

FACULTY OF ENGINEERING AND APPLIED SCIENCE

GENERAL INFORMATION

Inquiries

General inquiries can be directed to:
Faculty of Engineering and Applied Science Office
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Regina SK S4S 0A2
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Website: www.uregina.ca/engg/
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UNDERGRADUATE PROGRAMS

The Faculty of Engineering and Applied Science offers a Bachelor of Applied Science (BASc) degree in Engineering.

Systems Engineering

All of the programs in this group have in common the "systems approach" to engineering education. Although each program has some unique implementation of the systems theme, a common underlying objective is to produce engineering graduates with not only a strong base of technical knowledge but also the breadth of non-technical skills that a successful professional engineer should have in the workplace.

This breadth of skills includes economic, social, environmental, administrative and professional awareness. These are interdisciplinary skills that emphasize the interrelationships with people, workplace, environment, and the broader implication of engineering technology for society at large and for the surrounding technical and natural environment. When combined with the Co-operative work-study format (see the faculty's Co-operative Education Programs section), this "systems approach" provides engineering graduates with a high level of maturity and adaptability. The breadth skills comprise approximately 20% of the academic program.

On the technical level, "systems" engineering concentrates on the technical design of the whole, as distinct from the parts. In addition to being specialists in the various components of technology, systems engineers understand how these components are interrelated and interconnected. They can do the engineering design and analysis necessary to produce a total working system. For example, a landfill is not just an earthmoving project but also affects transportation and traffic, plus water, air and soil contamination. Technical and scientific skills comprise 80% of the academic program.

The Faculty of Engineering and Applied Science pioneered systems engineering and Co-operative education in Western Canada and continues to be a leader and innovator in engineering education.

Accreditation

The Canadian Engineering Accreditation Board has accredited programs in Electronic Systems, Industrial Systems, Environmental Systems, Petroleum Systems and Software Systems Engineering. This accreditation ensures that the graduates of these programs meet the standards necessary for registration as Professional Engineers in Canada.

Engineering Societies

Engineering students are encouraged to become members of the undergraduate Engineering Student Society, and also to become student members of the Institute of Electrical and Electronic Engineers, Canadian Society for Civil Engineering, the Institute of Industrial Engineers, the Society of Automotive Engineers, the Environmental Systems Engineering Students Society, and the Society of Petroleum Engineers.

ADMISSION, RE-ADMISSION, AND TRANSFER

Students admitted, re-admitted or transferred into the Faculty must meet program requirements as indicated in the most current undergraduate calendar in effect at the time of the admission, re-admission or transfer (subject to further program changes). See the Admissions section.

Special Admissions Provisions

Applicants who have completed diplomas at a technical institution will be admitted as long as they have a minimum average of 70.00%.

Students who have been required to discontinue permanently from an engineering program at another institution will not normally be accepted. A student who has been required to discontinue temporarily will be accepted when the term of the discontinuance has expired, but the student will be given a low priority.

Residency and Transfer Credit

A maximum of 20 courses (60 hours) of transfer credit from a Canadian University may be applied to a Bachelor of Applied Science program providing a minimum grade of 60.00% has been achieved.

A maximum of 10 courses (30 hours) of transfer credit from a Canadian Technical Institute may be applied to a Bachelor of Applied Science program providing a minimum grade of 70.00% has been achieved.

Courses are evaluated on a course-by-course basis. Students may be requested to provide the Faculty with comprehensive course information including course notes, assignments, labs, midterms, final exams, etc.

Advanced Standing from Post-Secondary Institutions

The following regulations for advanced standing from Post-secondary Institutions have been approved:

Students who wish to get credit for courses taken at other institutions may be requested to provide the Faculty with the following information:

- Calendar description and detailed course outline including the textbook used for the course; and/or
- Sample labs, assignments, and tests.

Transfer credits from Canadian technical institutes will be limited to a total of 10 courses at the University of Regina. A maximum of three (3) out of these 10 courses will be at the 300- or higher level; the remaining seven (7) or more courses will be at the 100- and 200-level. Transfer credit will be awarded for only one (1) course, at the introductory level, from each of the following areas: biology, chemistry, geology, mathematics, and physics. Transfer credit for 300- and higher-level courses will be awarded only if the course content, the teaching environment, and the instructors' qualifications clearly show that a University of Regina equivalency exists. In some cases, a combination of several courses taken at a Canadian technical institute may be equivalent to one course at the University of Regina. Each course from a Canadian technical institute that is used for transfer credit must have a minimum grade of 70.00%: no exceptions will be made to this rule.

Transfer credits from other Canadian universities will be limited to a total of 20 courses at the University of Regina. Each course from a Canadian university that is used for transfer credit must have a minimum grade of 60.00%: no exceptions will be made to this rule.

Transfer credits from foreign universities will be limited to a total of 15 courses at the University of Regina. Each course from a foreign university that is used for transfer credit must have a minimum grade of 60.00% or University of Regina equivalent: no exceptions will be made to this rule.

Notwithstanding the maximum number of transfer credits allowed, all students from other post-secondary institutions transferring to the University of Regina with advanced standing must take enough courses at the University of Regina to satisfy the criteria for "Engineering Science

(ES)" and "Engineering Design (ED)" as required by CEAB (Canadian Engineering Accreditation Board). All transfer students will be individually counseled to achieve this objective.

No transfer credit will be awarded for ENEL 400, ENEV 400, ENIN 400, ENPE 400, ENSE 400, ENGG 401, ENIN 413, ENEV 415, ENEL 417, ENPE 419, and ENSE 477. In addition, any program may have a list of other courses for which transfer credit will not normally be awarded.

Those transferring from another institution should note that students who have completed more than 63 credit hours are ineligible for the Co-operative Education Program (the faculty's Co-operative Education Programs section).

Transfer credit awarded in the Faculty of Engineering and Applied Science may not apply if a student transfers to another faculty.

ACADEMIC ADVISING AND REGISTRATION

Academic advising is offered to all engineering students. Students may book an appointment online:

www.uregina.ca/engineering/advising.

First-term engineering students are invited to attend a registration session at which time a timetable of assigned courses is provided. First-year students who are unable to attend may register by e-mail at engg@uregina.ca.

Engineering elective courses may not be offered every year and a scheduled elective may be cancelled because of low enrolment. There may at times be a change in the sequencing of some required courses, so students who plan to take a course outside the normal sequence should first consult the Faculty Office. Normal sequencing of courses is shown in the [Academic Programs section](#).

Course Load

The normal course load for Engineering students in all academic study terms, including Spring/Summer session, is 15 credit hours.

EVALUATION OF ACADEMIC PERFORMANCE

In addition to the University Regulations (refer to the [Academic Regulations](#) section) the following Faculty regulations apply to all students registered in the Faculty of Engineering and Applied Science. See the Academic Regulations section for descriptions of the different kinds of GPA referred to in this section.

Dean's Honours List

In order to be eligible for inclusion on the Dean's Honour List, Engineering students must obtain a TGPA of 85.00% on at least 12 credit hours of numerically graded courses. Refer to the Academic Regulations section.

Probation and Discontinuance

University regulations governing academic performance apply to Engineering students (see the Academic Regulations section).

Faculty Regulations

The Faculty of Engineering and Applied Science evaluates academic performance each term.

Students may be required to discontinue from the Faculty for a period of eight months (two terms) if a course is failed more than once with the exception of English (ENGL) 100. See the Academic Regulations section.

Students may also be required to discontinue from the Faculty at any time for unacceptable professional conduct. Refer also to the Academic Regulations section.

Students must repeat all required courses in which they have a grade of less than 50% (failed course).

When calculating a student's average, the Faculty will use the last grade obtained for all repeated courses (see [the Academic Regulations section](#)).

If an Incomplete (IN) is not completed by the end of the following term, an NP will be assigned.

Averages are calculated to two decimal points. The calculation is not rounded but is truncated to two decimal points.

These decisions can be appealed to the Faculty's Student Appeals Committee. Refer to the [Student Code of Conduct and Right to Appeal](#) section.

Re-admission and Transfer following an RTD

Students who have been required to discontinue under the Faculty regulations may petition for re-admission after they have discontinued studies for the required period, or students may petition for transfer to another faculty (see the Admissions section).

TIME LIMITS AND GRADUATION REQUIREMENTS

Upon completion of all program requirements, students are required to submit an application for graduation to the Engineering General Office.

Graduation and Time Limits

University regulations and deadlines governing graduation and convocation ceremonies apply to Engineering students. See the [Graduation](#) section for more information.

Students must complete the BAsC degree within ten years of starting in the Faculty. Students transferring into the Faculty of Engineering and Applied Science and who have been given transfer credits may have this time reduced depending on the transfer credits that have been given. Students with exceptional circumstances may request the approval of the Faculty for an extension.

Double majors are permitted if a student meets the course requirements of each program. Students must consult the Associate Dean (Academic) for approval.

A program grade point average (PGPA) of 60.00% is required for graduation.

Faculty and Institutional Honours are as follows:

- A PGPA of 80.00% is required for graduation with distinction.
- A PGPA of 85.00% is required for graduation with great distinction.
- Successful completion of four work terms is required for graduation with Co-op designation.
- Successful completion of the 12- or 16-month internship is required for graduation with Internship designation.

OTHER FACULTY REGULATIONS

Calculator Use in Examinations

Engineering students are required to obtain an approved calculator available for sale at the UR Bookstore. Bookstore staff will put an engineering sticker on the approved calculator. Only this calculator will be permitted for use in examinations.

Pre-requisite Waiver Procedure

All students are required to satisfy the prerequisite and corequisite course requirements before registering in a subsequent course. In a very limited number of special cases, a course instructor may waive such requirements; however, all prerequisite waivers must also be approved by the program chairs. Students must read eligibility criteria for prerequisite waivers before completing the prerequisite waiver form, which is available on the Faculty's website.

Faculty Appeals Procedures

Students have the right to appeal any academic action, including probation and discontinuance (University or Faculty).

Appeals must be made in writing within two weeks of notification of the academic action and are to include an explanation of extenuating circumstances. Supporting documents (for example, a medical certificate) must accompany the appeal. Appeals are to be addressed to:

Faculty of Engineering and Applied Science Student Appeals Committee

ED 409
University of Regina
Regina, SK S4S 0A2

The Faculty of Engineering and Applied Science Student Appeals Committee comprises appointed faculty, one from each program area. The Associate Dean (Academic), the faculty administrator, the manager of academic advising, and the director of Co-op sit on the committee as *ex officio* members. By appointment, students are permitted to present their case in person to the Committee. Students are notified in writing of the outcome of their appeal.

CO-OPERATIVE EDUCATION PROGRAMS

In conjunction with the University's Co-operative Education Program, the Faculty of Engineering and Applied Science operates a program in Co-operative engineering education in which students take university courses and obtain engineering-oriented work experience in industry or business. This is made possible by completing three 4-month terms per year.

Experience has shown that putting classroom theory into practice early in students' university life tends to improve motivation and academic performance. As well, the practical experience aids in choosing the area of studies best suited to students' talents. Being employed during a mix of work/study terms will help students who require financial assistance, but such employment is not assured by acceptance into the Co-operative Education Program.

Refer to the [General Information for Students](#) section for general regulations governing University of Regina Co-operative Education Programs.

Sequencing

Work terms and study terms are sequenced over a total period of four years and eight months as shown below. There are four required work terms and nine study terms (see below and the Faculty's Academic Programs section).

Fall	Winter	Spring	Fall	Winter	Spring	Fall
1	2		3	Work term or 4	4 or Work term	5
Winter	Spring	Fall	Winter	Spring	Fall	Winter
Work term	6	Work term	7	Work term	8	9

Normally, students must complete the first work term before study term 5, the second before study term 6, the third before study term 7, and the fourth before study term 8. Changes to this sequencing (e.g. double work terms) must be made in consultation with the Director, Co-op Work Study Programs for approval.

Academic Rules

Students registered in a BAsC program in Systems Engineering in the Faculty of Engineering and Applied Science (except for those explicitly excluded, such as by an exchange agreement) may participate in the Co-operative Education program, under the direction of the Director, Co-op Work Study Programs, who is responsible for admitting, withdrawing, and monitoring the progress of students through the program according to the following regulations. Appeals may be made to the Faculty of Engineering and Applied Science Student Appeals Committee.

Admission

To apply for admission to the Co-operative Education program in the Faculty of Engineering, a student must:

1. be registered in at least twelve credit hours in a Systems Engineering program in the Faculty of Engineering;
2. have completed or been given credit for no less than 27 and no more than 63 credit hours towards the Systems Engineering

degree (students are expected to have successfully completed the first three Terms of the Systems Engineering program before going on a first work term);

3. have a PGPA of at least 60.00%; and
4. have completed or been given credit for ENGL 100, ENGG 123, and ENGG 100.

Acceptance into the Co-operative Education program will be shown on the student's transcript. Students will remain in the Co-operative Education program until completion of the program requirements and convocation, or withdrawal. Upon graduation there will be an appropriate designation on the parchment and transcript of each student who successfully completes the four work terms required for Co-operative Education designation.

Progress

Students will be registered by the Faculty for four work terms, designated ENGG 051 through ENGG 054, which are graded on a pass/fail basis. At the end of each work term, students must submit a work term report to the Faculty of Engineering, which will be evaluated. Employers will provide an informal evaluation of student performance during the job-site visit (normally midway through the work term) and a formal evaluation at the end of the work term. A "Pass" grade requires both an acceptable work term report and an acceptable employer evaluation.

If the content of the work term report is deemed to be confidential or proprietary, the employer may request to evaluate the report in-house. The request should be in the form of a signed letter from an engineering supervisor, addressed to the Director, Co-op Work Study Programs, on company letterhead with the supervisor's position/title clearly stated and including an explanation of the necessity for a confidential report. Permission should be requested one month before the end of the work term. However, the ENGG 051 work term report cannot be confidential, and the student is permitted only two confidential reports in total.

Students must maintain a PGPA and TGPA (in the most recent term completed) of at least 60.00% in order to be eligible for a work term.

Students who are placed on academic probation by the Faculty of Engineering and Applied Science or the University of Regina will not be eligible for a work term until the probation is lifted.

Students who are required to discontinue (RTD) from the Faculty of Engineering and Applied Science and/or the University of Regina (MW) will be withdrawn from the Co-operative Education program and from the work term (if placed).

Students who wish to change the sequencing of their academic/work terms (e.g., double work term) must consult Director, Co-op Work Study Programs for approval.

Withdrawal

Students who are admitted into the Co-operative Education program are expected to remain in the program. However, under special circumstances, a student may withdraw from the program voluntarily or be withdrawn by the Director, Co-op Work Study Programs. Students who withdraw or are required to withdraw will normally not be re-admitted to the Co-operative Education program.

1. (voluntary) Under special circumstances, a student who has completed one work term may request withdrawal from the program. Such requests must be made, in writing and with supporting documentation, to Director, Co-op Work Study Programs.
2. (voluntary) Under exceptional circumstances, a student who has completed two or three work terms may request withdrawal from the program. Such requests must be made by completing a withdrawal form after consultation with Director, Co-op Work Study Programs and the Co-op office.
3. Students who receive an "F" grade for a work term will be withdrawn from the Co-operative Education program.

4. Students who behave in an unprofessional manner during the placement process or the work placement will be required to withdraw from the Co-operative Education program.
5. Students who complete more than 63 credit hours towards the Systems Engineering degree without obtaining a work placement are no longer eligible for the Co-operative Education program and will be withdrawn.
6. Students who are required to discontinue from the Faculty of Engineering and Applied Science (RTD) and/or the University of Regina (MW) will be withdrawn from the Co-operative Education program. If, at a later date, the student is re-admitted to the Faculty of Engineering and Applied Science, the student may apply for re-admission to the Co-operative Education program.

Co-operative Education Internship Program

In conjunction with the University of Regina Co-operative Education Program, the Faculty of Engineering and Applied Science offers a Co-operative Education Internship program for students enrolled in the Bachelor of Applied Science in Systems Engineering. This program is administered by the Director, Co-op Work Study Programs, who is responsible for academic rules proposed in the Co-operative Education Programs Rules section.

Co-operative Internship is a single 12- or 16-month placement immediately preceding the two final academic terms. Students who successfully complete the requirements of the program will receive "Internship" designation on their degree. Students who participate in more than one Co-operative Education term are not eligible for internship.

The objectives of the Co-operative Internship program are to enhance Engineering education by:

1. Exposing students to the application of engineering science and engineering design methods in the workplace;
2. Confirming academic theory through direct and indirect application in a workplace environment;
3. Enhancing the student's analytical and communication skills through active participation in the application of engineering in the workplace.
4. Enhance the University of Regina's partnerships with industry and the engineering community by providing students of varying skills, available for work placements of varying duration;
5. Provide opportunities to Joint Undergraduate Degree Program, Canadian and International students;
6. Provide internship opportunities in Saskatchewan, across Canada, and selected international placements.

Sequencing

The Co-operative Internship Program consists of a single, consecutive 12- or 16-month placement, normally taken between academic terms 7 and 8, and followed by a minimum of 15 credit hours towards the Systems Engineering program.

Co-operative Internship for Industrial, Environmental, and Petroleum Systems Engineering

Fall	Winter	Spring	Fall	Winter	Spring	Fall
1	2		3	4	6	5
Winter	Spring	Fall	Winter	Spring	Fall	Winter
7	Intern	Intern	Intern	Intern	8	9

Co-operative Internship for Electronic and Software Systems Engineering

Fall	Winter	Spring	Fall	Winter	Spring	Fall
1	2		3	4		5
Winter	Spring	Fall	Winter	Spring	Fall	Winter
7	6	Intern	Intern	Intern	8	9

Alternate sequencing to accommodate individual student programs is possible and should be discussed with and approved by the Director, Co-op Work Study Programs.

Academic Rules

1. Applications to the Co-operative Internship program in the Faculty of Engineering and Applied Science are due six months before the intended placement, as listed in the Academic Calendar. To apply for admission, a student must:
 - be registered in at least twelve credit hours in a Systems Engineering Program in the Faculty of Engineering;
 - have completed or been given credit for no less than 72 and no more than 102 credit hours towards the Systems Engineering degree. Students have to have successfully completed academic Terms 1, 2, 3, 4, 5, 6, and 7 of the Systems Engineering program before the internship placement;
 - have a PGPA of at least 60.00%;
 - have withdrawn from the Co-operative Education program, if previously admitted. Students who have completed more than one work term are not eligible for the Co-operative Internship program; and
 - have demonstrated fluency, written and oral, in both English and the language of employment in their desired country of internship.
2. Acceptance into the Co-operative Internship program does not ensure work placement.
3. The parchment and transcript of each student who successfully completes the minimum of these consecutive internship terms required for Co-operative Internship will include "Internship" designation.

Note: If students fail an Engineering Co-op Work Term, students are ineligible to continue with either the Co-operative Education Program or the Co-operative Internship Program.

For further information, please contact the Director, Co-op Work Study Programs.

Progress

After admission to the Co-operative Internship program, students are expected to maintain a PGPA and TGPA of 60.00% prior to the placement. If the PGPA and/or TGPA falls below 60.00%, the student will be asked to continue academic studies for a further term, or the student may be withdrawn from the Co-operative Internship program.

Students who are required to discontinue from the Faculty of Engineering and Applied Science and/or the University of Regina after admission to the Co-operative Internship program will be withdrawn from the internship (if placed), and the Co-operative Internship program.

Students will be registered by a staff member for three or four consecutive 4-month Co-operative Internship terms, ENGG 071 through ENGG 074, which are graded on a pass/fail basis. The grade is assigned by the Director, Co-op Work Study Programs, based acceptable employer evaluation "Internship Final Report" and Learning Skills Summary submitted by the student. The student must receive a "P" grade in all registered internship terms in order to receive Internship designation. If the analytical content of the students' reports are deemed to be confidential or proprietary, the employer should contact the Director, Co-op Work Study Program one month before the end of each internship term to discuss alternative methods of evaluation.

The first two months of ENGG 071 are probationary. During this period, the student or employer may terminate the placement by mutual consent and with the agreement of the Faculty of Engineering and Applied Science and the Co-operative Education Office. During each term a site visit will be conducted to ensure both parties are satisfied with the progress of the internship.

A grade will be issued at the end of each internship term. "P" will allow the student to continue. "F" will result in termination of the internship and removal from the Co-operative Internship program.

Withdrawal

Students who are admitted into the Co-operative Internship program are expected to complete the program; however, under special circumstances, a student may withdraw voluntarily or be withdrawn by the Director, Co-op Work Study Programs. Students who withdraw or are required to withdraw will normally not be re-admitted to the Co-operative Internship program.

Under exceptional circumstances, a student who has progressed beyond the 2-month probationary period may request withdrawal from the internship. Such requests must be made, in writing and with supporting documentation from the employer and any other relevant source, to the Dean of the Faculty of Engineering and Applied Science, after consultation with the Director, Co-op Work Study Programs and the Co-op Office.

Students who behave in an unprofessional manner during the placement process or the internship will be required to withdraw from the Co-operative Internship program. This includes, but is not limited to, the non-academic misconduct section found in the [Student Code of Conduct and Right to Appeal](#) section.

Students who complete more than 120 credit hours towards the Systems Engineering degree without obtaining an internship placement are no longer eligible for the Co-operative Internship program.

Students who are required to discontinue from the Faculty of Engineering and Applied Science and/or the University of Regina after being admitted to the Co-operative Internship program will be withdrawn from the program.

Students whose employment is terminated for cause by their employer will receive a grade of "F" for the current internship and will be withdrawn from the Co-operative Internship program.

Appeals may be made to the Faculty of Engineering and Applied Science Student Appeals Committee.

ACADEMIC PROGRAMS

Length and Sequencing of Systems Engineering Programs

All Systems Engineering programs are 136 credit hours (46 courses) in length, including a common first year. Pursuing a double major or minor will increase the number of courses required.

Students are encouraged to consider the Co-operative Education Program.

Co-operative Education – All Programs

Those who do not wish to complete this option, or who are not eligible to do so, may complete their academic program in 3 years and 8 months, as shown below:

Fall	Winter	Spring	Fall	Winter	Spring	Fall
1	2		3	Work term or 4	4 or Work term	5
Winter	Spring	Fall	Winter	Spring	Fall	Winter
Work term	6	Work term	7	Work term	8	9

Non-Co-op Electronic and Software Systems:

Fall	Winter	Spring	Fall	Winter	Spring
1	2		3	4	
Fall	Winter	Spring	Fall	Winter	Spring
5	7	6	8	9	

Non-Co-op Industrial, Environmental, and Petroleum Systems:

Fall	Winter	Spring	Fall	Winter	Spring
1	2		3	4	6
Fall	Winter	Spring	Fall	Winter	Spring
5	7		8	9	

PROGRAM REQUIREMENTS

Systems Engineering Majors

There are five majors in Engineering and Applied Science: Electronic Systems, Industrial Systems, Environmental Systems, Petroleum Systems, or Software Systems.

Selection of a Major

Application deadlines: December 1, April 1, and August 1

Eligibility

Students admitted to first year with a major of ENGE apply to the major of their choice with a minimum of 8 of the 10 required courses in Year 1 which must include ENGG 100, ENGG 123, ENGG 140 and ENGL 100. Application forms are available from [the Faculty's website](#). Acceptance priority is based on the average of the eight highest Year 1 course marks, number of credit hours completed and space in the desired program.

Current Faculty of Engineering and Applied Science students that wish to change their major may also submit an application form.

Double Majors

A double major is permitted, provided that students meet the course requirements for each program. Students must consult the Associate Dean (Academic) for approval.

Concurrent Programs

Normally, concurrent programs will not be available in the Faculty of Engineering. Students who are interested must consult the Associate Dean (Academic).

Bachelor of Applied Science in Electronic Systems Engineering (ESE)

Electronic Systems Engineering applies skills in electronics and computers to the design and operation of products or systems for handling information. Such systems include modern telecommunications, industrial controls and electronic consumer products.

Credit hours	BASc in Electronic Systems Engineering Required Courses
Term 1 (Fall)	
3.0	CHEM 104
3.0	ENGG 123
3.0	MATH 122
3.0	ENGG 140
3.0	MATH 110
Term 2 (Winter)	
3.0	CS 110
3.0	ENGG 100
3.0	ENGL 100
3.0	MATH 111
3.0	PHYS 119
Term 3 (Fall)	
3.0	CS115
3.0	ENEL 280
3.0	ENEV 223
3.0	MATH 217
3.0	PHYS 112
Term 4 (Winter, Spring/Summer)	
3.0	CS 210
3.0	ENEL 281
3.0	ENEL 282
3.0	MATH 213
3.0	STAT 289
Term 5 (Fall)	
3.0	BUS 260
3.0	ENEL 383
3.0	ENEL 384
3.0	ENSE 352
3.0	PHYS 201
Term 6 (Spring/Summer)	
3.0	BUS Elective (BUS 210, 250, 285, or 302)
3.0	CS 335
3.0	ECON 201
3.0	ENEL 361
3.0	ENEL 341
Term 7 (Winter)	
3.0	ENEL 371
3.0	ENEL 351
3.0	ENSE 350
3.0	* Approved Elective
3.0	* Approved Elective

Credit hours	BASc in Electronic Systems Engineering Required Courses
Term 8 (Fall)	
1.0	ENEL 400
3.0	ENGG 303
3.0	* Approved Elective
3.0	* Approved Elective
3.0	*Approved Elective
3.0	*Approved Elective
Term 9 (Winter)	
3.0	ENEL 417
3.0	ENGG 401
3.0	*Approved Elective
3.0	*Approved Elective
3.0	*Approved Elective
136.0	TOTAL
<p>* Approved Electives Choose electives from one of the following streams: Communications: ENEL 442, ENEL 443 and five courses from the approved list below. Micro-Electronics: ENEL 452, ENEL 453 and five courses from the approved list below. Control Systems: ENEL 462, ENEL 463 and five courses from the approved list below. Power: ENEL 472, ENEL 473 and five courses from the approved list below.</p>	
<p>Approved List: Technical Electives: ENEL 462, ENEL 442, ENEL 395, ENEL 472, ENEL 473, ENEL 463, ENEL 452, ENEL 453, ENEL 443, ENEL 494, ENEL 495, ENEV 261, ENIN 253, ENSE 481 Software Electives (may choose one): CS 215, CS 330, CS 340, CS 350, CS 372, CS 375 or any ENSE class except ENSE 477. Risk and Industrial Safety Electives (may choose one): ENEV 334, ENGG 411, ENIN 433, and ENIN 440.</p>	
<p>Social Sciences and Humanities elective: choose <u>one</u> Faculty of Arts or La Cité course.</p>	
<p>Natural Science Elective (choose one): from astronomy, biochemistry, biology, chemistry, geology, and physics. (CHEM 100 not permitted)</p>	

Bachelor of Applied Science in Environmental Systems Engineering (EVSE)

Environmental Systems Engineering offers studies in the areas of water resource systems, regional infrastructures systems, waste management, and air pollution control.

Credit hours	BASc in Environmental Systems Engineering Required Courses
Term 1 (Fall)	
3.0	CHEM 104
3.0	ENGG 123
3.0	ENGG 140
3.0	MATH 110
3.0	MATH 122
Term 2 (Winter)	
3.0	CS 110
3.0	ENGG 100
3.0	ENGL 100
3.0	MATH 111
3.0	PHYS 119
Term 3 (Fall)	
3.0	CHEM 140
3.0	ENEV 223
3.0	ENEV 372
3.0	ENGG 141
3.0	GEOL 102
Term 4 (Winter, Spring/Summer)	
3.0	ECON 201
3.0	ENIN 241
3.0	*Social Sciences and Humanities Elective
3.0	MATH 213
3.0	STAT 289
Term 5 (Fall)	
3.0	BIOL 223
3.0	ENEV 261
3.0	ENEV 321
3.0	ENVE 322
3.0	*Approved Elective
Term 6 (Spring/Summer)	
3.0	ENEV 281
3.0	ENEV 334
3.0	ENEV 384
3.0	ENEV 480
3.0	ENIN 253
Term 7 (Winter)	
3.0	ENEV 360
3.0	ENEV 421
3.0	ENEV 422
3.0	ENEV 440
3.0	ENEV 462

Credit hours	BASc in Environmental Systems Engineering Required Courses
Term 8 (Fall)	
3.0	ENEV 363
3.0	ENEV 383
1.0	ENEV 400
3.0	ENEV 435
3.0	ENGG 303
3.0	*Approved Elective
Term 9 (Winter)	
3.0	ENEV 415
3.0	ENEV 469
3.0	ENGG 401
3.0	*Approved Elective
3.0	*Approved Elective
136.0	TOTAL
<p>* Approved Electives (these electives may not be offered regularly):</p> <p>* Choose at least two design courses (at least two electives will be offered in each academic year) from the following: ENEV 408, ENEV 445, ENEV 463, ENEV 465, ENEV 475, ENEV 484</p> <p>* Choose one elective from the following (these electives may not be offered regularly): ENGG 411, ENIN 350, ENIN 453, ENIN 455, ENPE 490 or one from the design electives above.</p>	
<p>Choose at most one from the following: BUS 260, BUS 302, ENEL 280</p>	
<p>Social Sciences and Humanities elective: choose one Faculty of Arts or La Cité course.</p>	

Bachelor of Applied Science in Industrial Systems Engineering (ISE)

Industrial Systems Engineering is designed to develop engineers who can organize and effectively utilize the total resources of modern manufacturing and process industries. This includes the materials, machinery, facilities, people and capital.

Credit hours	BASc in Industrial Systems Engineering Required Courses
Term 1 (Fall)	
3.0	CHEM 104
3.0	ENGG 123
3.0	ENGG 140
3.0	MATH 110
3.0	MATH 122
Term 2 (Winter)	
3.0	CS 110
3.0	ENGG 100
3.0	ENGL 100
3.0	MATH 111
3.0	PHYS 119
Term 3 (Fall)	
3.0	ENEL 280
3.0	ENEV 223
3.0	ENGG 141
3.0	MATH 217
3.0	*Natural Science Elective
Term 4 (Winter, Spring/Summer)	
3.0	ENIN 233
3.0	ENIN 241
3.0	MATH 213
3.0	STAT 289
3.0	CHEM 105
Term 5 (Fall)	
3.0	*Social Science and Humanities or *Natural Science Elective
3.0	ENEV 261
3.0	ENGG 330
3.0	ENIN 331
3.0	ENIN 343
Term 6 (Spring/Summer)	
3.0	BUS 260
3.0	ECON 201
3.0	ENEL 361
3.0	ENIN 253
3.0	ENIN 350

Credit hours	BASc in Industrial Systems Engineering Required Courses
Term 7 (Winter)	
3.0	ENIN 355
3.0	ENIN 430
3.0	ENIN 440
3.0	ENIN 453
3.0	*Approved Elective
Term 8 (Fall)	
3.0	BUS 250
3.0	ENGG 303
3.0	ENIN 340
3.0	ENIN 349
1.0	ENIN 400
3.0	ENIN 444
Term 9 (Winter)	
3.0	B*Social Science and Humanities or *Natural Science Elective
3.0	ENGG 401
3.0	ENIN 413
3.0	ENIN 433
3.0	*Approved Elective
136.0	TOTAL
<p>*Approved Electives: Choose two: ENEL 462 ENEL 463, ENGG 411, ENIN 370, ENIN 445, ENIN 448, ENIN 455, ENIN 456, ENIN 457, ENIN 463, offered as follows:</p> <ul style="list-style-type: none"> • ENIN 370: Winter Term • ENIN 445 and ENIN 456: Winter term in even-numbered years • ENIN 448 and ENIN 455: Winter term in odd-numbered years. 	
<p>Social Sciences and Humanities elective: choose one Faculty of Arts or La Cité course.</p>	
<p>*Natural Science Elective (choose two): astronomy, biology, chemistry, geology, and physics. (CHEM 100 not permitted)</p>	

Bachelor of Applied Science in
Petroleum Systems Engineering (PSE)

Petroleum Systems Engineering evaluates, designs, and manages technologies in evaluating reserves, surface collection, and treatment facilities for oil and gas. Advanced computer utilization and automation combined with effective communications skills are integrated within the program. Techniques developed for the recovery of petroleum can be applied to the extraction of other important minerals. Petroleum System Engineers also contribute to activities such as pollution remediation and greenhouse gases control.

Credit hours	BASc in Petroleum Systems Engineering Required Courses
Term 7 (Winter)	
3.0	ENIN 355
3.0	ENPE 302
3.0	ENPE 370
3.0	CHEM 140
3.0	*Social Sciences and Humanities Elective
Term 8 (Fall)	
1.0	ENPE 400
3.0	ENPE 410
3.0	ENPE 440
3.0	ENPE 450
3.0	*Approved Elective
3.0	*Approved Elective
Term 9 (Winter)	
3.0	ENGG 401
3.0	ENPE 419
3.0	ENPE 486
3.0	*Approved Elective
3.0	*Approved Elective
136.0	TOTAL
*Approved Electives: Minimum of two from: ENPE 340, ENPE 380, ENPE 420, ENPE 425, ENPE 435, ENPE 448, ENPE 470, ENPE 475, ENPE 481, ENPE 490, ENPE 491, ENPE 492	
Minimum of two from: ENEV 422, ENIN 433, ENIN 453, ENIN 456	
Social Sciences and Humanities elective: choose one Faculty of Arts or La Cité course.	

Credit hours	BASc in Petroleum Systems Engineering Required Courses
Term 1 (Fall)	
3.0	CHEM 104
3.0	ENGG 123
3.0	ENGG 140
3.0	MATH 110
3.0	MATH 122
Term 2 (Winter)	
3.0	CS 110
3.0	ENGG 100
3.0	ENGL 100
3.0	MATH 111
3.0	PHYS 119
Term 3 (Fall)	
3.0	ENEL 280
3.0	ENGG 141
3.0	ENPE 241
3.0	GEOL 102
3.0	MATH 217
Term 4 (Winter, Spring/Summer)	
3.0	ECON 201
3.0	ENIN 233
3.0	ENPE 251
3.0	MATH 213
3.0	STAT 289
Term 5 (Fall)	
3.0	<u>GEOL 270</u>
3.0	ENE 261
3.0	ENGG 303
3.0	ENPE 300
3.0	ENPE 360
Term 6 (Spring/Summer)	
3.0	BUS 260
3.0	ENE 223
3.0	ENGG 330
3.0	ENIN 253
3.0	ENIN 350

Bachelor of Applied Science in Software Systems Engineering (SSE)

Software Systems Engineering is designed to develop engineers skilled in the professional construction and engineering of software systems and their life cycles. Such systems include World Wide Web transaction systems, management and information systems and interactive multimedia systems.

Credit hours	BASc in Software Systems Engineering Required Courses
Term 1 (Fall)	
3.0	CHEM 104
3.0	ENGG 123
3.0	ENGG 140
3.0	MATH 110
3.0	MATH 122
Term 2 (Winter)	
3.0	CS 110
3.0	ENGG 100
3.0	ENGL 100
3.0	MATH 111
3.0	PHYS 119
Term 3 (Fall)	
3.0	CS 115
3.0	ENEL 280
3.0	ENEV 223
3.0	MATH 217
3.0	PHYS 112
Term 4 (Winter, Spring/Summer)	
3.0	CS 210
3.0	<u>ENSE 271</u>
3.0	ENEL 282
3.0	MATH 213
3.0	STAT 289
Term 5 (Fall)	
3.0	CS 215
3.0	CS 340
3.0	ENEL 384
3.0	ENSE 352
3.0	ENSE 374
Term 6 (Spring/Summer)	
3.0	BUS 260
3.0	ECON 201
3.0	<u>ENSE 375</u>
3.0	ENSE 353
3.0	* Approved Elective

Credit hours	BASc in Software Systems Engineering Required Courses
Term 7 (Winter)	
3.0	ENEL 351
3.0	ENSE 370
3.0	ENSE 350
3.0	*Approved Elective
3.0	* Approved Elective
Term 8 (Fall)	
3.0	ENGG 303
1.0	ENSE 400
3.0	ENSE 472
3.0	ENSE 452
3.0	*Approved Elective
3.0	*Approved Elective
Term 9 (Winter)	
3.0	ENGG 401
3.0	*Approved Elective
3.0	ENSE 477
3.0	*Approved Elective
3.0	*Approved Elective
136.0	Total
Approved Technical Electives Four courses that are not included in the core SSE program course requirements. They must include a minimum of two ENSE 400-level courses. Eligible technical electives are any 300- or 400-level CS, ENEL, ENSE, and CTCH courses or other approved technical electives.	
Social Sciences and Humanities elective (one is required): choose one Faculty of Arts or La Cité course.	
Natural Science Electives (two are required): from astronomy, biology, chemistry, geology, and physics. (CHEM 100 not permitted)	
Open Elective (one is required) Any three-credit hour course (CS 100 is not permitted)	

ENGINEERING MINORS FOR SYSTEMS ENGINEERING PROGRAMS

Inclusion of a minor in a Systems Engineering program is optional, but a minor provides students with the opportunity to broaden their knowledge in areas other than their major discipline. Students must consult their Program Chair for approval to enroll in the minor program. In order to receive the minor designation, the student must have a minimum 60% average in their minor courses. Available minors are listed below.

ELECTRONICS ENGINEERING MINORS

Communications Stream Engineering Minor

Credit hours	Communications stream Engineering Minor Required Courses
3.0	ENEL 341
3.0	ENEL 442
3.0	ENEL 443
6.0	Any two approved ENEL Courses
15.0	TOTAL

Micro-electronics Stream Engineering Minor

Credit hours	Micro-electronics Stream Engineering Minor Required Courses
3.0	ENEL 351
3.0	ENEL 452
3.0	ENEL 453
6.0	Any two approved ENEL courses
15.0	TOTAL

Instrumentation and Control Stream Engineering Minor

Credit hours	Instrumentation and Control Stream Engineering Minor Required Courses
3.0	ENEL 361
3.0	ENEL 462
3.0	ENEL 463
6.0	Any two approved ENEL courses
15.0	TOTAL

Power Stream Engineering Minor

Credit hours	Power Stream Engineering Minor Required Courses
3.0	ENEL 371
3.0	ENEL 472
3.0	ENEL 473
6.0	Any two approved ENEL courses
15.0	TOTAL

Environmental Engineering Minor

Credit hours	Environmental Engineering Minor Required Courses
3.0	ENEV 321
3.0	ENEV 421
9.0	Three from ENEV 363, 372, 462, 465, 422, 462, 465
15.0	TOTAL

Manufacturing Engineering Minor

Credit hours	Manufacturing Engineering Minor Required Courses
15.0	Five of: ENIN 349, ENIN 350, ENIN 445, ENIN 448, ENEL 462, ENEL 463
15.0	TOTAL

Oil and Gas Engineering Minor

Credit hours	Oil and Gas Engineering Minor Required Courses
3.0	ENPE 241
3.0	ENPE 251
9.0	Three of: ENPE 300, ENPE 302, ENPE 370, ENPE 481, ENPE 410, ENPE 440, ENPE 450, ENPE 360 Minimum one 400-level course
15.0	TOTAL

Process Engineering Minor

Credit hours	Process Engineering Minor Required Courses
3.0	ENIN 350
3.0	ENIN 355
3.0	ENIN 455
3.0	ENIN 456
3.0	One of ENEV 363, 440, 465; ENPE 370, 490
15.0	TOTAL

Software Engineering Minor

Credit hours	Software Engineering Minor Required Courses
3.0	ENSE 374
3.0	ENSE <u>370</u>
6.0	Any two courses from ENSE 271, 350, 352, 353, 375, 472,
3.0	Any listed ENSE course excluding ENSE 400 and 477
15.0	TOTAL

Optional Non-Engineering Minors

Students may complete up to two minors in total in a subject other than, and distinct from, their major. The minor is a concentration of at least six courses in a discipline from any of the Faculties of Science, Arts, Media, Art, and Performance, La Cité universitaire francophone, or Kinesiology and Health Studies. The applications to graduate with a minor are ultimately approved by the Faculty offering the student's first major. The specific courses required for a minor in a given discipline can be found under the relevant departmental listing. A minimum of four (4) courses from outside the major are required.