

# Computer Engineering Curriculum - Fall 2020

## Non-CEGEP Entry

<b>1st Term (Fall)</b>		14 credits	Prerequisites/Co-requisites
FACC 100	Introduction to the Engineering Profession	1	-
MATH 133	Linear Algebra and Geometry	3	P - A course in functions
MATH 140	Calculus 1	3	P - High school calculus
PHYS 131	Mechanics and Waves	4	C - Calculus course [MATH 140]
CS	Complementary Studies Group B (HSSML) - 1*	3	-
<b>2nd Term (Winter)</b>		18 credits	Prerequisites/Co-requisites
CHEM 120	General Chemistry 2	4	P - College level mathematics and physics or permission of instructor
ECSE 202	Introduction to Software Development	3	-
MATH 141	Calculus 2	4	P - MATH 140
PHYS 142	Electromagnetism and Optics	4	P - PHYS 131 / C - MATH 141
CS	Complementary Studies Group A (Impact)*	3	-
<b>3rd Term (Fall)</b>		15 credits	Prerequisites/Co-requisites
CCOM 206	Communication in Engineering	3	-
ECSE 200	Electric Circuits 1	3	P - PHYS 142 / C - MATH 263
ECSE 222	Digital Logic	3	P - ECSE 202
FACC 250	Responsibilities of the Professional Engineer	0	P - FACC 100 or BREE 250
MATH 262	Intermediate Calculus	3	P - MATH 133, MATH 141
MATH 263	Ordinary Differential Equations for Engineers	3	C - MATH 262
<b>4th Term (Winter)</b>		18 credits	Prerequisites/Co-requisites
COMP 250	Introduction to Computer Science	3	P - Familiarity with a high level programming language and CEGEP level Math [MATH 133, MATH 140, MATH 141]
ECSE 211	Design Principles and Methods	3	P - ECSE 200, ECSE 202
ECSE 210	Electric Circuits 2	3	P - ECSE 200
FACC 300	Engineering Economy	3	-
ECSE 223	Model-Based Programming	3	P - ECSE 202
CS	Complementary Studies Group B (HSSML) - 2*	3	-
<b>5th Term (Fall)</b>		17 credits	Prerequisites/Co-requisites
ECSE 205	Probability and Statistics for Engineers	3	-
ECSE 206	Introduction to Signals and Systems	3	P - ECSE 200
ECSE 324	Computer Organization	4	P - ECSE 200, ECSE 222
ECSE 331	Electronics	4	P - ECSE 210
ECSE 353	Electromagnetic Fields and Waves	3	P - ECSE 210, MATH 262, MATH 263
<b>6th Term (Winter)</b>		18 credits	Prerequisites/Co-requisites
COMP 251	Algorithms and Data Structures	3	P - COMP 250 / C - MATH 240
ECSE 310	Thermodynamics of Computing	3	P - ECSE 200, ECSE 205, ECSE 222
ECSE 321	Introduction to Software Engineering	3	P - ECSE 223 and (COMP 202 or COMP 208 or ECSE 202)
ECSE 325	Digital Systems	3	P - ECSE 324
ECSE 427	Operating Systems	3	P - ECSE 324 or COMP 273
MATH 240	Discrete Structures 1	3	C - MATH 133
<b>7th Term (Fall)</b>		17 credits	Prerequisites/Co-requisites
ECSE 308	Introduction to Communication Systems and Networks	4	P - ECSE 205, ECSE 206
ECSE 444	Microprocessors	4	P - ECSE 324
ECSE 458D1	Capstone Design Project	3	P - ECSE 211 and ECSE 324 and CCOM 206 and (ECSE 331 or COMP 302)
ECSE xxx	Technical Complementary	3	-
ECSE xxx	Technical Complementary	3	-
<b>8th Term (Winter)</b>		16 credits	Prerequisites/Co-requisites
ECSE 425	Computer Architecture	3	P - ECSE 324
ECSE 458D2	Capstone Design Project	3	P - ECSE 458D1
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250**, and 60 program credits
ECSE xxx	Technical Complementary	3	-
ECSE xxx	Technical Complementary	3	-
XXXX xxx	Elective Course***	3	-

Technical Complementary courses are selected from an approved list given on the next page.

\*The Complementary Studies (CS) courses are Impact of Technology courses (Group A) and Humanities & Social Sciences, Management Studies and Law courses (Group B). Students must take one course (3 credits) from Group A and two courses (6 credits) from Group B. The curriculum above includes suggested terms during which these courses can be taken. These must be chosen from an approved list of courses/departments, found in the program list under "Complementary Studies" in the Faculty of Engineering Undergraduate section of the Programs, Courses and University Regulations publication ([www.mcgill.ca/study](http://www.mcgill.ca/study)) (see your program listing in the "Browse Academic Units & Programs" section).

\*\*FACC 250 is not yet indicated as a prerequisite in the eCalendar course information ([www.mcgill.ca/study](http://www.mcgill.ca/study)) but it will be before FACC 400 is taken.

Students are responsible for satisfying pre-/co-requisites and verifying with their department that they are meeting the requirements of their program.

# Technical Complementary Courses - Computer Engineering

## Technical Complementaries

12-16 credits

4 courses must be taken, chosen as follows:

- 1 course (minimum 3 credits) from List A
- The remaining 3 courses from List A or List B

### List A

3-16 credits from the following:

		Credits	Prerequisites/Co-requisites
ECSE 307	Linear Systems and Control	4	P - ECSE 206, ECSE 210
ECSE 335	Microelectronics	4	P - ECSE 331
ECSE 343	Numerical Methods in Engineering	3	P - ECSE 205, COMP 250, MATH 263
ECSE 403	Control	4	P - ECSE 307
ECSE 408	Communication Systems	4	P - ECSE 205, ECSE 308
ECSE 412	Discrete Time Signal Processing	3	P - ECSE 206
ECSE 415	Introduction to Computer Vision	3	P - ECSE 205, (ECSE 206 or ECSE 316)
ECSE 416	Telecommunication Networks	4	P - ECSE 205, (ECSE 308 or ECSE 316), COMP 250
ECSE 420	Parallel Computing	3	P - ECSE 427
ECSE 422	Fault Tolerant Computing	3	P - ECSE 324, COMP 250
ECSE 428	Software Engineering Practice	3	P - ECSE 321 or COMP 335
ECSE 429	Software Validation	3	P - ECSE 321 or COMP 303
ECSE 435	Mixed-Signal Test Techniques	3	P - ECSE 206, ECSE 335
ECSE 436	Signal Processing Hardware	3	P - ECSE 206, ECSE 324, ECSE 325
ECSE 437	Software Delivery	3	P - ECSE 321 or COMP 303
ECSE 439	Software Language Engineering	3	P - ECSE 321 or COMP 303
ECSE 446	Realistic Image Synthesis	3	P - ECSE 202, ECSE 205, COMP 250
ECSE 450	Electromagnetic Compatibility	3	P - ECSE 222, ECSE 331, (ECSE 353 or ECSE 354)
ECSE 472	Fundamentals of Circuit Simulation and Modelling	3	P - ECSE 206, ECSE 331, (ECSE 251 OR ECSE 353)
ECSE 501	Linear Systems	3	P - ECSE 500 or permission from instructor
ECSE 508	Multi-Agent Systems	3	P - ECSE 205
ECSE 510	Filtering and Prediction for Stochastic Systems	3	P - ECSE 500, ECSE 509
ECSE 516	Nonlinear and Hybrid Control Systems	3	P - ECSE 500, ECSE 501
ECSE 544	Computational Photography	4	P - ECSE 205, ECSE 206
ECSE 551	Machine Learning for Engineers*	4	P - (ECSE 205 or MATH 323), COMP 250 / C - (ECSE 343 or ECSE 543)

### List B

0-12 credits from the following:

COMP 424	Artificial Intelligence**	3	P - (COMP 206 or ECSE 321), ECSE 205, COMP 251
COMP 551	Applied Machine Learning*	4	P - ECSE 205
COMP 559	Fundamentals of Computer Animation	4	P - MATH 222, MATH 223, COMP 206, COMP 250
ECSE 421	Embedded Systems	3	P - ECSE 324
ECSE 424	Human-Computer Interaction	3	P - (ECSE 324, COMP 250) or (COMP 251, COMP 273)
ECSE 500	Mathematical Foundations of Systems	3	P - departmental permission
ECSE 507	Optimization and Optimal Control	3	P - ECSE 343 or ECSE 543 or ECSE 501 or COMP 540
ECSE 509	Probability and Random Signals 2	3	P - ECSE 205, ECSE 206
ECSE 521	Digital Communications 1	3	P - ECSE 408 or ECSE 511
ECSE 526	Artificial Intelligence**	3	P - ECSE 324
ECSE 532	Computer Graphics	4	P - ECSE 324
MATH 247	Honours Applied Linear Algebra	3	P - MATH 133

\* Students are not permitted to take ECSE 551 if they have already taken COMP 551 and vice and versa.

\*\* Students are not permitted to take COMP 424 if they have already taken ECSE 526 and vice and versa.

### Last update: April 3, 2020

For the official program listing, see the *Programs, Courses and University Regulations* publication ([www.mcgill.ca/study](http://www.mcgill.ca/study)).