Software Engineering Curriculum - Fall 2020

Non-CEGEP Entry

1st Term (Fall)		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	-
2nd Term (Winter)		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
Science	Natural Science Complementary	3	-
3rd Term (Fall)		15 credits	Prerequisites/Co-requisites
CCOM 206	Communication in Engineering	3	-
ECSE 205	Probability and Statistics for Engineers	3	-
FACC 250	Responsibilities of the Professional Engineer	0	P - FACC 100 or BREE 250
MATH 262	Intermediate Calculus	3	P - MATH 133, MATH 141
ECSE 223	Model-Based Programming	3	P - ECSE 202
MATH 263	Ordinary Differential Equations for Engineers	3	C - MATH 262
4th Term (Winter)		18 credits	Prerequisites/Co-requisites
COMP 206	Introduction to Software Systems	3	P - ECSE 202 or COMP 250
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 200	Electric Circuits 1	3	P - PHYS 142 / C - MATH 263
ECSE 222	Digital Logic	3	P - ECSE 202
CS	Complementary Studies Group B (HSSML) - 1*	3	-
MATH 240	Discrete Structures 1	3	C - MATH 133
5th Term (Fall)		17 credits	Prerequisites/Co-requisites
COMP 251	Algorithms and Data Structures	3	P - COMP 250 / C - MATH 240
ECSE 321	Introduction to Software Engineering	3	P - ECSE 223 and (COMP 202 or COMP 208 or ECSE 202)
ECSE 324	Computer Organization	4	P - ECSE 200, ECSE 222
ECSE 326	Software Requirements Engineering	3	P - ECSE 223 or COMP 303
FACC 300	Engineering Economy	3	-
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250**, and 60 program credits
6th Term (Winter)		18 credits	Prerequisites/Co-requisites
COMP 302	Programming Languages and Paradigms	3	P - COMP 250
ECSE 211	Design Principles and Methods	3	P - ECSE 200, ECSE 202
ECSE 310	Thermodynamics of Computing	3	P - ECSE 200, ECSE 205, ECSE 222
ECSE 316	Signals and Networks	3	P - COMP 251, ECSE 200, MATH 263
ECSE 427	Operating Systems	3	P - ECSE 322 or ECSE 324 or COMP 273
ECSE xxx	Technical Complementary	3	-
7th Term (Fall)		18 credits	Prerequisites/Co-requisites
COMP 360	Algorithm Design	3	P - COMP 251, MATH 240
ECSE 420	Parallel Computing	3	P - ECSE 427
ECSE 429	Software Validation	3	P - ECSE 321 or COMP 303
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	-
8th Term (Winter)		18 credits	Prerequisites/Co-requisites
COMP 421	Database Systems	3	P - COMP 206, COMP 251, COMP 302
ECSE 428	Software Engineering Practice	3	P - ECSE 321 or COMP 335
ECSE 458D2	Capstone Design Project	3	P - ECSE 458D1
ECSE xxx	Technical Complementary	3	-
XXXX xxx	Elective Course****	3	-
CS	Complementary Studies Group A (Impact)*	3	-

Technical and Natural Science 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) (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) 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 - Software Engineering

Technical Complementaries

12- 16 credits (4 courses) must be taken, chosen as follows:

3-4 credits (1 course) from List A

9-12 credits (3 courses) from List A or List B

List A

3-4 credits from the following list

		Credits	Prerequisites/Co-requisites
ECSE 325	Digital Systems	3	P - ECSE 324
ECSE 343	Numerical Methods in Engineering *	3	P - ECSE 205, COMP 250, MATH 263
ECSE 415	Introduction to Computer Vision	3	P - (ECSE 206 or ECSE 316) and ECSE 205
ECSE 416	Telecommunication Networks	4	P - COMP 250, ECSE 205, (ECSE 308 or ECSE 316)
ECSE 422	Fault Tolerant Computing	3	P - ECSE 324 and COMP 250
ECSE 425	Computer Architecture	3	P - ECSE 324
ECSE 437	Software Delivery	3	P - ECSE 321 or COMP 303
ECSE 439	Software Language Engineering	3	P- ECSE 321 or COMP 303
ECSE 444	Microprocessors	4	P- ECSE 324
ECSE 446	Realistic Image Synthesis	3	P- ECSE 202, ECSE 205, and COMP 250
ECSE 544	Computational Photography	4	P - ECSE 205 and ECSE 206
ECSE 551	Machine Learning for Engineers **	4	P - COMP 250 and (ECSE 205 or MATH 323); C - ECSE 343 or ECSE 543 or MATH 247

List B

9-12 credits from the following list:

COMP 330	Theory of Computation	3	P - COMP 251, MATH 240
COMP 350	Numerical Computing *	3	P - MATH 222 or MATH 262, MATH 223, and (COMP 202 or COMP 208 or COMP 250, or equivalents)
COMP 409	Concurrent Programming	3	P - COMP 251, COMP 302, (COMP 310 or ECSE 427)
COMP 417	Introduction Robotics and Intelligent Systems	3	P - COMP 251, MATH 223, (ECSE 321 or COMP 206)
COMP 424	Artificial Intelligence ***	3	P - COMP 206 / ECSE 321, MATH 323 or equivalent, and COMP 251
COMP 512	Distributed Systems	4	P- COMP 310, COMP 251 or equivalent
COMP 520	Compiler Design	4	P - COMP 273, COMP 302
COMP 521	Modern Computer Games	4	P - COMP 251, MATH 223, (COMP 303 or COMP 361)
COMP 525	Formal Verification	3	P - COMP 251, COMP 330
COMP 529	Software Architecture	4	P - COMP 303
COMP 533	Model-Driven Software Development	3	P - ECSE 321 or COMP 303 or COMP 361
COMP 551	Applied Machine Learning *	4	P - MATH 323 or ECSE 205 or ECSE 305 or equivalent
COMP 559	Fundamentals of Computer Animation	4	P - MATH 222, MATH 223, COMP 206, COMP 250
COMP 575	Fundamentals of Distributed Algorithms	3	P - COMP 310
ECSE 421	Embedded Systems	3	P - ECSE 324
ECSE 424	Human-Computer Interaction	3	P - (ECSE 324 and COMP 250) or (COMP 251 and COMP 273)
ECSE 507	Optimization and Optimal Control	3	P - (ECSE 343 or ECSE 443) or ECSE 543 or ECSE 501 or COMP 540 or permission of instructor.
ECSE 509	Probability and Random Signals 2	3	P - (ECSE 206 or ECSE 316) and ECSE 205
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 or equivalent.

* COMP 350 and ECSE 343 cannot both be taken.

** ECSE 551 and COMP 551 cannot both be taken.

*** COMP 424 and ECSE 526 cannot both be taken.

Natural Science Complementary Courses - Software Engineering

Students from CEGEP are required to complete two 3-credit courses at the 200-level or higher, chosen from the following science departments, approved by the Undergraduate Programs Office in the Department of Electrical and Computer Engineering:

Atmospheric and Oceanic Sciences (ATOC)
Biology (BIOL)
Chemistry (CHEM)
Environment (ENVR)
Earth and Planetary Sciences (EPSC)
Earth System Science (ESYS)
Microbiology (MIMM)
Physics (PHYS)

Last update: Aug 20, 2020

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