

# 2008-2009 Undergraduate Calendar

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

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

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

The University is a full member of:

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# Disclaimer

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## University of Guelph 2008

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

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

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

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

Published by: Undergraduate Program Services

## **Introduction**

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### **Collection, Use and Disclosure of Personal Information**

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Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) [http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31\\_e.htm](http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31_e.htm). This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of Training, Colleges and Universities, and Statistics Canada, for statistical and planning purposes, and is disclosed to other individuals or organizations in accordance with the Office of Registrarial Services Departmental Policy on the Release of Student Information. For details on the use and disclosure of this information call the Office of Registrarial Services at the University at (519) 824-4120 or see <http://www.uoguelph.ca/registrar/registrar/index.cfm?index>.

### **Statistics Canada - Notification of Disclosure**

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

### **Address for University Communication**

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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**

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

#### **Home Address**

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

#### **Name Changes**

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

### **Student Confidentiality and Release of Student Information Policy Excerpt**

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

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



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## Bachelor of Science in Technology [B.Sc.(Tech.)]

The B.Sc.(Tech.) program was designed for students who do not intend to pursue post-graduate studies and are strongly focused on securing industrial employment that makes use of the knowledge acquired in their bachelors degree. This program provides students with the knowledge and skills deemed to be essential by employers and exemplifies the positive benefits of cooperation between colleges and universities. The program combines rigorous theory with practical applications.

For the B.Sc.(Tech.) degree the University offers an honours program requiring the equivalent of 8 semesters of successful full-time study. Two of the semesters will be located at Seneca College in Toronto. The program requires the completion of four co-op work-terms. Students are encouraged to study full-time and to follow the schedule of studies listed below. In the B.Sc.(Tech.) program, 2.50 credits per semester is the normal load for a regular full-time student.

### Program Information

Students are required to follow the pattern of study for one of the two majors offered (Applied Pharmaceutical Chemistry or Physics, Computing and Communications) and complete all of the required courses specified in the Schedule of Studies.

Courses taught by Seneca College are noted in the schedule of studies. The course descriptions are in this calendar however detailed course profiles can be accessed through the Seneca College home page.

### Entry Credits

In general, the 4U or OAC credit or its equivalent is required in a subject area to allow entrance to the initial university course. Students who lack this requirement can remedy the deficiency by successful completion of:

- BIOL\*1020 for students lacking biology
- CHEM\*1060 for students lacking chemistry
- PHYS\*1020 for students lacking in physics

Not more than one of the above will be allowed for credit toward the B.Sc.(Tech.) degree.

### Continuation of Study

Students are advised to consult the University's regulations for continuation of study which are outlined in detail in Section VIII--Undergraduate Degree Regulations & Procedures. In addition to the University regulations, students will also be required to achieve a 70% cumulative average by the end of semester 2 due to the required co-op component within this program. Students will be evaluated after semester 2 and those students who have a cumulative average less than 70% but meet the Guelph continuation of study requirements will be withdrawn from the B.Sc.(Tech.) program. Under these circumstances, students in the Applied Pharmaceutical Chemistry major will be automatically moved to B.Sc. Biological Chemistry and those students in the Physics, Computing and Communications major will be automatically moved to the B.Sc. Physics major. Students should contact their Program Counsellor regarding co-op appeal procedures.

Note: Students who voluntarily withdraw from co-op will be moved to the B.Sc. majors specified above.

### Honours Minors

Students may wish to add a minor to their major. A minor is a group of courses which provides for exposure to and mastery of the fundamental principles of a subject. A minor consists of a minimum of 5.00 credits. It may also require certain specified courses. Given the intended technical training of this degree, students have very little flexibility in terms of electives. As such, students wishing to add a minor would be required to enrol in additional semesters of study. Students wishing to take a minor should consult with their Program Counsellor.

### Conditions for Graduation

In order to qualify for graduation from the B.Sc.(Tech.) program, the student must have successfully completed all of the courses approved for the program, achieved a 60%, or higher, cumulative average and received a minimum grade of satisfactory for the co-op work reports and work performance evaluations.

### Applied Pharmaceutical Chemistry (APPC:C)

Department of Chemistry, College of Physical and Engineering Science

#### Major (Honours Program)

This major will require the completion of 20.25 credits as indicated below:

##### Semester 1 - Fall

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics
XSEN*2010	[0.50]	Effective Business and Technical Writing

##### Semester 2 - Winter

BIOL*1040	[0.50]	Biology II
CHEM*1050	[0.50]	General Chemistry II
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II

PHYS*1010	[0.50]	Introductory Electricity and Magnetism
0.50 credits from an Arts/Social Science electives		

##### Semester 3 - Fall

CHEM*2060	[0.50]	Structure and Bonding
CHEM*2400	[0.75]	Analytical Chemistry I
CHEM*2880	[0.50]	Physical Chemistry
CIS*1200	[0.50]	Introduction to Computing
STAT*2040	[0.50]	Statistics I

##### Winter Semester

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

BIOC*2580	[0.50]	Introductory Biochemistry
CHEM*2070	[0.50]	Structure and Spectroscopy
CHEM*2700	[0.50]	Organic Chemistry I
MICR*2030	[0.50]	Microbial Growth

0.50 electives

##### Fall Semester

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

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

BIOC*3570	[0.50]	Analytical Biochemistry
CHEM*3360	[0.50]	Environmental Chemistry and Toxicology
CHEM*3430	[0.50]	Analytical Chemistry II: Instrumental Analysis
CHEM*3750	[0.50]	Organic Chemistry II

0.50 electives

##### Semester 6 - Fall

XSEN*3020	[0.50]	Pharmaceutical Analysis
XSEN*4020	[0.50]	Pharmaceutical Organic Chemistry
XSEN*4030	[0.50]	Pharmaceutical Product Formulations
XSEN*4040	[0.50]	Pharmaceutical Manufacturing
XSEN*4050	[0.50]	Biopharmaceuticals

Note: All courses in Semester 6 are taught at Seneca @ York campus College in Toronto (For more information go to: <http://www.bsctech.uoguelph.ca>. Seneca may change the ordering of the courses offered within semesters 6 and 7.

##### Semester 7 - Winter

XSEN*2020	[0.50]	Management Studies: EQ and the New Workplace
XSEN*3030	[0.50]	Pharmacology and Applied Toxicology
XSEN*3040	[0.50]	Occupational Health and Chemistry
XSEN*3060	[0.50]	Pharmaceutical Analysis - Advanced
XSEN*4010	[0.50]	Pharmaceutical Calculations

Note: All courses in Semester 7 are taught at Seneca @ York campus College in Toronto (For more information go to: <http://www.bsctech.uoguelph.ca>. Seneca may change the ordering of the courses offered within semesters 6 and 7.

##### Summer Semester

COOP*4000	[0.00]	Co-op Work Term IV
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##### Semester 8 - Fall

CHEM*3440	[0.50]	Analytical Chemistry III: Analytical Instrumentation
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On e of:

CHEM*4730	[0.50]	Synthetic Organic Chemistry
CHEM*4740	[0.50]	Topics in Bio-Organic Chemistry

On e of:

BIOC*4520	[0.50]	Metabolic Processes
CHEM*3640	[0.50]	Chemistry of the Elements I
MCB*4050	[0.50]	Protein and Nucleic Acid Structure
MCB*4080	[0.50]	Applied Microbiology and Biochemistry

One of:

BIOM*3100	[0.50]	Mammalian Physiology I
HK*3940	[1.25]	Human Physiology
MBG*2000	[0.50]	Introductory Genetics
PATH*3610	[0.50]	Principles of Disease

0.50 electives

### Physics, Computing and Communications (PHCC:C)

Department of Physics, College of Physical and Engineering Science

#### Major (Honours Program)

Two streams are available. Stream A is different from Stream B in that Stream B offers a double work term following academic semester 6. This major will require the completion of 21.00 credits as indicated below:

##### Stream A

##### Semester 1 - Fall

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

CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics
<b>Semester 2 - Winter</b>		
CIS*2500	[0.50]	Intermediate Programming
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism
PHYS*2040	[0.50]	Fundamental Electronics and Sensors
One of:		
CIS*1910	[0.50]	Discrete Structures in Computing I *
0.50 electives		
* CIS*1910 is a prerequisite for many upper level C.I.S. courses		
<b>Semester 3 - Fall</b>		
MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
PHYS*2440	[0.75]	Mechanics I
PHYS*2460	[0.75]	Electricity and Magnetism I
One of:		
CIS*2030	[0.50]	Structure and Application of Microcomputers
CIS*2910	[0.50]	Discrete Structures in Computing II
0.50 electives		
<b>Winter Semester</b>		
COOP*1000	[0.00]	Co-op Work Term I
<b>Semester 4 - Summer</b>		
MATH*2170	[0.50]	Differential Equations I
PHYS*2260	[0.50]	Quantum Physics
STAT*2040	[0.50]	Statistics I
One of:		
CIS*2030	[0.50]	Structure and Application of Microcomputers
CIS*2100	[0.50]	Scientific Computing and Applications Development
CIS*2520	[0.50]	Data Structures
CIS*3120	[0.50]	Digital Systems
0.50 electives		
<b>Fall Semester</b>		
COOP*2000	[0.00]	Co-op Work Term II
<b>Semester 5 - Winter</b>		
XSEN*3100	[0.50]	Analog and Digital Communications
XSEN*3120	[0.50]	Microprocessors I
XSEN*3130	[0.50]	Object Oriented Programming Using C++
XSEN*3140	[0.50]	Operating Systems
XSEN*4130	[0.50]	Networking Essentials
Note: All courses in Semester 5 are taught at Seneca College Newnham Campus in Toronto (For more information go to: <a href="http://www.bsctech.uoguelph.ca">http://www.bsctech.uoguelph.ca</a> .)		
<b>Summer Semester</b>		
COOP*3000	[0.00]	Co-op Work Term III
<b>Semester 6 - Fall</b>		
XSEN*4100	[0.50]	Event Driven Programming and Visual Basic
XSEN*4110	[0.50]	Data Acquisition and Control
XSEN*4120	[0.50]	Data Communications I
XSEN*4140	[0.50]	Technical and Personal Communications
One of:		
XSEN*4150	[0.50]	Microprocessors II
XSEN*4160	[0.50]	Computer Peripheral Systems
Note: All courses in Semester 6 are taught at Seneca College Newnham Campus in Toronto (For more information go to: <a href="http://www.bsctech.uoguelph.ca">http://www.bsctech.uoguelph.ca</a> .)		
<b>Semester 7 - Winter</b>		
PHYS*2450	[0.75]	Mechanics II
PHYS*2470	[0.75]	Electricity and Magnetism II
PHYS*3220	[0.50]	Waves and Optics
One of:		
CIS*3120	[0.50]	Digital Systems
0.50 electives		
<b>Summer Semester</b>		
COOP*4000	[0.00]	Co-op Work Term IV
<b>Semester 8 - Fall</b>		
MATH*3100	[0.50]	Differential Equations II
PHYS*3230	[0.50]	Quantum Mechanics I
PHYS*3240	[0.50]	Statistical Physics I
PHYS*4500	[0.50]	Advanced Physics Laboratory
0.50 electives		
<b>Note:</b> At least 0.50 in electives must be taken from courses in the Arts or Social Sciences.		

**Stream B****Semester 1 - Fall**

BIOL*1030	[0.50]	Biology I
CHEM*1040	[0.50]	General Chemistry I
CIS*1500	[0.50]	Introduction to Programming
MATH*1200	[0.50]	Calculus I
PHYS*1000	[0.50]	An Introduction to Mechanics

**Semester 2 - Winter**

CIS*2500	[0.50]	Intermediate Programming
COOP*1100	[0.00]	Introduction to Co-operative Education
MATH*1210	[0.50]	Calculus II
PHYS*1010	[0.50]	Introductory Electricity and Magnetism
PHYS*2040	[0.50]	Fundamental Electronics and Sensors

One of:

CIS*1910	[0.50]	Discrete Structures in Computing I *
0.50 electives		

\*CIS\*1910 is a prerequisite for many upper level C.I.S. courses

**Semester 3 - Fall**

MATH*2160	[0.50]	Linear Algebra I
MATH*2200	[0.50]	Advanced Calculus I
PHYS*2440	[0.75]	Mechanics I
PHYS*2460	[0.75]	Electricity and Magnetism I

One of:

CIS*2030	[0.50]	Structure and Application of Microcomputers
CIS*2910	[0.50]	Discrete Structures in Computing II
0.50 electives		

**Winter Semester**

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

MATH*2170	[0.50]	Differential Equations I
PHYS*2260	[0.50]	Quantum Physics
STAT*2040	[0.50]	Statistics I

One of:

CIS*2030	[0.50]	Structure and Application of Microcomputers
CIS*2100	[0.50]	Scientific Computing and Applications Development
CIS*2520	[0.50]	Data Structures
CIS*3120	[0.50]	Digital Systems
0.50 electives		

**Semester 5 - Fall**

XSEN*3100	[0.50]	Analog and Digital Communications
XSEN*3120	[0.50]	Microprocessors I
XSEN*3130	[0.50]	Object Oriented Programming Using C++
XSEN*3140	[0.50]	Operating Systems
XSEN*4130	[0.50]	Networking Essentials

Note: All courses in Semester 5 are taught at Seneca College Newnham Campus in Toronto  
(For more information go to: <http://www.bsctech.uoguelph.ca>.)**Semester 6 - Winter**

XSEN*4100	[0.50]	Event Driven Programming and Visual Basic
XSEN*4110	[0.50]	Data Acquisition and Control
XSEN*4120	[0.50]	Data Communications I
XSEN*4140	[0.50]	Technical and Personal Communications

One of:

XSEN*4150	[0.50]	Microprocessors II
XSEN*4160	[0.50]	Computer Peripheral Systems

Note: All courses in Semester 6 are taught at Seneca College Newnham Campus in Toronto  
(For more information go to: <http://www.bsctech.uoguelph.ca>.)**Summer Semester**

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

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

PHYS*2450	[0.75]	Mechanics II
PHYS*2470	[0.75]	Electricity and Magnetism II
PHYS*3220	[0.50]	Waves and Optics

One of:

CIS*3120	[0.50]	Digital Systems
0.50 electives		

**Summer Semester**

COOP*4000	[0.00]	Co-op Work Term IV
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**Semester 8 - Fall**

MATH*3100	[0.50]	Differential Equations II
PHYS*3230	[0.50]	Quantum Mechanics I
PHYS*3240	[0.50]	Statistical Physics I
PHYS*4500	[0.50]	Advanced Physics Laboratory

0.50 electives

**Note:** At least 0.50 in electives must be taken from courses in the Arts or Social Sciences.