

# 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 follow the academic work schedule as outlined below (also found on the Co-operative Education website: <https://www.recrutguelph.ca/cecs/>).

Engineering Systems and Computing 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

(26.00 Total Credits)

Code	Title	Credits
	Required Core Courses	18.75
	ESC Engineering Systems and Computing Electives	2.75
	Complementary Studies Electives	2.00

Co-op Work Terms	2.50
<b>Total Credits</b>	<b>26</b>

The recommended program sequence is outlined below.

## Major (Honours Program)

Code	Title	Credits
<b>Semester 1 - Fall</b>		
CHEM*1040	General Chemistry I	0.50
ENGG*1100	Engineering and Design I	0.75
ENGG*1410	Introductory Programming for Engineers	0.50
MATH*1200	Calculus I	0.50
PHYS*1130	Physics with Applications	0.50
<b>Semester 2 - Winter</b>		
ENGG*1210	Engineering Mechanics I	0.50
ENGG*1420	Object-Oriented Programming for Engineers	0.50
ENGG*1500	Engineering Analysis	0.50
MATH*1210	Calculus II	0.50
PHYS*1010	Introductory Electricity and Magnetism	0.50
<b>Semester 3 - Fall</b>		
CIS*2520	Data Structures	0.50
COOP*1100	Introduction to Co-operative Education	0.00
ENGG*2230	Fluid Mechanics	0.50
ENGG*2400	Engineering Systems Analysis	0.50
ENGG*2410	Digital Systems Design Using Descriptive Languages	0.50
MATH*2270	Applied Differential Equations	0.50
0.50 restricted electives		0.50
<b>Semester 4 - Winter</b>		
ENGG*2100	Engineering and Design II	0.75
ENGG*2120	Material Science	0.50
ENGG*2450	Electric Circuits	0.50
MATH*2130	Numerical Methods	0.50
STAT*2120	Probability and Statistics for Engineers	0.50
0.50 restricted electives		0.50
<b>Summer Semester</b>		
COOP*1000	Co-op Work Term I	0.50
<b>Semester 5 - Fall</b>		
ENGG*3260	Thermodynamics	0.50
ENGG*3390	Signal Processing	0.50
ENGG*3450	Electronic Devices	0.50
ENGG*3640	Microcomputer Interfacing	0.50
ENGG*4450	Large-Scale Software Architecture Engineering	0.50
0.50 restricted electives		0.50
<b>Winter Semester</b>		
COOP*2000	Co-op Work Term II	0.50
<b>Summer Semester</b>		
COOP*3000	Co-op Work Term III	0.50
<b>Semester 6 - Fall</b>		
ENGG*3240	Engineering Economics	0.50
ENGG*4420	Real-time Systems Design	0.75
1.50 or 1.75 restricted electives		1.50-1.75

**Semester 7 - Winter**

ENGG*3100	Engineering and Design III	0.75
ENGG*3130	Modelling Complex Systems	0.50
ENGG*3410	Systems and Control Theory	0.50
ENGG*3430	Heat and Mass Transfer	0.50
HIST*1250	Science and Technology in a Global Context	0.50
0.50 restricted electives		0.50

**Summer Semester**

COOP*4000	Co-op Work Term IV	0.50
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**Fall Semester**

COOP*5000	Co-op Work Term V	0.50
ENGG*4000	Proposal for Engineering Design IV	0.00

**Semester 8 - Winter**

ENGG*4120	Engineering Systems and Computing Design IV	1.00
ENGG*4490	Sampled Data Control Design	0.75
1.00 or 1.25 electives		1.00-1.25

**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:

- 2.75 credits from the ESC 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.