50 restricted el | ectives | berenee and reenhology in a crocar content | ENGG*3220 | [0.50] | Groundwater Engineering |
| Winter Semes | ter | | ENGG*3430 | [0.50] | Heat and Mass Transfer |
| COOP*2000 | [0 50] | Co. on Work Term II | HIST*1250 | [0.50] | Science and Technology in a Global Context |
| Summer Sem | octor | eo-op work term n | 1.00 restricted ele | ectives | |
| | 10 501 | Co. or Work Town III | Semester 7 | | |
| COOP*3000 | [0.50] | Co-op work term III | ENGG*3340 | [0.50] | Geographic Information Systems in Environmental |
| Semester 6 - F | all | | | [0.000] | Engineering |
| ENGG*3140 | [0.50] | Mechanical Vibration | ENGG*4000 | [00.0] | Proposal for Engineering Design IV |
| 2.50 restricted el | ectives | | ENGG*4360 | [0.75] | Soil-Water Conservation Systems Design |
| Semester 7 - V | Vinter | | ENGG*4370 | [0.75] | Urban Water Systems Design |
| ENGG*3100 | [0.75] | Engineering and Design III | 1.00 restricted ele | ectives | |
| ENGG*3370 | [0.50] | Applied Fluids and Thermodynamics | Semester 8 | | |
| ENGG*3410 | [0.50] | Systems and Control Theory | ENGG*4150 | [1.00] | Water Resources Engineering Design IV |
| ENGG*3430 | [0.50] | Heat and Mass Transfer | ENGG*4250 | [0.75] | Watershed Systems Design |
| 1.00 restricted el | lectives | | 1.00 restricted ele | ectives | |
| Summer Sem | ester | | Note: ENGG*42 | 50 can be ta | ken in Semester 6 |
| COOP*4000 | [0.50] | Co-op Work Term IV | Restricted Ele | ctives (see | Program Guide for more information) |
| Fall Semester | | | The Engineering | Program re | quires Water Resources Engineering students to complete |
| COOP*5000 | [0.50] | Co-op Work Term V | the following cor | nbination of | elective credits to complete their program: |
| ENGG*4000 | [0.00] | Proposal for Engineering Design IV | • 1.00 credits f | from the WR | E-1 Water Resources Engineering electives |
| Semester 8 - V | Vinter | | • 1.00 credits f | from the WD | E 2 Environmental and Water Resources electives |
| ENGG*4160 | [1.00] | Mechanical Engineering Design IV | | | L-2 Lawnonnental and water Resources electives |
| 1.75 restricted el | lectives | | • 2.00 credits 1 | from Comple | ementary Studies electives |
| Water Resou | irces End | gineering Program (WRE) | Consult the Prog | gram Guide | for further information on the prerequisite requirements |
| | | | specific to each e | elective. Stuc | ients can take a maximum of 1.50 credits at the 1000 level |
| School of Engin | eering, Co | llege of Engineering and Physical Sciences | from the above h | ist of elective | 3. |

Water Resources Engineering Program Co-op (WRE:C)

School of Engineering, College of Engineering and Physical Sciences

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.

Program Requirements

The Co-op program in Water Resources Engineering is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Water Resources Engineering Academic and Co-op Work Term Schedule | | | | |
|-------------------------------------------------------------------|------|---------------------|---------------------|--------|
| | Year | Fall | Winter | Summer |
| | 1 | Academic Semester 1 | Academic Semester 2 | Off |

sustain human life and water-dependent ecosystems.

[0.50]

[0.75]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

Major (Honours Program)

Semester 1

CHEM*1040

ENGG*1100

ENGG*1500

MATH*1200

PHYS*1130

Semester 2

CHEM*1050

ENGG*1210

MATH*1210

PHYS*1010

CIS*1500

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

General Chemistry I

Engineering Analysis

General Chemistry II

Calculus I

Calculus II

Engineering and Design I

Physics with Applications

Introduction to Programming

Introductory Electricity and Magnetism

Engineering Mechanics I

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (25.50 Total Credits)*

19.50 - Required Core Courses

1.00 - WRE-1 Water Resources Engineering Electives

1.00 - WRE-2 Environmental and Water Resources Electives

2.00 - Complementary Studies Electives

2.00 - Co-op Work Terms

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 26.00.

See Program Guide for more information on restricted electives and their prerequisite requirements. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| Semester 1 - Fa | | | |
|----------------------|--------|------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| ENGG*1100 | [0.75] | Engineering and Design I | |
| ENGG*1500 | [0.50] | Engineering Analysis | |
| MATH*1200 | [0.50] | Calculus I | |
| PHYS*1130 | [0.50] | Physics with Applications | |
| Semester 2 - Wi | inter | | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| CIS*1500 | [0.50] | Introduction to Programming | |
| ENGG*1210 | [0.50] | Engineering Mechanics I | |
| MATH*1210 | [0.50] | Calculus II | |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism | |
| Semester 3 - Fa | 11 | | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | |
| ENGG*2230 | [0.50] | Fluid Mechanics | |
| ENGG*2400 | [0.50] | Engineering Systems Analysis | |
| GEOG*2000 | [0.50] | Geomorphology | |
| MATH*2270 | [0.50] | Applied Differential Equations | |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers | |
| One of: | | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
| MICR*2420 | [0.50] | Introduction to Microbiology | |
| Semester 4 - Wi | inter | | |
| ENGG*2100 | [0.75] | Engineering and Design II | |
| ENGG*2120 | [0.50] | Material Science | |
| ENGG*2550 | [0.50] | Water Management | |
| ENGG*2560 | [0.50] | Environmental Engineering Systems | |
| MATH*2130 | [0.50] | Numerical Methods | |
| 0.50 restricted elec | ctives | | |
| Summer Semes | ter | | |
| COOP*1000 | [0.50] | Co-op Work Term I | |
| Semester 5 - Fa | 11 | | |
| ENGG*3240 | [0.50] | Engineering Economics | |
| ENGG*3260 | [0.50] | Thermodynamics | |
| ENGG*3590 | [0.50] | Water Quality | |
| ENGG*3650 | [0.50] | Hydrology | |
| ENGG*3670 | [0.50] | Soil Mechanics | |
| 0.50 restricted elec | ctives | | |
| Winter Semester | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | |
| | | | |

|] | Summer Sem | ester | |
|----|-----------------------|--------------|----------------------------------------------------------------|
| 1 | COOP*3000 | [0.50] | Co-op Work Term III |
| | Semester 6 - H | Fall | - |
| | ENGG*3340 | [0.50] | Geographic Information Systems in Environmental Engineering |
| | ENGG*4360 | [0.75] | Soil-Water Conservation Systems Design |
| | ENGG*4370 | [0.75] | Urban Water Systems Design |
| | 1.00 restricted el | lectives | |
| 1 | Semester 7 - V | Winter | |
| | ENGG*3100 | [0.75] | Engineering and Design III |
| | ENGG*3220 | [0.50] | Groundwater Engineering |
| 'n | ENGG*3430 | [0.50] | Heat and Mass Transfer |
|) | HIST*1250 | [0.50] | Science and Technology in a Global Context |
| í | 1.00 restricted el | lectives | |
| - | Summer Sem | ester | |
| r | COOP*4000 | [0.50] | Co-op Work Term IV |
| | Fall Semester | | |
| | COOP*5000 | [0.50] | Co-op Work Term V |
| | ENGG*4000 | [0.00] | Proposal for Engineering Design IV |
| | Semester 8 - V | Winter | |
| | ENGG*4150 | [1.00] | Water Resources Engineering Design IV |
| | ENGG*4250 | [0.75] | Watershed Systems Design |
| | 1.00 restricted el | lectives | |
| | Note: ENGG*42 | 250 can be t | aken in Semester 7 |
| • | Restricted Ele | ectives (see | e Program Guide for more information) |

The Engineering Program requires Water Resources Engineering students to complete the following combination of elective credits to complete their program:

- 1.00 credits from the WRE-1 Water Resources Engineering electives
- 1.00 credits from the WRE-2 Environmental and Water Resources electives
- 2.00 credits from Complementary Studies electives

Consult the Program Guide for further information on the prerequisite requirements specific to each elective. Students can take a maximum of 1.50 credits at the 1000 level from the above list of electives.

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

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

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

Program Information

Objectives of the Program

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

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

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

Accreditation

The Bachelor of Landscape Architecture program is accredited by the Landscape Architecture Accreditation Council (LAAC) of the Canadian Society of Landscape Architects (CSLA). This accreditation is also recognized by the American Society of Landscape Architects (ASLA). Graduates of accredited landscape architecture programs have the educational qualifications to apply for membership in provincial and state professional 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 BLA Program Counsellor is highly, recommended. In selecting electives two approaches may be followed: 1) electives may be chosen from a variety of disciplines to achieve breadth of knowledge or, 2) all or most electives may be chosen in a subject area in order to pursue a particular field of interest in depth. Some of these fields might include agricultural and biological sciences, environmental studies, studio arts, geography, philosophy or sociology.

Students wishing to elect a permissible substitute shall do so in consultation with the BLA Program Coordinator and BLA Program Counsellor. A substitute course will normally be in the same academic area as that listed in the Landscape Architecture Program.

Academic Advising

Students can consult the BLA Coordinator who is a faculty member that can address program issues and individual curriculum queries.

Computers

Expertise in many aspects of computer application is now a fundamental skill for the profession. Recognizing this, the school provides computer facilities in the building. If it is feasible we recommend that students acquire their own computer within the first two years of the program.

Field Trips

Participation in organized visits to site study areas and project sites is obligatory for all students taking certain courses in landscape architecture. To the extent that it is possible, students will be informed of the dates, destinations and cost of field trips prior to registration. Students who have reason to seek exemption from the requirement may apply to the director prior to registration for permission to substitute papers on appropriate topics.

Pre-Professional Experience

It is considered highly advisable that the prospective graduate prepare for later professional practice through summer employment in the landscape industry. Two summers spent in landscape related work followed by 1 summer in a professional office is considered to be a desirable sequence of employment.

Continuation of Study

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

Conditions for Graduation

In order to qualify for graduation from the 8 semester Honours B.L.A. program, the student must successfully complete all of the courses approved for the program (20.00 credits) and maintain a minimum 60.0% cumulative average.

Schedule of Studies

| Major | (Honours | Program) |
|-------|----------|----------|
|-------|----------|----------|

| Semester 1 | _ | |
|----------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| BIOL*1500 LARC*1100 LARC*1950 One of: | [0.50] [0.75] [0.50] | Humans in the Natural World Introduction to Design and Communication Studio History of Cultural Form |
| ANTH*1150 PHIL*1010 PSYC*1000 SOC*1100 0.50 electives | [0.50] [0.50] [0.50] [0.50] | Introduction to Anthropology Introductory Philosophy: Social and Political Issues Introduction to Psychology Sociology |
| Semester 2 | | |
| LARC*2020 LARC*2230 LARC*2420 PHIL*2070 0.50 electives | [0.75] [0.50] [0.50] [0.50] | Foundational Design Studio Planting Design Materials and Techniques Philosophy of the Environment |
| Semester 3 | | |
| LARC*2100 LARC*2240 LARC*2410 LARC*3040 0.50 electives Semester 4 | [0.50] [0.50] [0.50] [0.75] | Landscape and Site Analysis Plants in the Landscape Site Engineering Site Design Studio |
| LARC*2820 | [0.50] | Urban and Regional Planning |
| LARC*3050 LARC*3430 | [0.75] | Urban Design Studio Introduction to Landscape Construction |
| 0.50 Social Scienc | e elective | Infoldetion to Eandscape Construction |
| *Note: A "Social Anthropology, Ecc Political Science, I Semester 5 | Science" el onomics, Ge Psychology | ective can be any course in the following areas: eography, Women's Studies, International Development, or Sociology. |
| LARC*3060 LARC*3440 LARC*4610 0.50 cleating | [0.75] [0.75] [0.50] | Landscape Rehabilitation Design Studio Landscape Construction and Documentation Professional Practice |
| Semester 6 | | |
| Choose one of the Option 1 2.00 electives | following t | hree options: |
| Option 2 LARC*4620 1.00 electives Option 3 | [1.00] | Landscape Architecture Internship |
| Exchange Program | n (2.00 cred | its) |
| LARC*3070 LARC*3320 LARC*4510 0.50 electives Semester 8 | [1.00] [0.50] [0.50] | Urban and Community Design Studio Principles of Landscape Ecology Honours Thesis |
| LARC*4090 | [0.50] | Seminar |
| LARC*4710 0.50 electives 0.50 electives | [1.00] | Capstone Design Studio |

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 majority of 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

B.Sc. Program Requirements

Regulations 1-9 apply to all B.Sc. students.

1. Entry Credits

In general, the 4U /grade 12 credit or its equivalent is required in a subject area to allow entrance to the initial university course. Students who lack this requirement can remedy the deficiency by successful completion of:

BIOL*1020 for students lacking biology

CHEM*1060 for students lacking chemistry

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

2. 1st Year Science Core

All majors within the B.Sc. degree are required to complete the first year core as outlined within their major. The core consists of courses in biology, chemistry, physics and mathematical science.

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. A minimum of 12.00 science credits is required for the three year general B.Sc. degree. Acceptable science courses means "acceptable to the B.Sc. Program Committee". Lists of acceptable science courses are available at: <u>https://www.uoguelph.ca/bsc/Approved_electives</u>.

6. Liberal Education Requirement

All majors within the B.Sc. degree require a specified number of liberal education credits. The goal of the liberal education requirement is to increase breadth by requiring credits that are outside the disciplines of science with a focus in at least one of the following areas:

- Policy, operational and management practices pertaining to a practical activity, or influence of social, cultural and economic environments on such activities.
- Personal or professional growth including ethical responsibility, leadership and communication.
- Development of historical, cultural, global, artistic, social, and language competencies.

A complete listing of acceptable courses can be found at: https://www.uoguelph.ca/bsc/

7. Free Electives

All majors within the B.Sc. degree have a specified number of free electives. The free elective requirement can be fulfilled by any course on the B.Sc. approved science or liberal education elective list. Courses that are restricted from B.Sc. students are not eligible to fulfill the free elective requirement. This restriction is stated in the course description.

8. Double-Counting of Credits

A maximum of 2.50 credits required in a major program may be applied to meet the requirements of a minor or an additional major.

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

Students cannot declare a major or minor in the three year general B.Sc. degree.

9. Continuation of Study

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

General Program Requirements

The general B.Sc. degree requires the successful completion of 15.00 credits. Normally 2.50 credits (usually 5 courses) are taken in each semester so that the degree may be completed in 6 semesters. The general science program is designed to give a broad general training in biological science, chemistry, physics and mathematical science. This is achieved by requiring each student to take a minimum of 1.00 credits in each of the above areas and an additional 0.50 credits in three of the four above areas. The courses to be taken in semesters 4 to 6 may be selected to allow a broad study of the sciences from the list of approved electives for B.Sc. students.

Honours Program Requirements

In order to graduate from the honours program, students must fulfill all program requirements for the program and have achieved a 60%, or higher, cumulative average over all course attempts. Normally 2.50 credits (usually 5 courses) are taken in each semester so that the degree may be completed in generally 8 semesters. The following types of honours programs are offered:

Honours Major Programs

Major in a subject Major in a subject with a minor or a second major

Honours Major

Majors permit a student to study science in greater depth than is permitted by the general program. The student is required to take a minimum of 1.00 credits (usually 2 courses) in each of biological science, chemistry, physics and mathematical science. In each of semesters 3 to 8, students select science credits so that the total program provides a broad science training with concentration in an area of physical science or biological science.

A major normally consists of certain prescribed courses (minimum of 8.00 credits) and a number of elective courses to complete the requirements for the degree. The composition of science courses selected must contain a sufficient number (minimum of 6.00 credits) of 3000 and 4000 level courses including a grouping (minimum of 2.00 credits) 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 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 <u>College of Biological</u> <u>Science</u> or the <u>College of Engineering and Physical Sciences</u> dependent upon their primary area(s) of interest. Refer to B.Sc. Program Requirements: Regulation 6 Double-Counting of Credits.

Special Study Options

Study at Other Universities

Students contemplating study at another university for credit towards a Bachelor of Science 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.

Study Abroad

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

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:

- 4.00 credits from the first year science core 1.00 credits beyond the 4U/ grade 12 level in each of biological science, chemistry, mathematical science, physics. Note: A maximum of 7.00 credits at the 1000 level may be used towards the degree requirements.
- 2. An additional 0.50 credits from at least 3 of the following subject areas: biological science, biochemistry/chemistry, mathematical science, physics.
- 3. 6.50 additional credits selected from the list of approved sciences electives for the B.Sc. degree program of which 2.50 credits must be at the 3000 or 4000 level. Note: One of: BIOL*1020, CHEM*1060 may be counted towards the degree requirements, counting as 0.50 credits in science.
- 4. 2.00 credits Liberal Education electives selected from the B.Sc. list of Liberal Education electives.
- 5. 1.00 credits in electives.

Recommended Schedule for Students in Biological Science Areas

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology * | | |
|-----------------------------------------------------------------------------------------|--------|--------------------------------------------------|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | | |
| 0.50 Liberal Education electives | | | | |
| Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised | | | | |
| schedule of study for this major found at http://www.bsc.uoguelph.ca/revisedss | | | | |

Semester 2

| BIOL*1070 CHEM*1050 PHYS*1070 | [0.50] [0.50] [0.50] | Discovering Biodiversity * General Chemistry II Physics for Life Sciences II |
|-------------------------------------|----------------------------|------------------------------------------------------------------------------------|
| One of: | | |
| CIS*1000 | [0.50] | Introduction to Computer Applications |
| CIS*1200 | [0.50] | Introduction to Computing |
| CIS*1500 | [0.50] | Introduction to Programming |
| STAT*2040 | [0.50] | Statistics I |
| MATH*1090 | [0.50] | Elements of Calculus II |
| 0 50 L 1 1 E | - 41 | |

0.50 Liberal Education electives

* BIOL*1080 is a prerequisite for some courses in the biological sciences. Students are strongly recommended to also complete this course by the end of the third semester. **Semester 3 to 6**

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

Recommended Schedule for Students in Physical Science Areas

| Semester 1 | | | | |
|----------------------------------|--------|------------------------------------------------|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I | | |
| One of | | | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | |
| 0.50 Liberal Education electives | | | | |
| ~ | ~ | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: <u>http://www.bsc.uoguelph.ca/revisedss</u>

| CHEM*1050 IPS*1510 | [0.50] [1.00] | General Chemistry II Integrated Mathematics and Physics II | |
|----------------------------------|------------------|---------------------------------------------------------------|--|
| One of | | e , | |
| 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 Liberal Education electives | | | |

Semester 3 to 6

Semester 2

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

Honours Programs (BSCH)

Honours Program Majors

The following honours majors are available:

Biological Sciences:

20.00 credits - Animal Biology (ABIO) 20.00 credits -Biochemistry (BIOC) 20.00 credits -Biodiversity (BIOD) 20.00 credits -Biological Science (BIOS) 20.00 credits -Bio-Medical Science (BIOM) 20.00 credits -Biomedical Toxicology (BTOX) 20.00 credits - Environmental Biology (ENVB) 20.00 credits -Food Science (FOOD) 20.00 credits - Human Kinetics (HK) 20.00 credits - Marine and Freshwater Biology (MFB) 20.00 credits - Microbiology (MICR) 20.00 credits - Molecular Biology and Genetics (MBG) 20.00 credits - Neuroscience (NEUR) 20.00 credits - Nutritional and Nutraceutical Sciences (NANS) 20.00 credits - Plant Science (PLSC) 20.00 credits - Wildlife Biology and Conservation (WBC) 20.00 credits - Zoology (ZOO) **Physical Sciences:** 20.00 credits - Biological and Medical Physics (BMPH) 20.00 credits - Biological and Pharmaceutical Chemistry (BPCH) 20.00 credits - Chemical Physics (CHPY) 20.00 credits - Chemistry (CHEM) 20.00 credits - Environmental Geomatics (EG) 20.00 credits - Mathematical Science (MSCI) 20.00 credits - Nanoscience (NANO) 20.00 credits - Physical Science (PSCI)

20.00 credits -Physics (PHYS)

$20.00\ credits\ \text{-Theoretical Physics}\ (\text{THPY})$

Co-operative Educational Programs:

- 21.50 credits Biochemistry (Co-op) (BIOC:C)
- 22.00 credits Biological and Medical Physics (Co-op) (BMPH:C)
- 21.50 credits Biological and Pharmaceutical Chemistry (Co-op) (BPCH:C)
- 22.00 credits Marine and Freshwater Biology (Co-op) (MFB:C)
- 21.50 credits Biomedical Toxicology (Co-op) (BTOX:C)
- 22.00 credits Chemical Physics (Co-op) (CHPY:C)
- 21.50 credits Chemistry (Co-op) (CHEM:C)
- 21.50 credits Environmental Geomatics (Co-op) (EG:C)
- 21.50 credits Food Science (Co-op) (FOOD:C)
- 22.00 credits Nanoscience (NANO:C)
- 21.50 credits Microbiology (Co-op) (MICR:C)
- 22.00 credits Physics (Co-op) (PHYS:C)

Honours Program Minors

Minors are available in the following science areas with the particular credit requirements being given (additional minors are available from the <u>College of Arts</u> and the <u>College of Social and Applied Human Sciences</u>). A minor may include additional prerequisites - consult with the appropriate faculty advisor.

Biological Sciences:

5.00 credits - Biology (BIOL) 5.00 credits - Biotechnology (BIOC) 5.00 credits - Biotechnology (BIOT) 5.00 credits - Microbiology (MICR) 5.00 credits - Molecular Biology and Genetics (MBG) 5.00 credits - Neuroscience (NEUR) 5.00 credits - Nutritional and Nutraceutical Sciences (NANS) 5.00 credits - Plant Science (PLSC) 5.00 credits - Zoology (ZOO)

Physical Sciences:

5.00 credits - Chemistry (CHEM) 5.00 credits - Physics (PHYS)

Environmental Sciences:

5.00 credits - Ecology (ECOL)

5.00 credits - Geographic Information Systems (GIS) and Environmental Analysis Mathematical Sciences:

5.00 credits - Computing and Information Science (CIS)

- 5.00 credits Mathematical Science (MSCI)
- 5.00 credits Mathematics (MATH)

5.00 credits - Statistics (STAT)

Additional Disciplines:

5.00 credits - Business Economics (BECN)

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

Schedules 1 and 2

In order to qualify for graduation from the honours program, the student must fulfill all program requirements and have achieved 60%, or higher, cumulative average in all course attempts.

Note: A student registered in an honours program who has successfully completed all required courses and the specified total number of credits for the program but does not have a cumulative average of 60%, or higher, may apply to graduate from the general program.

Co-operative Education Program

Admission to the Co-operative Education program may be granted on entry to the University or by application normally before the conclusion of Semester 1. Application forms can be obtained from the Coop Education and Career Services website https://www.recruitguelph.ca/cecs/.

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

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

Animal Biology (ABIO)

Department of Animal Biosciences, Ontario Agricultural College

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor.

Semester 1

| BIOL*1050 | [0.50] | Biology of Plants & Animals in Managed Ecosystems | | |
|----------------------------------|--------|---------------------------------------------------|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | | |
| 0.50 Liberal Education electives | | | | |
| | | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2

| ANSC*1210 | [1.00] | Principles of Animal Care and Welfare | |
|----------------------------------------|--------|------------------------------------------------|--|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | |
| Semester 3 | | | |
| AGR*2350 | [0.50] | Animal Production Systems, Health and Industry | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics | |
| 0.50 electives or restricted electives | | | |

Students are encouraged to consider CIS*1000 as an elective if they wish to enhance their computer literacy.

Semester 4

| ANSC*2340 | [0.50] | Structure of Farm Animals |
|-------------------|---------------|----------------------------------|
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| STAT*2040 | [0.50] | Statistics I |
| 0.50 electives or | restricted el | lectives |
| Semester 5 | | |
| ANSC*3080 | [0.50] | Agricultural Animal Physiology |
| ANSC*3120 | [0.50] | Introduction to Animal Nutrition |

Semester 6

| ANSC*3040 | [0.50] | Animal Reproduction | | |
|----------------------------------------|--------|-----------------------|--|--|
| ANSC*3270 | [0.50] | Animal Disorders | | |
| MBG*3060 | [0.50] | Quantitative Genetics | | |
| 1.00 electives or restricted electives | | | | |

Semester 7

2.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

Restricted Electives

- Students must complete 2.00 credits of Liberal Education electives ANSC*1210 is a Liberal Education course, 1.00 credit. 1.00 additional credits from Liberal Education courses are required. The list of liberal education electives for B.Sc. students can be found at: <u>http://www.uoguelph.ca/bsc</u>
- 2. 0.50 credits is required from each of the following areas: Animal Nutrition, Animal Breeding & Genetics, and Animal Physiology & Behaviour. Students are encouraged to consult with the Faculty Advisor for help in tailoring their selection to meet personal and career interests.
- Animal Breeding & Genetics [0.50] Required

| | ANSC*4050 | [0.50] | Biotechnology in Animal Science |
|----|----------------------|-------------|-----------------------------------------------------|
| | MBG*4020 | [0.50] | Genetics of Companion Animals |
| | MBG*4030 | [0.50] | Animal Breeding Methods and Applications |
| Aı | nimal Nutrition [0.5 | 0] Required | 1 |
| | ANSC*3170 | [0.50] | Nutrition of Fish and Crustacea |
| | ANSC*3180 | [0.50] | Wildlife Nutrition |
| | ANSC*4260 | [0.50] | Beef Cattle Nutrition |
| | ANSC*4270 | [0.50] | Dairy Cattle Nutrition |
| | ANSC*4280 | [0.50] | Poultry Nutrition |
| | ANSC*4290 | [0.50] | Swine Nutrition |
| | ANSC*4560 | [0.50] | Pet Nutrition |
| | EQN*4020 | [0.50] | Advanced Equine Nutrition |
| Aı | nimal Physiology & | Behaviour | [0.50] Required |
| | ANSC*3090 | [0.50] | Vertebrate Ethology |
| | ANSC*4090 | [0.50] | Applied Animal Behaviour |
| | ANSC*4100 | [0.50] | Applied Environmental Physiology and Animal Housing |
| | ANSC*4350 | [0.50] | Experiments in Animal Biology |
| | ANSC*4470 | [0.50] | Animal Metabolism |
| | ANSC*4490 | [0.50] | Applied Endocrinology |
| • | 1 1 1 1 0 00 | | |

3. An additional 3.00 credits must be obtained by selecting courses from the above lists and from the following:

| ANSC*3050 | [0.50] | Aquaculture: Advanced Issues |
|-----------|--------|----------------------------------------|
| ANSC*4610 | [0.50] | Critical Analysis in Animal Science |
| ANSC*4650 | [0.50] | Comparative Immunology |
| ANSC*4700 | [0.50] | Research in Animal Biology I |
| ANSC*4710 | [0.50] | Research in Animal Biology II |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
| EQN*3050 | [0.50] | Equine Exercise Physiology |
| MICR*3230 | [0.50] | Immunology |
| PATH*3610 | [0.50] | Principles of Disease |
| POPM*3240 | [0.50] | Epidemiology |
| POPM*4230 | [0.50] | Animal Health |

Credit Summary (20.00 Total Credits)

3.50 - First year science credits

- 6.50 Required science courses semesters 3 8
- 4.50 Restricted electives (#2 and #3)
- 1.50 Approved Science electives
- 1.00 Required Arts and/or Social Science course (ANSC 1210)
- 1.00 Liberal Education electives

2.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biochemistry (BIOC)

Department of Molecular and Cellular Biology, College of Biological Science

A B.Sc. in Biochemistry offers a multidisciplinary curriculum that gives students broad exposure to the life sciences with specific attention paid to the physical and chemical nature of biomolecular systems. The lab-intensive experience in this program prepares students to pursue post-graduate research opportunities in many different life science related fields. Graduates are also positioned to be successful in obtaining entrance to a number of professional programs, as well as employment in industry and government.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. The major will require the completion of at least 20.00 credits as indicated below:

Major (Honours Program)

Semester 1

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
|----------------------------------|--------|------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| MATH*1080 | [0.50] | Elements of Calculus I | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | |
| 0.50 Liberal Education electives | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2

| 0.50] | Discovering Biodiversity |
|-------------|-------------------------------------------------------------------------------------------------|
| 0.50] | Biological Concepts of Health |
| 0.50] | General Chemistry II |
| 0.50] | Elements of Calculus II |
| 0.50] | Physics for Life Sciences II |
| | |
| 0.50] | Introduction to Biochemistry |
| 0.50] | Foundations in Molecular Biology and Genetics |
| 0.50] | Introduction to Microbiology |
| 0.50] | Statistics I |
| on elective | s |
| | 0.50] 0.50] 0.50] 0.50] 0.50] 0.50] 0.50] 0.50] 0.50] 0.50] 0.50] |

Semester 4

| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
|--------------------|---------------|---------------------------------------------|
| CHEM*2480 | [0.50] | Analytical Chemistry I |
| CHEM*2700 | [0.50] | Organic Chemistry I |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| MICR*2430 | [0.50] | Methods in Microbial Culture and Physiology |
| Semester 5 | | |
| BIOC*3570 | [0.75] | Analytical Biochemistry |
| CHEM*2880 | [0.50] | Physical Chemistry |
| CHEM*3750 | [0.50] | Organic Chemistry II |
| electives or restr | icted electiv | es to a maximum of 2.75 total credits |

Semester 6

MBG*3350 [0.75] Laboratory Methods in Molecular Biology electives or restricted electives to a maximum of 2.75 total credits

Enzymology

Semester 7

2.50 electives or restricted electives

Semester 8

BIOC*4540 [0.75]

electives or restricted electives to a maximum of 2.75 total credits

Restricted Electives

1. Students must take as part of their program: 4.00 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050.

| | BIOC*4520 | [0.50] | Metabolic Processes |
|-----|----------------------|---------------|--------------------------------------------------|
| | BIOC*4580 | [0.50] | Membrane Biochemistry |
| | BIOL*3300 | [0.50] | Applied Bioinformatics |
| | BIOM*3200 | [1.00] | Biomedical Physiology |
| | MBG*3040 | [0.50] | Molecular Biology of the Gene |
| | MBG*3080 | [0.50] | Bacterial Genetics |
| | MCB*3010 | [0.50] | Dynamics of Cell Function and Signaling |
| | MCB*4010 | [0.50] | Advanced Cell Biology |
| | MCB*4050 | [0.50] | Protein and Nucleic Acid Structure |
| | MCB*4500 | [1.00] | Research Project in Molecular & Cellular Biology |
| | | | I |
| | MCB*4510 | [1.00] | Research Project in Molecular & Cellular Biology |
| | MCB*4600 | [0.50] | Topics in Molecular and Cellular Biology |
| | MICR*3230 | [0.50] | Immunology |
| | MICR*3330 | [0.50] | World of Viruses |
| | MICR*4330 | [0.50] | Molecular Virology |
| | MICR*4530 | [0.50] | Immunology II |
| | PBIO*3110 | [0.50] | Crop Physiology |
| | PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| | STAT*2050 | [0.50] | Statistics II |
| | TOX*4590 | [0.50] | Biochemical Toxicology |
| Stu | dents must take as p | oart of their | program: 0.50 credits from the following list: |
| | PHYS*2030 | [0.50] | Biophysics of Excitable Cells |
| | PHYS*2240 | [0.50] | Thermal Physics |
| | PHYS*2330 | [0.50] | Electricity and Magnetism I |
| | PHYS*2600 | [0.50] | General Astronomy |
| | PHYS*3080 | [0.50] | Energy |
| | | | |

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

- 7.75 Required science courses semesters 3 8
- 4.50 Restricted elective (# 1 and # 2 in restricted elective list)
- 1.00 Liberal Education electives
- 2.25 Free electives any approved electives for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Biochemistry consists of at least 5.00 course credits. The following courses are required:

| BIOC*3560 | [0.50] | Structure and Function in Biochemistry | | |
|---------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|--|--|
| BIOC*3570 | [0.75] | Analytical Biochemistry | | |
| BIOC*4540 | [0.75] | Enzymology | | |
| CHEM*2480 | [0.50] | Analytical Chemistry I | | |
| CHEM*2700 | [0.50] | Organic Chemistry I | | |
| One of: | | | | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | |
| MICR*2420 | [0.50] | Introduction to Microbiology | | |
| In addition, at least 1.50 credits must be chosen from the following courses, with at least | | | | |
| 1.00 credits from t | he first thre | e courses listed: | | |
| BIOC*4520 | [0.50] | Metabolic Processes | | |
| BIOC*4580 | [0.50] | Membrane Biochemistry | | |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology | | |
| 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 | | |
| D! I | $(\mathbf{\Omega}_{-}, \ldots)$ | | | |

Biochemistry (Co-op) (BIOC:C)

Department of Molecular and Cellular Biology, College of Biological Science

A B.Sc. in Biochemistry offers a multidisciplinary curriculum that gives students broad exposure to the life sciences with specific attention paid to the physical and chemical nature of biomolecular systems. The lab-intensive experience in this program prepares students to pursue post-graduate research opportunities in many different life science related fields. Graduates are also positioned to be successful in obtaining entrance to a number of professional programs, as well as employment in industry and government.

Program Requirements

The Co-op program in Biochemistry is a four and a half year program, including four work terms. Students must complete a Fall (Sequence B only), Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule. Biochemistry Academic and Co-op Work Term Schedule – Sequence A

| Year | Fall | Winter | Summer |
|---------|---------------------------|----------------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |
| Biocher | mistry Academic and Co-op | Work Term Schedule – Se | equence B |
| Year | Fall | Winter | Summer |
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |

2.

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

4.50 - First year science credits

- 7.75 Required science courses semesters 3 8
- 4.50 Restricted elective (# 1 and #2 in restricted elective list)
- 1.00 Liberal Education electives
- 2.25 Free electives any approved electives for B.Sc. students
- 1.50 Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of three Co-op work terms including a Summer, Fall (Sequence B only), and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00.

The recommended program sequence is outlined below.

Sequence A

Semester 1 - Fall

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
|--------------|--------|------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| 0.501.1 1.51 | | |

0.50 Liberal Education electives Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

Semester 2 - Winter

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-----------|--------|----------------------------------------|
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| CHEM*1050 | [0.50] | General Chemistry II |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| MATH*1090 | [0.50] | Elements of Calculus II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |

Summer Semester

No academic semester or work term

| Semester 3 - Fa | all | |
|----------------------|--------------|-----------------------------------------------|
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| CHEM*2480 | [0.50] | Analytical Chemistry I |
| CHEM*2880 | [0.50] | Physical Chemistry |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| 0.50 Liberal Educ | cation elect | ives |
| Winter Semest | er | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 4 - St | ummer | |
| BIOC*3570 | [0.75] | Analytical Biochemistry |
| CHEM*2700 | [0.50] | Organic Chemistry I |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| STAT*2040 | [0.50] | Statistics I |
| electives or restric | cted electiv | es to a maximum of 2.75 total credits |
| Semester 5 - Fa | all | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
| CHEM*3750 | [0.50] | Organic Chemistry II |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| MICR*2430 | [0.50] | Methods in Microbial Culture and Physiology |
| 0.50 electives or i | restricted e | lectives |
| Winter Semest | er | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Summer Seme | ster | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 6 - Fa | all | |

MBG*3350 [0.75] Laboratory Methods in Molecular Biology electives or restricted electives to a maximum of 2.75 total credits Semester 7 - Winter BIOC*4540 [0.75] Enzymology

electives or restricted electives to a maximum of 2.75 total credits

Summer Semester COOP*4000

Co-op Work Term IV [0.50] Semester 8 - Fall

MCB*2050

MICR*2430

[0.50]

[0.50]

1.00 electives or restricted electives

2.50 electives or restricted electives

Restricted Electives

1. Students must take as part of their program: 4.00 credits from the following list, with at least 1.00 of these credits from BIOC*4520, BIOC*4580, MCB*4050.

| ut 1005t 1100 01 | | | | | |
|-----------------------------------------------------------------------------------------|----------------------|------------|----------------------------------------------------|--|--|
| BIOC*452 | 0 [0 |).50] | Metabolic Processes | | |
| BIOC*458 | 0 [(|).50] | Membrane Biochemistry | | |
| BIOL*3300 [0.50] | |).50] | Applied Bioinformatics | | |
| BIOM*3200 [1 | | [.00] | Biomedical Physiology | | |
| MBG*3040 |) (|).50] | Molecular Biology of the Gene | | |
| MBG*3080 |) (|).50] | Bacterial Genetics | | |
| MCB*3010 |) [(|).50] | Dynamics of Cell Function and Signaling | | |
| MCB*4010 |) [(|).50] | Advanced Cell Biology | | |
| MCB*4050 |) [(|).50] | Protein and Nucleic Acid Structure | | |
| MCB*4500 |) [: | 1.00] | Research Project in Molecular & Cellular Biology I | | |
| MCB*4510 |) [| [.00] | Research Project in Molecular & Cellular Biology | | |
| MCB*4600 |) [(|).50] | Topics in Molecular and Cellular Biology | | |
| MICR*323 | 0 [0 |).50] | Immunology | | |
| MICR*333 | i0 [(|).50] | World of Viruses | | |
| MICR*433 | io [(|).50] | Molecular Virology | | |
| MICR*453 | i0 [(|).50] | Immunology II | | |
| PBIO*3110 |) C |).50] | Crop Physiology | | |
| PBIO*4750 |) C |).50] | Genetic Engineering of Plants | | |
| STAT*2050 | 0 [0 |).50] | Statistics II | | |
| TOX*4590 | [(|).50] | Biochemical Toxicology | | |
| 2. Students must t | ake as par | t of their | program: 0.50 credits from the following list: | | |
| PHYS*203 | - 1 0 |).50] | Biophysics of Excitable Cells | | |
| PHYS*224 | 0 [0 | 0.50] | Thermal Physics | | |
| PHYS*233 | 0 [0 |).501 | Electricity and Magnetism I | | |
| PHYS*260 | 0 [0 |).501 | General Astronomy | | |
| PHYS*308 | 0 [0 |).501 | Energy | | |
| Sequence B | | | | | |
| | | | | | |
| Semester I - Fall | l | | | | |
| BIOL*1090 | [0.50] | Introduc | ction to Molecular and Cellular Biology | | |
| CHEM*1040 | [0.50] | General | Chemistry I | | |
| MATH*1080 | [0.50] | Element | ts of Calculus I | | |
| PHYS*1080 | [0.50] | Physics | for Life Sciences | | |
| 0.50 Liberal Education electives | | | | | |
| Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised | | | | | |
| schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS | | | | | |
| Semester 2 - Win | nter | | | | |
| BIOL*1070 | [0.50] | Discove | ring Biodiversity | | |
| BIOL*1080 | [0.50] | Biologia | cal Concepts of Health | | |
| CHEM*1050 | [0.50] | General | Chemistry II | | |
| COOP*1100 | [0.00] | Introduc | ction to Co-operative Education | | |
| MATH*1090 | [0.50] | Element | ts of Calculus II | | |
| PHYS*1070 | [0.50] | Physics | for Life Sciences II | | |
| Summer Semest | er | | | | |
| No academic semes | ster or wor | k term | | | |
| Semester 3 - Fall | | | | | |
| BIOC*2580 | [0.50] | Introduc | ction to Biochemistry | | |
| CHEM*2480 | [0.50] | Analytic | cal Chemistry I | | |
| CHEM*2880 | [0.50] | Physical | l Chemistry | | |
| MBG*2040 | [0.50] | Foundat | tions in Molecular Biology and Genetics | | |
| 0.50 Liberal Educat | tion electiv | /es | | | |
| Winter Semester | r | | | | |
| COOP*1000 | [0 50] | Co-o | n Work Term I | | |
| Semester 4 - Sun | nmer | 000 | | | |
| DIOC#2570 | 10 751 | A 1.0 | | | |
| BIOC*3570 | [0.75] | Analytic | Chamistry | | |
| CHEMT2/00 MICD*2420 | [0.50] | Urganic | Chemistry I otion to Microbiology | | |
| WIICK*2420 | [0.50] | Introduc | a I | | |
| alactivas or rostricts | [U.JU] d alective | Statistic | s 1 vinum of 2.75 total credita | | |
| Foll Comparison | | s to a mai | | | |
| | | | | | |
| COOP*2000 | [0.50] | Co-op V | Vork Term II | | |
| Semester 5 - Wir | nter | | | | |
| BIOC*3560 | [0.50] | Structur | e and Function in Biochemistry | | |

Molecular Biology of the Cell

Methods in Microbial Culture and Physiology

| Summer Semeste | r | | | BIOL* | ·1090 | [0.50] | Intro | duction to |
|---------------------------------------|----------------------|-----------|-----------------------------------------------------|---------|-----------------------------------------|--------------|----------------------|--------------|
| COOP*3000 [| 0.50] | Co-op V | Work Term III | CHEM | I *1050 | [0.50] | Gene | eral Chem |
| Semester 6 - Fall | ster 6 - Fall | | PHYS | *1070 | [0.50] | Phys | ics for Li | |
| CHEM*3750 [0.50] Organic Chemistry II | | | | 0.50 el | ectives or re | estricted el | ectives | * |
| 2 00 electives or rest | v.svj ricted elec | organic | Chemistry II | Seme | ster 3 | | | |
| Semester 7 - Win | ter | ettve3 | | BIOC | *2580 | [0.50] | Intro | duction to |
| | 0.751 | Enzum | blogy | MBG* | 2040 | [0.50] | Foun | dations in |
| MPC*2250 | 0.751 | Laborat | nogy | MICR | *2420 | [0.50] | Intro | duction to |
| 1 00 electives or rest | U. /J] | Laborat | ory methods in molecular biology | Z00* | 2090 | [0.50] | Verte | ebrate Stri |
| Summer Semeste | ricieu elec | cuves | | 0.50 el | ectives or re | estricted el | ectives | * |
| Summer Semeste | | | | Seme | ster 4 | | | |
| COOP*4000 [| 0.50] | Co-op V | Nork Term IV | BIOL* | 2060 | [0.50] | Ecol | ogy |
| Semester 8 - Fall | | | | BIOL* | 2400 | [0.50] | Evol | ution |
| 2.50 electives or rest | ricted elec | ctives | | STAT* | 2230 | [0.50] | Biost | tatistics fo |
| Restricted Electiv | ves | | | Z00* | 2700 | [0.50] | Inver | tebrate M |
| 1. Students must ta | ke as part | of their | program: 4.00 credits from the following list, with | 0.50 el | ectives or re | estricted el | ectives ² | * |
| at least 1.00 of the | hese credi | ts from I | BIOC*4520, BIOC*4580, MCB*4050. | Seme | ster 5 | | | |
| BIOC*4520 | 0] 0 | .50] | Metabolic Processes | 2.50 el | ectives or re | estricted el | ectives | * |
| BIOC*4580 | 0] 0 | .50] | Membrane Biochemistry | or | | | | |
| BIOL*3300 | 0] | .50] | Applied Bioinformatics | Study . | Abroad* | | | |
| BIOM*3200 |) [1 | .00] | Biomedical Physiology | Seme | ster 6 | | | |
| MBG*3040 | [0 | .50] | Molecular Biology of the Gene | BOT* | 3710 | [0.50] | Plant | Diversity |
| MBG*3080 | [0 | .50] | Bacterial Genetics | ENVS | *3090 | [0.50] | Insec | t Diversit |
| MCB*3010 | [0 | .50] | Dynamics of Cell Function and Signaling | IBIO* | 3100 | [0.50] | Inter | preting B |
| MCB*4010 | [0 | .50] | Advanced Cell Biology | 1.00 el | ectives or re | estricted el | ectives | * |
| MCB*4050 | [0 | .50] | Protein and Nucleic Acid Structure | Seme | ster 7 | | | |
| MCB*4500 | [1 | .00] | Research Project in Molecular & Cellular Biology | IBIO* | 4100 | [1.00] | Inter | nreting R |
| | | | Ι | 1.50 el | ectives or re | estricted el | ectives | * |
| MCB*4510 | [1 | .00] | Research Project in Molecular & Cellular Biology | Seme | ster 8 | ostrotou or | | |
| MCB*4600 | [0 | .50] | Topics in Molecular and Cellular Biology | 2 50 al | 2.50 electives or restricted electives* | | | |
| MICR*3230 |) [0 | .50] | Immunology | 2.30 Cl | triated FL | | ectives | |
| MICR*3330 |) [0 | .50] | World of Viruses | · Kes | | ecuves | a | |
| MICK*4530 |) [U | .50] | Molecular virology | The m | ajor in Biod | iversity is | a flex1b | le progra |
| MICK*4550 DDIO*2110 | 0] () 0] | .50] | Immunology II Crop Physiology | faculty | advisors, to | o pursue th | eir own | interests |
| PBIO*3110 | 0] [0 | 501 | Coopering of Plants | For exa | ample, stude | ents may w | ish to se | elect their |
| STAT*2050 | 0] [0 | 501 | Statistics II | group | such as mici | robes, plan | ts, inve | rtebrates, |
| TOX*4590 | 0] [0 | 501 | Biochemical Toxicology | or rese | earch streng | th in the L | Jepartn | ient of In |
| 2. Students must ta | ike as nart | of their | program: 0.50 credits from the following list | evoluti | | 1 | | F1 |
| | us part | 501 | Biophysics of Excitable Cells | I. At | least 1.00 (| credits of I | _iberal | Education |
| PHVS*2030 | , [U) [O | 501 | Thermal Physics | EC | lucation elec | cuves for E | s.sc. stu | udents cai |
| PHYS*2240 |) [0) [0 | 501 | Electricity and Magnetism I | 2. | A minimu | 1m of 0.50 | credits | from: |
| PHYS*2600 |) [0) [0 | 501 | General Astronomy | | BOT*2100 | [0 | .50] | Life Sti |
| PHYS*3080 |) [0) [0 | 501 | Energy | | вот*3050 | [0 | .50] | Plant F |
| 11115 5000 | , [0 | | | | 711073600 | 10 | | Comna |

Biodiversity (BIOD)

Department of Integrative Biology, College of Biological Science

The Major in Biodiversity offers a broad education in the diversity and evolution of life while providing a more specialized understanding of biology at the level of the organism. It is the most flexible of the majors offered by the Department of Integrative Biology and as such, it allows students the opportunity to design a customized program around their interests. The major qualifies students for postgraduate work in biodiversity, botany, zoology, and other life sciences and provides a sound science background for students wishing to pursue professional life science degrees or careers in teaching, government service or the private sector.

Biodiversity impacts every aspect of our planet. To maximize a student's exposure to biodiversity we strongly encourage students to consider an international exchange in their fifth semester. An increase in global awareness of the diverse issues facing biodiversity from different economic, social, environmental and biological landscapes will help students to critically think, analyze and recognize the inherent complexities within the field.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A minimum total of 20.00 credits required to complete the major.

Semester 1

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-------------|--------|---------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| 0.5011 1.01 | 1 . | • |

0.50 Liberal Education electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

Semester 2

BIOL*1080 [0.50] Biological Concepts of Health

o Molecular and Cellular Biology nistry II ife Sciences II o Biochemistry n Molecular Biology and Genetics o Microbiology ucture and Function or Integrative Biology Iorphology & Evolution y and Evolution ty and Biology Biodiversity I Biodiversity II

m that allows students, in consultation with and design a customized program of study. electives to focus on a particular taxonomic or vertebrates, and/or one of the three areas tegrative Biology: physiology, ecology, or

on electives are required. The list of Liberal n be found at: https://www.uoguelph.ca/bsc

| BOT*2100 | [0.50] | Life Strategies of Plants |
|----------|--------|---------------------------------|
| BOT*3050 | [0.50] | Plant Functional Ecology |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I |
| A CO | 0 11 0 | |

A minimum of 0.50 credits from:

| BOT*3310 | [0.50] | Plant Growth and Development |
|----------|--------|------------------------------|
| BOT*3410 | [0.50] | Plant Anatomy |

ZOO*3050 [0.50] Developmental Biology

4. A minimum of 0.50 credits from the following list. Biodiversity students are strongly encouraged to take at least one field course. Students should keep in mind that some of these courses have prerequisites that are not required courses for the BIOD major and should plan their programs accordingly

| | 1 0 | 8, |
|-------------------|--------------|--------------------------------------------|
| 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 | [1.00] | Research in Integrative Biology I |
| IBIO*4510 | [1.00] | 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 re | esearch cour | ses with approval of faculty advisor. |

** Study Abroad can include an exchange, international letter of permission, semester abroad or field school. Full details on the institutions and experiences available, along with application deadlines and admission requirements can be found on the University of Guelph, Centre for International Programs website: https://www.uoguelph.ca/cip/

Credit Summary (20.00 Total Credits)

- 4.00 First year science credits
- 6.50 Required science courses semesters 3 8
- 1.50 Restricted elective (# 2, 3 and 4 in restricted elective list)
- 4.00 Approved Science electives
- 1.00 Liberal Education (#1 in restricted electives)

3.00 - Free electives - any approved elective for B.Sc. students.

*Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological and Medical Physics (BMPH)

Department of Physics, College of Engineering and Physical Sciences

Major (Honours Program)

The program emphasizes the application of physics to biology and medicine. It provides an excellent background for careers in the expanding interdisciplinary research laboratories of government and industry, as well as a starting point for a career in medical physics. Completion of the program at an appropriate level will qualify a student to pursue post-graduate studies in biophysics, medical physics and related areas of physics.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. This major requires the completion of 20.00 credits as follows:

Semester 1

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | | |
|-----------------------------------------------------------------------|-------------------------|-------------------------------------------------------------|--|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | | |
| LIS*1300 1.00 anadita fuamu I | [0.50] | Programming | | | |
| 1.00 credits from: IPS*1500, or (MATH*1080, PHYS*1080) or (MATH*1200, | | | | | |
| ГП I 5° 1060) k IDS *1500 is maaa | mmondod | | | | |
| Findents looking G | mmended | II Pielogy Chemistry or Physics should follow the rayised | | | |
| students lacking O | or this mai | or found at: https://www.uogualph.ca/bsc/revised_SS | | | |
| Somestor 2 | or uns maj | or round at. <u>https://www.uogdeipii.ca/ose/revised_55</u> | | | |
| | 10 501 | | | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | | | |
| CHEM*1050 | [0.50] | General Chemistry II | | | |
| MAIH*1160 | [0.50] | Linear Algebra I | | | |
| 1.00 credits from: I | PS*1510, 0 | or (MATH*1090, PHYS*1070) or (MATH*1210, | | | |
| РП I S*1010) * IDS*1510 is room | mmandad | | | | |
| Somestor 3 | mmended | | | | |
| Semester 3 | 10 501 | | | | |
| MATH*2200 | [0.50] | Advanced Calculus I | | | |
| MATH*2270 | [0.50] | Applied Differential Equations | | | |
| PHYS*2240 | [0.50] | Thermal Physics | | | |
| PHYS*2330 | [0.50] tion of other | Electricity and Magnetism I | | | |
| Somestor A | tion electiv | es | | | |
| | 10 501 | | | | |
| BIOC*2580 | [0.50] | Discharge of Englishing Calls | | | |
| PH I 5*2050 | [0.50] | Europhysics of Excitable Cells | | | |
| PH I 5*2180 | [0.50] | Experimental Techniques in Physics | | | |
| PHYS*2310 | [0.50] | Mechanics | | | |
| Somester 5 | [0.50] | Electricity and Magnetism II | | | |
| | 10 501 | | | | |
| PS*3000 | [0.50] | Science Communication | | | |
| PHIS*3130 | [0.50] | Mathematical Physics | | | |
| PH 1 5*5250 | [0.50] | Quantum Mechanics I | | | |
| Somestor 6 | | | | | |
| | 10 501 | | | | |
| NANO*3600 | [0.50] | Computational Methods in Materials Science | | | |
| PHYS*4040 | [0.50] | Occurtante Laboratory | | | |
| PHYS*4040 | [0.50] | Quantum Mechanics II Melegular Dierbusies | | | |
| РП I 3°4340 | [0.30] | Molecular Biophysics | | | |
| Somestor 7 | | | | | |
| Semester 7 | 10 501 | | | | |
| PHYS*31/0 | [0.50] | A descent and Radiation Interactions | | | |
| PH I 5*4500 | [0.50] | Advanced Physics Laboratory | | | |
| DUVS*4001 | [0 50] | Desceration Division | | | |
| 0 50 electives | [0.50] | Research in Flysics | | | |
| 0.50 ciccuves 1 00 electives ** | | | | | |
| Semester 8 | | | | | |
| DUVS*/070 | [0 50] | Clinical Applications of Physics in Madiaina | | | |
| $\frac{1113}{2} + 0/0$ | [0.50] | Chinear Applications of Filysics in Medicine | | | |
| PHYS*4002 | [0 50] | Research in Physics | | | |
| 0 50 electives ** | (0.50] | Resource in 1 hysics | | | |

1.50 electives **

Note: PHYS*4001/2 will be projects in biological or medical physics, some of which may be in areas outside the <u>Department of Physics</u>.

** At least 1.00 credits of Liberal Education electives are required. In addition, students are required to complete 1.50 credits from either List A or List B as follows:

List A: Biological Physics stream

| | 495 |
|--------------------------------------|-----|
| and Europian in Biochemistry | |
| e Biochemistry | |
| ons in Molecular Biology and Genetic | s |

| DIOC 5500 | [0.50] | Structure and Function in Diochemistry |
|-----------|--------|--------------------------------------------|
| BIOC*4580 | [0.50] | Membrane Biochemistry |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genet |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| MCB*4050 | [0.50] | Protein and Nucleic Acid Structure |
| NANO*4100 | [0.50] | Biological Nanomaterials |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications |
| | | |

Structure

List B: Medical Physics stream

[0 50]

BIOC*3560

| BIOM*2000 | [0.50] | Concepts in Human Physiology |
|-----------|--------|-----------------------------------------------|
| ENGG*4040 | [0.50] | Medical Imaging Modalities |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| PATH*3610 | [0.50] | Principles of Disease |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications |
| PHYS*4130 | [0.50] | Subatomic Physics |
| | | |

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

9.50 - Required science courses semesters 3 - 8

1.50 - Restricted electives (from List A OR List B)

1.00 - Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological and Medical Physics (Co-op) (BMPH:C)

Department of Physics, College of Engineering and Physical Sciences

The program emphasizes the application of physics to biology and medicine. It provides an excellent background for careers in the expanding interdisciplinary research laboratories of government and industry, as well as a starting point for a career in medical physics. Completion of the program at an appropriate level will qualify a student to pursue post-graduate studies in biophysics, medical physics and related areas of physics.

Program Requirements

The Co-op program in Biological and Medical Physics is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

Biological and Medical Physics Academic and Co-op Work Term Schedule

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

- 5.00 First year science credits
- 9.50 Required science courses semesters 3-8
- 1.50 Restricted electives (from List A OR List B)
- 1.00 Liberal Education electives
- 3.00 Free electives any approved elective for B.Sc. students.
- 2.00 Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

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Major (Honours Program)

| Semester 1 - Fa | 11 | | | |
|---------------------------------------------------|---------------|-------------------------------------------------------------|--|--|
| DIOL *1000 | IO 501 | Introduction to Molecular and Collular Dielecty | | |
| DIOL*1090 | [0.50] | General Chemistry I | | |
| CIEWI*1040 | [0.50] | Programming | | |
| 1.00 credits from: | IPS*1500 | or (MATH*1080 PHYS*1080) or (MATH*1200 | | |
| PHYS*1080) | 11.5 1500, | or (Minini 1000, 11115-1000) of (Minini 1200, | | |
| * IPS*1500 is rec | ommended | | | |
| Students lacking C | Grade 12 or | 4U Biology, Chemistry or Physics should follow the revised | | |
| schedule of study | for this maj | jor found at: https://www.uoguelph.ca/bsc/revised_SS | | |
| Semester 2 - W | inter | | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| MATH*1160 | [0.50] | Linear Algebra I | | |
| 1.00 credits from: | IPS*1510, | or (MATH*1090, PHYS*1070) or (MATH*1210, | | |
| PHYS*1010) | | | | |
| * IPS*1510 is reco | ommended | | | |
| Semester 3 - Fa | 11 | | | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | | |
| MATH*2200 | [0.50] | Advanced Calculus I | | |
| MATH*2270 | [0.50] | Applied Differential Equations | | |
| PHYS*2240 | [0.50] | Thermal Physics | | |
| PHYS*2330 | [0.50] | Electricity and Magnetism I | | |
| 0.50 Liberal Educ | ation electiv | ves | | |
| Semester 4 - W | inter | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | |
| PHYS*2030 | [0.50] | Biophysics of Excitable Cells | | |
| PHYS*2180 | [0.50] | Experimental Techniques in Physics | | |
| PHYS*2310 | [0.50] | Mechanics | | |
| PHIS*2340 | [0.30] | Electricity and Magnetism II | | |
| Summer Semes | ster | | | |
| COOP*1000 | [0.50] | Co-op Work Term I | | |
| Semester 5 - Fa | | | | |
| PHYS*3130 | [0.50] | Mathematical Physics | | |
| PHYS*3230 | [0.50] | Quantum Mechanics I | | |
| 1.50 electives *** | | | | |
| | | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | | |
| (8-monul work term in conjunction with COOP*5000) | | | | |
| Summer Semes | ster | | | |
| COOP*3000 | [0.50] | Co-op Work Term III | | |
| (8-month work ter | m in conju | nction with COOP*2000) | | |
| Semester 6 - Fa | 11 | | | |
| IPS*3000 | [0.50] | Science Communication | | |
| PHYS*3170 | [0.50] | Radioactivity and Radiation Interactions | | |
| 1.50 electives *** | | | | |
| Semester 7 - W | inter | | | |
| NANO*3600 | [0.50] | Computational Methods in Materials Science | | |
| PHYS*3510 | [0.50] | Intermediate Laboratory | | |
| PHYS*4040 | [0.50] | Quantum Mechanics II | | |
| PHYS*4540 | [0.50] | Molecular Biophysics | | |
| 0.50 electives *** | | | | |
| Summer Semes | ster | | | |
| COOP*4000 | [0.50] | Co-op Work Term IV | | |
| Fall Semester | | | | |
| COOP*5000 | [0.50] | Co-op Work Term V | | |
| Semester 8 - W | inter | | | |
| PHYS*4070 | [0.50] | Clinical Applications of Physics in Medicine | | |
| PHYS*4500 | [0.50] | Advanced Physics Laboratory | | |
| 1.50 electives *** | - | - | | |
| Students are requi | red to comp | plete 1.50 credits from either List A or List B as follows: | | |
| List A: Biolog | ical Phy | sics stream | | |
| | | | | |

| | BIOC*3560 | [0.50] | Structure and Function in Biochemistry | Option B (at |
|-----|---------------------------------|-----------|-----------------------------------------------|----------------|
| | BIOC*4580 | [0.50] | Membrane Biochemistry | 2.50 credits f |
| | MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | XSEN*3030 |
| | MCB*2050 | [0.50] | Molecular Biology of the Cell | XSEN*3040 |
| | MCB*4050 | [0.50] | Protein and Nucleic Acid Structure | XSEN*3060 |
| | NANO*4100 | [0.50] | Biological Nanomaterials | XSEN*3070 |
| | PHYS*3000 | [0.50] | Optics: Fundamentals and Applications | XSEN*3090 |
| r : | ict D. Modical I | XSEN*3200 | | |
| L. | List D. Meulcal Flysics suleani | | | XSEN*3210 |

| ENGG*4040 | [0.50] | Medical Imaging Modalities |
|-----------|--------|-----------------------------------------------|
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| PATH*3610 | [0.50] | Principles of Disease |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications |
| PHYS*4130 | [0.50] | Subatomic Physics |
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Biological and Pharmaceutical Chemistry (BPCH)

Department of Chemistry, College of Engineering and Physical Sciences

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

Semester 1

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
|----------------------------------|--------|------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I | |
| 0.50 Liberal Education electives | | | |

0.50 Liberal Education 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: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2

| CHEM*1050 | [0.50] | General Chemistry II | | |
|----------------------------------------------------------------------------------------|---------------|------------------------------------------------|--|--|
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II | | |
| One of | | | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | | |
| 0.50 Liberal Educa | tion electiv | es | | |
| Semester 3 | | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | |
| CHEM*2060 | [0.50] | Structure and Bonding | | |
| CHEM*2880 | [0.50] | Physical Chemistry | | |
| One of | | | | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | |
| STAT*2040 | [0.50] | Statistics I | | |
| 0.50 electives or re | stricted elec | ctives | | |
| Semester 4 | | | | |
| CHEM*2070 | [0.50] | Structure and Spectroscopy | | |
| CHEM*2700 | [0.50] | Organic Chemistry I | | |
| CHEM*2400 | [0.75] | Analytical Chemistry I | | |
| MICR*2420 | [0.50] | Introduction to Microbiology | | |
| One of | | 25 | | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | |
| STAT*2040 | [0.50] | Statistics I | | |
| Semester 5 | | | | |
| BIOC*3570 | [0.75] | Analytical Biochemistry | | |
| CHEM*3750 | [0.50] | Organic Chemistry II | | |
| One of: | [0100] | | | |
| CHEM*3640 | [0.50] | Chemistry of the Elements I ** | | |
| 0.50 electives or restricted electives * | | | | |
| One of: | | | | |
| TOX*3300 | [0.50] | Analytical Toxicology *** | | |
| 0.50 electives or | restricted e | electives * | | |
| Electives or restricted electives to a maximum of 2.75 total credits in this semester* | | | | |
| ** CHEM*3640 is a prerequisite for CHEM*3650 | | | | |
| *** TOX*3300 is a subsitute for CHEM*3430 in Semester 6 | | | | |
| Semester 6 | | | | |
| Select either Optio | n A or Opti | on B | | |
| Option A (at Guel | lph) | | | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry | | |
| CHEM*3430 | [0.50] | Analytical Chemistry II: Instrumental Analysis | | |
| CHEM*3650 | [0.50] | Chemistry of the Elements II | | |
| CHEM*3760 | [0.50] | Organic Chemistry III | | |
| 0.50 electives or re | stricted elec | ctives * | | |
| Option B (at Sene | ca) | | | |
| 2.50 credits from: | , , | | | |
| XSEN*3030 | [0.50] | Pharmacology and Applied Toxicology | | |
| XSEN*3040 | [0.50] | Occupational Health and Chemistry | | |
| XSEN*3060 | [0.50] | Pharmaceutical Analysis - Advanced | | |
| XSEN*3070 | [0.50] | Pharmaceutical Product Formulations | | |
| XSEN*3090 | [0.50] | Biopharmaceuticals | | |

Pharmaceutical Organic Chemistry

Introduction to Pharmaceutical Manufacturing

[0.50]

[0.50]

BIOM*2000 [0.50] Concepts in Human Physiology 2019-2020 Undergraduate Calendar Note: All XSEN courses are taught at the Seneca@York campus of Seneca College in Toronto. Semester 7 One of:

CHEM*4730[0.50]Synthetic Organic ChemistryCHEM*4740[0.50]Topics in Bio-Organic Chemistry2.00 electives or restricted electives *

Semester 8

2

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. 0.50 credits from the following:

| MCB*2050 | [0.50] | Molecular Biology of the Cell |
|-------------------|----------------|----------------------------------------------------|
| TOX*2000 | [0.50] | Principles of Toxicology |
| A minimum of 1.50 | credits at the | 4000 level and 2.50 credits at the 3000/4000 level |

from the following list:

| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
|-----------|--------|----------------------------------------------|
| BIOC*4520 | [0.50] | Metabolic Processes |
| BIOC*4540 | [0.75] | Enzymology ** |
| BIOC*4580 | [0.50] | Membrane Biochemistry |
| BIOM*3090 | [0.50] | Principles of Pharmacology ** |
| BIOM*3200 | [1.00] | Biomedical Physiology |
| BIOM*4090 | [0.50] | Pharmacology ** |
| CHEM*3360 | [0.50] | Environmental Chemistry and Toxicology |
| CHEM*3440 | [0.50] | Analytical Chemistry III: Analytical |
| | | Instrumentation |
| CHEM*3640 | [0.50] | Chemistry of the Elements I |
| CHEM*3650 | [0.50] | Chemistry of the Elements II ** |
| CHEM*3760 | [0.50] | Organic Chemistry III |
| CHEM*4010 | [0.50] | Chemistry and Industry |
| CHEM*4400 | [0.50] | Advanced Topics in Analytical Chemistry |
| CHEM*4630 | [0.50] | Bioinorganic Chemistry ** |
| CHEM*4720 | [0.50] | Organic Reactivity ** |
| CHEM*4730 | [0.50] | Synthetic Organic Chemistry ** |
| CHEM*4740 | [0.50] | Topics in Bio-Organic Chemistry |
| CHEM*4900 | [1.00] | Chemistry Research Project I ** |
| CHEM*4910 | [1.00] | Chemistry Research Project II ** |
| MBG*3040 | [0.50] | Molecular Biology of the Gene ** |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology ** |
| MCB*4050 | [0.50] | Protein and Nucleic Acid Structure ** |
| MICR*3230 | [0.50] | Immunology |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| PATH*3610 | [0.50] | Principles of Disease |
| TOX*4590 | [0.50] | Biochemical Toxicology ** |
| XSEN*3030 | [0.50] | Pharmacology and Applied Toxicology |
| XSEN*3040 | [0.50] | Occupational Health and Chemistry |
| XSEN*3060 | [0.50] | Pharmaceutical Analysis - Advanced |
| XSEN*3070 | [0.50] | Pharmaceutical Product Formulations |
| XSEN*3090 | [0.50] | Biopharmaceuticals |
| XSEN*3200 | [0.50] | Pharmaceutical Organic Chemistry |
| XSEN*3210 | [0.50] | Introduction to Pharmaceutical Manufacturing |
| C (00.0 | | |

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

6.50 - Required science courses semesters 3 - 8

5.00 - Restricted electives (#1 and 2 in restricted electives list)

0.50 - Approved Science electives

1.00 - Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biological and Pharmaceutical Chemistry (Co-op) (BPCH:C)

Department of Chemistry, College of Engineering and Physical Sciences

Program Requirements

The Co-op program in Biological and Pharmaceutical Chemistry is a four and a half year program, including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Biological and Pharmaceutical Chemistry Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|----------------------------|----------------------------------|---------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | Academic Semester 5 | Academic Semester 6 | COOP*2000 Work Term II |
| 4 | COOP*3000 Work Term III | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

4.00 - First year science credits

6.00 - Required science courses semesters 3 - 8

5.50 - Restricted electives (#1 and #2 in restricted electives list)

0.50 - Approved Science electives

1.00 - Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

1.50 - Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00.

The recommended program sequence is outlined below.

Major (Honours Program)

| Semester 1 - Fan | | | |
|------------------|---------------|---------------------------------------------------------------|--|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
| CHEM*1040 | [0.50] | General Chemistry I | |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I | |
| 0.50 Liberal Edu | ucation elect | ives | |
| Students who ar | e lacking one | e 4U /grade 12 course in Biology, Chemistry or Physics must | |
| take the equival | ent introduct | ory course in first semester. The required first-year science | |

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: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2 - Winter

One of:

| emester |
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498 CHEM*3640 [0.50] Chemistry of the Elements I ** 0.50 electives or restricted electives * electives or restricted electives to a maximum of 2.75 total credits in this semester* ** CHEM*3640 is a prerequisite for CHEM*3650 Semester 6 - Winter Select either Option A or Option B Biologica **Option A (at Guelph)** BIOC*3560 [0.50] Structure and Function in Biochemistry CHEM*3650 Chemistry of the Elements II [0.50] CHEM*3760 [0.50] Organic Chemistry III 1.00 electives or restricted electives * **Option B (at Seneca)** 2.50 credits from: XSEN*3030 Pharmacology and Applied Toxicology [0.50] XSEN*3040 [0.50] Occupational Health and Chemistry Pharmaceutical Analysis - Advanced XSEN*3060 [0.50] XSEN*3070 [0.50] Pharmaceutical Product Formulations [0.50] XSEN*3090 Biopharmaceuticals XSEN*3200 [0.50] Pharmaceutical Organic Chemistry XSEN*3210 [0.50] Introduction to Pharmaceutical Manufacturing Note: All XSEN courses are taught at the Seneca@York campus of Seneca College in Toronto. Summer Semester COOP*2000 [0.50] Co-op Work Term II **Fall Semester** COOP*3000 [0.50] Co-op Work Term III Semester 7 - Winter 2.50 electives or restricted electives * Summer Semester COOP*4000 [0.50] Co-op Work Term IV Semester 8 - Fall One of: CHEM*4730 [0.50]Synthetic Organic Chemistry CHEM*4740 [0.50] Topics in Bio-Organic Chemistry 2.00 electives or restricted electives * * Restricted Electives **Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed. 1. MICR*2420 [0.50] Introduction to Microbiology 2. 1.00 credits from the following: MBG*2040 [0.50] Foundations in Molecular Biology and Genetics MCB*2050 [0.50] Molecular Biology of the Cell TOX*2000 [0.50] Principles of Toxicology 3. A minimum of 1.50 credits at the 4000 level and 2.50 credits at the 3000/4000 leve from the following list: BIOC*3560 [0.50] Structure and Function in Biochemistry Metabolic Processes BIOC*4520 [0.50] BIOC*4540 [0.75] Enzymology ** BIOC*4580 Membrane Biochemistry [0.50] BIOM*3090 [0.50] Principles of Pharmacology ** BIOM*3200 **Biomedical Physiology** [1.00] BIOM*4090 [0.50] Pharmacology ** Environmental Chemistry and Toxicology CHEM*3360 [0.50] 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 ** Synthetic Organic Chemistry ** CHEM*4730 [0.50] CHEM*4740 Topics in Bio-Organic Chemistry [0.50] CHEM*4900 [1.00] Chemistry Research Project I ** CHEM*4910 [1.00] Chemistry Research Project II ** Molecular Biology of the Gene ** MBG*3040 [0.50] MBG*3350 [0.75] Laboratory Methods in Molecular Biology ** MCB*4050 [0.50] Protein and Nucleic Acid Structure **

Immunology

Fundamentals of Nutrition

Biochemical Toxicology **

Pharmacology and Applied Toxicology

Principles of Disease

[0.50]

[0.50]

[0.50]

[0.50]

[0.50]

X. Degree Programs, Bachelor of Science (B.Sc.)

| EN*3040 | [0.50] | Occupational Health and Chemistry |
|------------|--------|----------------------------------------------|
| EN*3060 | [0.50] | Pharmaceutical Analysis - Advanced |
| EN*3070 | [0.50] | Pharmaceutical Product Formulations |
| EN*3090 | [0.50] | Biopharmaceuticals |
| EN*3200 | [0.50] | Pharmaceutical Organic Chemistry |
| EN*3210 | [0.50] | Introduction to Pharmaceutical Manufacturing |
| al Science | (BIOS) | |

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College of Biological Science

Major (Honours Program)

The Biological Science major offers the opportunity to study a wide range of topics within biological science. The major is one of the most flexible within the B.Sc. program. After the core sciences in first and second year, students can tailor the degree to create a major all their own. With the wide breadth of courses offered, students can choose to focus their studies in one area of biological science or create a unique skill set and combination of courses not currently offered in any one of our majors. Students can also add a minor in either an area of science, arts or social science.

With this flexibility, students in the Biological Science major are encouraged to seek out study abroad opportunities through the Centre for International Programs. With a high number of elective spaces within the major, students can incorporate a study abroad and still meet the degree requirements within four years. Students who wish to pursue this option should start researching and planning in semesters 3 and 4.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

Schedule of Studies

Semester 1

| | BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | | |
|---|-----------------------------------------------------------|---------------|------------------------------------------------------------|--|--|--|
| | CHEM*1040 | [0.50] | General Chemistry I | | | |
| | MATH*1080 | [0.50] | Elements of Calculus I | | | |
| | PHYS*1080 | [0.50] | Physics for Life Sciences | | | |
| | 0.50 Liberal Education electives | | | | | |
| | Students lacking G | Grade 12 or 4 | 4U Biology, Chemistry or Physics should follow the revised | | | |
| | schedule of study | for this maj | or found at https://www.uoguelph.ca/bsc/revised_SS | | | |
| | Semester 2 | | | | | |
| | BIOL*1070 | [0.50] | Discovering Biodiversity | | | |
| | BIOL*1080 | [0.50] | Biological Concepts of Health | | | |
| n | CHEM*1050 | [0.50] | General Chemistry II | | | |
| | PHYS*1070 | [0.50] | Physics for Life Sciences II | | | |
| | 0.50 Liberal Education electives | | | | | |
| | Semester 3 | | | | | |
| | BIOL*2400 | [0.50] | Evolution | | | |
| | One of: | | | | | |
| | BIOC*2580 | [0.50] | Introduction to Biochemistry | | | |
| 1 | MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | | |
| | 1.00 electives or re | estricted ele | ctives * | | | |
| | 0.50 Liberal Educa | ation electiv | /e | | | |
| | Semester 4 | | | | | |
| | STAT*2040 | [0.50] | Statistics I | | | |
| | One of: | | | | | |
| | BIOC*2580 | [0.50] | Introduction to Biochemistry | | | |
| | MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | | |
| | 1.00 electives or re | estricted ele | ctives * | | | |
| | 0.50 Liberal Educa | ation electiv | /e | | | |
| | Semester 5 | | | | | |
| | 2.50 credits of electives or restricted electives* | | | | | |
| | Students are encouraged to consider study abroad options† | | | | | |
| | | | | | | |

Semester 6

2.50 credits of electives or restricted electives*

Students are encouraged to consider study abroad options;

Semester 7 and 8

2.50 credits of electives or restricted electives*

†Students interested in studying abroad need to apply in the year prior to going abroad. Students need to contact the Centre for International Programs to confirm admission requirements and to submit an application. Study abroad requires approval from the appropriate individuals and is pending available space at the host institution.

* Restricted Electives

** Note: some courses may require additional prerequisites.

- 1. At least 2.00 credits of Liberal Education electives are required. The list of Liberal Education electives for B.Sc. students can be found at: https://www.uoguelph.ca/bsc/
- A minimum of 0.50 credits in Ecology: 2.
- BIOL*2060 [0.50] Ecology

MICR*3230

NUTR*3210

PATH*3610

XSEN*3030

TOX*4590

| | BOT*3050 | [0.50] | Plant Functional Ecology |
|------|-------------------|---------------|----------------------------------------------|
| 3. A | minimum of 0.50 c | credits in M | athematical or Computational Science: |
| | CIS*1000 | [0.50] | Introduction to Computer Applications |
| | CIS*1200 | [0.50] | Introduction to Computing |
| | MATH*1090 | [0.50] | Elements of Calculus II |
| | STAT*2050 | [0.50] | Statistics II |
| 4. | A minimum of 0 | .50 credits i | n Physiology: |
| | BIOM*3200 | [1.00] | Biomedical Physiology |
| | BOT*2100 | [0.50] | Life Strategies of Plants |
| | HK*2810 | [0.50] | Human Physiology I - Concepts and Principles |
| | ZOO*3600 | [0.50] | Comparative Animal Physiology I ** |
| | 50 1111 1 D. 1 | | |

5. 5.50 additional Biological Science credits of which 4.00 must be at the 3000 or 4000 level. The list of approved science electives is posted at http://www.bsc.uoguelph.ca/

Credit Summary (20.00 Total Credits)

4.00 - First year science core

3.50 - Required science courses semesters 3 - 8 (# 2, 3 and 4 in restricted elective list)

5.50 - Approved Biological Science electives of which 4.00 must be 3000/4000 level (# 5 in restricted elective list)

3.00 - Approved Science electives of which 2.00 credits must be 3000/4000 level* May include 1 of BIOL*1020, CHEM*1060

2.00 - Liberal Education electives

2.00 - Electives

*Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biology (BIOL)

College of Biological Science

Minor (Honours Program)

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

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-----------|--------|------------------------------------------------|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| One of: | | |
| BIOL*2060 | [0.50] | Ecology |

BOT*3050 [0.50] Plant Functional Ecology

Of the additional 3.00 credits of approved science electives, students must complete a minimum of 1.50 credits at the 3000 or 4000 level, from courses offered by the following departments: Human Health and Nutritional Sciences, Integrative Biology and Molecular and Cellular Biology. BIOL*1080 is a prerequisite for some CBS courses. This minor is restricted to students registered in B.Sc. majors in the Physical Sciences, B.A.S., and the B.A. degree programs.

Bio-Medical Science (BIOM)

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

This joint program of the Department of Human Health and Nutritional Sciences and the Department of Biomedical Sciences provides students with a broad and integrated foundational overview of human and animal health through the study of function (biochemistry and physiology), structure (anatomy and histology), and paraclinical sciences (epidemiology and pharmacology). The program prepares students well for more advanced studies or applied training in many health-related fields including clinical practice, business, government, research and education. Through the use of electives, students may structure a program emphasizing aspects of health and disease. For more information on recommended electives contact the Faculty Advisor of the major.

In addition, this program is designed to partially meet the current requirements for entry into medical schools in Ontario (a student interested in meeting these requirements should check the present admission requirements for the medical schools); as well as entry into the DVM program of the Ontario Veterinary College.

Live animals and/or animal tissues are used for teaching purposes in some courses in the Bio-Medical Science Major. This must be accepted by students admitted to the program. All animals are protected under the Animals for Research Act of Ontario (1980), the Guidelines for the Care and Use of Experimental Animals (Canadian Council on Animal Care), and the Animal Care Policies of the University of Guelph.

Students who are admitted into the Bio-Medical Science major from high school must meet additional requirements to continue in the major. Continuation from first to second year is based on the cumulative average in the first two semesters (total of 5.00 credits), including the eight core courses as prescribed by the Schedule of Studies (see below). Students with a minimum average of 75% average will be guaranteed continuation in this major. For students with a 70-74.9% average, continuation will be competitive based on available spaces. Students with an average below 70% will be changed to the Biological Science major. Students may subsequently change to another B.Sc. major of their choice.

B.Sc. students who wish to declare the specialization at the end of or beyond first year must apply directly to the Department of Biomedical Sciences by the last day of classes in the winter semester and meet the same requirements specified above.

Admission to the major will be based on the cumulative average in the two semesters (total of 5.00 credits) preceding application to the major (normally fall and winter). Acceptance will be competitive based on available spaces. Students with an average below 70% will not be considered for admission to the major. All decisions will be made at the end of June.

Major (Honours Program)

A minimum of 20.00 credits is required.

Semester 1

| BIOL*1080 | [0.50] | Biological Concepts of Health | | |
|----------------------------------------|--------|-------------------------------|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | | |
| 0.50 electives or restricted electives | | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: https://www.uoguelph.ca/bsc/revised_SS Semester 2

| BIOL*1070 | [0.50] | Discovering Biodiversity | |
|----------------------------------------|--------|------------------------------------------------|--|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | |
| 0.50 electives or restricted electives | | | |

Semester 3 (see admission statement above)

| BIOC*2580 | [0.50] | Introduction to Biochemistry |
|---------------------|---------------|---------------------------------------------------------|
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| STAT*2040 | [0.50] | Statistics I |
| 1.00 electives or 1 | estricted ele | ectives |
| Semester 4 | | |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| One of: | | |
| BIOM*3200 | [1.00] | Biomedical Physiology |
| HK*2810 | [0.50] | Human Physiology I - Concepts and Principles |
| Electives or restri | cted elective | es to a maximum of 2.50 total credits in this semester. |

Note: If HK*2810 is selected, then HK*3810 must be taken in Semester 5.

Semester 5

BIOC*3560 [0.50] Structure and Function in Biochemistry Electives or restricted electives to a maximum of 2.75 total credits in this semester. BIOM*3210 is recommended.

Note: As part of the electives or restricted electives, students must select HK*3810 in semester 5 if HK*2810 was selected in semester 4.

Semester 6

| BIOM*3090 | [0.50] | Principles of Pharmacology |
|-----------|--------|----------------------------|
| PATH*3610 | [0.50] | Principles of Disease |
| POPM*3240 | [0.50] | Epidemiology |

Electives or restricted electives to a maximum of 2.75 total credits in this semester. Semester 7

2.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

Restricted Electives

- 1. Anatomy Elective [1 of (BIOM*3010, BIOM*3040), HK*3401/2, HK*3501/2]
- 2. Immunology Elective ANSC*4650 or MICR*3230
- 3. Advanced Study Electives 2.00 credits from BIOM*4030, BIOM*4050, BIOM*4070, BIOM*4090, BIOM*4110, BIOM*4150, BIOM*4180, BIOM*4300, BIOM*4500, BIOM*4510, BIOM*4521/2, HK*4070, HK*4230, HK*4340, HK*4360, HK*4371/2, HK*4441/2, HK*4460, NUTR*4320, NUTR*4360, NUTR*4510, TOX*4000
- 4. At least 2.00 credits of Liberal Education electives are required. The list of Liberal Education electives for B.Sc. students can be found at: https://www.uoguelph.ca/bsc/

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

5.75 - Required science courses semesters 3 - 8 (with HK 2810,3810) or 5.50 (with BIOM 3200)

4.00 - Restricted elective (with HK 3401/2 or HK 3501/2) 3.75 (with BIOM 3010, BIOM 3040) (Restricted elective #1, #2 and #3)

2.25 - 2.75 Approved Science electives depending on which anatomy and physiology courses are completed above.

2.00 - Liberal Education electives

2.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biomedical Toxicology (BTOX)

Interdisciplinary Program, Departments of Biomedical Sciences, Chemistry, School of Environmental Sciences, Molecular and Cellular Biology

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A minimum of 20.00 credits are required for graduation.

Semester 1

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
|----------------------------------|--------|------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| MATH*1080 | [0.50] | Elements of Calculus I | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | |
| 0.50 Liberal Education electives | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: https://www.uoguelph.ca/bsc/revised_SS Somostor 2

| Semester 2 | | | |
|-------------------------------------------------------------------------------------|--------------|-------------------------------------------------------|--|
| BIOL*1080 | [0.50] | Biological Concepts of Health | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | |
| STAT*2040 | [0.50] | Statistics I | |
| 0.50 Liberal Educa | tion electiv | 7es | |
| Semester 3 | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | |
| TOX*2000 | [0.50] | Principles of Toxicology | |
| 1.00 elective or Lil | peral Educa | tion electives | |
| Semester 4 | | | |
| BIOM*3200 | [1.00] | Biomedical Physiology | |
| CHEM*2480 | [0.50] | Analytical Chemistry I | |
| CHEM*2700 | [0.50] | Organic Chemistry I | |
| 0.50 electives or re | stricted ele | ctives* | |
| Semester 5 | | | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry | |
| MCB*2050 | [0.50] | Molecular Biology of the Cell | |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition | |
| TOX*3300 | [0.50] | Analytical Toxicology | |
| 0.50 electives or re | stricted ele | ctives* | |
| Semester 6 | | | |
| BIOM*3090 | [0.50] | Principles of Pharmacology | |
| PATH*3610 | [0.50] | Principles of Disease | |
| TOX*3360 | [0.50] | Environmental Chemistry and Toxicology | |
| One of: | | | |
| BIOM*3040 | [0.75] | Medical Embryology | |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology * | |
| Electives or restric | ted elective | s to a maximum of 2.75 total credits in this semester | |
| Semester 7 | | | |
| NUTR*4510 | [0.50] | Toxicology, Nutrition and Food | |
| TOX*4000 | [0.50] | Medical Toxicology | |
| TOX*4590 | [0.50] | Biochemical Toxicology | |
| 1.00 electives or re | stricted ele | ctives* | |
| Semester 8 | | | |
| BIOM*4090 | [0.50] | Pharmacology | |
| TOX*4100 | [0.50] | Toxicological Pathology | |
| TOX*4200 | [0.50] | Topics in Toxicology | |
| 1.00 electives or restricted electives* | | | |
| * Restricted Ele | ectives | | |
| At least 1.50 credits must be completed from the following list of allowable course | | | |
| | | | |

**Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

| ANSC*4650 | [0.50] | Comparative Immunology |
|-----------|--------|-------------------------------------------|
| BIOM*3040 | [0.75] | Medical Embryology |
| BIOM*4050 | [0.50] | Biomedical Aspects of Aging |
| BIOM*4070 | [0.50] | Biomedical Histology |
| BIOM*4150 | [0.50] | Cancer Biology |
| CHEM*3750 | [0.50] | Organic Chemistry II |
| CHEM*3760 | [0.50] | Organic Chemistry III |
| CHEM*4740 | [0.50] | Topics in Bio-Organic Chemistry |
| MBG*3040 | [0.50] | Molecular Biology of the Gene |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology |
| MBG*4270 | [0.50] | DNA Replication, Recombination and Repair |

| MCB*4010 | [0.50] | Advanced Cell Biology |
|-----------|--------|--------------------------------------------|
| MICR*3230 | [0.50] | Immunology |
| NUTR*4090 | [0.50] | Functional Foods and Nutraceuticals |
| NUTR*4320 | [0.50] | Nutrition and Metabolic Control of Disease |
| PATH*3040 | [0.50] | Principles of Parasitology |
| POPM*3240 | [0.50] | Epidemiology |
| POPM*4040 | [0.50] | Epidemiology of Food-borne Diseases |
| STAT*2050 | [0.50] | Statistics II |
| STAT*3510 | [0.50] | Environmental Risk Assessment |
| TOX*4900 | [1.00] | Toxicology Research Project I |
| TOX*4910 | [1.00] | Toxicology Research Project II |
| | | |

Credit Summary (20.00 Total Credits)

4.00 - First year science credits 10.75 - Required science courses semesters 3-8

1.50 - Restricted electives

1.50 -Liberal Education electives

2.25 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Biomedical Toxicology (Co-op) (BTOX:C)

Interdisciplinary Program, Departments of Biomedical Sciences, Chemistry, School of Environmental Sciences, Molecular and Cellular Biology

Program Requirements

The Co-op program in Biomedical Toxicology is a five year program, including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Biomedical Toxicology Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|---------------------------|----------------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | COOP*2000 Work Term II |
| 3 | Academic Semester 4 | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | COOP*4000 Work Term IV | Academic Semester 6 | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

4.00 - First year science credits

10.75 - Required science courses semesters 3-8

- 1.50 Restricted electives
- 1.50 Liberal Education electives
- 2.25 Free electives any approved elective for B.Sc. students
- 1.50 Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00.

The recommended program sequence is outlined below.

Major (Honours Program)

| Semester 1 - Fall | | | |
|-------------------|--------------|------------------------------------------------|--|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
| CHEM*1040 | [0.50] | General Chemistry I | |
| MATH*1080 | [0.50] | Elements of Calculus I | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | |
| 0 50 Liberal Edu | cation elect | ives | |

2019-2020 Undergraduate Calendar

| 0 0 | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------|--|
| Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: <u>https://www.uoguelph.ca/bsc/revised_SS</u> | | | |
| Semester 2 - W | /inter | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | |
| STAT*2040 | [0.50] | Statistics I | |
| 0.50 Liberal Educ | cation electiv | ves | |
| Semester 3 - F | all | | |
| BIOC*2580 | [0 50] | Introduction to Biochemistry | |
| CHEM*2480 | [0.50] | Analytical Chemistry I | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | |
| TOX*2000 | [0.50] | Principles of Toxicology | |
| 0.50 Liberal Edu | [0.50] | ves | |
| Winter Semest | or | ves | |
| COOP*1000 | [0.50] | Co-on Work Term I | |
| Summer Seme | ster | | |
| COOP*2000 | [0.50] | Co-op Work Term II | |
| Semester 4 - F | all | | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry | |
| MCB*2050 | [0.50] | Molecular Biology of the Cell | |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition | |
| TOX*3300 | [0.50] | Analytical Toxicology | |
| 0.50 electives or | restricted ele | ectives | |
| Semester 5 - W | linter | | |
| CHEM*2700 | [0 50] | Organic Chemistry I | |
| BIOM*3200 | [0.50] | Biomedical Physiology | |
| TOV*2260 | [1.00] | Environmental Chemistry and Toxicology | |
| 0.50 electives or i | [0.50] | Environmental Chemistry and Toxicology | |
| Summer Some | stor | | |
| Summer Seme | 50 501 | | |
| COOP*3000 Fall Semester | [0.50] | Co-op Work Term III | |
| | [0 50] | Co. on Work Torm IV | |
| Somester 6 W | [0.30] | Co-op work term tv | |
| Semester 0 - W | | | |
| BIOM*3090 | [0.50] | Principles of Pharmacology | |
| PATH*3610 | [0.50] | Principles of Disease | |
| One of: | | | |
| BIOM*3040 | [0.75] | Medical Embryology | |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology * | |
| Electives or restri | cted elective | es to a maximum of 2.75 total credits in this semester | |
| Semester 7 - F | all | | |
| NUTR*4510 | [0.50] | Toxicology, Nutrition and Food | |
| TOX*4000 | [0.50] | Medical Toxicology | |
| TOX*4590 | [0.50] | Biochemical Toxicology | |
| One of: | | | |
| BIOM*4090 | [0.50] | Pharmacology | |
| TOX*4900 | [1.00] | Toxicology Research Project I | |
| 1.00 electives or | restricted ele | ectives* | |
| Semester 8- W | inter | | |
| BIOM*4090 | [0.50] | Pharmacology (if not taken in Semester 7) | |
| TOX*4100 | [0.50] | Toxicological Pathology | |

| BIOM*4090 | [0.50] | Pharmacology (if not taken in Semester 7) | |
|----------------------------------------------------|--------|-------------------------------------------|--|
| TOX*4100 | [0.50] | Toxicological Pathology | |
| TOX*4200 | [0.50] | Topics in Toxicology | |
| electives or restricted electives* to 2.50 credits | | | |

* Restricted Electives

At least 1.50 credits must be completed from the following list of allowable courses. **Students are advised to pay particular attention to pre-requisite requirements when choosing individual courses, and seek advice as needed.

| - | | |
|-----------|--------|--------------------------------------------|
| ANSC*4650 | [0.50] | Comparative Immunology |
| BIOM*3040 | [0.75] | Medical Embryology |
| BIOM*4050 | [0.50] | Biomedical Aspects of Aging |
| BIOM*4070 | [0.50] | Biomedical Histology |
| BIOM*4150 | [0.50] | Cancer Biology |
| CHEM*3750 | [0.50] | Organic Chemistry II |
| CHEM*3760 | [0.50] | Organic Chemistry III |
| CHEM*4740 | [0.50] | Topics in Bio-Organic Chemistry |
| MBG*3040 | [0.50] | Molecular Biology of the Gene |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology |
| MBG*4270 | [0.50] | DNA Replication, Recombination and Repair |
| MCB*4010 | [0.50] | Advanced Cell Biology |
| MICR*3230 | [0.50] | Immunology |
| NUTR*4090 | [0.50] | Functional Foods and Nutraceuticals |
| NUTR*4320 | [0.50] | Nutrition and Metabolic Control of Disease |

| PATH*3040 | [0.50] | Principles of Parasitology |
|--------------------|---------------|-------------------------------------------------|
| POPM*3240 | [0.50] | Epidemiology |
| POPM*4040 | [0.50] | Epidemiology of Food-borne Diseases |
| STAT*2050 | [0.50] | Statistics II |
| STAT*3510 | [0.50] | Environmental Risk Assessment |
| TOX*4900 | [1.00] | Toxicology Research Project I |
| TOX*4910 | [1.00] | Toxicology Research Project II |
| Biotechnology | y (BIOT) | |
| Department of Mo | elecular and | Cellular Biology, College of Biological Science |
| Minor (Honor | urs Prog | ram) |
| A minimum of 5.0 | 00 credits is | required including: |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| MICR*2430 | [0.50] | Methods in Microbial Culture and Physiology |
| 0.50 credits from: | | |
| ENGG*2660 | [0.50] | Biological Engineering Systems I |
| ENGG*3830 | [0.50] | Bio-Process Engineering |
| FOOD*2410 | [0.50] | Introduction to Food Processing |
| FOOD*2420 | [0.50] | Introduction to Food Microbiology |
| FOOD*2620 | [0.50] | Food Engineering Principles |
| 1.00 credits from: | | |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| MCS*1000 | [0.50] | Introductory Marketing |
| A minimum of 1.5 | 50 credits fr | om: |
| ANSC*4050 | [0.50] | Biotechnology in Animal Science |
| BIOC*4540 | [0.75] | Enzymology |
| BIOL*3300 | [0.50] | Applied Bioinformatics |
| FOOD*3270 | [0.50] | Industrial Microbiology |
| MBG*3660 | [0.50] | Genomics |
| MBG*4240 | [0.50] | Applied Molecular Genetics in Medicine and |
| | | Biotechnology |
| MCB*4050 | [0.50] | Protein and Nucleic Acid Structure |
| MICR*3230 | [0.50] | Immunology |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |

Business Economics (BECN)

Department of Economics and Finance, Gordon S. Lang School of Business and Economics

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

Minor (Honours Program)

| A minimum of 5.00 credits is required, including: | | | | |
|---------------------------------------------------|--------|------------------------------------------------|--|--|
| ACCT*1220 | [0.50] | Introductory Financial Accounting | | |
| ACCT*2230 | [0.50] | Management Accounting | | |
| ECON*1050 | [0.50] | Introductory Microeconomics * | | |
| ECON*1100 | [0.50] | Introductory Macroeconomics | | |
| ECON*2310 | [0.50] | Intermediate Microeconomics | | |
| ECON*2410 | [0.50] | Intermediate Macroeconomics | | |
| ECON*2560 | [0.50] | Introduction to Finance | | |
| One of: | | | | |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I | | |
| MATH*1030 | [0.50] | Business Mathematics | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| MATH*1200 | [0.50] | Calculus I | | |
| One of: | | | | |
| ECON*2740 | [0.50] | Economic Statistics | | |
| PSYC*1010 | [0.50] | Making Sense of Data in Psychological Research | | |
| SOAN*2120 | [0.50] | Introductory Methods | | |
| STAT*2040 | [0.50] | Statistics I | | |
| STAT*2060 | [0.50] | Statistics for Business Decisions | | |
| STAT*2080 | [0.50] | Introductory Applied Statistics I | | |
| STAT*2120 | [0.50] | Probability and Statistics for Engineers | | |
| One of: | | | | |
| ECON*3660 | [0.50] | Investments | | |
| ECON*4400 | [0.50] | Managerial Economics | | |

| ENGG*3240 | [0.50] | Engineering Economics | |
|------------------------------------------------------------------------------------|--------|-----------------------------------------|--|
| TAKE 3310 | [0.50] | In dividuals and Communications | |
| HKOB*2090 | [0.50] | Individuals and Groups in Organizations | |
| MCS*1000 | [0.50] | Introductory Marketing | |
| MCS*3040 | [0.50] | Business and Consumer Law | |
| MGMT*3320 | [0.50] | Financial Management | |
| * FARE*1040 and FARE*1400 may replace this course if it is required for the major. | | | |

Chemical Physics (CHPY)

Administered by the Office of the Dean, College of Engineering and Physical Sciences 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 may wish to consult the Faculty Advisor. A minimum of 20.00 credits is required. At least 1.00 credits must be from Liberal Education electives.

Semester 1

| CHEM*1040 | [0.50] | General Chemistry I |
|------------------|---------|------------------------------------------------|
| CIS*1300 | [0.50] | Programming |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| Ctord and a sub- | 1 1 - 1 | ALL / de 12 in Disland Chamister Dhave |

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: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2

| CHEM*1050 | [0.50] | General Chemistry II |
|--------------------|--------------|------------------------------------------------------|
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II |
| MATH*1160 | [0.50] | Linear Algebra I |
| One of: | | - |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| Semester 3 | | |
| CHEM*2060 | [0.50] | Structure and Bonding |
| MATH*2200 | [0.50] | Advanced Calculus I |
| MATH*2270 | [0.50] | Applied Differential Equations |
| PHYS*2330 | [0.50] | Electricity and Magnetism I |
| 0.50 Liberal Educa | tion electiv | /es |
| Semester 4 | | |
| CHEM*2070 | [0.50] | Structure and Spectroscopy |
| CHEM*2480 | [0.50] | Analytical Chemistry I |
| PHYS*2180 | [0.50] | Experimental Techniques in Physics |
| PHYS*2310 | [0.50] | Mechanics |
| PHYS*2340 | [0.50] | Electricity and Magnetism II |
| Semester 5 | [0.50] | Electricity and Magnetism II |
| CHEM*3860 | [0.50] | Quantum Chemistry |
| PHYS*3130 | [0.50] | Mathematical Physics |
| PHYS*3230 | [0.50] | Quantum Mechanics I |
| One of | [0.50] | |
| CHFM*2820 | [0 50] | Thermodynamics and Kinetics |
| PHYS*2240 | [0.50] | Thermal Physics |
| One of: | [0.50] | Thermal Thysics |
| IDS*3000 | [0 50] | Science Communication |
| 0.50 electives | [0.50] | Science Communication |
| Somestor 6 | | |
| Semester o | | |
| CHEM*3430 | [0.50] | Analytical Chemistry II: Instrumental Analysis |
| NANO*3600 | [0.50] | Computational Methods in Materials Science |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications |
| PHYS*4040 | [0.50] | Quantum Mechanics II |
| One of: | | |
| CHEM*3870 | [0.50] | Molecular Spectroscopy |
| CHEM*4880 | [0.50] | Topics in Advanced Physical Chemistry |
| Semester 7 | | |
| CHEM*3440 | [0.50] | Analytical Chemistry III: Analytical Instrumentation |
| PHYS*4120 | [0.50] | Atomic and Molecular Physics |
| PHYS*4240 | [0.50] | Statistical Physics II |
| One of: | [] | |
| PHYS*4001 | [0.50] | Research in Physics + |
| 0.50 electives + | [0.00] | ···· |
| 0.50 electives | | |
| | | |

| [0.50] | Molecular Spectroscopy |
|--------------|-------------------------------------------|
| [0.50] | Topics in Advanced Physical Chemistry |
| | |
| [1.00] | Chemistry Research Project I + |
| 0.50 electiv | ves |
| | |
| | [0.50] [0.50] [1.00] 0.50 electi |

IPS*3000 [0.50] Science Communication 0.50 electives +

0.50 electives

+ Students must complete either (PHYS*4001, PHYS*4002 in semester 7 and 8) or (CHEM*4900 in semester 8).

+ One of CHEM*3870 or CHEM*4880 is required for graduation.

A minimum of 1.00 credits of Liberal Education electives is required for completion of this program. The list of Liberal Education electives for B.Sc. students can be found at: <u>https://www.uoguelph.ca/bsc/</u>

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

11.50 - Required science courses semesters 3 - 8

1.00 - Liberal Education electives

2.50 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Chemical Physics (Co-op) (CHPY:C)

Administered by the Office of the Dean, College of Engineering and Physical Sciences on behalf of the Department of Chemistry and the Department of Physics Program Requirements

The Co-op program in Chemical Physics is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | COOP*4000 Work Term IV | COOP*5000 Work Term V |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

5.00 - First year science credits

- 10.50 Required science courses semesters 3 8
- 0.50 Approved science electives
- 1.00 Liberal Education electives
- 3.00 Free electives any approved elective for B.Sc. students.
- 2.00 Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 22.50.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| CHEM*1040 | [0.50] | General Chemistry I |
|-----------|--------|---------------------|
| CIS*1300 | [0.50] | Programming |

| X. Degree Program | ms. Bachelo | or of Science (B.Sc.) | |
|----------------------------|---------------|--------------------------------------------------------------|----------------|
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I | CHEM |
| One of: | [1.00] | Integrated Mathematics and Thysics I | 0.50 el |
| BIOI *1070 | [0 50] | Discovering Biodiversity | 0.50 elect |
| BIOL *1080 | [0.50] | Biological Concepts of Health | * A minir |
| BIOL *1090 | [0.50] | Introduction to Molecular and Cellular Biology | this progr |
| Students who are 1 | lacking one | 4U/grade 12 course in Biology Chemistry or Physics must | https://ww |
| take the equivalen | t introducto | ry course in first semester. The required first-year science | ** A |
| courses in that sub | viect should | be completed according to the revised schedule of studies | ** A mi |
| available at: https:// | | uelph ca/hsc/revised SS | graduatio |
| Somester 2 - W | intor | delph.ea/bse/tevised_55 | + One of |
| Semester 2 - W | III.CI | | Chemi |
| CHEM*1050 | [0.50] | General Chemistry II | Dementer |
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II | Departin |
| MATH*1160 | [0.50] | Linear Algebra I | Major |
| One of: | 10 501 | | Students |
| BIOL*10/0 | [0.50] | Discovering Biodiversity | to declare |
| BIOL*1080 | [0.50] | Biological Concepts of Health | completio |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | Semeste |
| Semester 3 - Fa | ll | | DIOL #10 |
| CHEM*2060 | [0.50] | Structure and Bonding | BIOL*IC |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | CHEM*I |
| MATH*2200 | [0.50] | Advanced Calculus I | 1P5*1500 |
| MATH*2270 | [0.50] | Applied Differential Equations | 0.50 Libe |
| PHYS*2330 | [0.50] | Electricity and Magnetism I | Students |
| 0.50 Liberal Educ | ation electiv | ves | take the e |
| Semester 4 - W | inter | | courses in |
| CHEM*2070 | [0.50] | Structure and Spectroscopy | available |
| CHEM*2480 | [0.50] | Analytical Chemistry I | Semeste |
| PHYS*2180 | [0.50] | Experimental Techniques in Physics | CHEM*1 |
| PHYS*2310 | [0.50] | Mechanics | IPS*1510 |
| PHYS*2340 | [0.50] | Electricity and Magnetism II | MATH*1 |
| Summer Seme | ster | | One of |
| | TO 501 | Co. on Work Town I | BIOL |
| COOP*1000 | [0.50] | Co-op work term t | BIOL' |
| Fall Semester | | | Semeste |
| COOP*2000 | [0.50] | Co-op Work Term II | BIOC*25 |
| Semester 5 - W | inter | | CHEM*2 |
| CHEM*3430 | [0.50] | Analytical Chemistry II: Instrumental Analysis | CHEM*2 |
| One of: | [0.00] | | MATH*2 |
| CHEM*3870 | [0.50] | Molecular Spectroscopy + | Electives |
| 0.50 electives * | (| 1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1, | Semeste |
| One of: | | | CUEM*C |
| CIS*2500 | [0.50] | Intermediate Programming | CHEM*2 |
| 0.50 electives * | | | CHEM*2 |
| 1.00 electives* | | | 1.00 -1 |
| Summer Seme | tor | | 1.00 elect |
| Summer Seme | | | Semeste |
| COOP*3000 | [0.50] | Co-op Work Term III | CHEM*2 |
| Semester 6 - Fa | ıll | | CHEM*3 |
| CHEM*3860 | [0.50] | Quantum Chemistry | CHEM*3 |
| IPS*3000 | [0.50] | Science Communication | CHEM*3 |
| PHYS*3130 | [0.50] | Mathematical Physics | 0.50 elect |
| PHYS*3230 | [0.50] | Quantum Mechanics I | Semeste |
| One of: | | | CHEM*3 |
| CHEM*2820 | [0.50] | Thermodynamics and Kinetics | CHEM*3 |
| PHYS*2240 | [0.50] | Thermal Physics | 1.50 elect |
| Winter Semest | er | | Semeste |
| COOP*4000 | [0.50] | Co-on Work Term IV | CHEM*2 |
| (8-month work ter | m in coniu | nction with COOP*5000) | 3 00 Cha |
| Summer Seme | ster | | 1.50 elect |
| COOD*5000 | FO 701 | | 1.50 election |
| COOP*5000 | [0.50] | Co-op work Term V | · selection |
| (8-month work ter | m in conjui | action with COOP*4000) | I. At le |
| Semester /*** - | ran | | Educ |
| CHEM*3440 | [0.50] | Analytical Chemistry III: Analytical Instrumentation | 2. Appr |
| PHYS*4240 | [0.50] | Statistical Physics II | listed |
| One of: | | | 3. Optio |
| CHEM*3640 | [0.50] | Chemistry of the Elements I | Bioc |
| CHEM*3750 | [0.50] | Organic Chemistry II | Scier |
| 0.50 electives * | ¢ | | Advi |
| 1.00 electives * **3.00 cr | | | |
| Semester 8** - | Winter | | 1.1.50 |
| NANO*3600 | [0.50] | Computational Methods in Materials Science | (CHI |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications | 2 1 50 |
| PHYS*4040 | [0.50] | Quantum Mechanics II | 2. 1.30 DIO |

503

1*4880 [0.50] lectives * tives *

mum of 1.00 credits of Liberal Education electives is required for completion of ram. The list of Liberal Education electives for B.Sc. students can be found at: ww.uoguelph.ca/bsc/

nimum of 2.00 credits in science courses at the 4000 level is required for on.

CHEM*3870 or CHEM*4880 is required for graduation.

stry (CHEM)

ent of Chemistry, College of Engineering and Physical Sciences (Honours Program)

may enter this major in Semester 1 or any semester thereafter. A student wishing the major may wish to consult the Faculty Advisor. The major will require the on of 20.00 credits as indicated below:

er 1

| BIOL*1090 CHEM*1040 | [0.50] [0.50] | Introduction to Molecular and Cellular Biology General Chemistry I |
|-----------------------------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| 0.50 Liberal Educ | cation electiv | ves |
| Students who are | lacking one | 4U/grade 12 course in Biology. Chemistry or Physics must |
| take the equivale | nt introducto | ry course in first semester. The required first-year science |
| courses in that su | bject should | be completed according to the revised schedule of studies |
| available at: <u>https</u> | <u>.://www.uog</u> | ueipn.ca/bsc/revised_55 |
| Semester 2 | | |
| CHEM*1050 | [0.50] | General Chemistry II |
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II |
| MATH*1160 | [0.50] | Linear Algebra I |
| One of | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| Semester 3 | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| CHEM*2060 | [0.50] | Structure and Bonding |
| CHEM*2400 | [0.75] | Analytical Chemistry I |
| MATH*2270 | [0.50] | Applied Differential Equations |
| Electives to a ma | ximum of 2. | 75 total credits in this semester * |
| Semester 4 | | |
| CHEM*2070 | [0.50] | Structure and Spectroscopy |
| CHEM*2700 | [0.50] | Organic Chemistry I |
| CHEM*3430 | [0.50] | Analytical Chemistry II: Instrumental Analysis |
| 1.00 electives* or | restricted el | lectives** |
| Semester 5 | | |
| CHEM*2820 | [0.50] | Thermodynamics and Kinetics |
| CHEM*3640 | [0.50] | Chemistry of the Elements I |
| CHEM*3750 | [0.50] | Organic Chemistry II |
| CHEM*3860 | [0.50] | Quantum Chemistry |
| 0.50 electives* | | |
| Semester 6 | | |
| CHEM*3650 | [0.50] | Chemistry of the Elements II |
| CHEM*3760 | [0.50] | Organic Chemistry III |
| 1.50 electives* or | restricted el | lectives** |
| Semester 7 and | 18 | |
| CHEM*3440 | [0.50] | Analytical Chemistry III: Analytical Instrumentation |
| 3.00 Chemistry o | r Biochemis | trv** |
| 1.50 electives* | | |
| *selection of elect | tives is subj | ect to the following: |
| 1. At least 1.00 | credits of L | iberal Education electives are required. The list of Liberal |
| Education ele | ectives for B. | Sc. students can be found at: https://www.uoguelph.ca/bsc/ |
| 2. Approval of listed as restr | the Faculty . | Advisor must be obtained for the selection of courses not res. |
| 3 Options for | an "Area of | Focus" or a minor are available. Subject areas include |
| Biochemistry Sciences, Ma Advisor for r | , Computing athematical | g and Information Science, Earth Sciences, Environmental Sciences, and Physics. Please consult with your Faculty |
| **3.00 credits fro | m the 3000/ | 4000 level as follows: |
| 1. 1.50 compris | ing of (CHE) | M*3870 or CHEM*4880), (CHEM*4620 or CHEM*4630). |
| (CHEM*472 | 0 or CHEM | *4730) |
| 2. 1.50 chosen BIOC*4540, | i from CH BIOC*4580 | IEM*3870, CHEM*4010, CHEM*4400, BIOC*4520, CHEM*4620, CHEM*4630, CHEM*4730, CHEM*4740, CHEM*400, CHEM*400, CHEM*400, CHEM*400, CHEM*400, CHEM*400, CHEM*400, CHEM*400 |

CHEM*4740, CHEM*4880, CHEM*4900, CHEM*4910, MCB*4050, MCB*4080

, TOX*4590

[0.50]

Molecular Spectroscopy +

CHEM*3870

One of:

Note:

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

Credit Summary (20.00 Total Credits)

- 4.50 First year science credits
- 7.25 Required science courses semesters 3 8
- 3.00 Restricted electives (#1 and 2 in restricted electives list)
- 1.25 Approved science electives
- 1.00 Liberal Education electives
- 3.00 Free electives any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Chemistry consists of at least 5.00 credits including the following courses:

CHEM*1040 [0.50] General Chemistry I

CHEM*1050 [0.50] General Chemistry II

Of the additional 4.00 credits, students will select Chemistry courses (CHEM) at the 2000 level or above including a minimum of 1.00 credits at the 3000 or 4000 level. BIOC*2580 can be counted towards this specialization

Chemistry (Co-op) (CHEM:C)

Department of Chemistry, College of Engineering and Physical Sciences Program Requirements

The Co-op program in Chemistry is a four and a half year program including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Chemistry Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|---------------------------|----------------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

- 4.50 First year science credits
- 7.25 Required science courses semesters 3 8
- 3.00 Restricted electives (#1 and 2 in restricted electives list)
- 1.25 Approved science electives
- 1.00 Liberal Education electives
- 3.00 Free electives any approved elective for B.Sc. students.
- 1.50 Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
|----------------------------------|--------|------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I | |
| 0.50 Liberal Education electives | | | |

X. Degree Programs, Bachelor of Science (B.Sc.)

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: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

| Semester 2 - W | Vinter | |
|-----------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CHEM*1050 | [0.50] | General Chemistry II |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II |
| MATH*1160 | [0.50] | Linear Algebra I |
| One of | 10 501 | |
| BIOL*10/0 BIOL*1080 | [0.50] | Discovering Biodiversity Biological Concerts of Health |
| Somestor 3 F | [0.30] all | Biological Concepts of Health |
| Semester 3 - F | an 10.501 | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry Structure and Bonding |
| CHEM*2000 | [0.30] | Analytical Chemistry I |
| MATH*2270 | [0.50] | Applied Differential Equations |
| Electives to a ma | ximum of 2. | 75 total credits in this semester * |
| Winter Semest | ter | |
| COOP*1000 | [0.50] | Co-on Work Term I |
| Semester 4 - S | ummer | |
| CHFM*2070 | [0 50] | Structure and Spectroscopy |
| CHEM*2700 | [0.50] | Organic Chemistry I |
| CHEM*3430 | [0.50] | Analytical Chemistry II: Instrumental Analysis |
| 1.00 electives * | [0.000] | |
| Semester 5 - F | all | |
| 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 - W | Vinter | |
| CHEM*3650 | [0.50] | Chemistry of the Elements II |
| CHEM*3760 | [0.50] | Organic Chemistry III |
| 1.50 electives* or | r restricted e | lectives** |
| Summer Seme | ester | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Fall Semester | | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 7 - W | Vinter | - |
| 2.50 electives* or | r restricted e | lectives** |
| Summer Seme | ster | |
| COOP*4000 | [0.50] | Co-on Work Term IV |
| Semester 8 - F | all | |
| CHEM*3440 | [0 50] | Analytical Chemistry III: Analytical Instrumentation |
| 2.00 electives* or | r restricted e | lectives** |
| * selection of ele | ctives is sub | ject to the following: |
| 1. At least 1.00 | credits of L | iberal Education electives are required. The list of Liberal |
| Education ele | ectives for B | Sc. students can be found at: <u>https://www.uoguelph.ca/bsc/</u> |
| 2. Approval of listed as restr | the Faculty rictive elective | Advisor must be obtained for the selection of courses not /es. |
| 3. Options for Biochemistry Sciences, Ma Advisor for r | an "Area of y, Computing athematical nore detail. | Focus" or a minor are available. Subject areas include g and Information Science, Earth Sciences, Environmental Sciences, and Physics. Please consult with your Faculty |
| ** 3.00 credits fr | om the 3000 | /4000 level as follows: |
| 1. 1.50 compris (CHEM*472 | ing of (CHE | M*3870 or CHEM*4880), (CHEM*4620 or CHEM*4630), *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)

School of Computer Science, College of Engineering and Physical Sciences

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*1300 | [0.50] | Programming |
|-------------------|----------------|----------------------------------------------|
| CIS*1910 | [0.50] | Discrete Structures in Computing I |
| CIS*2170 | [0.75] | User Interface Design |
| CIS*2430 | [0.50] | Object Oriented Programming |
| CIS*2500 | [0.50] | Intermediate Programming |
| CIS*2520 | [0.50] | Data Structures |
| CIS*2750 | [0.75] | Software Systems Development and Integration |
| 0.50 additional c | credits from C | CIS courses at the 2000 level or above |
| 0.50 11:0: 1 | 1. 6 | |

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

Ecology (ECOL)

Department of Integrative Biology, College of Biological Science

This minor provides a foundation in the principles and methods of ecology. It introduces the knowledge and skills necessary for work in conservation, environmental science, education, resource management, ecological consulting, or nature interpretation.

Minor (Honours Program)

A minimum of 5.00 credits is required to complete the minor, which must include:

| BIOL*2060 | [0.50] | Ecology | | |
|------------------------------|--------------|-----------------------------------------------------|--|--|
| BIOL*3010 | [0.50] | Laboratory and Field Work in Ecology | | |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems | | |
| BIOL*4110 | [1.00] | Ecological Methods | | |
| BIOL*4120 | [0.50] | Evolutionary Ecology | | |
| Of the remaining 2 | 2.00 require | d credits, students will select from the following: | | |
| At least one of: | | | | |
| BIOL*2400 | [0.50] | Evolution | | |
| BIOL*3020 | [0.50] | Population Genetics | | |
| At least one of: | | | | |
| BOT*2100 | [0.50] | Life Strategies of Plants | | |
| ZOO*2090 | [0.50] | Vertebrate Structure and Function | | |
| One of: | | | | |
| GEOG*1220 | [0.50] | Human Impact on the Environment | | |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment | | |
| Environmental Biology (ENVB) | | | | |

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 may wish to 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.

Semester 1

| bennester 1 | | | | |
|---------------------------------|--------------|------------------------------------------------------------|---|--|
| BIOL*1070 | [0.50] | Discovering Biodiversity |] | |
| CHEM*1040 | [0.50] | General Chemistry I | 5 | |
| ENVS*1100 | [0.50] | Fundamentals of Environmental Sciences | 1 | |
| MATH*1080 | [0.50] | Elements of Calculus I | 1 | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | | |
| Students lacking G | rade 12 or 4 | 4U Biology, Chemistry or Physics should follow the revised | | |
| schedule of study f | for this maj | or found at: https://www.uoguelph.ca/bsc/revised_SS | | |
| Semester 2 | | | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | 5 | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | | |
| One of: | | | | |
| CIS*1200 | [0.50] | Introduction to Computing | | |
| CIS*1500 | [0.50] | Introduction to Programming | | |
| MATH*1090 | [0.50] | Elements of Calculus II | | |
| STAT*2040 | [0.50] | Statistics I | | |
| 0.50 Liberal Education elective | | | | |
| Semester 3 | | | | |
| | | | | |

| DIOC#2500 | 10 501 | | | |
|------------------------------------------------------------------------------------------------|--------|-------------------------------------------|--|--|
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | |
| STAT*2040 | [0.50] | Statistics I (if not taken in semester 2) | | |
| TOX*2000 | [0.50] | Principles of Toxicology | | |
| 1.00 electives or restricted electives chosen from lists A, B, C and/or D or Liberal Education | | | | |
| elective (or 1.50 if STAT*2040 was taken in semester 2) | | | | |

Semester 4

| BIOL*2060 | [0.50] | Ecology | |
|---------------------------------------------------------------------------|--------|-----------------------------------------------|--|
| ENVS*2090 | [0.50] | Problem Solving in Environmental Biology | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | |
| 1.00 electives or restricted electives chosen from lists A, B, C and/or D | | | |

Semester 5

2.50 electives or restricted electives chosen from lists A, B, C and/or D.

Semester 6

2.50 electives or restricted electives chosen from lists A, B, C and/or D Semester 7

Project in Environmental Sciences ENVS*4001 [0.50] 2.00 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 or ENVS*4430 in 8.

Semester 8

| ENVS*4000 | [0.50] | Toxicological Risk Assessment |
|-------------------|---------------|--------------------------------------------|
| ENVS*4002 | [0.50] | Project in Environmental Sciences |
| 1.50 electives or | restricted el | ectives chosen from lists A. B. C and/or D |

Restricted Electives

- 1. A minimum of 1.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: https:// www.uoguelph.ca/bsc/
- 2. Select a minimum of 6.00 credits from the following lists of restricted electives during Semesters 3-8. 2.00 credits must be completed from List A. 1.00 credit must be completed from List B. A minimum 3.00 credits must be completed from List C.
- 3. Students should note that some restricted electives are prerequisites for other restricted electives. Students should consult the most recent undergraduate calendar for specific requirements.

List A - Environmental Processes

Minimum of 2.00 credits from the following list:

| BIOL*2400 | [0.50] | Evolution |
|-----------|--------|------------------------------------------------------|
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| ENVS*2060 | [0.50] | Soil Science |
| ENVS*2330 | [0.50] | Current Issues in Ecosystem Science and Biodiversity |
| ENVS*3010 | [0.50] | Climate Change Biology |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3040 | [0.50] | Natural Chemicals in the Environment |
| ENVS*3150 | [0.50] | Aquatic Systems |
| ENVS*3220 | [0.50] | Terrestrial Chemistry |
| ENVS*3340 | [0.50] | Use and Management of Environmental Data |
| ENVS*3370 | [0.50] | Terrestrial Ecosystem Ecology |

List B - Organismal Biology

Minimum of 1.00 credits from the following list:

| | | - |
|-----------|--------|--------------------------------------------|
| BOT*2100 | [0.50] | Life Strategies of Plants |
| BOT*3050 | [0.50] | Plant Functional Ecology |
| ENVS*2080 | [0.50] | Introduction to Environmental Microbiology |
| ENVS*3090 | [0.50] | Insect Diversity and Biology |
| ENVS*4230 | [0.50] | Biology of Aquatic Insects |
| MICR*3090 | [0.50] | Mycology |
| ZOO*4070 | [0.50] | Animal Behaviour |
| List C - | | |

Students in the Environmental Biology Major are required to take a minimum 3.00 restricted elective credits from any of the following lists: Forestry

| rolestry | | | | |
|-------------------------------------|--------|---------------------------------------------------|--|--|
| ENVS*3230 | [0.50] | Agroforestry Systems | | |
| ENVS*3250 | [0.50] | Forest Health and Disease | | |
| ENVS*3270 | [0.50] | Forest Biodiversity | | |
| ENVS*4350 | [0.50] | Forest Ecology | | |
| Soil/Aquatic Syste | ms | | | |
| ENVS*3060 | [0.50] | Groundwater | | |
| ENVS*3080 | [0.50] | Soil and Water Conservation | | |
| ENVS*3310 | [0.50] | Soil Biodiversity and Ecosystem Function | | |
| ENVS*4090 | [0.50] | Soil Management | | |
| ENVS*4160 | [0.50] | Soil and Nutrient Management | | |
| ENVS*4320 | [1.00] | Laboratory and Field Methods in Soil Biodiversity | | |
| ENVS*4390 | [1.00] | Soil Variability and Land Evaluation | | |
| Environmental Toxicology/Pollutants | | | | |
| BIOL*4350 | [0.50] | Limnology of Natural and Polluted Waters | | |
| ENVS*3290 | [0.50] | Waterborne Disease Ecology | | |
| ENVS*4180 | [0.50] | Insecticide Biological Activity and Resistance | | |
| ENVS*4190 | [0.50] | Biological Activity of Herbicides | | |
| ENVS*4370 | [0.50] | Environmental Organic Chemistry | | |
| | | | | |

| PBIO*4530 | [0.50] | Plants and Environmental Pollution |
|-------------------|----------------|-------------------------------------------------|
| TOX*3360 | [0.50] | Environmental Chemistry and Toxicology |
| Conservation of E | Biodiversity a | and Plant Protection |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems |
| BIOL*3130 | [0.50] | Conservation Biology |
| BIOL*4150 | [0.50] | Wildlife Conservation and Management |
| BIOL*4500 | [0.50] | Natural Resource Policy Analysis |
| ENVS*2120 | [0.50] | Introduction to Environmental Stewardship |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4070 | [0.50] | Pollinator Conservation |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests |
| ENVS*4260 | [0.50] | Field Entomology |
| ENVS*4350 | [0.50] | Forest Ecology |
| ENVS*4390 | [1.00] | Soil Variability and Land Evaluation |
| PBIO*4000 | [0.50] | Molecular and Cellular Aspects of Plant-Microbe |
| | | Interactions |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| List D - Indepe | endent Res | earch and Study Courses |
| BIOL*4610 | [0.75] | Arctic Ecology |
| ENVS*3030 | [0.50] | Conservation Field Course |
| ENVS*4260 | [0.50] | Field Entomology |
| ENVS*4410 | [0.50] | Introduction to Advanced Independent Research |
| ENVS*4420 | [0.50] | Advanced Independent Research |
| | | |

ENVS*4430 [1.00] Advanced Independent Research

ENVS*4510 [0.50] Topics in Environmental Sciences

Credit Summary (20.00 Total Credits)

4.00 - B.Sc. core credits

5.00 - Required credits for the Major (4.50 if STAT*2040 is taken in Semester 2)

6.00 - Restricted elective credits for the Major (some restricted electives do not count as science electives towards degree therefore additional science electives may be required)

1.00 - Approved Science electives (1.50 if STAT 2040 is taken in semester 2)

1.00 - Liberal Education electives (#1 in restricted elective list)

3.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Environmental Geomatics (EG)

Department of Geography, Environment and Geomatics, 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 will have unique specialty in the application of spatial technologies to the study and assessment of biophysical and Earth surface processes.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult with a B.Sc. Faculty Advisor in the Department of Geography, Environment and Geomatics. All students are encouraged to consult with the advisor on a regular basis.

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

Semester 1

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-----------|--------|----------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| GEOG*1350 | [0.50] | Earth: Hazards and Global Change |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| One of: | | - |
| MATH*1080 | [0.50] | Elements of Calculus I |
| MATH*1200 | [0.50] | Calculus I |

Students who are lacking one 4U/grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

| 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*1070 | [0.50] | Physics for Life Sciences II | | |
| 0.50 Liberal Education electives* (GEOG*1220 is recommended) | | | | |
| Semester 3 | | | | |
| ENVS*2240 GEOG*2000 | [0.50] [0.50] | Fundamentals of Environmental Geology Geomorphology | | |

| GEOG*2420 | [0.50] | The Earth From Space |
|----------------------------------------------------------------|---------------|----------------------------------------------|
| GEOG*2480 | [0.50] | Mapping and GIS |
| 0.50 Liberal Education electives* | | |
| Semester 4 | | |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| STAT*2040 | [0.50] | Statistics I |
| One of: | | |
| CIS*1200 | [0.50] | Introduction to Computing |
| CIS*1500 | [0.50] | Introduction to Programming |
| MATH*1210 | [0.50] | Calculus II |
| MATH*1090 | [0.50] | Elements of Calculus II |
| 0.50 approved Scie | ence electiv | es* |
| Semester 5 | | |
| GEOG*3000 | [0.50] | Fluvial Processes |
| GEOG*3110 | [0.50] | Biotic and Natural Resources |
| One of: | | |
| GEOG*3020 | [0.50] | Global Environmental Change |
| GEOG*3090 | [0.50] | Gender and Environment |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment |
| 1.00 electives, at le | east 0.50 fro | om 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 le | east 0.50 fro | om approved Science electives* (GEOG*4690 is |
| recommended) | | |
| Semester 8 | | |
| GEOG*4150 | [0.50] | Catchment Processes |
| GEOG*4480 | [1.00] | Applied Geomatics |
| 1.00 Approved Sci | ence electiv | ves* |
| C J'A C | (30.00.7 | D . (- 1 () - 1 () |

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

8.50 - Required science courses semesters 3-8

1.00 - Required social science courses semesters 3 - 8

3.00 - Approved Science electives

1.00 - Liberal Education electives

2.00 - Free electives - any approved elective for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Environmental Geomatics (Co-op) (EG:C)

Department of Geography, Environment and Geomatics, 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.

Program Requirements

The Co-op program in Environmental Geomatics is a five year program, including four work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Environmental | Geomatics Aca | demic and | Co-op W | Vork Term | Schedule |
|---------------|---------------|-----------|---------|-----------|----------|
| | | | | | |

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|--------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | Academic Semester 6 |
| 4 | COOP*3000 Work Term III | COOP*4000 Work Term IV | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

4.50 - First year science credits

- 9.00 Required science courses semesters 3-8
- 1.00 Required social science courses semesters 3-8
- 2.50 Approved Science electives
- 1.00 Liberal Education electives
- 2.00 Free electives any approved elective for B.Sc. students.
- 1.50 Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-----------|--------|----------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| GEOG*1350 | [0.50] | Earth: Hazards and Global Change |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| One of: | | |
| MATH*1080 | [0.50] | Elements of Calculus I |
| MATH*1200 | [0.50] | Calculus I |

Students who are lacking one 4U /grade 12 course in Biology, Chemistry or Physics must take the equivalent introductory course in first semester. The required first-year science courses in that subject should be completed according to the revised schedule of studies available at: https://www.uoguelph.ca/bsc/revised_SS

Semester 2 - Winter

| 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*1070 | [0.50] | Physics for Life Sciences II |
| 0.50 Liberal Educ | ation electiv | /es |
| Semester 3 - Fa | 11 | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| ENVS*2240 | [0.50] | Fundamentals of Environmental Geology |
| GEOG*2000 | [0.50] | Geomorphology |
| GEOG*2420 | [0.50] | The Earth From Space |
| GEOG*2480 | [0.50] | Mapping and GIS |
| STAT*2040 | [0.50] | Statistics I |
| Semester 4 - W | inter | |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| GEOG*3420 | [0.50] | Remote Sensing of the Environment |
| One of: | | |
| CIS*1200 | [0.50] | Introduction to Computing |
| CIS*1500 | [0.50] | Introduction to Programming |
| MATH*1210 | [0.50] | Calculus II |
| MATH*1090 | [0.50] | Elements of Calculus II |
| 0.50 approved Sci | ence electiv | es |
| Summer Semes | ter | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 5 - Fa | 11 | |
| GEOG*3000 | [0.50] | Fluvial Processes |
| GEOG*3110 | [0.50] | Biotic and Natural Resources |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| 0.50 approved Sci | ence electiv | es |
| 0.50 Liberal Educ | ation electiv | /es |
| Winter Semeste | er | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Semester 6 - Su | mmer | |
| GEOG*3610 | [0.50] | Environmental Hydrology |
| GEOG*4990 | [0.50] | Independent Study in Geography |

| GEOG*3020 | [0.50] | Global Environmental Change |
|----------------------|---------------|-------------------------------------------|
| GEOG*3210 | [0.50] | Management of the Biophysical Environment |
| 1.00 electives | | |
| Fall Semester | | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Winter Semest | er | - |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| Semester 7 - Fa | ıll | - |
| GEOG*4110 | [1.00] | Environmental Systems Analysis |
| 1.50 electives, at l | east 1.00 fro | om approved Science electives |
| Semester 8 - W | inter | |
| GEOG*4150 | [0.50] | Catchment Processes |
| GEOG*4480 | [1.00] | Applied Geomatics |
| 1.00 electives, at l | east 0.50 fro | om approved Science electives |
| Food Science | (FOOD) | |

Department of Food Science, Ontario Agricultural College

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor.

S

| Semester 1 - Fa | 11 | |
|---------------------|---------------|------------------------------------------------------------|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| 0.50 Liberal Educa | ation electiv | /es |
| Note: CIS*1200, ra | ather than ar | Liberal Education credit is recommended for those needing |
| to improve their co | omputer ski | lls. |
| Students lacking G | ade 12 or | 4U Biology, Chemistry or Physics should follow the revised |
| schedule of study i | for this maj | or found at: <u>https://www.uoguelph.ca/bsc/revised_SS</u> |
| Semester 2 - Wi | inter | |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| CHEM*1050 | [0.50] | General Chemistry II |
| MATH*1090 | [0.50] | Elements of Calculus II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| 0.50 Liberal Educa | ation electiv | /es |
| Semester 3 - Fa | 11 | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| CHEM*2880 | [0.50] | Physical Chemistry |
| FOOD*2150 | [0.50] | Introduction to Nutritional and Food Science |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| 0.50 electives | | |
| Semester 4 - Wi | inter | |
| FOOD*2100 | [0.50] | Communication in Food Science |
| FOOD*2620 | [0.50] | Food Engineering Principles |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| STAT*2040 | [0.50] | Statistics I |
| 0.50 electives | | |
| Semester 5 - Fa | 11 | |
| FOOD*3030 | [0.50] | Food Chemistry I |
| FOOD*3160 | [0.75] | Food Processing I |
| FOOD*3230 | [0.75] | Food Microbiology |
| 0.50 electives | | 65 |
| Semester 6 - Wi | inter | |
| FOOD*3040 | [0 50] | Food Chemistry II |
| FOOD*3170 | [0.50] | Food Processing II |
| FOOD*3260 | [0.50] | Industrial Microbiology |
| FOOD*3700 | [0.50] | Sensory Evaluation of Foods |
| 0.50 electives | [0.0.0] | |
| Semester 7 - Fa | 11 | |
| FOOD*4190 | [0 50] | Advanced Food Analysis |
| FOOD*4260 | [0.50] | Food Product Development I |
| 1 50 electives | [0.50] | 1 ood 1 foddet Development 1 |
| Semester 8 - Wi | inter | |
| | 10 501 | Food Product Development II |
| 10001.4270 | [0.50] | rood Floduct Development II |
| Notes | | |
| 1 ENCI \$1000 ' | | nded for these students used" () () () () () |
| 1. ENGL*1200 1 | is recomme | naed for those students needing to improve their English |
| grammar. | | |

- 2. FOOD*2150 could be replaced by FOOD*2010 with permission of department advisor
- 3. Of the 6.50 electives credits:

One of:

- b. At least 2.00 must be from list of Restricted electives.
- c. At least 1.00 must be from additional Science electives (1.50 if MCS*3010 is chosen as a Restricted Elective)

Restricted Electives:

| FOOD*4070 | [0.50] | Food Packaging |
|-----------|--------|---------------------------------------------|
| FOOD*4090 | [0.50] | Functional Foods and Nutraceuticals |
| FOOD*4110 | [0.50] | Meat and Poultry Processing |
| FOOD*4220 | [0.50] | Topics in Food Science |
| FOOD*4230 | [0.50] | Research in Food Science |
| FOOD*4310 | [0.50] | Food Safety Management Systems |
| FOOD*4400 | [0.50] | Dairy Processing |
| FOOD*4520 | [0.50] | Utilization of Cereal Grains for Human Food |
| MCS*3010 | [0.50] | Quality Management |
| POPM*4040 | [0.50] | Epidemiology of Food-borne Diseases |
| | | |

Credit Summary (20.00 Total Credits)

4.00 - 1st year science required

9.50 - Required in semesters 3-8

2.00 - Restricted electives

2.00 - Liberal Education electives

1.00 or 1.50 - Additional Science electives (See Note 3 above)

1.00 or 1.50 - Free electives (See Note 3 above)

Students not in the Food Science Major who are seeking further study in Food Science are encouraged to consider the Certificate in Food Science. See Special Study Opportunities, Chapter XI of the Calendar.

Food Science (Co-op) (FOOD:C)

Department of Food Science, Ontario Agricultural College

Program Requirements

The Co-op program in Food Science is a five year program, including four work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Food Science Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|---------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | Academic Semester 6 | COOP*2000 Work Term II |
| 4 | COOP*3000 Work Term III | COOP*4000 Work Term IV | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

4.00 - First year science required

9.50 - Required in semesters 3-8

2.00 - Restricted electives

2.00 - Liberal Education electives

1.00 or 1.50 - Additional Science electives (1.50 if MCS*3010 is chosen as a Restricted Elective)

1.00 or 1.50 - Free electives (1.00 if MCS*3010 is chosen as a Restricted Elective)

1.50 - Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00.

Students not in the Food Science Major who are seeking further study in Food Science are encouraged to consider the Certificate in Food Science. See Special Study Opportunities, Chapter XI of the Calendar.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology CHEM*1040 [0.50] General Chemistry I MATH*1080 [0.50] Elements of Calculus I PHYS*1080 [0.50] Physics for Life Sciences 0.50 Liberal Education electives Note: CIS*1200, rather than an Liberal Education credit is recommended for those needing to improve their computer skills. Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: https://www.uoguelph.ca/bsc/revised_SS Semester 2 - Winter BIOL*1080 [0.50] Biological Concepts of Health CHEM*1050 General Chemistry II [0.50] MATH*1090 [0.50] Elements of Calculus II PHYS*1070 [0.50] Physics for Life Sciences II 0.50 Liberal Education electives Summer Semester Off Semester 3 - Fall BIOC*2580 [0.50]Introduction to Biochemistry CHEM*2880 [0.50] Physical Chemistry COOP*1100 [0.00]Introduction to Co-operative Education FOOD*2150 Introduction to Nutritional and Food Science [0.50] MICR*2420 [0.50] Introduction to Microbiology 0.50 electives Semester 4 - Winter FOOD*2100 [0.50]Communication in Food Science FOOD*2620 [0.50] Food Engineering Principles NUTR*3210 [0.50] Fundamentals of Nutrition STAT*2040 [0.50] Statistics I 0.50 electives Summer Semester COOP*1000 [0.50] Co-op Work Term I Semester 5 - Fall FOOD*3030 [0.50]Food Chemistry I FOOD*3160 [0.75] Food Processing I FOOD*3230 [0.75] Food Microbiology 0.50 electives Semester 6 - Winter FOOD*3040 [0.50] Food Chemistry II FOOD*3170 [0.50] Food Processing II FOOD*3260 [0.50] Industrial Microbiology FOOD*3700 [0.50]Sensory Evaluation of Foods 0.50 electives Summer Semester Optional **Fall Semester** COOP*2000 Co-op Work Term II [0.50] Winter Semester COOP*3000 [0.50] Co-op Work Term III Semester 7 - Fall FOOD*4190 [0.50]Advanced Food Analysis FOOD*4260 [0.50] Food Product Development I 1.50 electives Semester 8 - Winter FOOD*4270 [0.50] Food Product Development II 2.00 electives Notes: 1. ENGL*1200 is recommended for those students needing to improve their English grammar. 2. FOOD*2150 could be replaced by FOOD*2010 with permission of department advisor. **Restricted Electives** F F

| FOOD*4070 | [0.50] | Food Packaging |
|-----------|--------|---------------------------------------------|
| FOOD*4090 | [0.50] | Functional Foods and Nutraceuticals |
| FOOD*4110 | [0.50] | Meat and Poultry Processing |
| FOOD*4220 | [0.50] | Topics in Food Science |
| FOOD*4230 | [0.50] | Research in Food Science |
| FOOD*4310 | [0.50] | Food Safety Management Systems |
| FOOD*4400 | [0.50] | Dairy Processing |
| FOOD*4520 | [0.50] | Utilization of Cereal Grains for Human Food |

| Geographic I | [nformati | on Systems (GIS) and Environmental Analysis |
|--------------|-----------|---------------------------------------------|
| POPM*4040 | [0.50] | Epidemiology of Food-borne Diseases |
| MCS*3010 | [0.50] | Quality Management |

Department of Geography, Environment and Geomatics, College of Social and **Applied Human Sciences**

Minor (Honours Program)

| A minimum of 5.00 credits is require | d, including the following 3.50 credits: |
|--------------------------------------|------------------------------------------|
|--------------------------------------|------------------------------------------|

| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
|---------------------|---------------|---------------------------------------------|
| GEOG*2420 | [0.50] | The Earth From Space |
| GEOG*2480 | [0.50] | Mapping and GIS |
| GEOG*3420 | [0.50] | Remote Sensing of the Environment |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| GEOG*4480 | [1.00] | Applied Geomatics |
| And at least 1.50 d | credits from: | |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| GEOG*3110 | [0.50] | Biotic and Natural Resources |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment |
| GEOG*4110 | [1.00] | Environmental Systems Analysis |
| GEOG*4210 | [0.50] | Environmental Governance |
| Human Kinet | tics (HK) | |

Department of Human Health and Nutritional Sciences, College of Biological Science

Human Kinetics is concerned with understanding capacities for, and limits of, human movement at different ages and with the role of physical activity in human health. Through the use of electives, students may structure a program emphasizing biomechanics and ergonomics, human population biology or nutrition, exercise and metabolism.

If lacking the fundamentals of word processing, spread sheet use and data management, the student should select CIS*1200 as early in the program as possible.

Major (Honours Program)

B.Sc. students who were not admitted directly into the Human Kinetics major from high school and subsequently wish to transfer to the specialization must apply directly to the Department of Human Health and Nutritional Science by the last day of classes in the winter semester.

To be eligible after first year, applicants must have successfully completed 4.0 science credits in a B.Sc. specialization with an average of 70% or better in BIOL*1070, BIOL*1080 and BIOL*1090. For students with a 65-69.9% average in these three courses, admission to the major will be competitive based on available spaces.

Students wishing to transfer after second year or third year must have an average of 70% or better in their last two semesters (total of best 4.00 science credits). For students with a 65-69.9%, admission to the major will be competitive based on available spaces.

All decisions regarding transfers will be made by the end of June.

To complete the major, a minimum of 20.00 credits are required.

Semester 1

| BIOL*1080 | [0.50] | Biological Concepts of Health |
|-----------|--------|-------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |

0.50 Liberal Education electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

Semester 2

| BIOL*1070 | [0.50] | Discovering Biodiversity | | | |
|--------------------|----------------------------------|------------------------------------------------|--|--|--|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | | |
| CHEM*1050 | [0.50] | General Chemistry II | | | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | | | |
| 0.50 Liberal Educa | tion electiv | es | | | |
| Semester 3 | | | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | | |
| HK*2270 | [0.50] | Principles of Human Biomechanics | | | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | | |
| STAT*2040 | [0.50] | Statistics I | | | |
| 0.50 Liberal Educa | 0.50 Liberal Education electives | | | | |
| Semester 4 | | | | | |
| HK*2810 | [0.50] | Human Physiology I - Concepts and Principles | | | |
| MCB*2050 | [0.50] | Molecular Biology of the Cell | | | |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition | | | |
| 0.50 electives | | | | | |
| 0.50 Liberal Educa | tion electiv | es | | | |
| Semester 5 | | | | | |
| HK*3600 | [0.75] | Applied Human Kinetics I | | | |
| HK*3810 | [0.75] | Human Physiology II - Integrated Systems | | | |
| NUTR*3360 | [0.50] | Lifestyle Genomics | | | |

| 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 ele | ectives |

Semester 8

One of

2.25 electives or restricted electives

Restricted Electives

- 1. A minimum of 2.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: https:// www.uoguelph.ca/bsc/
- 2. A minimum of 1.00 credits of restricted electives are required which must be selected from HK*4XXX, NUTR*4XXX (must be an approved B.Sc. Science Elective).

Credit Summary (20.00 Total Credits)

4.00 - First year science core

- 9.75 Required science courses semesters 3 8
- 1.00 Restricted elective (# 2 in restricted elective list)
- 1.25 Approved Science electives
- 2.00 Liberal Education electives (#1 in restricted electives list)
- 2.00 Free electives any approved electives for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Marine and Freshwater Biology (MFB)

Department of Integrative Biology, College of Biological Science

The Marine and Freshwater Biology major capitalizes on Guelph's recognized excellence in aquatic research and provides a broad perspective on aquatic environments based on the physical as well as the biological sciences. In this major, students will build upon core courses in ecology, evolution, genetics, and physiology of aquatic biota as they study freshwater and marine environments and work with aquatic organisms experimentally in the field and in the lab. They will have the opportunity to perform independent research projects under a variety of field and laboratory conditions to enhance their learning experience. The major prepares students for post-graduate work in the aquatic sciences, and provides a sound scientific background for students wishing to pursue careers in academia, government service, private sector (e.g., NGOs, fisheries, aquaculture, biotechnology, consulting), conservation, education and research.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A minimum total of 20.00 credits is required to complete the major.

Semester 1

| BIOL*1070 | [0.50] | Discovering Biodiversity | |
|----------------------------------|--------|---------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| MATH*1080 | [0.50] | Elements of Calculus I | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | |
| 0.50 Liberal Education electives | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

Semester 2

| BIOL*1080 | [0.50] | Biological Concepts of Health |
|------------------|--------------|------------------------------------------------|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| 0.50 Liberal Edu | cation elect | ives |
| Semester 3 | | |
| BIOL*2060 | [0.50] | Ecology |
| BIOL*2400 | [0.50] | Evolution |
| ZOO*2090 | [0.50] | Vertebrate Structure and Function |
| 1.00 electives* | | |

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Semester 4

| Semester . | | |
|--------------------|------------|-----------------------------------------------|
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| STAT*2230 | [0.50] | Biostatistics for Integrative Biology |
| ZOO*2700 | [0.50] | Invertebrate Morphology & Evolution |
| 0.50 electives* | | |
| Semester 5 | | |
| BIOL*3450 | [0.50] | Introduction to Aquatic Environments |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I |
| ZOO*3610 | [0.25] | Lab Studies in Animal Physiology I |
| ZOO*3700 | [0.50] | Integrative Biology of Invertebrates |
| Electives to a max | kimum of 2 | 2.75 total credits in this semester. |
| Semester 6 | | |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems |
| ZOO*3050 | [0.50] | Developmental Biology |
| ZOO*3620 | [0.50] | Comparative Animal Physiology II |
| ZOO*3630 | [0.25] | Lab Studies in Animal Physiology II |
| Electives to a max | kimum of 2 | 2.75 total credits in this semester. |
| Semester 7 | | |
| BIOL*4350 | [0.50] | Limnology of Natural and Polluted Waters |
| IBIO*4600 | [1.00] | Integrative Marine and Freshwater Research |
| 1.00 electives | | |
| Semester 8 | | |
| BIOL*4010 | [0.50] | Adaptational Physiology |
| ZOO*4330 | [0.50] | Biology of Fishes |
| ZOO*4570 | [0.50] | Marine Ecological Processes |
| 1.00 electives | | |

* CIS*1200 is recommended for those needing to improve their computer skills Electives

A minimum of 1.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: https://www.uoguelph.ca/bsc/

Credit Summary (20.00 Total Credits)

4.00 - First year science core

10.00 - Required science courses semesters 3 - 8

2.00 - Approved science electives

1.00 - Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. Students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Marine and Freshwater Biology (Co-op) (MFB:C)

Department of Integrative Biology, College of Biological Science

The Marine and Freshwater Biology major capitalizes on Guelph's recognized excellence in aquatic research and provides a broad perspective on aquatic environments based on the physical as well as biological sciences. In this major, you will build upon core courses in ecology, evolution, genetics, and physiology of aquatic biota as you study freshwater and marine environments and work with aquatic organisms experimentally in the field and in the lab. You will have the opportunity to perform independent research projects under a variety of field and laboratory conditions to enhance your learning experience. Work placements enable students to gain knowledge, skills and values appropriate for work with individuals and groups in a variety of settings. The major prepares students for post-graduate work in the aquatic sciences, and provides a sound scientific background for students wishing to pursue careers in academia, government service, private sector (e.g., NGOs, fisheries, aquaculture, biotechnology, consulting), conservation, education and research.

Program Requirements

The Co-op program in Marine and Freshwater Biology is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Marine and Freshwate | r Biology | Academic and | Co-op | Work | Term Schedule |
|----------------------|-----------|--------------|-------|------|---------------|
|----------------------|-----------|--------------|-------|------|---------------|

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |

| Year | Fall | Winter | Summer |
|------|--------------------------|---------------------|--------|
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

4.00 - First year science core

10.00 - Required science courses semesters 3 - 8

2.00 - Approved science electives

- 1.00 Liberal Education electives
- 3.00 Free electives any approved elective for B.Sc. Students
- 2.00 Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 22.50

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| BIOL*1070 | [0.50] | Discovering Biodiversity | | |
|----------------------------------|--------|---------------------------|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | | |
|) 50 Liberal Education electives | | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

Semester 2 - Winter

| BIOL*1080 | [0.50] | Biological Concepts of Health |
|------------------|---------------|------------------------------------------------|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| 0.50 Liberal Edu | acation elect | ives |
| Semester 3 - I | Fall | |
| BIOL*2060 | [0.50] | Ecology |
| BIOL*2400 | [0.50] | Evolution |

COOP*1100 [0.00] Introduction to Co-operative Education [0.50] ZOO*2090 Vertebrate Structure and Function

1.00 electives or restricted electives*

Semester 4 - Winter

| BIOC*2580 | [0.50] | Introduction to Biochemistry | |
|-----------------------------------------|--------|-----------------------------------------------|--|
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | |
| STAT*2230 | [0.50] | Biostatistics for Integrative Biology | |
| ZOO*2700 | [0.50] | Invertebrate Morphology & Evolution | |
| 0.50 electives or restricted electives* | | | |

Summer Semester

BIOL*3060

ZOO*3050

| COOP*1000 | [0.50] | Co-op Work Term I | | |
|---------------------------------------|----------------|----------------------------------------------------------|--|--|
| Semester 5 - I | Fall | | | |
| BIOL*3450 | [0.50] | Introduction to Aquatic Environments | | |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I | | |
| ZOO*3610 | [0.25] | Lab Studies in Animal Physiology I | | |
| ZOO*3700 | [0.50] | Integrative Biology of Invertebrates | | |
| Electives or rest | ricted electiv | ves to a maximum of 2.75 total credits in this semester. | | |
| Winter Semes | ster | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | | |
| Summer Sem | ester | | | |
| COOP*3000 | [0.50] | Co-op Work Term III | | |
| Semester 6 - I | Fall | | | |
| BIOL*4350 | [0.50] | Limnology of Natural and Polluted Waters | | |
| BIO*4600 | [1.00] | Integrative Marine and Freshwater Research | | |
| .00 electives or restricted electives | | | | |
| Semester 7 - V | Vinter | | | |

[0.50] Populations, Communities & Ecosystems [0.50] Developmental Biology

| ZOO*3620 | [0.50] | Comparative Animal Physiology II | | | | |
|------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------|--|--|--|--|
| ZOO*3630 | [0.25] | Lab Studies in Animal Physiology II | | | | |
| Electives or restr | Electives or restricted electives to a maximum of 2.75 total credits in this semester. | | | | | |
| Summer Seme | ester | | | | | |
| COOP*4000 | [0.50] | Co-op Work Term IV | | | | |
| Fall Semester | | - | | | | |
| COOP*5000 | [0.50] | Co-op Work Term V | | | | |
| Semester 8 - Winter | | | | | | |
| BIOL*4010 | [0.50] | Adaptational Physiology | | | | |
| ZOO*4330 | [0.50] | Biology of Fishes | | | | |
| ZOO*4570 | [0.50] | Marine Ecological Processes | | | | |
| 1.00 electives or restricted electives | | | | | | |
| * CIS*1200 is recommended for those needing to improve their computer skills | | | | | | |

Electives

A minimum of 1.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: https://www.uoguelph.ca/bsc/

Mathematical Science (MSCI)

Department of Mathematics & Statistics, College of Engineering and Physical Sciences Major (Honours Program)

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

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A total of 20.00 credits is required to complete the Major which includes at least 10.00 credits in Mathematics & Statistics, 0.50 credits in Computing and Information Science, and an additional 2.50 credits in an area of emphasis.

Note: Students majoring in Mathematical Science cannot minor in Mathematics or Statistics.

Semester 1

| CHEM*1040 MATH*1160 | [0.50] [0.50] | General Chemistry I Linear Algebra I | |
|-----------------------------------------------------------------------|------------------|------------------------------------------------|--|
| One of *** | | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
| 1.00 credits from: IPS*1500, or (MATH*1080, PHYS*1080) or (MATH*1200, | | | |

PHYS*1080)*

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at: https://www.uoguelph.ca/bsc/revised_SS

Semester 2

| CHEM*1050 | [0.50] | General Chemistry II | | |
|----------------------------------------|----------------------------------------|--------------------------------------------------|--|--|
| STAT*2040 | [0.50] | Statistics I | | |
| One of *** | | | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity | | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | |
| 1.00 credits from: | IPS*1510, | or (PHYS*1010 and 0.50 credits from : MATH*1090, | | |
| MATH*1210)** | | | | |
| Semester 3 | | | | |
| MATH*2200 | [0.50] | Advanced Calculus I | | |
| STAT*3100 | [0.50] | Introductory Mathematical Statistics I | | |
| One of: | | | | |
| CIS*1300 | [0.50] | Programming | | |
| CIS*1500 | [0.50] | Introduction to Programming | | |
| 1.00 electives or re | estricted ele | ctives | | |
| Semester 4 | | | | |
| MATH*2130 | [0.50] | Numerical Methods | | |
| STAT*2050 | [0.50] | Statistics II | | |
| 1.00 electives or restricted electives | | | | |
| Semester 5 | | | | |
| 2.50 electives or re | 2.50 electives or restricted electives | | | |
| Semester 6 | | | | |
| 2.50 electives or restricted electives | | | | |
| Semester 7 | | | | |
| 2.50 electives or restricted electives | | | | |
| Semester 8 | | | | |
| MATH*4440 | [0.50] | Case Studies in Mathematics and Statistics | | |
| 2.00 electives or restricted electives | | | | |

* Students entering the major in first year are strongly advised to take IPS*1500 or (MATH*1200, PHYS*1080). Students declaring the Energy and Mass Transfer, the Electricity and Systems, or the Signal Processing Area of Emphasis should take (MATH*1200, PHYS*1080).

** Students entering the major in first year are strongly advised to take IPS*1510 or (MATH*1210, PHYS*1010). Students declaring the Energy and Mass Transfer, the Electricity and Systems, or the Signal Processing Area of Emphasis should take (MATH*1210, PHYS*1010).

*** BIOL*1070 and BIOL*1090 are recommended if taking either the BINF or the BBM Area of Emphasis

RESTRICTED ELECTIVES

- 1. A minimum of 1.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: https:// www.uoguelph.ca/bsc/
- 2. 5.50 credits from either the Mathematics Stream or the Statistics Stream as follows:

3. 2.50 credits from an Area of Emphasis

Mathematics Stream:

| MATH*2000 | [0.50] | Proofs, Sets, and Numbers | |
|--------------------------------------------------------------------------------------|-----------|--------------------------------|--|
| MATH*2210 | [0.50] | Advanced Calculus II | |
| MATH*2270 | [0.50] | Applied Differential Equations | |
| MATH*3160 | [0.50] | Linear Algebra II | |
| MATH*3200 | [0.50] | Real Analysis | |
| 3.00 additional credits in MATH or STAT at the 3000 level or above of which at least | | | |
| 1.50 credits mus | t be MATH | at the 4000 level | |
| atistics Stream. | | | |

Statistics Stream:

STAT*3110 [0.50] Introductory Mathematical Statistics II STAT*3240 [0.50] Applied Regression Analysis 0.50 additional credits in MATH at 2000 level or above 1.00 additional credits in MATH or STAT at the 2000 level or above 3.00 additional credits in MATH or STAT at the 3000 level or above of which at least 1.50 credits must be STAT at the 4000 level

AREAS OF EMPHASIS

Students are required to complete one of the following Areas of Emphasis. Each Area of Emphasis is 2.50 credits from a single field of study.

BIOINFORMATICS (BINF)

| The following cr | redits must b | e taken: |
|------------------|---------------|-----------------------------------------------|
| BIOL*2400 | [0.50] | Evolution |
| BIOL*3020 | [0.50] | Population Genetics |
| BIOL*3040 | [0.50] | Methods in Evolutionary Biology |
| BIOL*3300 | [0.50] | Applied Bioinformatics |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| BIOMATHEMAT | ICAL OR I | BIOSTATISTICAL MODELLING (BBM) |

| The following credits must be taken: | | | | |
|---------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------|--|--|
| BIOL*2060 [0.50] | | Ecology | | |
| BIOL*2400 | [0.50] | Evolution | | |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems | | |
| BIOL*3130 | [0.50] | Conservation Biology | | |
| BIOL*4150 | [0.50] | Wildlife Conservation and Management | | |
| COMPUTER SCIEN | NCE (CS) | | | |
| The following cred | lits must be | taken: | | |
| CIS*2430 | [0.50] | Object Oriented Programming | | |
| CIS*2500 | [0.50] | Intermediate Programming | | |
| CIS*2520 | [0.50] | Data Structures | | |
| at least 1.00 credits | s from: | | | |
| CIS*3110 | [0.50] | Operating Systems I | | |
| CIS*3190 | [0.50] | Software for Legacy Systems | | |
| CIS*3490 | [0.50] | The Analysis and Design of Computer Algorithms | | |
| CIS*3530 | [0.50] | Data Base Systems and Concepts | | |
| Note: CIS*2750 is | recommen | ded in addition to the Area of Emphasis requirements | | |
| for students interested in Computer Science | | | | |
| ECONOMICS (ECO | DN) | | | |
| The following cred | The following credits must be taken: | | | |
| ECON*1050 | [0.50] | Introductory Microeconomics | | |
| ECON*1100 | [0.50] | Introductory Macroeconomics | | |
| ECON*2310 | [0.50] | Intermediate Microeconomics | | |
| at least 1.00 credits | s from: | | | |
| ECON*3100 | [0.50] | Game Theory | | |
| ECON*3710 | [0.50] | Advanced Microeconomics | | |
| ECON*4710 | [0.50] | Advanced Topics in Microeconomics | | |
| Note: ECON*1050 | Note: ECON*1050 and ECON*1100 are approved Liberal Education electives for | | | |
| B.Sc. students | | | | |
| ENERGY AND MASS TRANSFER (EMT) | | | | |
| The following credits must be taken: | | | | |
| ENGG*1210 | [0.50] | Engineering Mechanics I | | |

| ENGG*2230 | [0.50] | Fluid Mechanics | |
|---------------------------------------------------------------|--------|------------------------------|--|
| ENGG*2400 | [0.50] | Engineering Systems Analysis | |
| ENGG*3260 | [0.50] | Thermodynamics | |
| ENGG*3430 | [0.50] | Heat and Mass Transfer | |
| Note: No more than 3.00 credits in ENGG courses may be taken. | | | |

ELECTRICITY AND SYSTEMS (EAS) C 11 · 11.

| The following crec | lits must be | taken: |
|-----------------------|----------------|------------------------------|
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| ENGG*2450 | [0.50] | Electric Circuits |
| at least 1.00 credits | s from: | |
| ENGG*3410 | [0.50] | Systems and Control Theory |
| ENGG*3450 | [0.50] | Electronic Devices |
| ENGG*4460 | [0.50] | Robotic Systems |
| | a a a 1 | |

Note: No more than 3.00 credits in ENGG courses may be taken.

SIGNAL PROCESSING (SP)

| The following crea | lits must be | e taken: |
|--------------------|--------------|------------------------------------|
| ENGG*1210 | [0.50] | Engineering Mechanics I |
| ENGG*2400 | [0.50] | Engineering Systems Analysis |
| ENGG*2450 | [0.50] | Electric Circuits |
| ENGG*3390 | [0.50] | Signal Processing |
| ENGG*4660 | [0.50] | Medical Image Processing |
| Note: No more that | an 3.00 cred | lits in ENGG courses may be taken. |

INDIVIDUALIZED (IN)

It is required that 2.50 credits are taken from approved Science electives for B.Sc. students where 1.00 credits must be at the 3000 level or above. Students declaring an Individualized Area of Emphasis must have their choice of 2.50 credits approved by an academic advisor.

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

3.00 - Required science courses semesters 3 - 8

8.00 - Restricted electives (Stream and Area of Emphasis)

1.00 - Liberal Education electives (# 1 in restricted elective list)

3.00 - Free electives - any approved elective for B.Sc. students. (Could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

This requires 1.00 calculus credits and 4.00 other credits chosen from mathematics, statistics, and computing and information science. For these 4.00 credits students will choose at least 0.50 from each discipline. At least 1.00 credits must be at the 3000 level or above. CIS*2050 and CIS*3000 cannot be counted toward this minor. This minor cannot be combined with a major in Mathematics, Statistics, or Bachelor of Computing program.

Mathematics (MATH)

Department of Mathematics & Statistics, College of Engineering and Physical Sciences

Knowledge of mathematics is crucial for understanding our world. The Minor in Mathematics is designed to provide considerable flexibility for students to pursue their own mathematical interests, whether they be in the concepts of "pure" mathematics or techniques and applications. Students minoring in Mathematics will develop skills that are valued in many sectors such as business, education, government, and industry.

Minor (Honours Program)

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

(MATH*1090 or MATH*1210)**

| MATH*1160 | [0.50] | Linear Algebra I |
|-------------------|--------------------|-------------------------------------|
| MATH*2000 | [0.50] | Proofs, Sets, and Numbers |
| MATH*2200 | [0.50] | Advanced Calculus I |
| STAT*2040 | [0.50] | Statistics I |
| 0.50 additional M | Aathematics | credits at the 2000 level or above. |
| | · · · | |

1.50 additional Mathematics credits at the 3000 or 4000 level.

* IPS*1500 can count toward this 0.50 credit

** IPS*1510 can count toward this 0.50 credit

Note: Students majoring in Mathematical Science cannot minor in Mathematics.

Microbiology (MICR)

Department of Molecular and Cellular Biology, College of Biological Science

Microbiology programs are designed to give students a good understanding of microorganisms, including diversity, ecology, physiology, molecular genetics, current approaches in bacterial genomics/proteomics, and microbial associations with animal hosts and the environments. Such knowledge will provide the basis for further work with microbes in medicine, agricultural industries (including biotechnology, pharmaceuticals, food and beverage) and the environment (surveillance and bioremediation).

Students can take the B.Sc. program with a Major in Microbiology, or combine the minor with another major. Students should plan their programs in consultation with the microbiology faculty advisor. As course offerings may change during the program, students are strongly encouraged to review their plans at least once a year with their advisors, and to check the departmental website for program news.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor.

Semester 1

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biolog | |
|----------------------------------|--------|-----------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| MATH*1080 | [0.50] | Elements of Calculus I | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | |
| 0.50 Liberal Education electives | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

| Semester 2 | | | |
|----------------------------------|--------------|-----------------------------------------------|--|
| BIOL*1070 | [0.50] | Discovering Biodiversity | |
| BIOL*1080 | [0.50] | Biological Concepts of Health | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | |
| 0.50 Liberal Edu | cation elect | tives | |
| Semester 3 | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | |
| MICR*2420 | [0.50] | Introduction to Microbiology | |
| STAT*2040 | [0.50] | Statistics I | |
| 0.50 Liberal Education electives | | | |
| Semester 4 | | | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry | |
| MCB*2050 | [0.50] | Molecular Biology of the Cell | |
| MICR*2430 | [0.50] | Methods in Microbial Culture and Physiology | |
| 0.50 electives | | | |
| 0.50 Liberal Education electives | | | |
| ~ | | | |

Semester 5

| MBG*3080 | [0.50] | Bacterial Genetics |
|-----------|--------|---------------------------------|
| MICR*3420 | [0.50] | Microbial Diversity and Ecology |

| ment 5120 | [0.50] | interoolar Diversity and Deology | |
|----------------|---------------|----------------------------------|--|
| 1.50 electives | or restricted | electives | |

Semester 6

| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology |
|-----------|--------|-----------------------------------------|
| MICR*3260 | [0.50] | Microbial Adaptation |
| MCD*2420 | 10 751 | |

MICR*3430 Advanced Methods in Microbiology [0.75]A minimum of 0.50 electives or restricted electives

Semester 7

2.50 electives or restricted electives which can include MCB*4500

Semester 8

2.50 electives or restricted electives which can include MCB*4510

Restricted Electives

- 1. A minimum of 2.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: https:// www.uoguelph.ca/bsc/
- 2. 3.50 restricted elective credits of which 1.00 credits must be at the 4000 level.

| BIOC*4540 | [0.75] | Enzymology |
|-----------|--------|--------------------------------------------------|
| BIOC*4580 | [0.50] | Membrane Biochemistry |
| ENVS*3290 | [0.50] | Waterborne Disease Ecology |
| FOOD*3230 | [0.75] | Food Microbiology |
| FOOD*3240 | [0.50] | Food Microbiology |
| FOOD*3260 | [0.50] | Industrial Microbiology |
| FOOD*3270 | [0.50] | Industrial Microbiology |
| FOOD*4400 | [0.50] | Dairy Processing |
| MCB*3010 | [0.50] | Dynamics of Cell Function and Signaling |
| MCB*4500 | [1.00] | Research Project in Molecular & Cellular Biology |
| | | I |
| MCB*4510 | [1.00] | Research Project in Molecular & Cellular Biology |
| MCB*4600 | [0.50] | Topics in Molecular and Cellular Biology |
| MICR*3090 | [0.50] | Mycology |
| MICR*3220 | [0.50] | Plant Microbiology |
| | | |
| MICR*3230 | [0.50] | Immunology |
|---------------------|----------|----------------------------|
| MICR*3330 | [0.50] | World of Viruses |
| MICR*4010 | [0.50] | Pathogenic Microbiology |
| MICR*4330 | [0.50] | Molecular Virology |
| MICR*4430 | [0.50] | Medical Virology |
| MICR*4520 | [0.50] | Microbial Cell Biology |
| MICR*4530 | [0.50] | Immunology II |
| PATH*3040 | [0.50] | Principles of Parasitology |
| J:4 Carrier a mar (| 0 00 Tat | al Cruadita) |

Credit Summary (20.00 Total Credits)

4.00 - First year science core

6.50 - Required science courses semesters 3 - 8

3.50 - Restricted electives (#2 in restricted electives list)

2.00 - Approved Science electives

2.00 - Liberal Education electives (#1 in restricted electives list)

2.00 - Free electives - any approved electives for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

The minor in Microbiology consists of the following 5.00 credits including:

| BIOC*3560 | [0 50] | Structure and Function in Biochemistry | |
|-------------------------------|----------------|-----------------------------------------------|--|
| MICR*2420 | [0.50] | Introduction to Microbiology | |
| MICR*2430 | [0.50] | Methods in Microbial Culture and Physiology | |
| A minimum of 2.5 | 0 credits from | n. | |
| FOOD*2020 | | | |
| FOOD*3230 | [0.75] | Food Microbiology | |
| FOOD*3240 | [0.50] | Food Microbiology | |
| FOOD*3260 | [0.50] | Industrial Microbiology | |
| FOOD*3270 | [0.50] | Industrial Microbiology | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | |
| MBG*3080 | [0.50] | Bacterial Genetics | |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology | |
| MICR*3090 | [0.50] | Mycology | |
| MICR*3220 | [0.50] | Plant Microbiology | |
| MICR*3230 | [0.50] | Immunology | |
| MICR*3260 | [0.50] | Microbial Adaptation | |
| MICR*3330 | [0.50] | World of Viruses | |
| MICR*3420 | [0.50] | Microbial Diversity and Ecology | |
| MICR*3430 | [0.75] | Advanced Methods in Microbiology | |
| 1.00 credits from: | | | |
| MICR*4010 | [0.50] | Pathogenic Microbiology | |
| MICR*4330 | [0.50] | Molecular Virology | |
| MICR*4430 | [0.50] | Medical Virology | |
| MICR*4520 | [0.50] | Microbial Cell Biology | |
| MICR*4530 | [0.50] | Immunology II | |
| Microbiology (Co-op) (MICR:C) | | | |

Department of Molecular and Cellular Biology, College of Biological Science

Microbiology programs are designed to give students a good understanding of microorganisms, including diversity, ecology, physiology, molecular genetics, current approaches in bacterial genomics/proteomics, and microbial associations with animal hosts and the environments. Such knowledge will provide the basis for further work with microbes in medicine, agricultural industries (including biotechnology, pharmaceuticals, food and beverage) and the environment (surveillance and bioremediation).

Program Requirements

The Co-op program in Microbiology is a five year program, including four work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Microbiology Academic and Co-op Work Term Schedule | | | |
|----------------------------------------------------|----------------------------------|---------------------------|---------------------------|
| Year | Fall | Winter | Summer |
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | Academic Semester 6 | COOP*2000 Work Term II |
| 4 | COOP*3000 Work Term III | COOP*4000 Work Term IV | Off |
| 5 | Academic Semester 7 | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

4.00 - First year science required

- 6.50 Required science courses semesters 3 8
- 3.50 Restricted electives (# 2 in restricted electives list)
- 2.00 Approved Science electives
- 2.00 Liberal Education electives (#1 in restricted electives)
- 2.00 Free electives any approved electives for B.Sc. students.
- 1.50 Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fourth Co-op work term is optional and if completed, the total number of credits will equal 22.00.

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
|----------------------------------|--------|------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| MATH*1080 | [0.50] | Elements of Calculus I | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | |
| 0.50 Liberal Education electives | | | |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

Semester 2 - Winter

| BIOL*1070 | [0.50] | Discovering Biodiversity | | |
|----------------------------------|--------|-------------------------------|--|--|
| BIOL*1080 | [0.50] | Biological Concepts of Health | | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | | |
| 0.50 Liberal Education 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 Liberal Edu | acation elect | tives |
| Semester 4 - V | Winter | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| MICR*2430 | [0.50] | Methods in Microbial Culture and Physiology |
| 0.50 electives | | |
| 0.50 Liberal Edu | acation elect | tives |
| Summer Sem | ester | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 5 - I | Fall | |
| MBG*3080 | [0.50] | Bacterial Genetics |
| MICR*3420 | [0.50] | Microbial Diversity and Ecology |
| 1.50 electives or | restricted e | lectives |
| Semester 6 - V | Winter | |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology |
| MICR*3260 | [0.50] | Microbial Adaptation |
| MICR*3430 | [0.75] | Advanced Methods in Microbiology |
| A minimum of (|).50 elective | s or restricted electives |
| Summer - Ser | nester | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Fall Semester | | • |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Winter Semes | ster | * |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| | [0.00] | |

Semester 7 - Fall

2.50 electives or restricted electives which can include MCB*4500 Semester 8 - Winter

2.50 electives or restricted electives which can include MCB*4510

Restricted Electives

- A minimum of 2.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: <u>https:// www.uoguelph.ca/bsc/</u>
- 2. 3.50 restricted elective credits of which 1.00 credits must be at the 4000 level.

| BIOC*4540 | [0.75] | Enzymology |
|-----------|--------|-------------------------------------------------|
| BIOC*4580 | [0.50] | Membrane Biochemistry |
| ENVS*3290 | [0.50] | Waterborne Disease Ecology |
| FOOD*3230 | [0.75] | Food Microbiology |
| FOOD*3240 | [0.50] | Food Microbiology |
| FOOD*3260 | [0.50] | Industrial Microbiology |
| FOOD*3270 | [0.50] | Industrial Microbiology |
| FOOD*4400 | [0.50] | Dairy Processing |
| MCB*3010 | [0.50] | Dynamics of Cell Function and Signaling |
| MCB*4500 | [1.00] | Research Project in Molecular & Cellular Biolog |
| | | Ι |
| MCB*4510 | [1.00] | Research Project in Molecular & Cellular Biolog |
| MCB*4600 | [0.50] | Topics in Molecular and Cellular Biology |
| MICR*3090 | [0.50] | Mycology |
| MICR*3220 | [0.50] | Plant Microbiology |
| MICR*3230 | [0.50] | Immunology |
| MICR*3330 | [0.50] | World of Viruses |
| MICR*4010 | [0.50] | Pathogenic Microbiology |
| MICR*4330 | [0.50] | Molecular Virology |
| MICR*4430 | [0.50] | Medical Virology |
| MICR*4520 | [0.50] | Microbial Cell Biology |
| MICR*4530 | [0.50] | Immunology II |
| PATH*3040 | [0.50] | Principles of Parasitology |
| | | |

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 may wish to consult the Faculty Advisor.

Major (Honours Program)

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

| Sem | ester | I |
|------|-------|---|
| BIUI | *1000 | h |

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
|-----------|--------|------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| | | - |

0.50 Liberal Education electives

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-------------------|---------------|-----------------------------------------------|
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| CHEM*1050 | [0.50] | General Chemistry II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| 0.50 Liberal Educ | ation electiv | ves |
| Semester 3 | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| STAT*2040 | [0.50] | Statistics I |
| 0.50 Liberal Educ | ation electiv | /es |
| Semester 4 | | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
| CHEM*2700 | [0.50] | Organic Chemistry I |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| MICR*2430 | [0.50] | Methods in Microbial Culture and Physiology |
| 0.50 Liberal Educ | ation electiv | /es |
| Semester 5 | | |
| MBG*3040 | [0.50] | Molecular Biology of the Gene |

MBG*3350 [0.75] Laboratory Methods in Molecular Biology Electives or restricted electives to a maximum of 2.75 total credits in this semester. Semester 6

2.50 electives or restricted electives

Semester 7*

MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I 1.50 electives or restricted electives

Semester 8*

3.

MCB*4510 [1.00] Research Project in Molecular & Cellular Biology 1.50 electives or restricted electives

*instead of the 2 semester sequence of MCB*4500 / MCB*4510 students may choose to take MCB*4600 and 1.50 subject area electives at the 4000 level.

Restricted Electives

Note: Some courses have prerequisites, so be sure to consult the undergraduate calendar.

 A minimum of 2.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: <u>https://</u> www.uoguelph.ca/bsc/

2. Physiology Elective - 0.50 credits

| BIOM*3200 | [1.00] | Biomedical Physiology |
|---------------------|------------|-----------------------------------------------|
| BOT*3310 | [0.50] | Plant Growth and Development |
| HK*2810 | [0.50] | Human Physiology I - Concepts and Principles |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I |
| Subject Area Electi | ves - 2.50 | credits (4.00 if MCB*4600 is taken instead of |
| MCB*4500 and MC | B*4510) | |
| BIOL*3020 | [0.50] | Population Genetics |
| BIOL*3300 | [0.50] | Applied Bioinformatics |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| MBG*3050 | [0.50] | Human Genetics |
| MBG*3060 | [0.50] | Quantitative Genetics |
| MBG*3080 | [0.50] | Bacterial Genetics |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*3660 | [0.50] | Genomics |
| MBG*4030 | [0.50] | Animal Breeding Methods and Applications |
| MBG*4040 | [0.50] | Genetics and Molecular Biology of Development |
| MBG*4110 | [0.50] | Epigenetics |
| MBG*4160 | [0.50] | Plant Breeding |
| MBG*4240 | [0.50] | Applied Molecular Genetics in Medicine and |
| | | Biotechnology |
| MBG*4270 | [0.50] | DNA Replication, Recombination and Repair |
| MBG*4300 | [0.50] | Plant Molecular Genetics |
| MCB*3010 | [0.50] | Dynamics of Cell Function and Signaling |
| MCB*4010 | [0.50] | Advanced Cell Biology |
| MCB*4050 | [0.50] | Protein and Nucleic Acid Structure |
| MICR*3330 | [0.50] | World of Viruses |
| MICR*4330 | [0.50] | Molecular Virology |
| STAT*2050 | [0.50] | Statistics II |
| | | |

Credit Summary (20.00 Total Credits)

4.00 - First year science core

7.25 - Required science courses semesters 3 - 8

3.00 - Restricted electives (#2 and 3 in restricted electives list)

1.75 - Approved science electives

2.00 - Liberal Education electives (# 1 in restricted elective list)

2.00 - Free electives - any approved elective for B.Sc. Students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Molecular Biology and Genetics requires 5.00 credits in Molecular Biology and Genetics chosen in consultation with the faculty advisor, and will include:

| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
|-----------------|-----------------|-----------------------------------------------|
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| A minimum of 4. | .00 credits fro | om: |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
| BIOL*3020 | [0.50] | Population Genetics |
| BIOL*3300 | [0.50] | Applied Bioinformatics |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| MBG*3040 | [0.50] | Molecular Biology of the Gene |
| MBG*3050 | [0.50] | Human Genetics |
| MBG*3060 | [0.50] | Quantitative Genetics |
| MBG*3080 | [0.50] | Bacterial Genetics |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology |
| MBG*3660 | [0.50] | Genomics |
| | | |

| MBG*4030 | [0.50] | Animal Breeding Methods and Applications |
|----------------|--------|-----------------------------------------------|
| MBG*4040 | [0.50] | Genetics and Molecular Biology of Development |
| MBG*4110 | [0.50] | Epigenetics |
| MBG*4160 | [0.50] | Plant Breeding |
| MBG*4240 | [0.50] | Applied Molecular Genetics in Medicine and |
| | | Biotechnology |
| MBG*4270 | [0.50] | DNA Replication, Recombination and Repair |
| MBG*4300 | [0.50] | Plant Molecular Genetics |
| MCB*3010 | [0.50] | Dynamics of Cell Function and Signaling |
| MCB*4010 | [0.50] | Advanced Cell Biology |
| MCB*4050 | [0.50] | Protein and Nucleic Acid Structure |
| MICR*3330 | [0.50] | World of Viruses |
| MICR*4330 | [0.50] | Molecular Virology |
| Nanoscience () | NANO) | |

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

Major (Honours Program)

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

| Semester 1 | | |
|--------------------|------------|--------------------------------------------------|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1040 | [0.50] | General Chemistry I |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| NANO*1000 | [0.50] | Introduction to Nanoscience |
| Students who are l | acking one | 4U /grade 12 course in Biology, Chemistry or Phy |

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: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2

| [0.50] | General Chemistry II |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [1.00] | Integrated Mathematics and Physics II |
| [0.50] | Linear Algebra I |
| | |
| [0.50] | Discovering Biodiversity |
| [0.50] | Biological Concepts of Health |
| | |
| [0.50] | Structure and Bonding |
| [0.50] | Applied Differential Equations |
| [0.50] | Synthesis and Characterization of Nanomaterials I |
| [0.50] | Electricity and Magnetism I |
| | |
| [0.50] | Thermodynamics and Kinetics |
| [0.50] | Thermal Physics |
| | |
| [0.50] | Structure and Spectroscopy |
| [0.50] | Synthesis and Characterization of Nanomaterials II |
| [0.50] | Mechanics |
| | |
| | |
| [0.50] | Nanolithographic Techniques |
| [0.50] | Thin Film Science |
| | |
| [0.50] | Quantum Chemistry |
| [0.50] | Quantum Mechanics I |
| | |
| | |
| [0.50] | Spectroscopy of Nanomaterials |
| [0.50] | Computational Methods in Materials Science |
| | 1 |
| | |
| [0.50] | Biological Nanomaterials |
| [0.50] | Concepts in Quantum Computing |
| [0.50] | Concepts in Quantum Computing |
| | |
| [0 50] | Topics in Nanomaterials |
| [0.50] | topics in realonaterials |
| 3230 in se | mester 5 PHVS*2340 must be selected as an elective in |
| 5250 m 80 | mester 5, 11115 25+0 must be selected as all elective in |
| | [0.50] [1.00] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] |

Note: In semesters 7 and 8, the student must select to do either NANO*4900 or NANO*4910.

Areas of Focus

In completing the science requirements for the degree, some suggested complementary areas of focus are:

Chemistry: Inorganic

Semester 4: CHEM*2480 Semester 5: CHEM*3640 Semester 6: CHEM*3650 Semester 7: CHEM*4620 Semester 8: CHEM*2700

Chemistry: Organic

Semester 4: CHEM*2700 Semester 5: CHEM*3750 Semester 6: CHEM*3760 Semester 7: CHEM*4730 Semester 8: CHEM*2480, CHEM*4720

Chemistry: Physical/Analytical

Semester 4: CHEM*2480 Semester 5: CHEM*3860 Semester 6: CHEM*3430 or CHEM*3870 Semester 7: CHEM*3440

Semester 8: CHEM*3430 or CHEM*3870

Engineering

Semester 2: CIS*1500 Semester 4: ENGG*2450 Semester 5: ENGG*2410, ENGG*3450 Semester 6: ENGG*4550 Semester 7: ENGG*4080

Mathematics and Statistics

Semester 4: STAT*2040 Semester 5: STAT*3100 Semester 6: MATH*2130 Semester 7: MATH*4240 Semester 8: MATH*3160

Physics

Semester 4: PHYS*2340 Semester 5: MATH*2200, PHYS*3130 Semester 6: PHYS*3000 Semester 7: PHYS*4180, PHYS*4240 Semester 8: PHYS*4040, PHYS*4150 *Note: Courses marked with an asterisk may require addit

*Note: Courses marked with an asterisk may require additional prerequisites. Students should consult the relevant course descriptions for further information.

Credit Summary (20.00 Total Credits)

4.50 - First year science credits

8.00 - Required science courses semesters 3-8

 $0.50 \mbox{ or } 1.00\mbox{-} \mbox{Restricted}$ electives (either NANO 4900 (1.00) or NANO 4910 (0.50))

2.50 to 3.00 - Approved Science electives (depending on restricted elective chosen above) 1.00 - Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Nanoscience (NANO:C)

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

Program Requirements

The Co-op program in Nanoscience is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Nanoscience Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |

| Year | Fall | Winter | Summer |
|------|--------------------------|---------------------|--------|
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

4.50 - First year science core

8.00 - Required science courses semesters 3 - 8

0.50 or 1.00 - Restricted electives (either NANO 4900 (1.00) or NANO 4910 (0.50))

2.50 to 3.00 - Approved Science electives (depending on restricted elective chosen above) 1.00 - Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

2.00 - Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 22.50

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
|--------------------------------------------------------------------------------|--------|------------------------------------------------|--|
| CHEM*1040 | [0.50] | General Chemistry I | |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I | |
| NANO*1000 | [0.50] | Introduction to Nanoscience | |
| Students who are lacking one AU/grade 12 course in Biology Chemistry or Physic | | | |

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: <u>https://www.uoguelph.ca/bsc/revised_SS</u>

Semester 2 - Winter CHEM*1050 General Chemistry II [0.50]IPS*1510 [1.00] Integrated Mathematics and Physics II MATH*1160 [0.50] Linear Algebra I One of: BIOL*1070 [0.50] Discovering Biodiversity BIOL*1080 [0.50] Biological Concepts of Health Semester 3 - Fall CHEM*2060 [0.50] Structure and Bonding COOP*1100 [0.00] Introduction to Co-operative Education MATH*2270 [0.50] Applied Differential Equations NANO*2000 [0.50] Synthesis and Characterization of Nanomaterials I PHYS*2330 [0.50] Electricity and Magnetism I One of: CHEM*2820 [0.50] Thermodynamics and Kinetics PHYS*2240 [0.50] Thermal Physics Semester 4 - Winter CHEM*2070 [0.50] Structure and Spectroscopy NANO*2100 [0.50] Synthesis and Characterization of Nanomaterials II PHYS*2310 [0.50] Mechanics 1.00 electives* Summer Semester COOP*1000 [0.50] Co-op Work Term I Semester 5 - Fall NANO*3200 Nanolithographic Techniques [0.50]NANO*3500 [0.50] Thin Film Science One of: CHEM*3860 [0.50] Quantum Chemistry PHYS*3230 [0.50] Quantum Mechanics I 1.00 electives Winter Semester COOP*2000 [0.50] Co-op Work Term II (8-month work term in conjunction with COOP*3000) Summer Semester

Co-op Work Term III

(8-month work term in conjunction with COOP*2000) Semester 6 - Fall **Biological Nanomaterials** NANO*4100 [0.50] NANO*4700 Concepts in Quantum Computing [0.50]1.50 electives Semester 7 - Winter NANO*3300 [0.50] Spectroscopy of Nanomaterials NANO*3600 [0.50] Computational Methods in Materials Science 1.50 electives Summer Semester COOP*4000 Co-op Work Term IV [0.50] **Fall Semester** COOP*5000 [0.50] Co-op Work Term V Semester 8 -- Winter NANO*4200 Topics in Nanomaterials [0.50]2.00 electives * To take PHYS*3230 in semester 5, then PHYS*2340 must be selected as an elective in semester 4.

Note: In semesters 7 and 8, the student must select to do either NANO*4900 or NANO*4910.

Neuroscience (NEUR)

Departments of Biomedical Sciences (Ontario Veterinary College), Human Health and Nutritional Sciences (College of Biological Science), Molecular & Cellular Biology (College of Biological Science), and Psychology (College of Social and Applied Human Science).

Major (Honours Program)

This Honours program provides a foundation in the natural sciences and an opportunity to develop advanced knowledge of nervous system structure and function, and the skills required for independent inquiry within neuroscience. The specialization is unique in its emphasis on integrative/interdisciplinary problem solving. Through the use of electives, students may structure a program that emphasizes molecular and biomedical neuroscience, behavioural and cognitive neuroscience, or comparative neuroscience.

The major prepares students for professional programs in health science (medical, physiotherapy, pharmacy, veterinary medicine, nursing), post-graduate degrees in neuroscience research, and provides a strong foundation for students wishing to pursue careers in the pharmaceutical and biotechnology industries, public health, teaching, and scientific publishing & journalism.

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult with a Faculty Advisor. A minimum total of 20.00 credits is required to complete the major.

Semester 1

| BIOL*1080 | [0.50] | Biological Concepts of Health |
|---------------------|----------------|------------------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| 0.50 Liberal Educ | cation electiv | ve |
| Students lacking | Grade 12 or 4 | 4U Biology, Chemistry or Physics should follow the revised |
| schedule of study | for this maj | or found at: https://www.uoguelph.ca/bsc/revised_SS |
| Semester 2 | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| PSYC*1000 | [0.50] | Introduction to Psychology |
| Semester 3 | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| NEUR*2000 | [0.50] | Introduction to Neuroscience |
| One of: | | |
| STAT*2040 | [0.50] | Statistics I |
| PSYC*1010 | [0.50] | Making Sense of Data in Psychological Research |
| 0.50 Liberal Educ | cation electiv | ve |
| Semester 4 | | |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| PHYS*2030 | [0.50] | Biophysics of Excitable Cells |
| PSYC*3410 | [0.50] | Behavioural Neuroscience II |
| 1.00 electives or i | restricted ele | ectives |
| Note: Physiology | restricted el | ective (# 3) must be taken before registering in BIOM*3090 |
| in semester 6. | | |
| Semester 5 | | |
| | | |

2019-2020 Undergraduate Calendar

[0.50]

COOP*3000

| NEUR*3100 | [0.50] | Molecular Biology of Neurodevelopmental and |
|-------------------|----------------|--------------------------------------------------------------|
| | | Degenerative Disease |
| PSYC*3270 | [0.50] | Cognitive Neuroscience |
| 1.00 electives or | restricted e | lectives |
| Note:Physiology | v restricted e | elective (# 3) must be taken before registering in BIOM*3090 |
| in semester 6. | | |
| Semester 6 | | |
| BIOM*3090 | [0.50] | Principles of Pharmacology |
| NEUR*3500 | [0.50] | Techniques in Neuroscience |
| 1.50 electives or | restricted e | lectives |
| Semester 7 | | |
| NEUR*4000 | [0.50] | Current Issues in Neuroscience |
| NEUR*4100 | [0.50] | Neuropharmacology |
| 1.50 electives or | restricted e | lectives |
| Semester 8 | | |

Semester 8

4

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. *Indicates courses that require additional prerequisites.

1. A minimum of 0.50 credits of Critical thinking/ Philosophy / Ethics from:

| BIOM*3210 | [0.50] | Critical Thinking in the Health Sciences |
|-----------|--------|------------------------------------------|
| PHIL*2100 | [0.50] | Critical Thinking |
| PHIL*2110 | [0.50] | Formal Logic |
| PHIL*2120 | [0.50] | Ethics |
| PHIL*2180 | [0.50] | Philosophy of Science |
| PHIL*2240 | [0.50] | Knowledge and Belief |
| | | |

Note: if a PHIL course is completed from this list, students are required to take an additional 0.50 credit approved science course as an elective to ensure the minimum science requirement is met.

2. A minimum of 0.50 credits of Developmental Biology

| BIOM*3040 | [0.75] | Medical Embryology * | | |
|--------------------------------------------|--------|-------------------------------|--|--|
| MBG*3040 | [0.50] | Molecular Biology of the Gene | | |
| ZOO*3050 | [0.50] | Developmental Biology | | |
| 3. A minimum of 0.50 credits of Physiology | | | | |
| DIOM#2200 | F1 001 | D'ana d'a d Dhara' da an | | |

| BIOM*3200 | [1.00] | Biomedical Physiology |
|----------------|-------------|------------------------------------------------|
| HK*2810 | [0.50] | Human Physiology I - Concepts and Principles |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I * |
| NOTE: If HK*28 | 810 is comp | leted in Semester 4, HK*3810 must be completed |

in Semester 5 in order to meet the BIOM*3090 pre-requisite requirement

| A minimum of 0.50 | credits of ad | lditional statistics or experimental design |
|-------------------|---------------|---------------------------------------------|
| PSYC*2360 | [0.50] | Psychological Methods and Statistics |
| STAT*2050 | [0.50] | Statistics II |

5. A minimum of 1.00 credits of Independent Study

For students who are interested in graduate studies, a research course is recommended.

* Indicates courses that have additional prerequisites.

** faculty advisor will determine if this course is an eligible science elective, depending on the instructor and topic

| - | | - |
|-------------|--------|--------------------------------------------------|
| BIOM*4500 | [0.50] | Literature-based Research in Biomedical Sciences |
| BIOM*4510 | [1.00] | Research in Biomedical Sciences |
| BIOM*4521/2 | [2.00] | Research in Biomedical Sciences |
| 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 |
| IBIO*4500 | [1.00] | Research in Integrative Biology I |
| IBIO*4510 | [1.00] | Research in Integrative Biology II |
| IBIO*4521/2 | [2.00] | Thesis in Integrative Biology |
| MCB*4500 | [1.00] | Research Project in Molecular & Cellular Biology |
| | | I * |
| MCB*4510 | [1.00] | Research Project in Molecular & Cellular Biology |
| | | * |
| MCB*4600 | [0.50] | Topics in Molecular and Cellular Biology * |
| NEUR*4401/2 | [1.00] | Research in Neurosciences |
| NEUR*4450 | [1.00] | Research in Neurosciences |
| PSYC*3240 | [0.50] | Independent Research Project ** |
| PSYC*4240 | [0.50] | Advanced Independent Research Project ** |
| PSYC*4870 | [0.50] | Honours Thesis I ** |
| PSYC*4880 | [1.00] | Honours Thesis II ** |
| | | |
| | | |

Lists of recommended electives

The following lists contain recommended electives for students wishing to emphasize particular areas in neuroscience.

*Indicates courses that require additional prerequisites.

. .

| Psychology | | |
|---------------------------|------------|-------------------------------------------------|
| PSYC*2330 | [0.50] | Principles of Learning |
| PSYC*2390 | [0.50] | Sensation and Perception |
| PSYC*2650 | [0.50] | Cognitive Psychology |
| PSYC*3030 | [0.50] | Neurochemical Basis of Behaviour * |
| PSYC*3100 | [0.50] | Evolutionary Psychology * |
| PSYC*3330 | [0.50] | Memory and Attention * |
| PSYC*3410 | [0.50] | Behavioural Neuroscience II |
| PSYC*4470 | [0.50] | Advanced Topics in Behavioural and Cognitive |
| | | Neuroscience |
| PSYC*4750 | [0.50] | Seminar in Motivation and Emotion |
| Computation, Mo | deling and | Statistics |
| CIS*1300 | [0.50] | Programming |
| CIS*2500 | [0.50] | Intermediate Programming * |
| MATH*1090 | [0.50] | Elements of Calculus II |
| MATH*1160 | [0.50] | Linear Algebra I |
| MATH*2270 | [0.50] | Applied Differential Equations * |
| MATH*3510 | [0.50] | Biomathematics * |
| PSYC*3250 | [0.50] | Psychological Measurement * |
| PSYC*3290 | [0.50] | Conducting Statistical Analyses in Psychology * |
| STAT*3240 | [0.50] | Applied Regression Analysis * |
| Biological Science | | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry |
| BIOC*4580 | [0.50] | Membrane Biochemistry * |
| BIOM*4070 | [0.50] | Biomedical Histology * |
| MBG*3050 | [0.50] | Human Genetics |
| MCB*3010 | [0.50] | Dynamics of Cell Function and Signaling |
| MCB*4010 | [0.50] | Advanced Cell Biology * |
| ZOO*3000 | [0.50] | Comparative Histology * |
| Health & Disease | | |
| BIOM*3040 | [0.75] | Medical Embryology * |
| BIOM*4030 | [0.50] | Endocrine Physiology * |
| BIOM*4050 | [0.50] | Biomedical Aspects of Aging * |
| HK*3100 | [0.50] | Neuromuscular Physiology * |
| HK*3810 | [0.75] | Human Physiology II - Integrated Systems * |
| HK*4070 | [0.50] | Clinical Biomechanics * |
| TOX*4000 | [0.50] | Medical Toxicology |

Credit Summary (20.00 Total Credits)

4.00 - First year science core

7.00 - Required science courses semester 3-8

3.00 - Restricted elective (#1,2,3,4,5 in restricted electives list)

2.00 - Approved Science elective*

0.50 - Required Liberal Education elective (PSYC*1000)

1.00 - Liberal Education electives

2.50 - Free electives

Of the 20 total credits required, students must complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

*2.50 Approved Science Electives if a PHIL*XXXX course is selected for restricted electives #1

Minor (Honours Program)

A minor in Neuroscience requires a minimum of 5.00 credits including:

| II minor mi i couro | ri minor mi teurosetenee requires u minimum or ereo ereuns meruumg. | | | |
|---------------------------------|---------------------------------------------------------------------|------------------------------------------------|--|--|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | |
| PSYC*1000 | [0.50] | Introduction to Psychology | | |
| PSYC*2330 | [0.50] | Principles of Learning | | |
| One of: | | | | |
| NEUR*2000 | [0.50] | Introduction to Neuroscience | | |
| PSYC*2410 | [0.50] | Behavioural Neuroscience I | | |
| One of: | | | | |
| PSYC*1010 | [0.50] | Making Sense of Data in Psychological Research | | |
| STAT*2040 | [0.50] | Statistics I | | |
| A minimum of 0.50 credits from: | | | | |
| BIOM*2000 | [0.50] | Concepts in Human Physiology | | |
| BIOM*3200 | [1.00] | Biomedical Physiology | | |
| HK*2810 | [0.50] | Human Physiology I - Concepts and Principles | | |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I | | |
| A minimum of 2. | 00 credits fro | om: | | |
| BIOM*3000 | [0.50] | Functional Mammalian Neuroanatomy | | |
| BIOM*3090 | [0.50] | Principles of Pharmacology | | |
| BIOM*4030 | [0.50] | Endocrine Physiology | | |

| | HK*3100 | [0.50] | Neuromuscular Physiology |
|----|-----------------------|----------------|-----------------------------------------------------------|
| | MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| | MBG*3050 | [0.50] | Human Genetics |
| | MCB*2050 | [0.50] | Molecular Biology of the Cell |
| | NEUR*3100 | [0.50] | Molecular Biology of Neurodevelopmental and |
| | | | Degenerative Disease |
| | NEUR*4000 | [0.50] | Current Issues in Neuroscience |
| | NEUR*4100 | [0.50] | Neuropharmacology |
| | PHYS*2030 | [0.50] | Biophysics of Excitable Cells |
| | PHYS*2330 | [0.50] | Electricity and Magnetism I |
| | PSYC*2390 | [0.50] | Sensation and Perception |
| | PSYC*2650 | [0.50] | Cognitive Psychology |
| | PSYC*3030 | [0.50] | Neurochemical Basis of Behaviour |
| | PSYC*3270 | [0.50] | Cognitive Neuroscience |
| | PSYC*3330 | [0.50] | Memory and Attention |
| | PSYC*3410 | [0.50] | Behavioural Neuroscience II |
| | PSYC*4750 | [0.50] | Seminar in Motivation and Emotion |
| 0 | f the 2.00 additional | credits, stu | idents may select one course from: |
| | BIOM*3040 | [0.75] | Medical Embryology |
| | MBG*4040 | [0.50] | Genetics and Molecular Biology of Development |
| | ZOO*3050 | [0.50] | Developmental Biology |
| DI | looso noto that some | of the next mi | ated electives require prerequisites that are not include |

Please note that some of the restricted electives require prerequisites that are not included in the minor.

Nutritional and Nutraceutical Sciences (NANS)

Department of Human Health and Nutritional Sciences, College of Biological Science

The Nutritional and Nutraceutical Sciences major is concerned with understanding the contribution of food, beverage and nutritional supplement consumption to growth, development of optimal biological function, maintenance of health, and treatment of disease.

If lacking the fundamentals of word processing, spread sheet use and data management, the student should select CIS*1200 as early in the program as possible.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A total of 20.00 credits is required.

Semester 1

| | [0.50] | Diclosical Concents of Health | N | |
|----------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------|----|--|
| BIOL*1080 | [0.50] | General Chemistry I | | |
| CHEMI*1040 | [0.50] | Elements of Colonius I | | |
| MATH*1080 | [0.50] | Elements of Calculus I | A | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | | |
| 0.50 Liberal Educa | tion electiv | es | | |
| schedule of study f | rade 12 or 4 for this majo | or found at <u>https://www.uoguelph.ca/bsc/revised_SS</u> | | |
| Semester 2 | | | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity | an | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II | | |
| 0.50 Liberal Educa | tion electiv | es | | |
| Semester 3 | | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | |
| STAT*2040 | [0.50] | Statistics I | | |
| 0.50 electives or re | stricted elec | ctives | | |
| 0.50 Liberal Educa | tion electiv | es | | |
| Semester 4 | | | | |
| BIOC*3560 | [0.50] | Structure and Function in Biochemistry | | |
| HK*2810 | [0.50] | Human Physiology I - Concepts and Principles | | |
| MCB*2050 | [0.50] | Molecular Biology of the Cell | | |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition | | |
| 0.50 Liberal Educa | tion electiv | es | | |
| Semester 5 | | | | |
| HK*3810 | [0.75] | Human Physiology II - Integrated Systems | | |
| NUTR*3330 | [0.50] | Micronutrients, Phytochemicals and Health | | |
| NUTR*3360 | [0.50] | Lifestyle Genomics | | |
| NUTR*3390 | [0.75] | Applied Nutritional and Nutraceutical Sciences I | | |
| Semester 6 | | | | |
| BIOM*3090 | [0.50] | Principles of Pharmacology | | |
| NUTR*4090 | [0.50] | Functional Foods and Nutraceuticals | | |
| NUTR*4320 | [0.50] | Nutrition and Metabolic Control of Disease | Р | |
| NUTR*4330 | [0.75] | Applied Nutritional and Nutraceutical Sciences II | C | |
| Electives or restricted electives to a maximum of 2.75 total credits in this semester. | | | | |
| | | | | |

Semester 7

| NUTR*4210 | [0.50] | Nutrition, Exercise and Energy Metabolism |
|-----------|--------|-------------------------------------------|
| NUTR*4510 | [0.50] | Toxicology, Nutrition and Food |

NUTR*4510 [0.50] Toxicology, Nutrition 1.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

Restricted Electives

 A minimum of 2.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: <u>https://</u> www.uoguelph.ca/bsc/

2. 1.00 credits from the following:

| HK*4230 | [0.50] | Advanced Study in Human Health and Nutritional Sciences |
|-----------|--------|---------------------------------------------------------|
| HK*4340 | [0.50] | Genomics: Exercise and Disease |
| HK*4360 | [1.00] | Research in Human Health and Nutritional Sciences |
| HK*4371/2 | [1.00] | Research in Human Health and Nutritional Sciences II |
| HK*4510 | [1.00] | Teaching, Learning & Knowledge Transfer |
| HK*4511/2 | [1.00] | Teaching, Learning & Knowledge Transfer II |
| HK*4460 | [0.50] | Regulation of Human Metabolism |
| NUTR*4360 | [0.50] | Current Issues in Nutrigenomics |
| PATH*3610 | [0.50] | Principles of Disease |
| | | |

Credit Summary (20.00 Total Credits)

4.00 - First year science core

9.25 - Required science courses semesters 3 - 8

1.00 - Restricted electives (#2 in restricted electives list)

1.75 - Approved science electives

2.00 - Liberal Education electives (#1 in restricted electives list)

2.00 - Free electives - any approved electives for B.Sc. students.

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Nutritional and Nutraceutical Sciences (NANS) requires 5.00 credits as follows:

| | | ······································ |
|----------------------|-----------|------------------------------------------------------------|
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| NUTR*3330 | [0.50] | Micronutrients, Phytochemicals and Health |
| NUTR*4090 | [0.50] | Functional Foods and Nutraceuticals |
| STAT*2040 | [0.50] | Statistics I |
| At least 0.50 cred | its from: | |
| ANSC*3080 | [0.50] | Agricultural Animal Physiology (restricted to ABIO majors) |
| BIOM*3200 | [1.00] | Biomedical Physiology |
| HK*2810 | [0.50] | Human Physiology I - Concepts and Principles |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I |
| and 2.00 credits fi | rom: | 1 2 20 |
| ANSC*3170 | [0.50] | Nutrition of Fish and Crustacea |
| ANSC*3180 | [0.50] | Wildlife Nutrition |
| ANSC*4260 | [0.50] | Beef Cattle Nutrition |
| ANSC*4270 | [0.50] | Dairy Cattle Nutrition |
| ANSC*4280 | [0.50] | Poultry Nutrition |
| ANSC*4290 | [0.50] | Swine Nutrition |
| ANSC*4560 | [0.50] | Pet Nutrition |
| EQN*4020 | [0.50] | Advanced Equine Nutrition |
| FOOD*2010 | [0.50] | Principles of Food Science |
| HK*3810 | [0.75] | Human Physiology II - Integrated Systems |
| HK*4230 | [0.50] | Advanced Study in Human Health and Nutritional |
| | | Sciences |
| HK*4340 | [0.50] | Genomics: Exercise and Disease |
| HK*4360 | [1.00] | Research in Human Health and Nutritional Sciences |
| HK*4371/2 | [1.00] | Research in Human Health and Nutritional Sciences II |
| HK*4510 | [1.00] | Teaching, Learning & Knowledge Transfer |
| HK*4511/2 | [1.00] | Teaching, Learning & Knowledge Transfer II |
| NUTR*2150 | [0.50] | Introduction to Nutritional and Food Sciences |
| NUTR*3360 | [0.50] | Lifestyle Genomics |
| NUTR*3390 | [0.75] | Applied Nutritional and Nutraceutical Sciences I |
| NUTR*4210 | [0.50] | Nutrition, Exercise and Energy Metabolism |
| NUTR*4320 | [0.50] | Nutrition and Metabolic Control of Disease |
| NUTR*4330 | [0.75] | Applied Nutritional and Nutraceutical Sciences II |
| NUTR*4360 | [0.50] | Current Issues in Nutrigenomics |
| NUTR*4510 | [0.50] | Toxicology, Nutrition and Food |
| Physical Scie | nce (PSCI | |

College of Engineering and Physical Sciences

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. This major will require the completion of 20.00 credits as indicated below:

1. Basic Science Core - 4.00 credits

1.00 - Biology (BIOL*1070, BIOL*1080, BIOL*1090)

1.00 - Chemistry (CHEM*1040, CHEM*1050)*

1.00 - Physics [PHYS*1080, (1 of PHYS*1010, PHYS*1070, PHYS*1130)]*

1.00 - Mathematical Science [(MATH*1080, MATH*1090) or (MATH*1200, MATH*1210)]

* IPS*1500 can be taken instead of PHYS*1080 and MATH*1200, and IPS*1510 can be taken instead of PHYS*1010 and MATH*1210.

2. Subject Area Core - 8.00 credits

0.50 STAT*2040

0.50 (1 of CIS*1200, CIS*1300, 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. Liberal Education - 2.00

2.00 acceptable Liberal Education 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*1080 | [0.50] | Physics for Life Sciences |
| PHYS*1130 | [0.50] | Physics with Applications |
| One of: | | |
| MATH*1080 | [0.50] | Elements of Calculus I |
| MATH*1200 | [0.50] | Calculus I |
| * IPS*1500 car | n be taken ir | nstead of PHYS*1080 and MATH*1200. |
| One of | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| 0.50 Liberal Educ | ation electiv | /es |
| Students lacking C | Grade 12 or 4 | 4U Biology, Chemistry or Physics should follow the revised |
| schedule of study | for this maj | or found at: https://www.uoguelph.ca/bsc/revised_SS |
| Semester 2 | | |
| CHEM*1050 | [0 50] | General Chemistry II |
| One of: | [0.50] | General Chemistry H |
| PHYS*1010 | [0,50] | Introductory Electricity and Magnetism |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| One of: | [0.00] | |
| MATH*1210 | [0,50] | Calculus II |
| MATH*1090 | [0.50] | Elements of Calculus II |
| IPS*1510 can b | be taken inst | tead of PHYS*1010 and MATH*1210. |
| One of | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| 0.50 Liberal Educ | ation electiv | /es |
| Semester 3 | | |
| 1 50 science electi | ives from th | a approved list of acceptable R Sc. science electives* |
| 0.50 electives | ives nom u | e approved list of acceptable D.Sc. science electives |
| One of: | | |
| CIS*1200 | [0 50] | Introduction to Computing |
| CIS*1200 | [0.50] | Programming |
| CIS*1500 | [0.50] | Introduction to Programming |
| OR | [0.50] | introduction to Programming |
| STAT*2040 | [0 50] | Statistics I |
| Semester 4 | [0.50] | Statistics I |
| 1.50 | | |
| 1.50 science electi | ives from th | e approved list of B.Sc. science electives* |
| 0.50 electives | | |
| One of: | | |
| CIS*1200 | [0.50] | Introduction to Computing |
| CIS*1300 | [0.50] | Programming |
| CIS*1500 | [0.50] | Introduction to Programming |
| (if a statistics cour | se is chosei | n in Semester 3) |

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: https:// /www.uoguelph.ca/bsc/Approved_electives

Credit Summary (20.00 Total Credits)

4.00 - First year science credits

8.00 - Subject area core semesters 3 - 8 (including STAT 2040 and CIS 1200 or CIS 1500)

4.00 - Approved Science electives

2.00 - Liberal Education electives (# 1 in restricted elective list)

2.00 - Free electives - any approved elective for B.Sc. students. (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Honours Physical Science (With a Minor)

The requirements and schedules are the same as for Honours Physical Science. Available Minor subjects are listed at the beginning of the B.SC. Program section under the heading Honours Program Minors.

Physics (PHYS)

Department of Physics, College of Engineering and Physical Sciences

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. Since some of the required courses are not offered every semester, students entering the Major in Honours Physics should plan their program in consultation with the Department of Physics Faculty Advisor.

Major (Honours Program)

This major requires the completion of 20.00 credits. At least 1.00 credits must be from Arts and/or Social Science courses.

Semester 1*

1 1

| CHEM*1040 | [0.50] | General Chemistry I |
|-----------|--------|--------------------------------------|
| CIS*1300 | [0.50] | Programming |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |

BIOL*1090 [0.50]Introduction to Molecular and Cellular Biology 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: https://www.uoguelph.ca/bsc/revised_SS

Semester 2*

| CHEM*1050 | [0.50] | General Chemistry II Integrated Mathematics and Physics II |
|-----------|--------|---------------------------------------------------------------|
| MATH*1160 | [1.00] | Linear Algebra I |
| One of: | [0.50] | Lineal Algeora I |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0 50] | Biological Concepts of Health |

Biological Concepts of Health [0.50]

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology * students who have taken physics courses other than IPS*1500 or PHYS*1080 in Semester 1 and IPS*1510 or PHYS*1010 in Semester 2, may proceed to semester 3 with the permission of the Department of Physics

Semester 3 MATH*2200 Advanced Calculus I [0.50] MATH*2270 [0.50] Applied Differential Equations [0.50] PHYS*2240 Thermal Physics PHYS*2330 [0.50]Electricity and Magnetism I 0.50 Liberal Education electives Semester 4 PHYS*2180 [0.50] Experimental Techniques in Physics PHYS*2310 [0.50] Mechanics PHYS*2340 [0.50] Electricity and Magnetism II 1.00 electives Semester 5 IPS*3000 [0.50] Science Communication PHYS*3130 [0.50] Mathematical Physics

| PHYS*3230 | [0.50] | Quantum Mechanics I |
|-------------------|--------|--------------------------------------------|
| PHYS*3400 | [0.50] | Advanced Mechanics |
| 0.50 electives | | |
| Semester 6 | | |
| NANO*3600 | [0.50] | Computational Methods in Materials Science |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications |
| PHYS*3510 | [0.50] | Intermediate Laboratory |
| PHYS*4040 | [0.50] | Quantum Mechanics II |
| One of: | | |
| MATH*3260 | [0.50] | Complex Analysis |
| 0.50 electives | | |
| Semester 7+ | | |
| PHYS*4500 | [0.50] | Advanced Physics Laboratory |
| PHYS*4180 | [0.50] | Advanced Electromagnetic Theory |
| One of: | | |
| PHYS*4240 | [0.50] | Statistical Physics II |
| 0.50 electives | | · |
| One of: | | |
| PHYS*4001 | [0.50] | Research in Physics |
| 0.50 electives | | - |
| 0.50 electives ** | | |
| Semester 8+ | | |
| | | |

One of:

| PHYS*4002 | [0.50] | Research in Physics |
|------------------|--------|---------------------|
| 0.50 electives** | | |

2.00 electives **

+ students going on to graduate school in physics should take PHYS*4001/2, PHYS*4120, PHYS*4130, PHYS*4150, PHYS*4240

** At least 1.00 credits must be from the restricted electives listed below.

| Restricted Elective | es |
|---------------------|----|
|---------------------|----|

| Credit Summary (20.00 Total Credits) | | |
|--------------------------------------|--------|------------------------------|
| PHYS*4150 | [0.50] | Solid State Physics |
| PHYS*4130 | [0.50] | Subatomic Physics |
| PHYS*4120 | [0.50] | Atomic and Molecular Physics |

5.00 - First year science credits

8.50 - Required science courses semesters 3 - 8

1.00 - Restricted electives

- 1.50 Approved Science electives
- 1.00 Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

A minor in Physics requires 5.00 credits in interdisciplinary physical science or physics courses including:

| PHYS*2180 | [0.50] | Experimental Techniques in Physics |
|----------------|-----------------|---------------------------------------------------------|
| PHYS*2310 | [0.50] | Mechanics |
| PHYS*2330 | [0.50] | Electricity and Magnetism I |
| PHYS*2340 | [0.50] | Electricity and Magnetism II |
| A maximum of1 | .00 credits fro | om the following courses may be used towards the minor: |
| PHYS*1010 | [0.50] | Introductory Electricity and Magnetism |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| PHYS*1130 | [0.50] | Physics with Applications |
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II |
| A minimum of 1 | 1.00 credits ar | e required at the 3000 or 4000 level. |

NOTE: PHYS*1300, PHYS*1600 and PHYS*1810 may not be taken for credit toward this minor.

Physics (Co-op) (PHYS:C)

Department of Physics, College of Engineering and Physical Sciences

Program Requirements

The Co-op program in Physics is a five year program, including five work terms. Students must complete a Fall, Winter and Summer work term and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https:// www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Physics Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|---------------------|---------------------|--------|
| 1 | Academic Semester 1 | Academic Semester 2 | Off |

| Year | Fall | Winter | Summer |
|------|----------------------------------|---------------------------|----------------------------|
| 2 | Academic Semester 3 COOP*1100 | Academic Semester 4 | COOP*1000 Work Term I |
| 3 | Academic Semester 5 | COOP*2000 Work Term II | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | COOP*5000 Work Term V | Academic Semester 8 | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (22.00 Total Credits)*

5.00 - First year science credits

8.50 - Required science courses semesters 3-8

1.00 - Restricted electives

1.50 - Approved Science electives

1.00 - Liberal Education electives

3.00 - Free electives - any approved elective for B.Sc. students

2.00 - Co-op Work Terms

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Note: A minimum of four Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *A fifth Co-op work term is optional and if completed, the total number of credits will equal 22.50

The recommended program sequence is outlined below.

Major (Honours Program)

Semester 1 - Fall

| CHEM*1040 CIS*1300 | [0.50] | General Chemistry I Programming |
|-----------------------|--------|--------------------------------------|
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |

BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology 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: https://www.uoguelph.ca/bsc/revised_SS

Semester 2 - Winter

| CHEM*1050 | [0.50] | General Chemistry II |
|--------------------|---------------|------------------------------------------------|
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II |
| MATH*1160 | [0.50] | Linear Algebra I |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| Semester 3 - Fa | 11 | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| MATH*2200 | [0.50] | Advanced Calculus I |
| MATH*2270 | [0.50] | Applied Differential Equations |
| PHYS*2240 | [0.50] | Thermal Physics |
| PHYS*2330 | [0.50] | Electricity and Magnetism I |
| 0.50 Liberal Educa | ation electiv | /es* |
| Semester 4 - Wi | inter | |
| PHYS*2180 | [0.50] | Experimental Techniques in Physics |
| PHYS*2310 | [0.50] | Mechanics |
| PHYS*2340 | [0.50] | Electricity and Magnetism II |
| One of: | | |
| CIS*2500 | [0.50] | Intermediate Programming |
| 0.50 electives | | |
| 0.50 electives | | |
| Summer Semes | ter | |
| COOP*1000 | [0.50] | Co-op Work Term I ++ |
| | | |

| Semester 5 - Fal | 11 | |
|---------------------|--------------|-------------------------------------------------|
| IPS*3000 | [0.50] | Science Communication |
| PHYS*3130 | [0.50] | Mathematical Physics |
| PHYS*3230 | [0.50] | Quantum Mechanics I |
| PHYS*3400 | [0.50] | Advanced Mechanics |
| 0.50 electives | | |
| Winter Semeste | r | |
| COOP*2000 | [0.50] | Co-op Work Term II ++ |
| (8-month work terr | n in conjur | action with COOP*3000) |
| Summer Semest | ter | |
| COOP*3000 | [0.50] | Co-op Work Term III ++ |
| (8-month work terr | n in conjur | action with COOP*2000) |
| Semester 6 - Fal | l l + | |
| PHYS*4180 | [0.50] | Advanced Electromagnetic Theory |
| One of: | | · · |
| CIS*2520 | [0.50] | Data Structures |
| 0.50 electives** | | |
| One of: | | |
| PHYS*4240 | [0.50] | Statistical Physics II |
| 0.50 electives** | | |
| 1.00 electives ** | | |
| Semester 7 - Wi | nter + | |
| NANO*3600 | [0.50] | Computational Methods in Materials Science |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications |
| PHYS*3510 | [0.50] | Intermediate Laboratory |
| PHYS*4040 | [0.50] | Quantum Mechanics II |
| One of: | | |
| MATH*3260 | [0.50] | Complex Analysis |
| 0.50 electives** | | |
| Summer Semes | ter | |
| COOP*4000 | [0.50] | Co-op Work Term IV ++ |
| Fall Semester | | |
| COOP*5000 | [0.50] | Co-op Work Term V ++ |
| Semester 8 - Wi | nter + | |
| PHYS*4500 | [0.50] | Advanced Physics Laboratory |
| One of: | | |
| PHYS*4130 | [0.50] | Subatomic Physics |
| 0.50 electives** | | |
| One of: | | |
| PHYS*4150 | [0.50] | Solid State Physics |
| 0.50 electives** | | |
| 1.00 electives** | | |
| + students going or | i to graduat | e school in physics should take PHYS*4130, PHYS |

and PHYS*4240

** At least 1.00 credits must be from the restricted electives listed below.

Restricted Electives

| Plant Science (PLSC) | | |
|----------------------|--------|------------------------|
| PHYS*4240 | [0.50] | Statistical Physics II |
| PHYS*4150 | [0.50] | Solid State Physics |
| PHYS*4130 | [0.50] | Subatomic Physics |

Department of Plant Agriculture, Ontario Agricultural College School of Environmental Sciences, Ontario Agricultural College

Department of Integrative Biology, College of Biological Science

Department of Molecular and Cellular Biology, College of Biological Science

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. The major requires the completion of 20.00 credits.

Semester 1

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-------------------|---------------|-----------------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| ENGL*1030 | [0.50] | Effective Writing |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| Students lacking | Grade 12 or 4 | U Biology, Chemistry or Physics should follow the revised |
| schedule of study | for this maj | or found at: https://www.uoguelph.ca/bsc/revised_SS |
| Semester 2 | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| One of: | | |
| CIS*1200 | [0.50] | Introduction to Computing |

Semester 3 AGR*2470 [0.50] Introduction to Plant Agriculture BIOC*2580 [0.50] Introduction to Biochemistry BOT*2100 [0.50] Life Strategies of Plants [0.50] Foundations in Molecular Biology and Genetics MBG*2040 0.50 Liberal Education Semester 4 MCB*2050 Molecular Biology of the Cell [0.50]Statistics I STAT*2040 [0.50] One of: AGR*2050 [0.50] Agroecology BIOL*2060 [0.50] Ecology 1.00 electives or restricted electives Semester 5 BOT*3410 [0.50] Plant Anatomy 2.00 electives or restricted electives Semester 6 BOT*3310 [0.50] Plant Growth and Development 2.00 electives or restricted electives **Option A** Semester 7 One of: AGR*4450 [1.00] Research Project I IBIO*4500 [1.00] Research in Integrative Biology I MCB*4500 [1.00] Research Project in Molecular & Cellular Biology I 1.50 electives or restricted electives Semester 8 BOT*4380 [0.50] Metabolism in the Whole Life of Plants 2.00 electives or restricted electives **Option B** Semester 7 2.50 electives or restricted electives Semester 8 AGR*4600 [1.00] Agriculture and Food Issues Problem Solving BOT*4380 [0.50] Metabolism in the Whole Life of Plants 1.00 electives or restricted electives **Restricted Electives** 1. A minimum of 1.00 credits of Liberal Education electives is required. The list of *4150, Liberal Education electives for B.Sc. students can be found at: https:// www.uoguelph.ca/bsc/ 2. 5.00 credits from within their area of emphasis from the lists below Note: Restricted electives indicated with † are non-science electives. If non-science restricted electives are chosen students are reminded that they will still be responsible for meeting the minimum requirement of 16.00 credits in science and that the credit summary may vary from what is specified below. Note: Restricted electives indicated with ** require other restricted electives as prerequisites. Students should consult the most recent undergraduate calendar for specific requirements. ‡ Students are required to take one of (AGR*4450 or IBIO*4500 or MCB4500) in semester 7 OR AGR*4600 in semester 8. For those choosing (AGR*4450 or IBIO*4500 or MCB*4500), one of the following may count towards restricted elective requirements in an area of emphasis.

| [1.00] | Research Project II |
|--------|-----------------------------------------------|
| [1.00] | Research in Integrative Biology II |
| [1.00] | Research Project in Molecular & Cellular Biol |
| | [1.00] [1.00] [1.00] |

MCB*4510 [1.00] Research Project in Molecular & Cellular Biology Credit Summary (20.00 Total Credits)

Option A

CIS*1500

MATH*1090

0.50 Liberal Education electives

[0.50]

[0.50]

Introduction to Programming

Elements of Calculus II

4.00 - First year science core6.00 - Required science courses semesters 3 - 8

5.00 - Restricted electives for the declared area of emphasis (#2) (some restricted electives do not count as science electives towards the degree. Therefore additional science electives may be required.)

1.00 - Approved science electives, if all restricted electives chosen are approved science electives.

1.00 - Liberal Education electives

0.50 - ENGL*1030

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Last Revision: July 4, 2019

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Of the total credits required, students are required to complete a minimum of 16.00 credits in science, of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Option B

4.00 - First year science core

5.00 - Required science courses semesters 3 - 8

1.00 - AGR*4600

5.00 - Restricted electives for the declared area of emphasis (#2) (some restricted electives do not count as science electives towards the degree therefore additional science electives may be required)

2.00 - Approved science electives, if all restricted electives chosen are approved science electives (can be reduced to 1.00 of approved science electives if AGR*4600 is approved as science by faculty advisor and all restricted electives chosen are approved science electives)

1.00 - Liberal Education electives

0.50 - ENGL*1030

1.50 - Free electives - any approved elective for B.Sc. Students (could be less if restricted electives do not count as science)

Of the total credits required, students are required to complete a minimum of 16.00 credits in science, of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Area of Emphasis

Applied Plant Science (APSC)

| CROP*4240 | [0.50] | Weed Science |
|---------------------|--------|----------------------------------------------------------|
| ENVS*2060 | [0.50] | Soil Science |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests ** |
| ‡ 3.00 credits from | n: | |
| AGR*3450 | [0.50] | Research Methods in Agricultural Science |
| BOT*3710 | [0.50] | Plant Diversity and Evolution |
| CROP*3300 | [0.50] | Grain Crops |
| CROP*3310 | [0.50] | Protein and Oilseed Crops |
| CROP*3340 | [0.50] | Managed Grasslands |
| CROP*4220 | [0.50] | Cropping Systems ** |
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3080 | [0.50] | Soil and Water Conservation ** |
| ENVS*3140 | [0.50] | Management of Turfgrass Diseases ** |
| ENVS*3310 | [0.50] | Soil Biodiversity and Ecosystem Function ** |
| ENVS*4090 | [0.50] | Soil Management |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science |
| HORT*3010 | [0.50] | Annual, Perennial and Indoor Plants - Identification and |
| | | Use |
| HORT*3050 | [0.50] | Management of Turfgrass Insect Pests and Weeds ** |
| HORT*3150 | [0.50] | Principles and Applications of Plant Propagation |
| HORT*3270 | [0.50] | Medicinal Plants |
| HORT*3280 | [0.50] | Greenhouse Production |
| HORT*3310 | [0.50] | Plants, Food and Health |
| HORT*3430 | [0.50] | Wine-Grape Culture |
| HORT*3510 | [0.50] | Vegetable Production |
| HORT*4200 | [0.50] | Plants, the Environment and Society |
| HORT*4300 | [0.50] | Postharvest Physiology |
| HORT*4420 | [0.50] | Fruit Crops |
| HORT*4450 | [0.50] | Advanced Turfgrass Science |
| LARC*2240 | [0.50] | Plants in the Landscape |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*4160 | [0.50] | Plant Breeding |
| OAGR*2070 | [1.00] | Introduction to Organic Agriculture |
| OAGR*4050 | [1.00] | Design of Organic Production Systems ** |
| PBIO*3110 | [0.50] | Crop Physiology |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| STAT*2050 | [0.50] | Statistics II |
| STAT*3210 | [0.50] | Experimental Design |
| Botany (BOT) | | |
| BOT*3050 | [0.50] | Plant Functional Ecology |
| MBG*3100 | [0.50] | Plant Genetics |
| PBIO*4000 | [0.50] | Molecular and Cellular Aspects of Plant-Microbe |
| | | Interactions |
| PBIO*4150 | [0.50] | Molecular and Cellular Aspects of Plant Development |
| ‡ 3.00 credits from | n: | |

| AC10*24E0 | FO 501 | Descent Matheda in Arminational Calence |
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| AGK*5450 | [0.50] | Research Methods III Agricultural Science |
| BOT*3/10 | [0.50] | Plant Diversity and Evolution |
| MBG*4300 | [0.50] | Plant Molecular Genetics |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| MICR*3090 | [0.50] | Mycology |
| MICR*3220 | [0.50] | Plant Microbiology |
| PBIO*3110 | [0.50] | Crop Physiology |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| STAT*2050 | [0.50] | Statistics II |
| STAT*3210 | [0.50] | Experimental Design ** |
| Plant Biotechnolo | ogy (PBTC |) |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*3350 | [0.75] | Laboratory Methods in Molecular Biology |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| ‡ minimum of 2.7 | 5 credits fro | om: |
| AGR*3450 | [0.50] | Research Methods in Agricultural Science |
| BOT*3710 | [0.50] | Plant Diversity and Evolution |
| BIOL*3300 | [0.50] | Applied Bioinformatics |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| MBG*3660 | [0.50] | Genomics |
| MBG*4160 | [0.50] | Plant Breeding |
| MBG*4300 | [0.50] | Plant Molecular Genetics |
| MCB*4010 | [0.50] | Advanced Cell Biology |
| MICR*2420 | [0.50] | Introduction to Microbiology |
| MICR*3220 | [0.50] | Plant Microbiology |
| MICR*3230 | [0.50] | Immunology |
| MICR*3330 | [0.50] | World of Viruses |
| PBIO*3110 | [0.50] | Crop Physiology |
| PBIO*4150 | [0.50] | Molecular and Cellular Aspects of Plant Development |
| STAT*2050 | [0.50] | Statistics II |
| STAT*3210 | [0.50] | Experimental Design ** |
| Plant Environme | ntal Scienc | e (PESC) |
| BOT*3050 | [0 50] | Plant Functional Ecology |
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| ENVS*4350 | [0.50] | Forest Ecology |
| | [0.50] | I ofest Leology |
| ()=()()*2/8() | IO 501 | Mapping and GIS |
| GEOG*2480 † 3.00 credits from | [0.50] | Mapping and GIS |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 | [0.50] n: [0.50] | Mapping and GIS |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL *3010 | [0.50] n: [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 | [0.50] n: [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations Communities & Ecosystems |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 | [0.50] n: [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVC*2060 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2330 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2300 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2120 ENVS*2330 ENVS*3000 ENVS*3000 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pasticides and the Environment |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2120 ENVS*2300 ENVS*3000 ENVS*3020 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pesticides and the Environment Natural Chemicals in the Environment |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2300 ENVS*3000 ENVS*3040 ENVS*3090 | [0.50] n: [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] [0.50] | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pesticides and the Environment Natural Chemicals in the Environment Insect Diversity and Biology |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2300 ENVS*3000 ENVS*3020 ENVS*3040 ENVS*3010 | $\begin{matrix} [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\$ | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pesticides and the Environment Natural Chemicals in the Environment Insect Diversity and Biology Plant Pathology |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2300 ENVS*3000 ENVS*3020 ENVS*3040 ENVS*3250 | $\begin{matrix} [0.50] \\ \text{n:} \\ \hline [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] \\ [0.50] $ | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pesticides and the Environment Natural Chemicals in the Environment Insect Diversity and Biology Plant Pathology Erret Health and Disease |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3060 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2330 ENVS*3000 ENVS*3020 ENVS*3020 ENVS*3020 ENVS*3210 ENVS*3250 ENVS*3250 | $\begin{matrix} [0.50] \\ n: \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \\ & [0.50] \end{matrix}$ | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pesticides and the Environment Natural Chemicals in the Environment Insect Diversity and Biology Plant Pathology Forest Health and Disease Integrated Management of Invasive Insect Pasts ** |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3010 BIOL*3010 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2330 ENVS*3000 ENVS*3000 ENVS*3040 ENVS*3040 ENVS*3210 ENVS*3210 ENVS*3210 ENVS*3210 ENVS*3210 | $\begin{matrix} [0.50] \\ n; \\ \hline [0.50] \\ \hline \hline \ \hline \ \hline \ \hline \ \hline \ \hline \hline \hline \ \hline \hline \hline \ \hline \hline \hline \ \hline \hline \hline \hline \ \hline \hline$ | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pesticides and the Environment Natural Chemicals in the Environment Insect Diversity and Biology Plant Pathology Forest Health and Disease Integrated Management of Invasive Insect Pests ** Environment and Resources |
| GEOG*2480 ‡ 3.00 credits from AGR*3450 BIOL*3010 BIOL*3010 BIOL*3010 BIOL*3130 BIOL*4500 BOT*3710 ENVS*2060 ENVS*2120 ENVS*2330 ENVS*3000 ENVS*3020 ENVS*3020 ENVS*3040 ENVS*3020 ENVS*3210 ENVS*3210 ENVS*3220 ENVS*3210 ENVS*3210 ENVS*3210 ENVS*3210 | $\begin{matrix} [0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50] \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\ (0.50) \\$ | Mapping and GIS Research Methods in Agricultural Science Laboratory and Field Work in Ecology Populations, Communities & Ecosystems Conservation Biology Natural Resource Policy Analysis Plant Diversity and Evolution Soil Science Introduction to Environmental Stewardship ** Current Issues in Ecosystem Science and Biodiversity Nature Interpretation Pesticides and the Environment Natural Chemicals in the Environment Insect Diversity and Biology Plant Pathology Forest Health and Disease Integrated Management of Invasive Insect Pests ** Environment and Resources |
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Plant Diversity and Evolution

BOT*3710

[0.50]

| 301*4380 | [0.50] | Metabolism in the Whole Life of Plants |
|--------------------|------------------|---------------------------------------------------------------|
| 2.00 credits from | any courses l | listed in the areas of emphasis. |
| Restricted electiv | es indicated w | ith are non-science electives. Restricted electives indicated |
| with ** require o | other restricted | l electives as prerequisites. |

Statistics (STAT)

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

Statistics plays a fundamental role in virtually all scientific disciplines, including biology, physics, chemistry, medicine, epidemiology, kinesiology, and toxicology. Students minoring in Statistics will develop practical skills in data visualization and analysis, statistical computing, technical writing and communication in a variety of applications areas, preparing them well for careers in the modern workplace.

Students may declare this minor in any semester.

Minor (Honours Program)

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

(MATH*1080 or MATH*1200)* ATU*1000 ~* MATU*1210 **

| (MATH*1090 of | r MATH*12 | 10)** |
|--------------------|----------------|---------------------------------------------------|
| MATH*1160 | [0.50] | Linear Algebra I |
| STAT*2040 | [0.50] | Statistics I |
| STAT*2050 | [0.50] | Statistics II |
| STAT*3100 | [0.50] | Introductory Mathematical Statistics I |
| STAT*3110 | [0.50] | Introductory Mathematical Statistics II |
| STAT*3240 | [0.50] | Applied Regression Analysis |
| 0.50 additional of | credits in Sta | tistics |
| 0.50 additional of | credits in Sta | tistics or Mathematics ar the 2000 level or above |
| * IPS*1500 can | count towar | d this 0.50 credit |

** IPS*1510 can count toward this 0.50 credit

Note: Students majoring in Mathematical Science cannot minor in Statistics.

Theoretical Physics (THPY)

Department of Physics, College of Engineering and Physical Sciences

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. Since some of the required courses are not offered every semester, students entering the Major in Theoretical Physics should plan their program in consultation with the Faculty Advisor.

Major (Honours Program)

This major requires the completion of 20.00 credits. At least 1.00 of these credits must be obtained from the completion of Liberal Education electives.

Semester 1

| CHEM*1040 | [0.50] | General Chemistry I |
|-----------|--------|------------------------------------------------|
| CIS*1300 | [0.50] | Programming |
| IPS*1500 | [1.00] | Integrated Mathematics and Physics I |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |

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: https://www.uoguelph.ca/bsc/revised_SS

Semester 2

| CHEM*1050 | [0.50] | General Chemistry II |
|-----------|--------|------------------------------------------|
| IPS*1510 | [1.00] | Integrated Mathematics and Physics II |
| MATH*1160 | [0.50] | Linear Algebra I |
| One of: | | |
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| BIOL*1080 | [0.50] | Biological Concepts of Health |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular B |

iology Note: students who have taken physics courses other than IPS*1500 or PHYS*1080 in Semester 1 and IPS*1510 or PHYS*1010 in Semester 2, may proceed to semester 3 with the permission of the Department of Physics

Semester 3

| MATH*2200 | [0.50] | Advanced Calculus I |
|------------------|---------------|---------------------------------|
| MATH*2270 | [0.50] | Applied Differential Equations |
| PHYS*2240 | [0.50] | Thermal Physics |
| PHYS*2330 | [0.50] | Electricity and Magnetism I |
| 0.50 Liberal Edu | acation elect | ives |
| Semester 4 | | |
| MATH*2210 | [0.50] | Advanced Calculus II |
| PHYS*2180 | [0.50] | Experimental Techniques in Phys |
| PHYS*2310 | [0.50] | Mechanics |

| MATH*2210 | [0.50] | Advanced Calculus II |
|-----------------|--------|------------------------------------|
| PHYS*2180 | [0.50] | Experimental Techniques in Physics |
| PHYS*2310 | [0.50] | Mechanics |
| PHYS*2340 | [0.50] | Electricity and Magnetism II |
| 0.50 electives* | | |

| Semester 5 | | |
|-------------------|------------|--------------------------------------------|
| IPS*3000 | [0.50] | Science Communication |
| PHYS*3130 | [0.50] | Mathematical Physics |
| PHYS*3230 | [0.50] | Quantum Mechanics I |
| PHYS*3400 | [0.50] | Advanced Mechanics |
| 0.50 electives* | | |
| Semester 6 | | |
| NANO*3600 | [0.50] | Computational Methods in Materials Science |
| PHYS*3000 | [0.50] | Optics: Fundamentals and Applications |
| PHYS*3510 | [0.50] | Intermediate Laboratory |
| PHYS*4040 | [0.50] | Quantum Mechanics II |
| 0.50 electives* | | |
| Semester 7 | | |
| PHYS*4120 | [0.50] | Atomic and Molecular Physics |
| PHYS*4180 | [0.50] | Advanced Electromagnetic Theory |
| PHYS*4240 | [0.50] | Statistical Physics II |
| Two of: | | |
| PHYS*4001 | [0.50] | Research in Physics |
| PHYS*4500 | [0.50] | Advanced Physics Laboratory |
| 0.50 electives* | | |
| 0.50 electives* | | |
| Semester 8 | | |
| MATH*3260 | [0.50] | Complex Analysis |
| PHYS*4130 | [0.50] | Subatomic Physics |
| PHYS*4150 | [0.50] | Solid State Physics |
| One of: | | |
| PHYS*4002 | [0.50] | Research in Physics |
| 0.50 electives* | | |
| 0.50 electives* | | |
| *Restricted Ele | ctives | |
| Students must com | plete 2.00 | credits from the following list: |
| CIS*2500 | [0.50] | Intermediate Programming |
| MATH*2000 | [0.50] | Proofs, Sets, and Numbers |
| MATH*2130 | [0.50] | Numerical Methods |

| CIS 2500 | [0.50] | intermediate i rogramming |
|-----------|--------|---------------------------|
| MATH*2000 | [0.50] | Proofs, Sets, and Numbers |
| MATH*2130 | [0.50] | Numerical Methods |
| MATH*3100 | [0.50] | Differential Equations II |
| MATH*3130 | [0.50] | Abstract Algebra |
| MATH*3160 | [0.50] | Linear Algebra II |
| MATH*3200 | [0.50] | Real Analysis |
| MATH*3240 | [0.50] | Operations Research |

Credit Summary (20.00 Total Credits)

5.00 - First year science credits

11.00 - Required science courses semesters 3-8

2.00 - Restricted electives

1.00 - Liberal Education electives

1.00 - Free electives - any approved elective for B.Sc. students., could be less if restricted electives do not count as science

Of the total credits required, students are required to complete 16.00 credits in science of which 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Wildlife Biology and Conservation (WBC)

Department of Integrative Biology, College of Biological Science

The core of this major will provide students with an integrated foundation in three disciplines necessary to understand the origins, interactions, and protection of biological diversity: evolution, ecology, and conservation biology. After the second semester, the student has the opportunity to take a wide variety of electives, including courses that meet their specific interests within one or two of these disciplines. The program offers a sound scientific background in preparation for careers in resource management, conservation, ecological consulting, teaching, and government service. This major also qualifies students for post-graduate work in ecology, evolutionary biology, environmental sciences, or wildlife management.

Major (Honours Program)

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A minimum total of 20.00 credits is required to complete the major.

Semester 1

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|------------------|--------------|---------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| 0.50 Liberal Edu | cation elect | ives |

Students lacking Grade 12 or 4U Biology, Chemistry or Physics should follow the revised schedule of study for this major found at https://www.uoguelph.ca/bsc/revised_SS

| emester 2 |
|-----------|
|-----------|

| BIOL*1080 | [0.50] | Biological Concepts of Health |
|----------------------|---------------|----------------------------------------------------------|
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| 0.50 Liberal Educa | ation electiv | res |
| Semester 3 | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| 1.50 electives or re | estricted ele | ctives |
| Semester 4 | | |
| BIOL*2060 | [0.50] | Ecology |
| BIOL*2400 | [0.50] | Evolution |
| STAT*2230 | [0.50] | Biostatistics for Integrative Biology |
| 1.00 electives or re | estricted ele | ctives |
| Semester 5 | | |
| BIOL*3010 | [0.50] | Laboratory and Field Work in Ecology |
| 2.00 electives or re | estricted ele | ctives |
| Semester 6 | | |
| BIOL*3040 | [0.50] | Methods in Evolutionary Biology |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems |
| BIOL*3130 | [0.50] | Conservation Biology |
| 1.00 electives or re | estricted ele | ctives |
| Semester 7 | | |
| BIOL*4110 | [1.00] | Ecological Methods |
| BIOL*4150 | [0.50] | Wildlife Conservation and Management |
| 1.00 electives or re | estricted ele | ctives |
| Note: For students | considering | graduate research programs, BIOL*4110 may be substituted |
| | | |

by an independent research course (1.00 credits minimum). Course options include: (IBIO*4500 and IBIO*4510), IBIO*4521/IBIO*4522.

Semester 8

| BIOL*4500 | [0.50] | Natural Resource Policy Analysis |
|-------------------|---------------|----------------------------------|
| 2.00 electives or | restricted el | ectives |

Restricted Electives

Note that some courses have prerequisites, so be sure to consult the undergraduate calendar.

 A minimum of 1.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: <u>https://</u> www.uoguelph.ca/bsc/

| 2. | A minimum o | f 0.50 credits | from: |
|----|------------------|----------------|-------------------------------------|
| | BOT*2100 | [0.50] | Life Strategies of Plants |
| | ZOO*2090 | [0.50] | Vertebrate Structure and Function |
| | ZOO*2700 | [0.50] | Invertebrate Morphology & Evolution |
| 3 | A minimum of 0.5 | 0 credits from | n: |
| | BOT*3050 | [0.50] | Plant Functional Ecology |
| | 700*3600 | [0 50] | Comparative Animal Physiology I |

4. A minimum of 0.50 credits from: BIOL*3020 [0.50] Population Genetics BIOL*4120 [0.50] Evolutionary Ecology

5. A minimum of 3.00 credits from any of the following lists of courses. The courses are broken into disciplines for which they are most suitable to help students tailor their electives towards a specific field if desired.

*Some of the restricted electives will require additional courses outside of the required courses listed in Semesters 3-8

** Please note not all restricted electives are considered science electives for B.Sc students. If the non-science restricted electives are chosen, students are reminded that they will still be responsible for meeting the minimum of 16.00 credits in science and that the credit summary may vary from what is specified below.

Evolution

| BIOL*3020 | [0.50] | Population Genetics |
|-----------|--------|---------------------------------------------|
| BIOL*3300 | [0.50] | Applied Bioinformatics |
| BOT*3710 | [0.50] | Plant Diversity and Evolution |
| ENVS*3090 | [0.50] | Insect Diversity and Biology |
| ENVS*3180 | [0.50] | Sedimentary Environments * |
| MBG*3040 | [0.50] | Molecular Biology of the Gene |
| MBG*4110 | [0.50] | Epigenetics * |
| MBG*4270 | [0.50] | DNA Replication, Recombination and Repair * |
| ZOO*2700 | [0.50] | Invertebrate Morphology & Evolution |
| ZOO*3050 | [0.50] | Developmental Biology |
| Ecology | | |
| ANSC*3180 | [0.50] | Wildlife Nutrition * |
| BIOL*3450 | [0.50] | Introduction to Aquatic Environments |
| ENVS*3000 | [0.50] | Nature Interpretation |
| ENVS*3270 | [0.50] | Forest Biodiversity * |

| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
|--------------------|-------------|----------------------------------------------|
| ZOO*4300 | [0.75] | Marine Biology and Oceanography * |
| ZOO*4570 | [0.50] | Marine Ecological Processes * |
| Conservation | | - |
| BIOL*4350 | [0.50] | Limnology of Natural and Polluted Waters * |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality ** |
| ENVS*2030 | [0.50] | Meteorology and Climatology |
| ENVS*3010 | [0.50] | Climate Change Biology |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics ** |
| GEOG*1220 | [0.50] | Human Impact on the Environment ** |
| GEOG*2480 | [0.50] | Mapping and GIS |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| GEOG*4230 | [0.50] | Environmental Impact Assessment * |
| GEOG*4480 | [1.00] | Applied Geomatics |
| Integrative/Cross- | Disciplinar | у |
| IBIO*4500 | [1.00] | Research in Integrative Biology I |
| IBIO*4510 | [1.00] | Research in Integrative Biology II |
| IBIO*4521/2 | [2.00] | Thesis in Integrative Biology |
| MCB*2050 | [0.50] | Molecular Biology of the Cell |
| ZOO*3610 | [0.25] | Lab Studies in Animal Physiology I |
| ZOO*3620 | [0.50] | Comparative Animal Physiology II |
| ZOO*3630 | [0.25] | Lab Studies in Animal Physiology II |
| ZOO*3700 | [0.50] | Integrative Biology of Invertebrates * |
| ZOO*4070 | [0.50] | Animal Behaviour |
| ZOO*4910 | [0.50] | Integrative Vertebrate Biology * |
| ZOO*4920 | [0.25] | Lab Studies in Ornithology |
| ZOO*4940 | [0.25] | Lab Studies in Herpetology |
| ZOO*4950 | [0.25] | Lab Studies in Mammalogy |
| Field Courses | | |
| BIOL*4410 | [0.75] | Field Ecology |
| BIOL*4610 | [0.75] | Arctic Ecology |
| BIOL*4700 | [0.50] | Field Biology |
| BIOL*4710 | [0.25] | Field Biology |
| BIOL*4800 | [0.50] | Field Biology |
| BIOL*4810 | [0.25] | Field Biology |
| BIOL*4900 | [0.50] | Field Biology |

Credit Summary (20.00 Total Credits) 4.00 - First year science core

6.50 - Required science courses semesters 3 - 8

4.50 - Restricted electives (# 2, 3, 4 and 5 in restricted electives list)**

1.00 - Approved Science electives

- 1.00 Liberal Education electives (#1 in restricted electives list)
- 3.00 Free electives any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Zoology (ZOO)

ENVS*4350

[0.50]

Forest Ecology *

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)

[0.50]

Students may enter this major in Semester 1 or any semester thereafter. A student wishing to declare the major may wish to consult the Faculty Advisor. A minimum total of 20.00 credits is required to complete the major. At least 6.00 science credits must be at the 3000 or 4000 level, 2.00 of which must be at the 4000 level.

Semester 1

PHYS*1070

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|-------------------|---------------|------------------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| 0.50 Liberal Edu | cation elect | ives |
| Students lacking | Grade 12 or | 4U Biology, Chemistry or Physics should follow the revised |
| schedule of study | y for this ma | ajor found at https://www.uoguelph.ca/bsc/revised_SS |
| 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 |

Physics for Life Sciences II

2019-2020 Undergraduate Calendar

| .50 Liberal Education electives | | | ZOO*2090 | [0.50] | Vertebrate Structure and Function |
|-------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|---------------|------------------------------------|--------------------------------------------------|
| Semester 3 | emester 3 | | | [0.50] | Invertebrate Morphology & Evolution |
| SIOL *2060 | [0 50] | Ecology | ZOO*3000 | [0.50] | Comparative Histology |
| SIOL *2400 | [0.50] | Evolution | ZOO*3050 | [0.50] | Developmental Biology |
| 200*2090 | [0.50] | Vertebrate Structure and Function | ZOO*3600 | [0.50] | Comparative Animal Physiology I |
| 00 electives or restricted electives * | | ZOO*3610 | [0.25] | Lab Studies in Animal Physiology I | |
| Samester A | | | ZOO*3620 | [0.50] | Comparative Animal Physiology II |
| | FO 501 | | ZOO*3630 | [0.25] | Lab Studies in Animal Physiology II |
| SIOC*2580 | [0.50] | Introduction to Biochemistry | ZOO*3700 | [0.50] | Integrative Biology of Invertebrates |
| ABG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | ZOO*4070 | [0.50] | Animal Behaviour |
| 51A1*2230 | [0.50] | Biostatistics for Integrative Biology | ZOO*4330 | [0.50] | Biology of Fishes |
| 200*2700 | [0.50] | Invertebrate Morphology & Evolution | ZOO*4910 | [0.50] | Integrative Vertebrate Biology |
| .50 electives or restricted electives * Semester 5 | | ZOO*4920 | [0.25] | Lab Studies in Ornithology | |
| | | ZOO*4940 | [0.25] | Lab Studies in Herpetology | |
| 200*3000 | [0.50] | Comparative Histology | ZOO*4950 | [0.25] | Lab Studies in Mammalogy |
| 200*3600 | D*3600 [0.50] Comparative Animal Physiology I | | The remaining | 1.00 credits | may also come from this list or from outside thi |

is list. in consultation with a faculty advisor.

| 0100 010001 000 01 | restreted e | |
|--------------------|----------------|----------------------------------------------------------|
| Semester 5 | | |
| ZOO*3000 | [0.50] | Comparative Histology |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I |
| ZOO*3610 | [0.25] | Lab Studies in Animal Physiology I |
| ZOO*3700 | [0.50] | Integrative Biology of Invertebrates |
| Electives or restr | ricted electiv | ves to a maximum of 2.75 total credits in this semester. |
| G | | |

Semester 6

| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems | | |
|----------------------------------------------------------------------------------------|--------|---------------------------------------|--|--|
| ZOO*3050 | [0.50] | Developmental Biology | | |
| ZOO*3620 | [0.50] | Comparative Animal Physiology II | | |
| ZOO*3630 | [0.25] | Lab Studies in Animal Physiology II | | |
| Electives or restricted electives to a maximum of 2.75 total credits in this semester. | | | | |
| Somostor 7 | | | | |

Semester 7

| ZOO*4070 | [0.50] | Animal Behaviour |
|----------|--------|--------------------------------|
| ZOO*4910 | [0.50] | Integrative Vertebrate Biology |
| | | |

1.50 electives or restricted electives

Semester 8

2.50 electives or restricted electives

* CIS*1200 is recommended for those needing to improve their computer skills.

Restricted Electives must include:

1. A minimum of 1.00 credits of Liberal Education electives is required. The list of Liberal Education electives for B.Sc. students can be found at: https:// www.uoguelph.ca/bsc/

| 2. A minimum of 0.50 credits from | 2. | А | minimum | of | 0.50 | credits | from: |
|-----------------------------------|----|---|---------|----|------|---------|-------|
|-----------------------------------|----|---|---------|----|------|---------|-------|

| ZOO*4330 | [0.50] | Biology of Fishes |
|----------------------------|-------------|--------------------------------------------|
| ZOO*4920 | [0.25] | Lab Studies in Ornithology |
| ZOO*4940 | [0.25] | Lab Studies in Herpetology |
| ZOO*4950 | [0.25] | Lab Studies in Mammalogy |
| 3. A minimum of 0.50 cre | dits 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 | [1.00] | Research in Integrative Biology I |
| IBIO*4510 | [1.00] | 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 of | courses wit | h approval of faculty advisor. |

Credit Summary (20.00 Total Credits)

4.00 - First year science core

- 8.00 Required science courses semesters 3 8
- 1.00 Restricted electives (# 2, and 3 in restricted electives list)
- 3.00 Approved Science electives
- 1.00 Liberal Education electives (#1 in restricted electives)
- 3.00 Free electives any approved elective for B.Sc. students

Of the total credits required, students are required to complete 16.00 credits in science of which a minimum of 2.00 credits must be at the 4000 level and an additional 4.00 credits must be at the 3000 or 4000 level.

Minor (Honours Program)

Students in majors other than Zoology, Biodiversity, Wildlife Biology & Conservation and Marine & Freshwater Biology who have a strong interest in Zoology may choose to take a minor in Zoology.

A minor in Zoology requires a minimum of 5.00 credits, 4.00 of which must be from the following list:

| BIOL*2060 | [0.50] | Ecology |
|-----------|--------|---------------------------------------|
| BIOL*2400 | [0.50] | Evolution |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems |

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Bachelor of Science in Agriculture [B.Sc.(Agr.)]

The B.Sc.(Agr.) degree program is a 4 year honours science program designed to provide a fundamental education in the science of agriculture. The curriculum includes courses in the agricultural sciences, the physical, biological and social sciences, and in the arts.

Program Information

Agricultural scientists must be effective communicators and problem solvers, self-directed in their learning, and have a global perspective of the agrifood systems. Students will be involved in co-operative group learning activities and will experience courses that are multidisciplinary and integrate the teaching activities of many faculty and departments.

Students will have the option of completing a broad agricultural program (honours agricultural science) or another major in which they take courses towards a more focused subject area. The curriculum provides opportunities for students to select courses that will help them prepare for professional careers as entrepreneurs, scientists, marketing specialists, financial managers, technical advisors, or communication specialists. Students will have a comprehensive understanding of the food system when they graduate. They will be able to integrate their knowledge of production agriculture, environmental management, resource allocation and business management as it applies to the food system nationally and globally.

Students will be encouraged to integrate their academic program with a well-planned series of employment activities in the summer months and to develop their leadership and interpersonal skills in on-campus and community activities.

Graduates meet the educational requirements for membership in the Ontario Institute of Agrologists. The Ontario Institute of Agrologists is the professional organization in agriculture in the Province of Ontario. Professional institutes in the various provinces in Canada and the scientific societies in agriculture collectively comprise the Agricultural Institute of Canada. The program received full accreditation from the Agricultural Institute of Canada in April 2007.

B.Sc.(Agr.) Majors:

Animal Science

Crop, Horticulture and Turfgrass Science

Honours Agricultural Science

Declaration of a Major

All students are admitted into an undeclared major upon entry. Students will be required to select a major by semester 3 through consultation with the Program Counsellor and Faculty Advisors. The course requirements are listed for each major in the following section.

Students may, with appropriate approvals, elect to complete Minors associated with other degree programs as listed in the undergraduate calendar.

Honours Minor

A minor is a group of courses which provides for exposure to and mastery of the fundamental principles of a subject. A minor consists of a minimum of 5.00 credits (normally 10 courses). It may also require certain other courses from other areas to be taken along with the specified courses of the minor. A minor is taken in conjunction with a major.

A maximum of 2.50 credits required in a major program may be applied to meet the requirements of a minor.

Students should seek advice from the B.Sc.(Agr.) Program Counsellor about the addition of a minor. Students in the B.Sc.(Agr.) are not eligible for a minor in Agriculture.

Study Abroad

The B.Sc.(Agr.) degree program is similar in many respects to programs offered at faculties of agricultural science in other provinces in Canada. Students are strongly encouraged to consider studying for 1 or 2 semesters in other faculties of agricultural science in Canada and in selected countries around the world.

Students interested in studying at another institution should consult the B.Sc.(Agr.) Program Counsellor to discuss their plans, and refer to the scholarship section for financial support. For more specific information on these opportunities refer to Section V--International Study in this calendar, or contact the OAC Dean's Office.

Doctor of Veterinary Medicine

Students in the B.Sc.(Agr.) program may apply for admission to the D.V.M. program after semester 4 or later. Applications must be submitted to the Admissions Services, Office of Registrarial Services. Students should consult the D.V.M. Section of the calendar. Students who do not gain admission to the D.V.M. program are eligible to continue in the B.Sc.(Agr.) program through to graduation.

Students planning to enter the D.V.M. program are advised to include 12U biology, 12U chemistry, and 12U physics in addition to calculus in secondary school.

Continuation of Study

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

Conditions of Graduation

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

Honours Agriculture (AGRS)

Departments of Plant Agriculture and Animal Biosciences

The Honours Agriculture major combines a core curriculum of agricultural science courses with a wide range of electives focusing on agri-food business, animal and plant production, land stewardship and sustainability. This major allows students to create a curriculum uniquely tailored to their career goals and provides diverse opportunities to explore international agriculture and leading edge agricultural research in animal production, plant biotechnology and pest management. The flexibility provided in semesters 5 and 6 permits students to participate in international exchanges and semesters abroad. Students can also incorporate a variety of field trips, experiential learning in the workplace and independent study into their program of studies. The combination of a solid understanding of life science and current agricultural practice with specialized skills and experience provided by this program is greatly valued by prospective employers in this essential sector of Canada's economy.

Semester 1

| AGR*1110 | [1.00] | Introduction to the Agri-Food Systems |
|-------------------|--------------|---------------------------------------------------|
| BIOL*1050 | [0.50] | Biology of Plants & Animals in Managed Ecosystems |
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| Semester 2 | . , | |
| AGR*2050 | [0.50] | Agroecology |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| FARE*1400 | [1.00] | Economics of the Agri-Food System |
| Semester 3 | | |
| AGR*2320 | [0.50] | Soils in Agroecosystems |
| AGR*2350 | [0.50] | Animal Production Systems, Health and Industry |
| AGR*2470 | [0.50] | Introduction to Plant Agriculture |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| Semester 4 | | |
| ANSC*2340 | [0.50] | Structure of Farm Animals |
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| STAT*2040 | [0.50] | Statistics I |
| 1.00 electives or | restricted e | lectives |

Semester 5 to 8

Students must choose either Option A (Production and Management) or B (Research). **Option A - Production and Management**

Semester 5

FOOD*3090 [0.50] Food Science and Human Nutrition 2.00 electives or restricted electives

Semester 6

2.50 electives or restricted electives

Semester 7

2.50 electives or restricted electives

Semester 8

```
AGR*4600
                  [1.00]
                             Agriculture and Food Issues Problem Solving
1.50 electives or restricted electives
```

Restricted Electives - Option A

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

• A minimum of 1.00 credits from the list of restricted electives below:

| AGR*2500 | [0.50] | Field Course in International Agriculture |
|-----------|--------|----------------------------------------------|
| AGR*3010 | [0.50] | Special Studies in Agricultural Science I |
| AGR*3450 | [0.50] | Research Methods in Agricultural Science |
| AGR*3500 | [0.50] | Experiential Education I |
| ANSC*4010 | [0.50] | Animal Welfare Judging and Evaluation |
| ANSC*4230 | [0.50] | Challenges and Opportunities in Dairy Cattle |
| | | Production |
| ANSC*4610 | [0.50] | Critical Analysis in Animal Science |
| CROP*4260 | [0.50] | Crop Science Field Trip |
| EDRD*2020 | [0.50] | Interpersonal Communication |
| EDRD*3050 | [0.50] | Agricultural Communication I |
| EDRD*3140 | [0.50] | Organizational Communication |
| FARE*3310 | [0.50] | Operations Management |
| | | |

| FARE*4220 | [0.50] | Advanced Agribusiness Management |
|----------------------|----------------|--------------------------------------------------|
| FARE*4310 | [0.50] | Resource Economics |
| FARE*4360 | [0.50] | Marketing Research |
| FARE*4550 | [0.50] | Independent Studies I |
| • A minimum of 2.00 | credits from | the following lists: |
| A minimum of 0.50 | credits from | the following list: |
| CROP*3300 | [0.50] | Grain Crops |
| CROP*3310 | [0.50] | Protein and Oilseed Crops |
| CROP*3340 | [0.50] | Managed Grasslands |
| ENVS*4090 | [0.50] | Soil Management |
| ENVS*4160 | [0.50] | Soil and Nutrient Management |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science |
| HORT*3150 | [0.50] | Principles and Applications of Plant Propagation |
| HORT*4380 | [0.50] | Tropical and Sub-Tropical Crops |
| PBIO*3110 | [0.50] | Crop Physiology |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| A minimum of 0.50 | credits from | the following list: |
| CROP*4240 | [0.50] | Weed Science |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*3230 | [0.50] | Agroforestry Systems |
| A minimum of 0.50 | credits from | the following list: |
| ACCT*1220 | [0.50] | Introductory Financial Accounting |
| ECON*1050 | [0.50] | Introductory Microeconomics |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| FARE*2410 | [0.50] | Agrifood Markets and Policy |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| Students may also ta | ake any of the | e following courses as restricted electives: |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| BOT*2100 | [0.50] | Life Strategies of Plants |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| MBG*3060 | [0.50] | Quantitative Genetics |
| OAGR*2070 | [1.00] | Introduction to Organic Agriculture |
| | | |

- A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
- A humanities or social science courses (0.50 credits) at the 1000-level or above. See Program Counsellor for acceptable list of courses.

Option B - Research

Semester 5 AGR*3450 Research Methods in Agricultural Science [0.50] FOOD*3090 Food Science and Human Nutrition [0.50] 1.50 electives or restricted electives Semester 6 2.50 electives or restricted electives Semester 7 AGR*4450 [1.00] Research Project I 1.50 electives or restricted electives Semester 8 AGR*4460 [1.00] Research Project II 1.50 electives or restricted electives **Restricted Electives - Option B**

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

1. minimum of 2.00 credits from the list of restricted electives below:

A minimum of 0.50 credits from the following list:

| | | e | ENVS*3020 | 10.501 | Pesticides a |
|-------------------|--------------|--------------------------------------------------|---------------------|--------|--------------|
| CROP*3300 | [0.50] | Grain Crops | ENVS*3040 | [0.50] | Natural Che |
| CROP*3310 | [0.50] | Protein and Oilseed Crops | ENVS*3210 | [0.50] | Plant Pathol |
| CROP*3340 | [0.50] | Managed Grasslands | ENVS*4100 | [0.50] | Integrated N |
| ENVS*4090 | [0.50] | Soil Management | Horticultural Scien | ce: | 8 |
| ENVS*4160 | [0.50] | Soil and Nutrient Management | HORT*3150 | [0.50] | Principles a |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science | HORT*3280 | [0.50] | Greenhouse |
| HORT*3150 | [0.50] | Principles and Applications of Plant Propagation | HORT*4300 | [0.50] | Postharvest |
| HORT*4380 | [0.50] | Tropical and Sub-Tropical Crops | PBIO*3110 | [0.50] | Crop Physic |
| PBIO*3110 | [0.50] | Crop Physiology | PBIO*3750 | [0.50] | Plant Tissue |
| PBIO*3750 | [0.50] | Plant Tissue Culture | Resource Managem | nent: | |
| A minimum of 0.50 | credits from | the following list: | ENVS*2120 | [0.50] | Introduction |
| CROP*4240 | [0.50] | Weed Science | ENVS*2030 | [0.50] | Meteorolog |
| ENVS*3020 | [0.50] | Pesticides and the Environment | ENVS*3050 | [0.50] | Microclima |
| ENVS*3210 | [0.50] | Plant Pathology | ENVS*3080 | [0.50] | Soil and Wa |
| ENVS*3230 | [0.50] | Agroforestry Systems | ENVS*4090 | [0.50] | Soil Manage |
| | | | | | |

| | ACCT*1220 | [0.50] | Introductory Financial Accounting |
|---|----------------------|---------------|----------------------------------------------------|
| | ECON*1050 | [0.50] | Introductory Microeconomics |
| | ECON*1100 | [0.50] | Introductory Macroeconomics |
| | ECON*2310 | [0.50] | Intermediate Microeconomics |
| | FARE*2410 | [0.50] | Agrifood Markets and Policy |
| | FARE*3170 | [0.50] | Cost-Benefit Analysis |
| | Students may also ta | ke any of the | e following courses as restricted electives: |
| | BIOC*2580 | [0.50] | Introduction to Biochemistry |
| | BOT*2100 | [0.50] | Life Strategies of Plants |
| | MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetic |
| | MBG*3060 | [0.50] | Quantitative Genetics |
| | OAGR*2070 | [1.00] | Introduction to Organic Agriculture |
| 2 | A minimum of 7.00 | redite must | be at the 3000 level or higher of which 5 00 credi |

- 2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
- 3. A humanities or social science courses (0.50 credits) at the 1000-level or above. See Program Counsellor for acceptable list of courses.

Agriculture (AGR)

OAC Dean's Office

Minor (Honours Program)

The requirement of 5.00 credits for the minor is divided into three groups of courses: required courses and two lists of restricted electives. Students should ensure that they obtain the necessary prerequisites for required and restricted elective courses. Students should seek academic counselling from the B.Sc.(Agr) Program Counsellor early in their program. This minor is not open to students in the B.Sc.(Agr) Program.

Minor

A minimum of 5.00 credits is required including:

| AGR*1110 | [1.00] | Introduction to the Agri-Food Systems | |
|-----------------------------------------------------------|----------|------------------------------------------------|--|
| 1.50 credits from the following Restricted Elective list: | | | |
| AGR*2050 | [0.50] | Agroecology | |
| AGR*2320 | [0.50] | Soils in Agroecosystems | |
| AGR*2350 | [0.50] | Animal Production Systems, Health and Industry | |
| AGR*2470 | [0.50] | Introduction to Plant Agriculture | |
| AGR*2500 | [0.50] | Field Course in International Agriculture | |
| EDRD*3400 | [0.50] | Sustainable Communities | |
| FARE*1400 | [1.00] | Economics of the Agri-Food System | |
| FOOD*3090 | [0.50] | Food Science and Human Nutrition | |
| 0.50 11 6 4 | C 11 · 1 | | |

2.50 credits from the following Restricted Elective list, without regard to group:

Note: At least 0.50 credits from the following list must be at the 4000 level and 1.00 credits at the 3000 level or higher.

| Agronomy: |
|-----------|
|-----------|

| CROP*3300 | [0.50] | Grain Crops |
|---------------------|--------|--------------------------------------------------|
| CROP*3310 | [0.50] | Protein and Oilseed Crops |
| CROP*3340 | [0.50] | Managed Grasslands |
| CROP*4220 | [0.50] | Cropping Systems |
| CROP*4240 | [0.50] | Weed Science |
| HORT*4380 | [0.50] | Tropical and Sub-Tropical Crops |
| PBIO*3110 | [0.50] | Crop Physiology |
| Animal Science: | | |
| ANSC*1210 | [1.00] | Principles of Animal Care and Welfare |
| ANSC*2330 | [0.50] | Horse Management Science |
| ANSC*2340 | [0.50] | Structure of Farm Animals |
| ANSC*3080 | [0.50] | Agricultural Animal Physiology |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| MBG*3060 | [0.50] | Quantitative Genetics |
| Environmental Bio | logy: | |
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3040 | [0.50] | Natural Chemicals in the Environment |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests |
| Horticultural Scien | ce: | 0 0 |
| HORT*3150 | [0.50] | Principles and Applications of Plant Propagation |
| HORT*3280 | [0.50] | Greenhouse Production |
| HORT*4300 | [0.50] | Postharvest Physiology |
| PBIO*3110 | [0.50] | Crop Physiology |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| Resource Managen | nent: | |
| ENVS*2120 | [0.50] | Introduction to Environmental Stewardship |
| ENVS*2030 | [0.50] | Meteorology and Climatology |
| ENVS*3050 | [0.50] | Microclimatology |
| ENVS*3080 | 0.501 | Soil and Water Conservation |
| ENVS*4090 | [0.50] | Soil Management |

| ENVS*4160 | [0.50] | Soil and Nutrient Management |
|-------------------|-------------|---------------------------------------------|
| Students may also | count the f | ollowing courses as restricted electives: |
| AGR*4600 | [1.00] | Agriculture and Food Issues Problem Solving |
| FARE*4000 | [0.50] | Agricultural and Food Policy |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |
| Animal Scienc | e (ANSC | |

Department of Animal Biosciences, Ontario Agricultural College

The animal science curriculum is designed to provide a broad opportunity to study animal physiology, nutrition, genetics, behaviour and welfare across a range of large and small domestic animal species. The program is designed around an option to follow a Production and Management focus or a Research focus in semesters 5-8 with additional flexibility to allow for a semester of study abroad.

Semester 1

| AGR*1110 | [1.00] | Introduction to the Agri-Food Systems |
|------------|--------|---------------------------------------------------|
| BIOL*1050 | [0.50] | Biology of Plants & Animals in Managed Ecosystems |
| CHEM*1040 | [0.50] | General Chemistry I |
| MATH*1080 | [0.50] | Elements of Calculus I |
| Semester 2 | | |
| AGR*2050 | [0.50] | Agroecology |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| FARE*1400 | [1.00] | Economics of the Agri-Food System |
| Semester 3 | | |
| AGR*2320 | [0.50] | Soils in Agroecosystems |
| AGR*2350 | [0.50] | Animal Production Systems, Health and Industry |
| AGR*2470 | [0.50] | Introduction to Plant Agriculture |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics |
| One of: | | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| Semester 4 | | |
| ANSC*1210 | [1.00] | Principles of Animal Care and Welfare |
| ANSC*2340 | [0.50] | Structure of Farm Animals |
| BIOC*2580 | [0.50] | Introduction to Biochemistry |
| STAT*2040 | [0.50] | Statistics I |
| | | |

Semester 5 to 8

Students must choose either Option A (Production and Management) or B (Research). Option A - Production and Management

Semester 5 ANSC*3080 [0.50] Agricultural Animal Physiology ANSC*3120 [0.50] Introduction to Animal Nutrition NUTR*3210 [0.50] Fundamentals of Nutrition 1.00 electives or restricted electives Semester 6 ANSC*3040 [0.50] Animal Reproduction ANSC*3270 [0.50] Animal Disorders

| MBG*3060 | [0.50] | Quantitative Genetics |
|---------------------|-------------|-----------------------|
| 1.00 electives or r | estricted e | lectives |
| Semester 7 | | |

2.50 electives or restricted electives

Semester 8

AGR*4600 [1.00] Agriculture and Food Issues Problem Solving 1.50 electives or restricted electives

Restricted Electives - Option A

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

1. A minimum of 1.00 credits from the list:

| AGR*2500 | [0.50] | Field Course in International Agriculture |
|-----------|--------|----------------------------------------------|
| AGR*3010 | [0.50] | Special Studies in Agricultural Science I |
| AGR*3450 | [0.50] | Research Methods in Agricultural Science |
| AGR*3500 | [0.50] | Experiential Education I |
| ANSC*4010 | [0.50] | Animal Welfare Judging and Evaluation |
| ANSC*4230 | [0.50] | Challenges and Opportunities in Dairy Cattle |
| | | Production |
| ANSC*4610 | [0.50] | Critical Analysis in Animal Science |
| CROP*4260 | [0.50] | Crop Science Field Trip |
| EDRD*2020 | [0.50] | Interpersonal Communication |
| EDRD*3050 | [0.50] | Agricultural Communication I |
| EDRD*3140 | [0.50] | Organizational Communication |
| FARE*3310 | [0.50] | Operations Management |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |

Resource Economics Marketing Research

Independent Studies I

FARE*4310

FARE*4360

FARE*4550

[0.50]

[0.50]

[0.50]

| 2. A minimum of | 3.00 credits | is required from the following lists: |
|----------------------------|-------------------------|------------------------------------------------------------|
| A minimur | n of 0.50 cr | edits from the following list: |
| ANSC*4050 |) [0.5 | 0] Biotechnology in Animal Science |
| MBG*4020 | [0.5 | 0] Genetics of Companion Animals |
| MBG*4030 | [0.5 | 0] Animal Breeding Methods and Applications |
| A minimur | n of 1.00 cr | edits from the following list: |
| ANSC*3170 |) [0.5 | 0] Nutrition of Fish and Crustacea |
| ANSC*3180 |) [0.5 | 0] Wildlife Nutrition |
| ANSC*4260 |) [0.5 | 0] Beef Cattle Nutrition |
| ANSC*4270 |) [0.5 | D] Dairy Cattle Nutrition |
| ANSC*4280 |) [0.5 | 0] Poultry Nutrition |
| ANSC*4290 |) [0.5 | 0] Swine Nutrition |
| ANSC*4470 |) [0.5 | 0] Animal Metabolism |
| ANSC*4560 |) [0.5 | 0] Pet Nutrition |
| EQN*4020 | [0.5 | 0] Advanced Equine Nutrition |
| A minimur | n of 1.00 cr | edits from the following list: |
| ANSC*3090 |) [0.5 | 0] Vertebrate Ethology |
| ANSC*4090 |) [0.5 | 0] Applied Animal Behaviour |
| ANSC*4100 |) [0.5 | 0] Applied Environmental Physiology and Animal |
| | | Housing |
| ANSC*4490 |) [0.5 | 0] Applied Endocrinology |
| ANSC*4650 |) [0.5 | 0] Comparative Immunology |
| EQN*3050 | [0.5 | 0] Equine Exercise Physiology |
| 3. A minimum of | 7.00 credits | must be at the 3000 level or higher, of which 5.00 credits |
| must be in agri | cultural sci | ence and of which 3.50 credits must be at the 4000 level. |
| Refer to Progra | m Counsell | or for list of agricultural science courses. |
| 4. A humanities o | r social scie | nce courses (0.50 credits) at the 1000-level or above. See |
| Program Couns | sellor for ac | ceptable list of courses. |
| Option B - Researc | h | |
| Semester 5 | | |
| ACP*2450 | [0 50] | Passarah Mathada in Agricultural Sajanaa |
| AUK*3430 | [0.50] | A grigultural A nimel Dhysiology |
| ANSC*2000 | [0.50] | Agricultural Animal Physiology |
| AINSC ' 5120 NUTD *2210 | [0.50] | Evadementals of Nutrition |
| NUTR*5210 | [U.SU] stricted aloo | Fundamentals of Nutrition |
| 0.50 electives of res | stricted elec | lives |
| Semester 6 | | |
| ANSC*3040 | [0.50] | Animal Reproduction |
| ANSC*3270 | [0.50] | Animal Disorders |
| MBG*3060 | [0.50] | Quantitative Genetics |
| 1.00 electives or res | stricted elec | tives |
| Semester 7 | | |
| 2.50 electives or res | stricted elec | tives |
| Semester 8 | | |
| 2.50 electives or res | stricted elec | tives |
| Restricted Flect | $i_{vec} = Ont$ | ion B |
| Restricted Elect | ives - Opt | |
| Students should no | te that som | e restricted electives require other courses not included |
| among the required | courses fo | r the major as prerequisites. Students should consult the |
| most recent underg | raduate cale | ndar for specific requirements. |
| 1. A minimum of | f 1.00 credi | ts from the following list (normally to be taken during |
| semesters 7 and | 18): | |
| ANSC*435 | 50 [0. | 50] Experiments in Animal Biology |
| ANSC*46 | 10 [0. | 50] Critical Analysis in Animal Science |
| ANSC*470 | 00 [0. | 50] Research in Animal Biology I |
| ANSC*47 | 10 [0. | 50] Research in Animal Biology II |
| 2. A minimum of | 3.00 credits | is required from the following lists: |
| A minimur | n of 0.50 cr | edits from the following list: |
| ANSC*4050 |) [0.5 |)] Biotechnology in Animal Science |
| MBG*4020 | [0.5 |)] Genetics of Companion Animals |
| MBG*4030 | [0.5 | Animal Breeding Methods and Applications |
| A minimur | n of 1.00 cr | edits from the following list: |
| ANSC*317(|) [0.5 | Nutrition of Fish and Crustacea |
| ANSC*3180 |) [0.5 | 0] Wildlife Nutrition |
| ANSC*4260 |) [0.5 | Beef Cattle Nutrition |
| ANSC*4270 |) [0.5 | Di Dairy Cattle Nutrition |
| ANSC*4280 |) [0.5 |)] Poultry Nutrition |
| ANSC*4290 |) [0.5 |)] Swine Nutrition |
| ANSC*4470 |) [0.5 | Animal Metabolism |
| ANSC*4560 |) [0.5 | 0] Pet Nutrition |
| EQN*4020 | [0.5 | Advanced Equine Nutrition |
| A minimur | n of 1.00 cr | edits from the following list: |
| ANSC*3090 |) [0.5 | 0] Vertebrate Ethology |
| | - | |
| | | Last Revision: July 4, 2019 |
| | | |

X. Degree Programs, Bachelor of Science in Agriculture [B.Sc.(Agr.)]

| ANSC*4090 ANSC*4100 | [0.50] [0.50] | Applied Animal Behaviour Applied Environmental Physiology and Animal |
|------------------------|------------------|-------------------------------------------------------------------------|
| | | Housing |
| ANSC*4490 | [0.50] | Applied Endocrinology |
| ANSC*4650 | [0.50] | Comparative Immunology |
| EQN*3050 | [0.50] | Equine Exercise Physiology |
| | | |

- 3. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to Program Counsellor for list of agricultural science courses.
- 4. A humanities or social science courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Crop, Horticulture and Turfgrass Sciences (CHAT)

Department of Plant Agriculture, Ontario Agricultural College

The Crop, Horticultural and Turfgrass Sciences major is for students who want to apply the latest advancements in the biological sciences to contemporary problems in the plant production industries. This major is appropriate for students with a focus on the production of field crops for food, fuel or biomaterials, management of today's advanced commercial greenhouses, horticultural production, breeding improved crop varieties, or using turfgrass and other plant species to enhance urban environments. The flexibility provided in semester 6 permits students to participate in international exchanges and semesters abroad. Students can also incorporate a variety of field trips, experiential learning in the workplace and independent study into their program of studies.

Semester 1

| AGR*1110 | [1.00] | Introduction to the Agri-Food Systems | | |
|---------------------------------------------------------------------------------|--------|---------------------------------------------------|--|--|
| BIOL*1050 | [0.50] | Biology of Plants & Animals in Managed Ecosystems | | |
| CHEM*1040 | [0.50] | General Chemistry I | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| Semester 2 | . , | | | |
| AGR*2050 | [0.50] | Agroecology | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| FARE*1400 | [1.00] | Economics of the Agri-Food System | | |
| Semester 3 | | | | |
| AGR*2320 | [0.50] | Soils in Agroecosystems | | |
| AGR*2350 | [0.50] | Animal Production Systems, Health and Industry | | |
| AGR*2470 | [0.50] | Introduction to Plant Agriculture | | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics | | |
| MBG*2400 | [0.50] | Fundamentals of Plant and Animal Genetics | | |
| Semester 4 | | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | |
| BOT*2100 | [0.50] | Life Strategies of Plants | | |
| ENVS*2040 | [0.50] | Plant Health and the Environment | | |
| STAT*2040 | [0.50] | Statistics I | | |
| 0.50 electives or restricted electives | | | | |
| Note: Students who wish to add business courses to their program are advised to | | | | |

Note: Students who wish to add business courses to their program are advised to takeACCT*1220 in semester 4 and ACCT*2230 in semester 5.

Semester 5 to 8

Students must choose either Option A (Production and Management) or B (Research). **Option A - Production and Management**

Semester 5

FOOD*3090 Food Science and Human Nutrition [0.50] 2.00 electives or restricted electives

Semester 6

PBIO*3110 [0.50] Crop Physiology 2.00 electives or restricted electives

Semester 7

One of:

|] | ENVS*4090 | [0.50] | Soil Management |
|--------|-----------------------|--------------|------------------------------|
|] | ENVS*4160 | [0.50] | Soil and Nutrient Management |
| 2.00 e | lectives or restricte | ed electives | |

Semester 8

AGR*4600 [1.00] Agriculture and Food Issues Problem Solving 1.50 electives or restricted electives

Restricted Electives - Option A

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

| 1. A minimum of 1.00 credits from the following list: | | | | |
|-------------------------------------------------------|--------|-------------------------------------------|--|--|
| AGR*3010 | [0.50] | Special Studies in Agricultural Science I | | |
| AGR*3450 | [0.50] | Research Methods in Agricultural Science | | |

| AGR*3500 | [0.50] | Experiential Education I |
|---------------------|---------|---------------------------------------------------|
| CROP*4260 | [0.50] | Crop Science Field Trip |
| EDRD*3050 | [0.50] | Agricultural Communication I |
| EDRD*3140 | [0.50] | Organizational Communication |
| FARE*3310 | [0.50] | Operations Management |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |
| FARE*4310 | [0.50] | Resource Economics |
| FARE*4550 | [0.50] | Independent Studies I |
| dents must select a | minimum | of 3.00 credits from the below, without regard to |

2. Students must select a minimum of 3.00 credits from the below, without group. Courses are organized into three subject areas only to provide guidance to students who wish to concentrate in a particular area of plant agriculture.

| Crop Science: | | |
|------------------------|--------------|-------------------------------------------------------|
| AGR*2500 | [0.50] | Field Course in International Agriculture |
| CROP*3300 | [0.50] | Grain Crops |
| CROP*3310 | [0.50] | Protein and Oilseed Crops |
| CROP*3340 | [0.50] | Managed Grasslands |
| CROP*4220 | [0.50] | Cropping Systems |
| CROP*4240 | [0.50] | Weed Science |
| ENVS*3080 | [0.50] | Soil and Water Conservation |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests |
| HORT*4380 | [0.50] | Tropical and Sub-Tropical Crops |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*4160 | [0.50] | Plant Breeding |
| OAGR*2070 | [1.00] | Introduction to Organic Agriculture |
| OAGR*4050 | [1.00] | Design of Organic Production Systems |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4070 | [0.50] | Biological and Cultural Control of Plant Diseases |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| Horticultural S | cience: | |
| CROP*4240 | [0.50] | Weed Science |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science |
| HORT*3010 | [0.50] | Annual, Perennial and Indoor Plants - Identification |
| | | and Use |
| HORT*3150 | [0.50] | Principles and Applications of Plant Propagation |
| HORT*3270 | [0.50] | Medicinal Plants |
| HORT*3280 | [0.50] | Greenhouse Production |
| HORT*3310 | [0.50] | Plants, Food and Health |
| HORT*3510 | [0.50] | Vegetable Production |
| HORT*4300 | [0.50] | Postharvest Physiology |
| HORT*4420 | [0.50] | Fruit Crops |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*4160 | [0.50] | Plant Breeding |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4070 | [0.50] | Biological and Cultural Control of Plant Diseases |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| Turfgrass Scien | ce: | |
| CROP*4240 | [0.50] | Weed Science |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3140 | [0.50] | Management of Turfgrass Diseases |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science |
| HORT*3050 | [0.50] | Management of Turfgrass Insect Pests and Weeds |
| HORT*4200 | [0.50] | Plants, the Environment and Society |
| HORT*4450 | [0.50] | Advanced Turfgrass Science |
| 3. A minimum of 7.00 c | credits must | be at the 3000 level or higher, of which 5.00 credits |
| must be in agricultur | al science a | nd of which 3.50 credits must be at the 4000 level. |
| Refer to Program Co | unsellor for | list of agricultural |
| | | |

4. A humanities or social science courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Option B - Research

Semester 5

| AGR*3450 | [0.50] | Research Methods in Agricultural Science |
|----------------------|---------------|------------------------------------------|
| FOOD*3090 | [0.50] | Food Science and Human Nutrition |
| 1.50 electives or re | stricted elec | ctives |
| Semester 6 | | |
| PBIO*3110 | [0.50] | Crop Physiology |
| 2.00 electives or re | stricted elec | ctives |
| Semester 7 | | |
| AGR*4450 | [1.00] | Research Project I |
| One of: | | |
| ENVS*4000 | IO 50 | Soil Management |

AGR*4460 [1.00] Research Project II 1.50 electives or restricted electives

Restricted Electives - Option B

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

1. During semesters 4-8 students must select a minimum of 3.00 credits from the lists of restricted electives below, without regard to group. Courses are organized into three subject areas only to provide guidance to students who wish to concentrate in a particular area of plant agriculture.

Crop Science:

| AGR*2500 | [0.50] | Field Course in International Agriculture |
|----------------|----------|-----------------------------------------------------------------|
| CROP*3300 | [0.50] | Grain Crops |
| CROP*3310 | [0.50] | Protein and Oilseed Crops |
| CROP*3340 | [0.50] | Managed Grasslands |
| CROP*4220 | [0.50] | Cropping Systems |
| CROP*4240 | [0.50] | Weed Science |
| ENVS*3080 | [0.50] | Soil and Water Conservation |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests |
| HORT*4380 | [0.50] | Tropical and Sub-Tropical Crops |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*4160 | [0.50] | Plant Breeding |
| OAGR*2070 | [1.00] | Introduction to Organic Agriculture |
| OAGR*4050 | [1.00] | Design of Organic Production Systems |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4070 | [0.50] | Biological and Cultural Control of Plant Diseases |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| Horticultural | Science: | |
| CROP*4240 | [0.50] | Weed Science |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science |
| HORT*3010 | [0.50] | Annual, Perennial and Indoor Plants - Identification and Use |
| HORT*3150 | [0.50] | Principles and Applications of Plant Propagation |
| HORT*3270 | [0.50] | Medicinal Plants |
| HORT*3280 | [0.50] | Greenhouse Production |
| HORT*3310 | [0.50] | Plants, Food and Health |
| HORT*3510 | [0.50] | Vegetable Production |
| HORT*4300 | [0.50] | Postharvest Physiology |
| HORT*4420 | [0.50] | Fruit Crops |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics |
| MBG*3100 | [0.50] | Plant Genetics |
| MBG*4160 | [0.50] | Plant Breeding |
| PBIO*3750 | [0.50] | Plant Tissue Culture |
| PBIO*4070 | [0.50] | Biological and Cultural Control of Plant Diseases |
| PBIO*4750 | [0.50] | Genetic Engineering of Plants |
| Turfgrass Scie | nce: | |
| CROP*4240 | [0.50] | Weed Science |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3140 | [0.50] | Management of Turfgrass Diseases |
| HORT*2450 | [0.50] | Introduction to Turfgrass Science |
| HORT*3050 | [0.50] | Management of Turfgrass Insect Pests and Weeds |
| HORT*4200 | [0.50] | Plants, the Environment and Society |
| HORT*4450 | [0.50] | Advanced Turfgrass Science |

2. A minimum of 7.00 credits must be at the 3000 level or higher, of which 5.00 credits must be in agricultural science and of which 3.50 credits must be at the 4000 level. Refer to the Program Counsellor for the list of agricultural science courses.

3. A humanities or social science courses (0.50 credits) at the 1000-level or above from the College of Arts or College of Social and Applied Human Sciences. See Program Counsellor for acceptable list of courses.

Business Electives:

Students in either Option A or Option B who wish to add business courses to their program are advised to select courses from the following list:

| - | | - |
|-----------|--------|----------------------------------|
| FARE*3310 | [0.50] | Operations Management |
| FARE*4220 | [0.50] | Advanced Agribusiness Management |
| FARE*4240 | [0.50] | Futures and Options Markets |
| FARE*4370 | [0.50] | Food & Agri Marketing Management |
| MGMT*3320 | [0.50] | Financial Management |
| | | |

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 | Schedul | le |
|-----------------|----------|-------|--------|------|---------|----|
| Linvironnientai | Defences | 00 OP | ", OIK | ronn | Denedan | |

| Year | Fall | Winter | Summer |
|------|-----------------|-----------------|-------------------------|
| 1 | Academic Term 1 | Academic Term 2 | Off |
| 2 | Academic Term 3 | COOP*1000 | Academic Term 4 |
| 3 | COOP*2000 | Academic Term 5 | COOP*3000 |
| 4 | Academic Term 6 | Academic Term 7 | COOP*4000 (Optional) |
| 5 | Academic Term 8 | N/A | N/A |

Since some of the course requirements in the degree program (core or major) are not offered each semester, careful planning and program consultation with the Faculty Co-op Advisor is essential. In particular, students are encouraged to seek advice when choosing for their Summer academic semester.

The Environmental Sciences Program

The degree in Environmental Sciences consists of a minimum of 20.00 credits, as follows:

- 1. 7.00 Environmental Sciences Core
- 8.50 11.00 Environmental Sciences prescribed and restricted electives according to major.
- 3. free electives*

Within these courses, students must include at least 6.00 credits at the 3000 or 4000 level, and no program may include more than 7.00 credits at the 1000 level.

* There are not specific subject requirements for the elective courses, however, you may NOT select the following: BIOL*1500, BOT*1200, CHEM*1100, CIS*1000, ENVS*1060, GEOL*1100, MICR*1020, MBG*1000, PHYS*1600.

Please note that not all courses in the "One of:" options are available each semester (F, W, S). Students are encouraged to seek advice from the appropriate advisor when selecting and scheduling courses.

First Year Curriculum

The first year courses have been selected to provide students with sufficient background and knowledge to enter any one of the Environmental Sciences majors.

Semester 1

| BIOL*1070 | [0.50] | Discovering Biodiversity |
|------------------|--------------|--------------------------------------------------------|
| CHEM*1040 | [0.50] | General Chemistry I |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences |
| MATH*1080 | [0.50] | Elements of Calculus I |
| Semester 2 | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| Note: Co-op stud | dents must s | elect COOP*1100 Introduction to Co-operative Education |
| | | ~ |

Environmental Sciences Core

In addition to the common first year curriculum, students are required to take the following core Environmental Sciences courses in the semesters recommended in the schedule of studies:

| ENVS*4001 ENVS*4002 | [0.50] [0.50] | Project in Environmental Sciences Project in Environmental Sciences |
|------------------------|------------------|------------------------------------------------------------------------|
| One or: | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| GEOG*2210 | [0.50] | Environment and Resources |
| | | |

A required statistics course is prescribed by the student's choice of major.

Environmental Sciences Majors

Ecology

Environment and Resource Management

Environmental Economics and Policy

Environmental Sciences

Requirements for each of these majors are described in the detailed schedules of studies below.

Ecology (ECOL)

Department of Integrative Biology, College of Biological Science

This program provides a solid foundation in the principles of ecology, training in both pure and applied aspects of ecology and an introduction to economic, legal and policy issues related to the management of the environment. From the 2nd year on, students increasingly augment the core in ecology and policy with extensive restricted electives choices that allow the student to tailor the program to their interests. The major provides a sound science background for careers in conservation, resource management, ecological consulting, or nature interpretation used in teaching, government, non-government or the private sector; or for further post-graduate training in fundamental ecology, environmental biology and environmental management or policy.

Major

| Semester 1 | | |
|------------|--------|------------------------------------------------|
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| CHEM*1040 | [0.50] | General Chemistry I |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences |
| MATH*1080 | [0.50] | Elements of Calculus I |
| Semester 2 | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| Semester 3 | | |
| BIOL*2060 | [0.50] | Ecology |
| One of: | | |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| PHYS*1300 | [0.50] | Fundamentals of Physics |
| One of: | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| | | |

1.00 electives or restricted electives

Note: Students lacking 4U physics or equivalent must take PHYS*1300. Students with 4U physics or equivalent must take PHYS*1080. PHYS*1130 may be substituted for PHYS*1080.

Note: GEOG*2210 may be substituted for ECON*2100 or FARE*2700 and would be taken in semester 4.

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| Semester 4 | | | | |
|-------------------------|--------------|--------------------------------------------------------------|---------|--|
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | |
| BIOL*2400 | [0.50] | Evolution | | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | |
| STAT*2230 | [0.50] | Biostatistics for Integrative Biology | | |
| 0.50 electives or re | stricted ele | ctives | | |
| Semester 5 | | | | |
| BIOL*3010 | [0.50] | Laboratory and Field Work in Ecology | | |
| One of: | | | | |
| BOT*2100 | [0.50] | Life Strategies of Plants | | |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I | | |
| One of: | | | | |
| BOT*3410 | [0.50] | Plant Anatomy | | |
| ZOO*2090 | [0.50] | Vertebrate Structure and Function | | |
| 1.00 electives or re | stricted ele | ctives | | |
| Note: ZOO*2700 1 | may be sub | stituted for BOT*3410 or ZOO*2090 and would be taken | | |
| in semester 6. | | | | |
| Semester 6 | | | | |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems | | |
| BIOL*3130 | [0.50] | Conservation Biology | | |
| 1.50 electives or re | stricted ele | ctives | | |
| Semester 7 | | | | |
| ENVS*4001 | [0.50] | Project in Environmental Sciences | Credi | |
| 2.00 electives or re | stricted ele | ctives | 7.00 ci | |
| Semester 8 | | | 5.00 ci | |
| ENVS*4002 | [0.50] | Project in Environmental Sciences | 5.50 ci | |
| 2.00 electives or re | stricted ele | ctives | 2.50 ci | |
| Note: See note in s | emester 7. | | Studer | |
| Restricted Elect | ives | | 3000-4 | |
| Students are requir | ed to take f | 5.50 restricted credits in Ecology as noted below. Of these, | 5000 - | |
| at least 1.00 credits | s must be a | t the 4000 level. | prior | |
| 1. A minimum of | 0.50 credi | ts from: | restric | |
| DIOI */15 | ю го | 501 Wildlife Conservation and Management | | |

| BIOL*4150 | [0.50] | Wildlife Conservation and Management |
|-----------|--------|--------------------------------------|
| CIS*1500 | [0.50] | Introduction to Programming |
| GEOG*2420 | [0.50] | The Earth From Space |
| GEOG*2480 | [0.50] | Mapping and GIS |
| GEOG*3420 | [0.50] | Remote Sensing of the Environment * |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis * |
| GEOG*4480 | [1.00] | Applied Geomatics * |
| | | |

* Additional prerequisites are required.

2. Students in the Ecology Major are required to take an additional 5.00 restricted elective credits from the following lists. Some courses may require other courses from the list as prerequisites.

Ecology

| ANSC*3180 | [0.50] | Wildlife Nutrition |
|--------------|--------|-------------------------------------------|
| BIOL*3450 | [0.50] | Introduction to Aquatic Environments |
| BOT*3050 | [0.50] | Plant Functional Ecology |
| ENVS*2030 | [0.50] | Meteorology and Climatology |
| ENVS*3010 | [0.50] | Climate Change Biology |
| ENVS*3270 | [0.50] | Forest Biodiversity |
| ENVS*3290 | [0.50] | Waterborne Disease Ecology |
| ENVS*4350 | [0.50] | Forest Ecology |
| GEOG*2000 | [0.50] | Geomorphology |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*3000 | [0.50] | Fluvial Processes |
| GEOG*3610 | [0.50] | Environmental Hydrology |
| NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| ZOO*4570 | [0.50] | Marine Ecological Processes |
| Conservation | | |
| BIOL*4120 | [0.50] | Evolutionary Ecology |
| BIOL*4150 | [0.50] | Wildlife Conservation and Management |
| BIOL*4350 | [0.50] | Limnology of Natural and Polluted Waters |
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| ENVS*2330 | [0.50] | Current Issues in Ecosystem Science and |
| | | Biodiversity |
| ENVS*3000 | [0.50] | Nature Interpretation |
| ENVS*3010 | [0.50] | Climate Change Biology |
| GEOG*2480 | [0.50] | Mapping and GIS |
| GEOG*3020 | [0.50] | Global Environmental Change |
| GEOG*3110 | [0.50] | Biotic and Natural Resources |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| GEOG*4110 | [1.00] | Environmental Systems Analysis |
| GEOG*4230 | [0.50] | Environmental Impact Assessment |
| GEOG*4480 | [1.00] | Applied Geometics |

| Policy, Law and M | Managemer | nt |
|-------------------|-------------|-----------------------------------------------|
| BIOL*4500 | [0.50] | Natural Resource Policy Analysis |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| GEOG*2210 | [0.50] | Environment and Resources |
| GEOG*4210 | [0.50] | Environmental Governance |
| GEOG*4220 | [0.50] | Local Environmental Management |
| PHIL*2070 | [0.50] | Philosophy of the Environment |
| POLS*3370 | [0.50] | Environmental Politics and Governance |
| Independent Rese | arch and Fi | ield Courses |
| BIOL*4410 | [0.75] | Field Ecology |
| BIOL*4700 | [0.50] | Field Biology |
| BIOL*4710 | [0.25] | Field Biology |
| BIOL*4800 | [0.50] | Field Biology |
| BIOL*4810 | [0.25] | Field Biology |
| ENVS*4410 | [0.50] | Introduction to Advanced Independent Research |
| ENVS*4420 | [0.50] | Advanced Independent Research |
| ENVS*4430 | [1.00] | Advanced Independent Research |
| IBIO*4500 | [1.00] | Research in Integrative Biology I |
| IBIO*4510 | [1.00] | Research in Integrative Biology II |
| IBIO*4521 | [1.00] | Thesis in Integrative Biology |
| IBIO*4522 | [1.00] | Thesis in Integrative Biology |
| ZOO*4300 | [0.75] | Marine Biology and Oceanography |
| | | |

Credit Summary (20.00 Total Credits)

7.00 credits - Environmental Sciences core

5.00 credits - Ecology Required courses

5.50 credits - Ecology Restricted electives

2.50 credits - Free electives

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. With prior approval, students may be able to use courses not on these lists towards their Ecology restrictive electives.

Ecology (ECOL:C)

Department of Integrative Biology, College of Biological Science

This program provides a solid foundation in the principles of ecology, training in both pure and applied aspects of ecology and an introduction to economic, legal and policy issues related to the management of the environment. From the 2nd year on, students increasingly augment the core in ecology and policy with extensive restricted electives choices that allow the student to tailor the program to their interests. The major provides a sound science background for careers in conservation, resource management, ecological consulting, or nature interpretation used in teaching, government, non-government or the private sector; or for further post-graduate training in fundamental ecology, environmental biology and environmental management or policy.

Program Requirements

The Co-op program in Ecology is a four and a half year program including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Ecology Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|---------------------------|----------------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

7.00 - Environmental Sciences core

5.00 - Ecology Required courses

- 5.50 Ecology Restricted electives
- 2.50 Free electives
- 1.50 Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *COOP*4000 is optional and if completed the total number of credits will equal 22.00.

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. With prior approval, students may be able to use courses not on these lists towards their Ecology restrictive electives.

The recommended program sequence is outlined below.

Major

Semester 1 - Fall DIOI *1070

| BIOL*1070 | [0.50] | Discovering Biodiversity | | |
|-------------------|--------|------------------------------------------------|--|--|
| CHEM*1040 | [0.50] | General Chemistry I | | |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| Semester 2 - W | inter | | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| COOP*1100 | [0.00] | Introduction to Co-operative Education | | |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy | | |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment | | |
| Semester 3 - Fall | | | | |
| BIOL*2060 | [0.50] | Ecology | | |
| One of: | | | | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | | |
| PHYS*1300 | [0.50] | Fundamentals of Physics | | |
| One of: | | | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality | | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics | | |
| | | | | |

1.00 electives or restricted electives

Note: Students lacking 4U physics or equivalent must take PHYS*1300. Students with 4U physics or equivalent must take PHYS*1080. PHYS*1130 may be substituted for PHYS*1080.

Note: GEOG*2210 may be substituted for ECON*2100 or FARE*2700 and would be taken in semester 4.

Winter Semester

| COOP*1000 | [0.50] | Co-op Work Term I | | | |
|----------------------|-------------------------------|------------------------------------------------------|--|--|--|
| Semester 4 - Su | mmer | | | | |
| BIOC*2580 | [0.50] | Introduction to Biochemistry | | | |
| 2.00 electives or re | stricted ele | ctives | | | |
| Fall Semester | | | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | | | |
| Semester 5 - Wi | nter | | | | |
| BIOL*2400 | [0.50] | Evolution | | | |
| MBG*2040 | [0.50] | Foundations in Molecular Biology and Genetics | | | |
| STAT*2230 | [0.50] | Biostatistics for Integrative Biology | | | |
| 1.00 electives or re | stricted ele | ctives | | | |
| Summer Semes | ter | | | | |
| COOP*3000 | [0.50] | Co-op Work Term III | | | |
| Semester 6 - Fall | | | | | |
| BIOL*3010 | [0.50] | Laboratory and Field Work in Ecology | | | |
| ENVS*4001 | [0.50] | Project in Environmental Sciences | | | |
| One of: | | | | | |
| BOT*2100 | [0.50] | Life Strategies of Plants | | | |
| ZOO*3600 | [0.50] | Comparative Animal Physiology I | | | |
| One of: | | | | | |
| BOT*3410 | [0.50] | Plant Anatomy | | | |
| ZOO*2090 | [0.50] | Vertebrate Structure and Function | | | |
| 0.50 electives or re | stricted ele | ctives | | | |
| Note: ZOO*2700 | may be sub | stituted for BOT*3410 or ZOO*2090 and would be taken | | | |
| in semester 7. | | | | | |
| Semester 7 - Wi | nter | | | | |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems | | | |
| BIOL*3130 | [0.50] | Conservation Biology | | | |
| ENVS*4002 | [0.50] | Project in Environmental Sciences | | | |
| 1.00 electives or re | stricted ele | ctives | | | |
| Note: See note in s | Note: See note in semester 6. | | | | |

Summer Semester (Optional)

COOP*4000 [0.50] Co-op Work Term IV

Semester 8- Fall

2.50 electives or restricted electives

Restricted Electives

Students are required to take 5.50 restricted credits in Ecology as noted below. Of these, at least 1.00 credits must be at the 4000 level.

1.

| 1. A | minimum of 0.50 | credits fron | n: |
|----------|------------------------|--------------|--------------------------------------------------------|
| | BIOL*4150 | [0.50] | Wildlife Conservation and Management |
| | CIS*1500 | [0.50] | Introduction to Programming |
| | GEOG*2420 | [0.50] | The Earth From Space |
| | GEOG*2480 | [0.50] | Mapping and GIS |
| | GEOG*3420 | [0.50] | Remote Sensing of the Environment * |
| | GEOG*3480 | [0.50] | GIS and Spatial Analysis * |
| | GEOG*4480 | [1.00] | Applied Geomatics |
| | * Additional pre | requisites a | re required. |
| 2. | Students in the I | Ecology Ma | jor are required to take an additional 5.00 restricted |
| | elective credits f | rom the foll | lowing lists. Some courses may require other courses |
| | from the list as p | prerequisite | S. |
| | Ecology | FO 501 | X7111C XT / '/' |
| | ANSC*3180 | [0.50] | Wildlife Nutrition |
| | BIOL*3450 DOT*2050 | [0.50] | Diant Eurotional Ecology |
| | BO1 5050 | [0.50] | Mateorology and Climatelogy |
| | ENVS*2030 | [0.50] | Climate Change Biology |
| | ENVS*3010 | [0.50] | Forest Biodiversity |
| | ENVS*3290 | [0.50] | Waterborne Disease Ecology |
| | ENVS*4350 | [0.50] | Forest Ecology |
| | GEOG*2000 | [0.50] | Geomorphology |
| | GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| | GEOG*3000 | [0.50] | Fluvial Processes |
| | GEOG*3610 | [0.50] | Environmental Hydrology |
| | NUTR*3210 | [0.50] | Fundamentals of Nutrition |
| | ZOO*4570 | [0.50] | Marine Ecological Processes |
| | Conservation | | - |
| | BIOL*4120 | [0.50] | Evolutionary Ecology |
| | BIOL*4150 | [0.50] | Wildlife Conservation and Management |
| | BIOL*4350 | [0.50] | Limnology of Natural and Polluted Waters |
| | ENVS*2040 | [0.50] | Plant Health and the Environment |
| | ENVS*2330 | [0.50] | Current Issues in Ecosystem Science and |
| | | | Biodiversity |
| | ENVS*3000 | [0.50] | Nature Interpretation |
| | ENVS*3010 | [0.50] | Climate Change Biology |
| | GEOG*2480 | [0.50] | Mapping and GIS |
| | GEOG*3020 | [0.50] | Global Environmental Change |
| | GEOG*3110 | [0.50] | Biotic and Natural Resources |
| | GEOG*3210 GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| | GEOG*3480 GEOG*4110 | [0.30] | Environmental Systems Analysis |
| | GEOG*4110 GEOG*4230 | [1.00] | Environmental Impact Assessment |
| | GEOG*4480 | [1.00] | Applied Geomatics |
| | Policy Law and | Manageme | int |
| | BIOL*4500 | [0.50] | Natural Resource Policy Analysis |
| | ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| | FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| | GEOG*2210 | [0.50] | Environment and Resources |
| | GEOG*4210 | [0.50] | Environmental Governance |
| | GEOG*4220 | [0.50] | Local Environmental Management |
| | PHIL*2070 | [0.50] | Philosophy of the Environment |
| | POLS*3370 | [0.50] | Environmental Politics and Governance |
| | Independent Res | search and I | Field Courses |
| | BIOL*4410 | [0.75] | Field Ecology |
| | BIOL*4700 | [0.50] | Field Biology |
| | BIOL*4710 | [0.25] | Field Biology |
| | BIOL*4800 | [0.50] | Field Biology |
| | BIOL*4810 | [0.25] | Field Biology |
| | ENVS*4410 | [0.50] | Introduction to Advanced Independent Research |
| | ENVS*4420 | [0.50] | Advanced Independent Research |
| | ENVS*4430 | [1.00] | Advanced Independent Research |
| | IBIO*4500 | [1.00] | Research in Integrative Biology I |
| | IBIO*4510 IBIO*4521 | [1.00] | Research in Integrative Biology II |
| | IDIO*4521 IBIO*4522 | [1.00] | Thesis in Integrative Biology |
| | 700*4322 | [0.75] | Marine Biology and Oceanography |
| F | 200 4500 | [0.75] | |
| LUNA | ironmental Sci | ences (E | IN V D) |

School of Environmental Sciences, Ontario Agricultural College

This major combines a foundation in the breadth of environmental science while giving students practical experience in integrating the basic science in environmental problem solving. The integration of biophysical sciences with real-world applications provides students with a unique skill set for engaging with current and future environmental issues. The many opportunities in the major for experiential learning and independent research give students an ability to collect, analyze and interpret environmental data, and propose solutions that account for both the biophysical science and the socio-economic context. The second year core curriculum develops a cross-disciplinary understanding of the biophysical environment, while the third and fourth years allow students to engage more deeply with issues of interest to them. Students will graduate from this major ready to address diverse problems such as pollinator conservation, soil and water conservation, greenhouse gas mitigation, plant disease management and chemical movement in the environment. It provides a solid background for careers in environmental protection, resource management and research, in both the public and private sectors.

Major

| Semester 1 | | | |
|------------------------------|----------------|----------------------------------------------------------------|--|
| BIOL*1070 | [0.50] | Discovering Biodiversity | |
| CHEM*1040 | [0.50] | General Chemistry I | |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences | |
| MATH*1080 | [0.50] | Elements of Calculus I | |
| Semester 2 | | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | |
| CHEM*1050 | [0.50] | General Chemistry II | |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy | |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment | |
| Semester 3 | | | |
| ENVS*2030 | [0.50] | Meteorology and Climatology | |
| ENVS*2060 | [0.50] | Soil Science | |
| ENVS*2240 | [0.50] | Fundamentals of Environmental Geology | |
| 1.00 electives or r | estricted ele | ctives | |
| Semester 4 | | | |
| BIOL*2060 | [0.50] | Ecology | |
| ENVS*2080 | [0.50] | Introduction to Environmental Microbiology | |
| ENVS*2310 | [0.50] | Introduction to Biogeochemistry | |
| STAT*2040 | [0.50] | Statistics I | |
| 0.50 electives or r | estricted ele | ctives | |
| Semester 5 | | | |
| One of: | | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics | |
| GEOG*2210 | [0.50] | Environment and Resources | |
| 2.00 electives or r | estricted ele | ctives | |
| Students wishing | to register in | BIOL*4350 must substitute BIOL*3450 in Semester 5 for | |
| ENVS*3150 in Se | emester 6. | | |
| Semester 6 | | | |
| ENVS*3150 | [0.50] | Aquatic Systems | |
| 2.00 electives or r | estricted ele | ctives | |
| Semester 7 | | | |
| ENVS*4001 | [0.50] | Project in Environmental Sciences | |
| 2.00 electives or r | estricted ele | ctives | |
| Semester 8 | | | |
| ENVS*4002 | [0.50] | Project in Environmental Sciences | |
| 2.00 electives or r | estricted ele | ctives | |
| Restricted Elec | tives | | |
| Students must take lists. | e a total of 6 | .50 restricted elective credits as prescribed by the following | |
| Students must tak | e 0.50 credi | ts from each of List A & B | |
| List A | | | |
| One of: | | | |
| ENVS*2330 | [0 50] | Current Issues in Ecosystem Science and Biodiversity | |
| ENVS*2550 | [0.50] | Plant Health and the Environment | |
| List B | [0.50] | Fiant freatur and the Environment | |
| One of: | | | |
| PHYS*1070 | [0 50] | Physics for Life Sciences II | |
| PHYS*1080 | [0.50] | Physics for Life Sciences | |
| PHYS*1300 | [0.50] | Fundamentals of Physics | |
| Students lacking 4 | U Physics | or equivalent must take PHYS*1300. | |
| Students are requi | ired to choo | use a minimum of 5.50 credits from Lists C D F and F | |
| waarmo are rouu. | | a manual of 2.20 create nom Liste C. D. L. and T. | |

Students must take a minimum of 1.50 credits from List C, a minimum of 1.00 credits from List D, and students may not count more than 1.00 credits from List F towards their restricted electives. Students should note that many restricted electives, particularly in List D, require other courses as prerequisites. Students should consult the most recent Undergraduate Calendar for specific requirements.

List C Students must take a minimum of 1.50 credits from the following list: BIOL*3130 [0.50] Conservation Biology CHEM*3360 [0.50] Environmental Chemistry and Toxicology ENVS*2120 [0.50] Introduction to Environmental Stewardship ENVS*2210 Apiculture and Honey Bee Biology [0.50]ENVS*2230 [0.50] Communications in Environmental Science ENVS*3000 [0.50] Nature Interpretation ENVS*3010 [0.50] Climate Change Biology ENVS*3020 [0.50] Pesticides and the Environment ENVS*3030 [0.50] Conservation Field Course ENVS*3040 [0.50] Natural Chemicals in the Environment Microclimatology ENVS*3050 [0.50] ENVS*3060 [0.50] Groundwater ENVS*3080 [0.50] Soil and Water Conservation ENVS*3090 [0.50] Insect Diversity and Biology ENVS*3180 [0.50] Sedimentary Environments ENVS*3210 [0.50] Plant Pathology ENVS*3220 [0.50] Terrestrial Chemistry ENVS*3230 [0.50] Agroforestry Systems ENVS*3250 [0.50] Forest Health and Disease ENVS*3270 [0.50] Forest Biodiversity ENVS*3290 [0.50] Waterborne Disease Ecology ENVS*3300 [0.50] Introduction to Controlled Environment Systems ENVS*3310 [0.50] Soil Biodiversity and Ecosystem Function ENVS*3340 [0.50] Use and Management of Environmental Data ENVS*3370 [0.50] Terrestrial Ecosystem Ecology MICR*3220 [0.50] Plant Microbiology TOX*2000 [0.50] Principles of Toxicology List D Students must take a minimum of 1.00 credits from the following list: BIOL*4350 [0.50] Limnology of Natural and Polluted Waters ENVS*4000 [0.50] Toxicological Risk Assessment ENVS*4070 [0.50] Pollinator Conservation ENVS*4090 [0.50] Soil Management ENVS*4100 [0.50] Integrated Management of Invasive Insect Pests ENVS*4160 [0.50] Soil and Nutrient Management ENVS*4180 [0.50] Insecticide Biological Activity and Resistance ENVS*4190 [0.50] **Biological Activity of Herbicides** ENVS*4210 [0.50] Meteorological and Environmental Instrumentation ENVS*4230 [0.50] **Biology of Aquatic Insects** ENVS*4260 [0.50] Field Entomology ENVS*4320 [1.00] Laboratory and Field Methods in Soil Biodiversity Forest Ecology ENVS*4350 [0.50] ENVS*4360 [0.50] **Glacial Environments** ENVS*4370 [0.50] Environmental Organic Chemistry ENVS*4390 [1.00] Soil Variability and Land Evaluation PBIO*4530 [0.50] Plants and Environmental Pollution List E ENVS*4410 [0.50] Introduction to Advanced Independent Research ENVS*4420 [0.50] Advanced Independent Research ENVS*4430 [1.00] Advanced Independent Research ENVS*4510 [0.50] Topics in Environmental Sciences List F Students may count up to 1.00 credits from the following list towards their 6.50 credit restricted electives. GEOG*2420 [0.50] The Earth From Space GEOG*2480 [0.50] Mapping and GIS GEOG*3420 [0.50]Remote Sensing of the Environment GEOG*3480 [0.50] GIS and Spatial Analysis Credit Summary (20.00 Total Credits) 7.00 credits - Environmental Sciences core 4.50 credits - Required Courses for the Major 5.50 credits - Restricted Electives 3.00 credits - Free electives Students are encouraged to seek advice from their faculty advisor and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000-4000 level. With prior approval,

electives Environmental Sciences (ENVS:C)

School of Environmental Sciences, Ontario Agricultural College

students may be able to use courses not on Lists C, D, E, or F toward their restricted

This major combines a foundation in the breadth of environmental science while giving students practical experience in integrating the basic science in environmental problem solving. The integration of biophysical sciences with real-world applications provides students with a unique skill set for engaging with current and future environmental issues. The many opportunities in the major for experiential learning and independent research give students an ability to collect, analyze and interpret environmental data, and propose solutions that account for both the biophysical science and the socio-economic context. The second year core curriculum develops a cross-disciplinary understanding of the biophysical environment, while the third and fourth years allow students to engage more deeply with issues of interest to them. Students will graduate from this major ready to address diverse problems such as pollinator conservation, soil and water conservation, greenhouse gas mitigation, plant disease management and chemical movement in the environment. It provides a solid background for careers in environmental protection, resource management and research, in both the public and private sectors.

Program Requirements

The Co-op program in Environmental Sciences is a four and a half year program including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

Environmental Sciences Academic and Co-op Work Term Schedule

| Year | Fall | Winter | Summer |
|------|---------------------------|----------------------------------|----------------------------|
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

7.00 - Environmental Sciences core

- 4.50 Required Courses for the Major
- 5.50 Restricted Electives
- 3.00 Free electives
- 1.50 Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *COOP*4000 is optional and if completed the total number of credits will equal 22.00.

Students are encouraged to seek advice from their faculty advisor and are reminded that 6.00 credits of their B.Sc.(Env.) degree must be at the 3000-4000 level. With prior approval, students may be able to use courses not on Lists C, D, E or F toward their restricted electives.

The recommended program sequence is outlined below.

Major

Semester 1 - Fall El BIOL*1070 [0.50] **Discovering Biodiversity** Eľ CHEM*1040 General Chemistry I [0.50] Eľ Introduction to Environmental Sciences ENVS*1030 [1.00] E MATH*1080 [0.50] Elements of Calculus I Eľ Semester 2 - Winter E BIOL*1090 [0.50] Introduction to Molecular and Cellular Biology El CHEM*1050 [0.50] General Chemistry II E COOP*1100 [0.00] Introduction to Co-operative Education E FARE*1040 [1.00] Intro to Environmental Economics, Law & Policy E GEOG*1300 [0.50] Introduction to the Biophysical Environment E Semester 3 - Fall El Eľ ENVS*2030 [0.50] Meteorology and Climatology E ENVS*2060 [0.50] Soil Science Eľ ENVS*2240 [0.50] Fundamentals of Environmental Geology E 1.00 electives or restricted electives Eľ

| STAT*2040 | [0.50] | Statistics I | | |
|----------------------|---------------|-------------------------------------------------------|--|--|
| 2.00 electives or re | estricted ele | ctives | | |
| Fall Semester | | | | |
| COOP*2000 | [0.50] | Co-op Work Term II | | |
| Semester 5 - W | inter | | | |
| BIOL*2060 | [0.50] | Ecology | | |
| ENVS*2080 | [0.50] | Introduction to Environmental Microbiology | | |
| ENVS*2310 | [0.50] | Introduction to Biogeochemistry | | |
| 1.00 electives or re | estricted ele | ctives | | |
| Summer Semes | ter | | | |
| COOP*3000 | [0.50] | Co-op Work Term III | | |
| Semester 6 - Fa | 11 | | | |
| ENVS*4001 | [0.50] | Project in Environmental Sciences | | |
| One of: | | | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality | | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics | | |
| GEOG*2210 | [0.50] | Environment and Resources | | |
| 1.50 electives or re | estricted ele | ctives | | |
| Students wishing t | o register in | BIOL*4350 must substitute BIOL*3450 in Semester 6 for | | |
| ENVS*3150 in Se | mester 7. | | | |
| Semester 7 - W | inter | | | |
| ENVS*3150 | [0.50] | Aquatic Systems | | |

Co-op Work Term I

ENVS*4002 [0.50] Project in Environmental Sciences 1.50 electives or restricted electives

Summer Semester - (Optional)

COOP*4000 [0.50] Co-op Work Term IV

Semester 8 - Fall

Winter Semester

Semester 4 - Summer

[0.50]

COOP*1000

2.50 electives or restricted electives

Restricted Electives

Students must take a total of 6.50 restricted elective credits as prescribed by the following lists.

Students must take 0.50 credits from each of List A & B

List A

| One of: | | |
|---------------------|--------------|------------------------------------------------------|
| ENVS*2330 | [0.50] | Current Issues in Ecosystem Science and Biodiversity |
| ENVS*2040 | [0.50] | Plant Health and the Environment |
| List B | | |
| One of: | | |
| PHYS*1070 | [0.50] | Physics for Life Sciences II |
| PHYS*1080 | [0.50] | Physics for Life Sciences |
| PHYS*1300 | [0.50] | Fundamentals of Physics |
| Students lacking 4U | J Physics or | equivalent must take PHYS*1300. |

Students are required to choose a minimum of 5.50 credits from Lists C, D, E, and F. Students must take a minimum of 1.50 credits from List C, a minimum of 1.00 credits from List D, and students may not count more than 1.00 credits from List F towards their restricted electives. Students should note that many restricted electives, particularly in List D, require other courses as prerequisites. Students should consult the most recent Undergraduate Calendar for specific requirements.

List C

Students must take a minimum of 1.50 credits from the following list:

| BIOL*3130 | [0.50] | Conservation Biology |
|-----------|--------|-------------------------------------------|
| CHEM*3360 | [0.50] | Environmental Chemistry and Toxicology |
| ENVS*2120 | [0.50] | Introduction to Environmental Stewardship |
| ENVS*2210 | [0.50] | Apiculture and Honey Bee Biology |
| ENVS*2230 | [0.50] | Communications in Environmental Science |
| ENVS*3000 | [0.50] | Nature Interpretation |
| ENVS*3010 | [0.50] | Climate Change Biology |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3030 | [0.50] | Conservation Field Course |
| ENVS*3040 | [0.50] | Natural Chemicals in the Environment |
| ENVS*3050 | [0.50] | Microclimatology |
| ENVS*3060 | [0.50] | Groundwater |
| ENVS*3080 | [0.50] | Soil and Water Conservation |
| ENVS*3090 | [0.50] | Insect Diversity and Biology |
| ENVS*3180 | [0.50] | Sedimentary Environments |
| ENVS*3210 | [0.50] | Plant Pathology |
| ENVS*3220 | [0.50] | Terrestrial Chemistry |
| ENVS*3230 | [0.50] | Agroforestry Systems |
| ENVS*3250 | [0.50] | Forest Health and Disease |
| ENVS*3270 | [0.50] | Forest Biodiversity |

| ENVS*3290 | [0.50] | Waterborne Disease Ecology | |
|--------------------|------------|---------------------------------------------------|--|
| ENVS*3300 | [0.50] | Introduction to Controlled Environment Systems | |
| ENVS*3310 | [0.50] | Soil Biodiversity and Ecosystem Function | |
| ENVS*3340 | [0.50] | Use and Management of Environmental Data | |
| ENVS*3370 | [0.50] | Terrestrial Ecosystem Ecology | |
| MICR*3220 | [0.50] | Plant Microbiology | |
| TOX*2000 | [0.50] | Principles of Toxicology | |
| List D | | | |
| Students must take | e a minimu | m of 1.00 credits from the following list: | |
| BIOL*4350 | [0.50] | Limnology of Natural and Polluted Waters | |
| ENVS*4000 | [0.50] | Toxicological Risk Assessment | |
| ENVS*4070 | [0.50] | Pollinator Conservation | |
| ENVS*4090 | [0.50] | Soil Management | |
| ENVS*4100 | [0.50] | Integrated Management of Invasive Insect Pests | |
| ENVS*4160 | [0.50] | Soil and Nutrient Management | |
| ENVS*4180 | [0.50] | Insecticide Biological Activity and Resistance | |
| ENVS*4190 | [0.50] | Biological Activity of Herbicides | |
| ENVS*4210 | [0.50] | Meteorological and Environmental Instrumentation | |
| ENVS*4230 | [0.50] | Biology of Aquatic Insects | |
| ENVS*4260 | [0.50] | Field Entomology | |
| ENVS*4320 | [1.00] | Laboratory and Field Methods in Soil Biodiversity | |
| ENVS*4350 | [0.50] | Forest Ecology | |
| ENVS*4360 | [0.50] | Glacial Environments | |
| ENVS*4370 | [0.50] | Environmental Organic Chemistry | |
| ENVS*4390 | [1.00] | Soil Variability and Land Evaluation | |
| PBIO*4530 | [0.50] | Plants and Environmental Pollution | |
| List E | | | |
| ENVS*4410 | [0.50] | Introduction to Advanced Independent Research | |
| ENVS*4420 | [0.50] | Advanced Independent Research | |
| ENVS*4430 | [1.00] | Advanced Independent Research | |
| ENVS*4510 | [0.50] | Topics in Environmental Sciences | |
| List F | | | |

Students may count up to 1.00 credits from the following list towards their 6.50 credit restricted electives.

| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
|-----------|--------|-----------------------------------|
| GEOG*3420 | [0.50] | Remote Sensing of the Environment |
| GEOG*2480 | [0.50] | Mapping and GIS |
| GEOG*2420 | [0.50] | The Earth From Space |
| | | |

Environmental Economics and Policy (EEP)

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

This major provides the foundation for applying science and economics to environmental issues to produce effective environmental policy. Students gain an understanding of the policy tools and market mechanisms for managing our natural resources effectively. Knowledge and skills learned in this major will enable students to identify, prioritize and solve environmental problems by integrating both scientific and economic theories and data. Equipped with the ability to look at current topics from the perspectives of economics, politics and environmental sciences, students have a number of interesting career opportunities in the public, private and NGO sectors. At the same time, the major fully prepares students to move onto professional and research graduate programs.

Major

| Semester 1 | | | | |
|----------------------------------------|--------|------------------------------------------------|--|--|
| BIOL*1070 | [0.50] | Discovering Biodiversity | | |
| CHEM*1040 | [0.50] | General Chemistry I | | |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences | | |
| MATH*1080 | [0.50] | Elements of Calculus I | | |
| Semester 2 | | | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology | | |
| CHEM*1050 | [0.50] | General Chemistry II | | |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy | | |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment | | |
| Semester 3 | | | | |
| ECON*1100 | [0.50] | Introductory Macroeconomics | | |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics | | |
| 1.50 electives or restricted electives | | | | |
| Semester 4 | | | | |
| ECON*2310 | [0.50] | Intermediate Microeconomics | | |
| ECON*2410 | [0.50] | Intermediate Macroeconomics | | |
| ECON*2770 | [0.50] | Introductory Mathematical Economics | | |
| One of: | | | | |
| ECON*2740 | [0.50] | Economic Statistics | | |
| STAT*2040 | [0.50] | Statistics I | | |
| 0.50 electives or restricted electives | | | | |

Note: Students interested in the Statistics and Environmental Risk Assessment sequence in their restricted electives should choose STAT*2040 to satisfy the statistics requirement in the ENVS core.

Semester 5

| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
|----------------------|---------------|-------------------------------------------|
| ECON*3740 | [0.50] | Introduction to Econometrics |
| 1.50 electives or re | estricted ele | ctives |
| Semester 6 | | |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| 2.00 electives or re | estricted ele | ctives |
| Semester 7 | | |
| ECON*4930 | [0.50] | Environmental Economics |
| ENVS*4001 | [0.50] | Project in Environmental Sciences |
| FARE*4290 | [0.50] | Land Economics |
| 1.00 electives or re | estricted ele | ctives |
| Semester 8 | | |
| ENVS*4002 | [0.50] | Project in Environmental Sciences |
| FARE*4310 | [0.50] | Resource Economics |
| 1.50 restricted elec | tives or ele | ctives |

Restricted Electives

Students in the Environmental Economics and Policy major are required to complete 6.00 credits in restricted electives. 2.50 restricted elective credits must be in FARE or ECON courses at the 3000 or 4000 level.

Courses in the following lists may be taken to satisfy the restricted electives requirement. Courses are grouped to assist students select programs of study aimed at different educational and career paths.

List A

Students must select a minimum of 2.50 credits from the following lists:

1. Ouantitative Methods, Research and Graduate Studies

| | unititati e nicetitea. | , | | | |
|---------------|--------------------------------------------------------------------------|--------|------------------------------------------------|--|--|
| | ECON*3100 | [0.50] | Game Theory | | |
| | ECON*3710 | [0.50] | Advanced Microeconomics | | |
| | ECON*4640 | [0.50] | Advanced Econometrics | | |
| | ECON*4700 | [0.50] | Advanced Mathematical Economics | | |
| | ECON*4710 | [0.50] | Advanced Topics in Microeconomics | | |
| | ECON*4750 | [0.50] | Topics in Public Economics | | |
| | ECON*4840 | [0.50] | Financial Econometrics | | |
| | FARE*4500 | [0.50] | Decision Science | | |
| | FARE*4550 | [0.50] | Independent Studies I | | |
| | FARE*4560 | [0.50] | Independent Studies II | | |
| 2. Pol | icy Analysis | | | | |
| | ECON*2650 | [0.50] | Introductory Development Economics | | |
| | ECON*3500 | [0.50] | Urban Economics | | |
| | ECON*3580 | [0.50] | Economics of Regulation | | |
| | ECON*3610 | [0.50] | Public Economics | | |
| | ECON*3620 | [0.50] | International Trade | | |
| | ECON*4830 | [0.50] | Economic Development | | |
| | ECON*4880 | [0.50] | Topics in International Economics | | |
| | EDRD*2650 | [0.50] | Introduction to Planning and Environmental Law | | |
| | FARE*2410 | [0.50] | Agrifood Markets and Policy | | |
| | FARE*3250 | [0.50] | Food and International Development | | |
| | FARE*4000 | [0.50] | Agricultural and Food Policy | | |
| | FARE*4210 | [0.50] | World Agriculture, Food Security and Economic | | |
| | | | Development | | |
| | FARE*4550 | [0.50] | Independent Studies I | | |
| | FARE*4560 | [0.50] | Independent Studies II | | |
| | POLS*3370 | [0.50] | Environmental Politics and Governance | | |
| List B | | | | | |
| Student | Students must select a minimum of 1.00 credits from the following lists: | | | | |
| 1. Re | 1. Remote Sensing, Geographical Information Systems and Spatial Analysis | | | | |

| 1. Kennote Bensing, Geo | gi apincai i | mormation Systems and Spatial Analysis | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------|--|--|
| GEOG*2420 | [0.50] | The Earth From Space | | |
| GEOG*2480 | [0.50] | Mapping and GIS | | |
| GEOG*3420 | [0.50] | Remote Sensing of the Environment | | |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis | | |
| GEOG*4480 | [1.00] | Applied Geomatics | | |
| 2. Statistics and Enviror | nmental Ri | sk Assessment | | |
| STAT*2050 | [0.50] | Statistics II | | |
| STAT*3510 | [0.50] | Environmental Risk Assessment | | |
| Note : Students interested in this sequence should take STAT*2040 rather ECON*2740 to satisfy the statistics requirement in the ENVS core. | | | | |

3. Earth Sciences

| ENVS*2030 | [0.50] | Meteorology and Climatology |
|-----------|--------|---------------------------------|
| ENVS*2060 | [0.50] | Soil Science |
| ENVS*2310 | [0.50] | Introduction to Biogeochemistry |

than

X. Degree Programs, Bachelor of Science in Environmental Sciences [B.Sc.(Env.)]

| ENVS*3060 | [0.50] | Groundwater |
|-----------------------|-------------|-----------------------------------------|
| 4. Ecology and Conser | rvation Bio | logy |
| BIOL*2060 | [0.50] | Ecology |
| BIOL*3060 | [0.50] | Populations, Communities & Ecosystems |
| BIOL*3130 | [0.50] | Conservation Biology |
| BIOL*4150 | [0.50] | Wildlife Conservation and Management |
| BIOL*4500 | [0.50] | Natural Resource Policy Analysis |
| ENVS*2330 | [0.50] | Current Issues in Ecosystem Science and |
| | | Biodiversity |
| 5. Toxicology and Env | ironmental | l Chemistry |
| ENVS*3020 | [0.50] | Pesticides and the Environment |
| ENVS*3040 | [0.50] | Natural Chemicals in the Environment |
| ENVS*3220 | [0.50] | Terrestrial Chemistry |

TOX*2000 [0.50] Principles of Toxicology

TOX*3360 [0.50] Environmental Chemistry and Toxicology

Credit Summary (20.00 Total Credits) 7.00 credits - Environmental Sciences core

5.00 credits - Environmental Economics and Policy required courses

6.00 credits - Environmental Economics and Policy restricted electives

2.00 credits - Free electives

Students are encouraged to seek advice on their choices from their faculty advisor. Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000 or 4000 level

Environmental Economics and Policy (EEP:C)

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

This major provides the foundation for applying science and economics to environmental issues to produce effective environmental policy. Students gain an understanding of the policy tools and market mechanisms for managing our natural resources effectively. Knowledge and skills learned in this major will enable students to identify, prioritize and solve environmental problems by integrating both scientific and economic theories and data. Equipped with the ability to look at current topics from the perspectives of economics, politics and environmental sciences, students have a number of interesting career opportunities in the public, private and NGO sectors. At the same time, the major fully prepares students to move onto professional and research graduate programs.

Program Requirements

The Co-op program in Environmental Economics and Policy is a four and a half year program including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: https://www.recruitguelph.ca/cecs/). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Environmental Economics and Polic | y Academic and C | Co-op Work | Term Schedule |
|-----------------------------------|------------------|------------|---------------|
|-----------------------------------|------------------|------------|---------------|

| | Year | Fall | Winter | Summer |
|---|------|---------------------------|----------------------------------|----------------------------|
| | 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| | 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| | 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| | 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| ĺ | 5 | Academic Semester 8 | N/A | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

7.00 - Environmental Sciences core

- 5.00 Environmental Economics and Policy Required Courses
- 6.00 Environmental Economics and Policy restricted electives
- 2.00 Free electives
- 1.50 Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *COOP*4000 is optional and if completed the total number of credits will equal 22.00.

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

The recommended program sequence is outlined below.

Major

| Semester I - Fa | all | |
|---------------------|---------------|------------------------------------------------|
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| CHEM*1040 | [0.50] | General Chemistry I |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences |
| MATH*1080 | [0.50] | Elements of Calculus I |
| Semester 2 - W | inter | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| Semester 3 - Fa | all | |
| ECON*1100 | [0.50] | Introductory Macroeconomics |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| 1.50 electives or r | estricted ele | ectives |
| Winter Semest | er | |
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 4 - Su | ımmer | |
| ECON*2310 | [0.50] | Intermediate Microeconomics |
| ECON*2410 | [0.50] | Intermediate Macroeconomics |
| ECON*2770 | [0.50] | Introductory Mathematical Economics |
| One of: | | |
| ECON*2740 | [0.50] | Economic Statistics |

[0.50] 0.50 electives or restricted electives

Note: Students interested in the Statistics and Environmental Risk Assessment sequence in their restricted electives should choose STAT*2040 to satisfy the statistics requirement in the ENVS core. ECON*2740 may not be offered in the summer semester, so STAT*2040 should be taken if students wish to satisfy this program requirement in the summer semester.

Statistics I

Fall Semester

STAT*2040

| COOP*2000 | [0.50] | Co-op Work Term II |
|-------------------------|---------------|-------------------------------------------|
| Semester 5 - Wi | nter | |
| ECON*3740 | [0.50] | Introduction to Econometrics |
| FARE*3170 | [0.50] | Cost-Benefit Analysis |
| 1.50 electives or re | stricted elec | ctives |
| Summer Semest | ter | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 6 - Fal | 1 | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| ENVS*4001 | [0.50] | Project in Environmental Sciences |
| 1.50 electives or re | stricted elec | ctives |
| Semester 7 - Wi | nter | |
| ENVS*4002 | [0.50] | Project in Environmental Sciences |
| FARE*4310 | [0.50] | Resource Economics |
| 1.50 electives or re | stricted elec | ctives |
| Summer Semest | ter (Optio | nal) |
| COOP*4000 | [0.50] | Co-op Work Term IV |
| Semester 8 - Fal | 11 | |
| ECON*4930 | [0.50] | Environmental Economics |
| FARE*4290 | [0.50] | Land Economics |
| 1.50 electives or re | stricted elec | ctives |
| Doctrictod Floot | ivos | |

Restricted Electives

Students in the Environmental Economics and Policy major are required to complete 6.00 credits in restricted electives. 2.50 restricted elective credits must be in FARE or ECON courses at the 3000 or 4000 level.

Courses in the following lists may be taken to satisfy the restricted electives requirement. Courses are grouped to assist students select programs of study aimed at different educational and career paths.

List A

Students must select a minimum of 2.50 credits from the following lists:

| 1. Quantitative Method | ls, Researc | ch and Graduate Studies | |
|------------------------|-------------|-----------------------------------|--|
| ECON*3100 | [0.50] | Game Theory | |
| ECON*3710 | [0.50] | Advanced Microeconomics | |
| ECON*4640 | [0.50] | Advanced Econometrics | |
| ECON*4700 | [0.50] | Advanced Mathematical Economics | |
| ECON*4710 | [0.50] | Advanced Topics in Microeconomics | |
| ECON*4750 | [0.50] | Topics in Public Economics | |
| ECON*4840 | [0.50] | Financial Econometrics | |
| FARE*4500 | [0.50] | Decision Science | |

Intro to Environmental Economics, Law & Policy

Introduction to the Biophysical Environment

General Chemistry II

[0.50]

[1.00]

[0.50]

| FARE*4550 | [0.50] | Independent Studies I | CHEM*1050 |
|--------------------------|--------------------|------------------------------------------------|-----------------|
| FARE*4560 | [0.50] | Independent Studies II | FARE*1040 |
| 2. Policy Analysis | | | GEOG*1300 |
| ECON*2650 | [0.50] | Introductory Development Economics | Semester 3 |
| ECON*3500 | [0.50] | Urban Economics | GEOG*2000 |
| ECON*3580 | [0.50] | Economics of Regulation | GEOG*2460 |
| ECON*3610 | [0.50] | Public Economics | One of: |
| ECON*3620 | [0.50] | International Trade | ECON*21 |
| ECON*4830 | [0.50] | Economic Development | FARE*270 |
| ECON*4880 | [0.50] | Topics in International Economics | 1.00 electives |
| EDRD*2650 | [0.50] | Introduction to Planning and Environmental Law | Semester 4 |
| FARE*2410 | [0.50] | Agrifood Markets and Policy | GEOG*2110 |
| FARE*3250 | [0.50] | Food and International Development | GEOG*2210 |
| FARE*4000 | [0.50] | Agricultural and Food Policy | GEOG*2480 |
| FARE*4210 | [0.50] | World Agriculture, Food Security and Economic | 1.00 electives |
| EA DE*4550 | FO F O1 | Development | Semester 5 |
| FARE*4550 | [0.50] | Independent Studies I | ENVS*2120 |
| FAKE*4500 | [0.50] | Environmental Balities and Covernance | GEOG*3000 |
| POLS*5570 | [0.50] | Environmental Politics and Governance | GEOG*3110 |
| | | | GEOG*3210 |
| Students must select a m | inimum of I | .00 credits from the following lists: | 0.50 electives |
| 1. Remote Sensing, G | eographical | Information Systems and Spatial Analysis | Note: GEOG |
| GEOG*2420 | [0.50] | The Earth From Space | 6. |
| GEOG*2480 | [0.50] | Mapping and GIS | Semester 6 |
| GEOG*3420 | [0.50] | Remote Sensing of the Environment | GEOG*3480 |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis | 2.00 electives |
| GEOG*4480 | [1.00] | Applied Geomatics | Semester 7 |
| 2. Statistics and Envi | ronmental F | Risk Assessment | ENVS*4001 |
| STAT*2050 | [0.50] | Statistics II | GEOG*4110 |
| STAT*3510 | [0.50] | Environmental Risk Assessment | GEOG*4110 |
| Note: Students inte | erested in th | is sequence should take STAT*2040 rather than | 0.50 electives |
| ECON*2740 to satis | sfy the statis | tics requirement in the ENVS core. | Semester 8 |
| 3. Earth Sciences | | | ENVS*4002 |
| ENVS*2030 | [0 50] | Meteorology and Climatology | ENVS*4002 |
| ENVS*2060 | [0.50] | Soil Science | 2.00 electives |
| ENVS*2310 | [0.50] | Introduction to Biogeochemistry | Restricted |
| ENVS*3060 | [0.50] | Groundwater | 1.A minimun |
| 4. Ecology and Conse | rvation Bio | logy | ENVS*43 |
| BIOL*2060 | [0 50] | Ecology | GEOG*42 |
| BIOL*3060 | [0.50] | Populations Communities & Ecosystems | GEOG*42 |
| BIOL*3130 | [0.50] | Conservation Biology | 2. An addition |
| BIOL*4150 | [0.50] | Wildlife Conservation and Management | Credit Sum |
| BIOL*4500 | [0.50] | Natural Resource Policy Analysis | 7.00 credits - |
| ENVS*2330 | [0.50] | Current Issues in Ecosystem Science and | 6.00 credits - |
| | | Biodiversity | 200 - 250 |
| 5. Toxicology and En | vironmental | Chemistry | depending on |
| ENVS*3020 | [0.50] | Pesticides and the Environment | 4 00 - 4 50 cr |
| ENVS*3040 | [0.50] | Natural Chemicals in the Environment | -+.00 = 4.00 Cl |
| ENVS*3220 | [0.50] | Terrestrial Chemistry | 2000 4000 1- |
| TOX*2000 | [0.50] | Principles of Toxicology | 5000-4000 le |
| TOX*3360 | [0.50] | Environmental Chemistry and Toxicology | Students are |
| | | | E |

Environment and Resource Management (ERM)

Department of Geography, Environment and Geomatics, College of Social and Applied Human Sciences

The major focuses on environmental interactions and problem solving by developing an integrated biophysical environment - human environment perspective. In ERM, students will gain knowledge across the natural sciences, an understanding of how they interact, the skills (tools and techniques) needed to support decision making, as well as the methods of management and governance that are critical for environmental decision making. Beginning in first year students learn in the classroom and through hands-on work in labs and in the field. Students are expected to design and conduct experiments and problem solve using state-of-the-art computing and analytical tools. This major provides the knowledge, skills and methods an environmental scientist requires as environmental consultant, environmental manager, environmental and/or resource planner, geographic information systems analyst or to facilitate future graduate work.

Major

| Semester 1 | | |
|------------|--------|------------------------------------------------|
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| CHEM*1040 | [0.50] | General Chemistry I |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences |
| MATH*1080 | [0.50] | Elements of Calculus I |
| Semester 2 | | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |

| Semester 3 | | |
|---------------------|------------------------|----------------------------------------------------------------|
| GEOG*2000 | [0.50] | Geomorphology |
| GEOG*2460 | [0.50] | Analysis in Geography |
| One of: | | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| FARE*2700 | [0.50] | Survey of Natural Resource Economics |
| 1.00 electives | | |
| Semester 4 | | |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*2210 | [0.50] | Environment and Resources |
| GEOG*2480 | [0.50] | Mapping and GIS |
| 1.00 electives or 1 | restricted ele | ectives |
| Semester 5 | | |
| ENVS*2120 | [0.50] | Introduction to Environmental Stewardship |
| GEOG*3000 | [0.50] | Fluvial Processes |
| GEOG*3110 | [0.50] | Biotic and Natural Resources |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment |
| 0.50 electives or 1 | restricted ele | ectives |
| Note: GEOG*361 | 10 may be su | abstituted for GEOG*3000 and would be taken in Semester |
| 6. | | |
| Semester 6 | | |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| 2.00 electives or 1 | restricted ele | ectives |
| Semester 7 | | |
| ENVS*4001 | [0.50] | Project in Environmental Sciences |
| GEOG*4110 | [1.00] | Environmental Systems Analysis |
| GEOG*4210 | [0.50] | Environmental Governance |
| 0.50 electives or 1 | restricted ele | ectives |
| Semester 8 | | |
| ENVS*4002 | [0.50] | Project in Environmental Sciences |
| 2.00 electives or 1 | restricted ele | ectives |
| Restricted Elec | ctives | |
| 1.A minimum of | 2 of the follo | owing courses: |
| ENVS*4390 | [1.00] | Soil Variability and Land Evaluation |
| GEOG*4220 | [0.50] | Local Environmental Management |
| GEOG*4230 | [0.50] | Environmental Impact Assessment |
| 2. An additional 1 | .00 credits i | n Geography (GEOG) at the 3000 level or higher. |
| Credit Summa | ry (20.00 [*] | Total Credits) |
| 7.00 credits - Env | vironmental 3 | Sciences core |
| 6.00 credits - Env | vironment an | d Resource Management Required courses |
| 2.00 - 2.50 cred | lits - Enviro | onment and Resource Management Restricted electives |
| depending on cou | irse selection | 1 |
| 4 00 - 4 50 credits | s - Free elec | tives depending on course selection |
| Students are rem | inded that | 6.00 gradits of their B Sa (Env.) degree must be at the |
| 3000_4000 laval | mueu mat | 0.00 creatts of them b.sc. (Env.) degree must be at the |
| Studente ens | unaged to | alt advice on their sheizes from their feaultry - definer |
| Students are enco | uraged to se | ek advice on their choices from their faculty advisor. |
| Environment | and Res | ource Management (ERM:C) |

Department of Geography, Environment and Geomatics, College of Social and Applied Human Sciences

The major focuses on environmental interactions and problem solving by developing an integrated biophysical environment - human environment perspective. In ERM, students will gain knowledge across the natural sciences, an understanding of how they interact, the skills (tools and techniques) needed to support decision making, as well as the methods of management and governance that are critical for environmental decision making. Beginning in first year students learn in the classroom and through hands-on work in labs and in the field. Students are expected to design and conduct experiments and problem solve using state-of-the-art computing and analytical tools. This major provides the knowledge, skills and methods an environmental scientist requires as environmental consultant, environmental manager, environmental and/or resource planner, geographic information systems analyst or to facilitate future graduate work.

Program Requirements

The Co-op program in Environment and Resource Management is a four and a half year program including four work terms. Students must complete a Fall, Winter and Summer work term, and must follow the academic work schedule as outlined below (also found on the Co-operative Education website: <u>https://www.recruitguelph.ca/cecs/</u>). Please refer to the Co-operative Education program policy with respect to adjusting this schedule.

| Environ | ment and Resource Manag | ement Academic and Co-o | p Work Term Schedule |
|---------|---------------------------|----------------------------------|----------------------------|
| Year | Fall | Winter | Summer |
| 1 | Academic Semester 1 | Academic Semester 2 COOP*1100 | Off |
| 2 | Academic Semester 3 | COOP*1000 Work Term I | Academic Semester 4 |
| 3 | COOP*2000 Work Term II | Academic Semester 5 | COOP*3000 Work Term III |
| 4 | Academic Semester 6 | Academic Semester 7 | COOP*4000 Work Term IV |
| 5 | Academic Semester 8 | N/A | N/A |

To be eligible to continue in the Co-op program, students 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, work term report grading and program completion requirements.

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

Credit Summary (21.50 Total Credits)*

7.00 - Environmental Sciences core

6.00 - Environment and Resource Management Required courses

2.00 - 2.50 - Environment and Resource Management Restricted electives, depending on course selection

4.00 - 4.50 - Free electives, depending on course selection

1.50 - Co-op Work Terms

Note: A minimum of three Co-op work terms including a Summer, Fall, and Winter are necessary to complete the Co-op requirement. *COOP*4000 is optional and if completed the total number of credits will equal 22.00.

Students are reminded that 6.00 credits of their B.Sc. (Env.) degree must be at the 3000-4000 level.

Students are encouraged to seek advice on their choices from their faculty advisor. The recommended program sequence is outlined below.

Maior

Semester 1 - Fall

| Semester 1 - F | an | |
|----------------|--------|------------------------------------------------|
| BIOL*1070 | [0.50] | Discovering Biodiversity |
| CHEM*1040 | [0.50] | General Chemistry I |
| ENVS*1030 | [1.00] | Introduction to Environmental Sciences |
| MATH*1080 | [0.50] | Elements of Calculus I |
| Semester 2 - V | Vinter | |
| BIOL*1090 | [0.50] | Introduction to Molecular and Cellular Biology |
| CHEM*1050 | [0.50] | General Chemistry II |
| COOP*1100 | [0.00] | Introduction to Co-operative Education |
| FARE*1040 | [1.00] | Intro to Environmental Economics, Law & Policy |
| GEOG*1300 | [0.50] | Introduction to the Biophysical Environment |
| Semester 3 - F | all | |
| ENVS*2120 | [0.50] | Introduction to Environmental Stewardship |
| | | ~ |

GEOG*2000[0.50]GeomorphologyGEOG*2480[0.50]Mapping and GIS1.00 electives or restricted electives

Note: FARE*2700 may be substituted for ECON*2100 and may be taken in Semester 3 or 6, GEOG*2460 may be substituted for STAT*2040 and may be taken in Semester 3 or 6.

Winter Semester

| i inter semest | | |
|---------------------|---------------|-------------------------------------------|
| COOP*1000 | [0.50] | Co-op Work Term I |
| Semester 4 - St | ummer | |
| ECON*2100 | [0.50] | Economic Growth and Environmental Quality |
| GEOG*2210 | [0.50] | Environment and Resources |
| STAT*2040 | [0.50] | Statistics I |
| 1.00 electives or 1 | restricted el | lectives |
| Fall Semester | | |
| COOP*2000 | [0.50] | Co-op Work Term II |
| Semester 5 - W | inter | |
| GEOG*2110 | [0.50] | Climate and the Biophysical Environment |
| GEOG*3480 | [0.50] | GIS and Spatial Analysis |
| 1.50 electives or 1 | restricted el | lectives |
| Summer Seme | ster | |
| COOP*3000 | [0.50] | Co-op Work Term III |
| Semester 6 - Fa | all | |
| ENVS*4001 | [0.50] | Project in Environmental Sciences |

| GEOG*3000 | [0.50] | Fluvial Processes | | |
|---------------------------------------------------------------------------------|--------|-------------------------------------------|--|--|
| GEOG*3110 | [0.50] | Biotic and Natural Resources | | |
| GEOG*3210 | [0.50] | Management of the Biophysical Environment | | |
| 0.50 electives or restricted electives | | | | |
| Note: GEOG*3610 may be substituted for GEOG*3000 and would be taken in Semester | | | | |
| 6 | | | | |

Semester 7 - Winter

ENVS*4002 [0.50] Project in Environmental Sciences 2.00 electives or restricted electives

Summer Semester (Optional)

| COOP*4000 | [0.50] | Co-op Work Term IV |
|-----------|--------|--------------------|
|-----------|--------|--------------------|

Semester 8 - Fall

| GEOG*4110 | [1.00] | Environmental Systems Analysis |
|-------------------|--------------|--------------------------------|
| GEOG*4210 | [0.50] | Environmental Governance |
| 1.00 electives or | restricted e | lectives |

Restricted Electives

1.A minimum of 2 of the following courses:

ENVS*4390 [1.00] Soil Variability and Land Evaluation

- GEOG*4220 [0.50] Local Environmental Management
- GEOG*4230 [0.50] Environmental Impact Assessment

2. An additional 1.00 credits in Geography (GEOG) at the 3000 level or higher. 2. An additional 1.00 credits in Geography (GEOG) at the 3000 level or higher.

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 <u>Ontario Veterinary College</u>. 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 <u>Canadian</u> and <u>American Veterinary Medical Association</u>, and the <u>Royal College of Veterinary Surgeons of Britain</u>. The D.V.M. degree from Guelph is respected by veterinarians throughout the world.

Objectives of the Program

- 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 <u>Canadian Veterinary Medical Association</u>, 339 Booth Street, Ottawa, Ontario, Canada K1R 7K1, who will refer them to the appropriate provincial veterinary association.

Admission to the Veterinary Medicine Program

Complete details on admission requirements and procedures are listed in Section IV--Admission Information. Additional information may be found at: http://www.ovc.uoguelph.ca/recruitment/en/index.asp

Academic Counselling

The Office of the Associate Dean, Students provides academic counselling and referral to other appropriate resources for all D.V.M. students. In particular, students who are requesting a Supplemental Privilege are required to meet with the Associate Dean so that the student can be informed of appropriate resources (such as Learning and Writing Services and the Counselling and Student Resource Centre) and use them to deal with their 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 , and in light of the student's particular circumstances (see VIII--Undergraduate Degree Regulations and Procedures).

Full-time Study

The D.V.M. program is offered as a full-time program and normally requires four years (over the equivalent of eight academic semesters at the University of Guelph) to complete. In exceptional extenuating circumstances, the Academic Review Sub-Committee may allow a student to take courses on a part-time basis. In these instances, the Academic Review Sub-Committee has the discretion to select the courses that the student will register in on a part-time basis. Students permitted to take courses on a part-time basis are cautioned that there is an enrolment limitation for the program and that access to certain courses or resumption of the program on a full-time basis will be conditional on the availability of space.

Failed Courses

- 1. Continuation of study from one phase of the D.V.M. Program to the next is dependent on the successful completion of all courses, or approved equivalents, in the published schedule of studies for the D.V.M. Program.
- 2. A student who fails one course in a Phase may be required to repeat all courses in the Phase. The consequences of failure of any particular course in the D.V.M. Program are as follows:
 - a. Failure in any of the following courses result in the **Repeat of the Course:** VETM*3210, VETM*3390, VETM*3430, VETM*3220, VETM*3440, VETM*3510, VETM*4220, VETM*4450, VETM*4530, VETM*4610, VETM*4660, VETM*4710, VETM*4870, VETM*4900, VETM*4920.
 - 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 their 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

For the D.V.M. program, students must seek advice from, and submit a Request for Withdrawal form to, the Associate Dean, Students and Academic when voluntarily withdrawing from the program. Students who have voluntarily withdrawn from the D.V.M. program and who wish to return must give notice to the Associate Dean, Students and Academic 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.

X. Degree Programs, Doctor of Veterinary Medicine (D.V.M.)

Immunization against rabies is a requirement for admission and continuation in the D.V.M. Program. Annual rabies titres and booster immunizations (if necessary) are mandatory for all Program participants. Prospective students and in-course students should contact Student Health Services (519-824-4120 extension 52131) for further information and guidance about the rabies surveillance program. Faculty and staff members should contact Occupational Health Services, extension 52133, for information about medical surveillance programs provided in accordance with University Safety Policy 851.13.03.

Schedule 5 (D.V.M. Continuation of Study)

Continuation of Study is assessed on the student's D.V.M. Program Average (not the University Cumulative Average) and according to the policy on failures as stated above.

In Phase 2 and beyond, eligibility to continue is also assessed at the end of each Phase using the Phase Average (PHA). Courses that are given a grade of Pass or Fail do not affect either the PA or PHA because they are not attached to any numerical grade.

Students required to repeat a Phase must achieve the required PA of greater than or equal to 60% by the end of the repeated Phase. If a student does not achieve the required standing by the end of the repeated Phase, they will normally be required to withdraw from the program.

The required averages are as follows:

For Course Attempts in Phase I

Continuation of Study Assessment for DVM Students in Phase 1

| Program Average (PA) | Status of Student |
|----------------------------------|--------------------------|
| PA < 50% | Required to Withdraw |
| $PA \ge 50\% \text{ but} < 60\%$ | Required to Repeat Phase |
| PA ≥ 60% | Eligible to Continue |

For Course Attempts in Phase 2 and Phase 3

Continuation of Study Assessment for DVM Students in Phase 2 and Phase 3

| Program Average (PA) and Phase Average (PHA) | Status of Student |
|-------------------------------------------------|---------------------------|
| PHA < 50% | Required to Withdraw |
| PA or PHA $\ge 50\%$ but $< 60\%$ | Required to Repeat Phase* |
| PA and PHA $\geq 60\%$ | Eligible to Continue |

* Students required to repeat Phase 3 will not be permitted to proceed to the Externship course prior to Phase 4.

If Repeating Phase 1, 2, or 3

Continuation of Study Assessment for DVM Students Repeating Phase 1, 2 or 3

| Program Average (PA) | Status of Student |
|----------------------|----------------------|
| PA < 60% | Required to Withdraw |
| $PA \ge 60\%$ | Eligible to Continue |

For Course Attempts in Phase 4

Continuation of Study Assessment for DVM Students in Phase 4

| Program Average (PA) and Phase Average (PHA) | Status of Student |
|-------------------------------------------------|-------------------------|
| PHA < 50% | Required to Withdraw |
| PA or PHA $\ge 50\%$ but $< 60\%$ | Required to Remediate** |
| PA and PHA $\ge 60\%$ | Eligible to Continue*** |

** Students finishing Phase 4 with a PA or PHA > 50% but < 60%, will not be permitted to graduate. The Academic Review Sub-Committee will establish the appropriate remediation requirements that must be fulfilled in order for the student to obtain the standing of Eligible to Graduate. These may include repeating a component of a course, one or more entire courses, or one or more clinical rotations.

*** Students finishing Phase 4 with a PA and PHA ≥ 60% and having satisfied all course requirements for the program are Eligible to Graduate.

Schedule of Studies

| Phase 1 | | |
|-----------|--------|----------------------------------------------|
| VETM*3070 | [2.00] | Veterinary Anatomy |
| VETM*3080 | [2.00] | Veterinary Physiology and Biochemistry |
| VETM*3120 | [0.75] | Veterinary Histology and General Pathology |
| VETM*3210 | [0.50] | Art of Veterinary Medicine I |
| VETM*3390 | [0.50] | Developmental Biology |
| VETM*3400 | [0.75] | Health Management I |
| VETM*3430 | [0.25] | Clinical Medicine I |
| Phase 2 | | |
| VETM*3220 | [0.50] | Art of Veterinary Medicine II |
| VETM*3410 | [0.75] | Health Management II |
| VETM*3440 | [0.50] | Clinical Medicine II |
| VETM*3450 | [2 75] | Principles of Disease in Veterinary Medicine |

[0.75] [0.75] Anaesthesiology and Pharmacology [0.25] Principles of Surgery

| Phase 3 | | |
|-----------|--------|-------------------------------------|
| VETM*4220 | [0.50] | Art of Veterinary Medicine III |
| VETM*4420 | [0.25] | Clinical Pharmacology |
| VETM*4450 | [0.50] | Equine Medicine and Surgery |
| VETM*4460 | [1.00] | Food Animal Medicine and Surgery |
| VETM*4470 | [1.00] | Medicine and Surgery of Dog and Cat |
| VETM*4480 | [0.75] | Comparative Medicine |
| VETM*4490 | [1.00] | Systems Pathology |
| VETM*4530 | [0.50] | Health Management III |
| VETM*4540 | [1.75] | Surgical Exercises |
| VETM*4870 | [0.25] | Clinical Medicine III |
| | | |

Theriogenology

Phase 4

VETM*3460

VETM*3470

VETM*3510

Students entering into the Phase 4 of the DVM Program will select an area of emphasis from either: Small Animal Stream, Rural Community Practice Stream, Equine Stream or the Food Animal Stream.

Small Animal Stream:

| VETM*4610 | [7.50] | Small Animal Stream |
|-----------------|--------------|---------------------------------|
| VETM*4900 | [2.50] | Veterinary Externship |
| Rural Communit | y Practice S | Stream: |
| VETM*4660 | [7.50] | Rural Community Practice Stream |
| VETM*4900 | [2.50] | Veterinary Externship |
| Equine Stream: | | |
| VETM*4920 | [7.50] | Equine Stream |
| VETM*4900 | [2.50] | Veterinary Externship |
| Food Animal Str | eam: | |
| VETM*4710 | [7.50] | Food Animal Stream |
| VETM*4900 | [2.50] | Veterinary Externship |

Co-operative Education Programs

Co-operative Education (Co-op), constitutes part of the student's formal education and is available in over 35 majors for students. A form of experiential learning, Co-op is a model of education that integrates a student's academic learning with periods of paid workplace learning in fields relevant to the student's academic and personal/professional goals. The academic and work schedules will vary with degree program and major. The first co-op work term is scheduled after the third or fourth academic semester, providing an academic foundation on which to build the work experience.

Each co-op position is developed and approved in collaboration between the employer and Co-operative Education Career Services (CECS). Students participate in a competitive employment process to secure an approved co-op position that is relevant to the student's area of academic study. COOP*1100 – Introduction to Co-operative Education, a mandatory, non-credit course, is a prerequisite for the first co-op work term and prepares the student for the employment process.

The student's performance in the workplace is supervised and evaluated by the student's employer using the Work Performance Evaluation tool. The student's progress during the work term is also monitored by CECS, which may include a site visit during the co-op work term and a review of the student's official Learning Goals. A Co-op Work Report is required for each co-op work term and is graded by an assigned Co-op Faculty Advisor. All evaluation grades will appear on the student's official transcript.

The Co-operative Education program at the University of Guelph is accredited by the Co-operative Education and Work Integrated Learning Canada (CEWIL), therefore standardized guidelines regarding co-op programs will be followed at all times.

Course requirements and schedules of studies for specific majors are listed under the appropriate degree program in this section.

In addition to Co-operative Education CECS supports, trains and leads students and alumni as they make career and further education planning decisions. Successful students connect with CECS early in their academic career and take full advantage of the career planning and job search services offered. CECS helps students to discern "what to do with their degree". As well, the CECS job posting service, Recruit Guelph, provides online job postings including full-time, part-time, contract, seasonal, summer and internships. Job & Career Fairs and employer networking events also provide exposure to the working world. Please refer to <u>https://www.recruitguelph.ca/cecs/</u> for more information.

Admission Information

Normally students are admitted to a Co-operative Education program directly from high school in the Fall semester through Admission Services. For a complete listing of University of Guelph admission requirements refer to www.uoguelph.ca/admissions.

Some programs may admit a limited number of in-course students after first or second semester. Refer to the schedule of dates in the Undergraduate Calendar for in-course application deadlines.

External transfer students may apply to Co-operative Education following admission to the University of Guelph. Students must not be beyond second year of their studies and be interested in one of over 35 co-operative education programs available at the University of Guelph. Interested students should visit https://www.recruitguelph.ca/cecs/co-op/external-transfer-students for up-to-date information on admission eligibility.

The decision to admit an in-course or external transfer student is dependent upon space in the program, the grades of the student, the approved Academic & Work Sequence Agreement, and any other information relevant to the program.

Note: Due to the Schedule of Studies for Hotel & Tourism Management co-op there is no Winter start date available. Students must begin their program in the Fall term.

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 of full-time study in order to continue in the co-op program.

First year in-course students must maintain a 70% cumulative average in their academic semester(s) prior to admission to the co-op program. There must also be space in the co-op program in which they wish to be admitted.

External transfer students must meet normal admission requirements, as well as submit an official transcript from their previous educational institution, and may be required to achieve a minimum 70% cumulative average prior to participating in the co-op employment process. An academic and work schedule must also be approved by the academic department prior to the student being accepted into the co-op program.

Continuation of Study

Students are required to meet a continuation requirement at the end of semester two. Students will be allowed to continue in the co-op program if their cumulative average, over 4.0 credits, is 70% or higher after two full-time academic semesters. * Students are also required to meet the conditions for continuation of study for their degree program as listed in the Undergraduate Calendar. In addition, all students must satisfactorily complete COOP*1100 - Introduction to Co-operative Education in the semester scheduled.

Co-op students are required to be registered full-time for the duration of their program as outlined in the schedule of studies listed in the Undergraduate Calendar. Co-op students are also required to meet other conditions, (e.g. satisfactory co-op work reports, work performance evaluations and learning goals) in order to continue in the co-op program. Complete conditions for continuation of study for a co-op program are outlined in the "Policy Agreement for Student Involvement in Co-operative Education University of Guelph". The complete policy can be viewed at <a href="https://www.recruitguelph.ca/cecs/sites/uoguelph.ca/cecs/sites/u

* Students that cannot follow the prescribed schedule for their co-op program due to a disability may require an approved accommodation plan. CECS must approve the accommodation plan and students may be requested to provide additional information during the approval process.

Release of Academic Information

By applying to the co-op program, students grant permission to the Office of Registrarial Services to release to Co-operative Education & Career Services their University of Guelph transcript and any transcript from other post-secondary institutions that may be part of the academic record held by the Office of Registrarial Services.

Students also grant permission to Co-operative Education & Career Services to release their resumes, cover letters and any transcripts released by the Office of Registrarial Services to prospective employers to whom the students are applying. Employment information, the Co-op Work Performance Evaluation grade, and the Co-op Work Report Evaluation grade will appear on the student's official academic transcript for each co-op work term accepted by the student. Students also grant permission for employment information to be released for use in statistical analysis at the University of Guelph.

Procedures for Work Term Reports

A Co-op Work Report is required for each co-op work term which the student accepts. Co-op Work Reports must be submitted to the Co-op Faculty Advisor according to the deadline indicated in the Undergraduate Calendar. The Co-op Faculty Advisor is responsible for grading the co-op work report within the agreed to deadlines listed in the Schedule of Dates. Students completing two or more 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 or twelve month co-op work terms. A grade of Outstanding, Very Good, Good, Satisfactory, or Unsatisfactory will appear on the student's Academic Record.

A student who does not submit a Co-op Work Report will be required to withdraw from co-op and a grade of "Required to Withdraw from Co-op" will be assigned to the student's official transcript. A student who receives an Unsatisfactory Co-op Work Report Evaluation will be given one opportunity to make revisions and resubmit the co-op report during the semester following the co-op work term. Students who are resubmitting a co-op work report within the prescribed timeline will not be eligible to proceed to the next employment process until receiving a grade of Satisfactory or higher on the report. If, upon resubmission, the co-op work report evaluation remains Unsatisfactory, the student will be required to withdraw from Co-op and will be transferred to the regular program.

Confidential Co-op Work Reports are not permitted.

Conditions for Graduation

In order to graduate with co-op certification, co-op students must follow the conditions for graduation for their degree program as outlined in the Undergraduate Calendar. In addition, co-op students must receive evaluations of Good or higher in all but one Work Performance Evaluations and an evaluation of Satisfactory or higher in all Co-op Work Report Evaluations. Students must also have paid all required co-op fees, including eight academic semesters and all co-op work terms, prior to receiving co-op certification.

Co-op Fees

As determined by the University of Guelph's Board of Governors, involvement in the Co-op Program requires Co-op students to pay a co-op fee for a maximum of 8 academic semesters and all accepted co-op work terms (see Section VI--Schedule of Fees). It is important to note that co-op fees are amortized over the entire program beginning in Semester 1 and not related to the specific services received in any one term.

Co-op fees will be paid each academic and co-op work term semester and will be billed to the student's financial account. If registered for an academic course during a co-op work term both the academic and co-op work term semester fees will be billed. If registered in an academic course during an OFF semester the co-op academic fee will be charged. In both cases the co-op academic fee will count towards the maximum of 8 academic fees.

If a student does not follow the prescribed schedule in the Undergraduate Calendar, this may result in an under or over payment on the student's account. To resolve these issues, the student is required to contact CECS. Should a student not identify an over/under payment, CECS conducts an audit at the time of convocation and will bill or credit the student's account accordingly. Students are responsible for paying all other university fees as outlined in the Undergraduate Calendar.

Withdrawing from Co-op after accepting a second co-op work term will result in the student being responsible for paying the balance of their remaining co-op academic fees at the time of withdrawal.

Withdrawing from Co-op after accepting an eight or twelve month co-op work term will result in the student being responsible for paying the balance of their remaining co-op academic fees at the time of withdrawal.

Schedule of Studies

Students are required to follow the schedule of studies as outlined in the Undergraduate Calendar. Where a program has two co-op stream options, students will be defaulted to an established "Stream A".

If, under exceptional circumstances, the schedule cannot be followed, the student must obtain written approval of an alternative Co-op Academic & Work Sequence Agreement from the academic department and submit the form to CECS for final approval. These exceptions are listed on the sequence form.

There is no guarantee that a sequence revision will be approved.

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 <u>http://www.uoguelph.ca/diploma_calendar/</u>.