

2020 / 2021 CURRICULUM - SOFTWARE ENGINEERING

ENTRY FROM CEGEP

Total credits: **108**

First Semester (Fall 2020)			Second Semester (Winter 2021)		
ECSE 202	Intro. to Software Development	(3 cr)	COMP 250	Introduction to Computer Science	(3 cr) P - Familiarity with a high level programming language and CEGEP level MATH [MATH 133, MATH 140, MATH 141]
ECSE 205	Probability & Statistics for Eng.	(3 cr)	ECSE 222	Digital Logic	(3 cr, P - ECSE 202)
MATH 262	Intermediate Calculus	(3 cr, P-MATH 141 or equiv, MATH 133)	ECSE 200	Electric Circuits 1	(3 cr, P - PHYS 142; C - MATH 263)
MATH 263	ODEs for Engineers	(3 cr, C - MATH 262)	ECSE 223	Model-based Programming	(3 cr, P - ECSE 202)
XXXX xxx	Humanities & Social Sciences *	(3 cr)	XXXX xxx	Impact of Technology on Society **	(3 cr)
			FACC 100	Intro. to Engineering Profession	(1 cr)
Third Semester (Fall 2021)			Fourth Semester (Winter 2022)		
COMP 206	Introduction to Software Systems	(3 cr, P - ECSE 202 or COMP 250)	ECSE 428	Software Engineering Practice	(3 cr, P - ECSE 321 or COMP 335)
COMP 302	Prog. Languages & Paradigms	(3 cr, P - COMP 250)	ECSE 310	Thermodynamics of Computing	(3 cr, P - ECSE 200, ECSE 205, ECSE 222)
ECSE 211	Design Principles and Methods	(3 cr, P - ECSE 200, ECSE 202)	MATH 240	Discrete Structures	(3 cr, C - MATH 133)
ECSE 324	Computer Organization	(4 cr, P - ECSE 200, ECSE 222)	CCOM 206	Communication in Engineering	(3 cr)
ECSE 321	Intro. to Software Engineering	(3 cr, P - ECSE 223 and COMP 202 or COMP 208 or ECSE 202)	COMP 251	Algorithms and Data Structures	(3 cr, P - COMP 250, C - MATH 240)
			FACC 250	Resp. of the Prof. Engineer	(0 cr, P - FACC 100 or BREE 250)
Fifth Semester (Fall 2022)			Sixth Semester (Winter 2023)		
COMP 360	Algorithm Design	(3 cr, P - COMP 251, MATH 240)	ECSE 458 N1	Capstone Design Project	(3 cr, P - CCOM 206, ECSE 211, ECSE 324, COMP 302)
ECSE 326	Software Requirements Eng.	(3 cr, P - ECSE 223 or COMP 303)	XXXX xxx	Technical Complementary 1	(4 cr)
ECSE 427	Operating Systems	(3 cr, P - ECSE 324 or COMP 273)	XXXX xxx	Technical Complementary 2	(3 cr)
ECSE 429	Software Validation	(3 cr, P - ECSE 321 or COMP 303)	ECSE 316	Signals and Networks	(3 cr, P - MATH 263, ECSE 200, COMP 251)
FACC 300	Engineering Economy	(3 cr)	COMP 421	Database Systems	(3 cr, P - COMP 206, COMP 251, COMP 302)
			FACC 400	Engineering Professional Practice	(1 cr, P - FACC 100, FACC 250, and 60 program credits)
Seventh Semester (Fall 2023)					
ECSE 458 N2	Capstone Design Project	(3 cr, P - ECSE 458 N1)			
XXXX xxx	Technical Complementary 3	(3 cr)			
XXXX xxx	Technical Complementary 4	(3 cr)			
XXXX xxx	Elective Course ****	(3 cr)			
ECSE 420	Parallel Computing	(3 cr, P - ECSE 427)			

Courses shown in boldface above must be passed with a grade "C" or better. A "D" is *only* acceptable in the courses *not* in boldface. Also, a grade of "C" is required in all prerequisites in order to proceed with the follow-on courses. (Exception: A student who fails a course with a grade of D may take an ECSE course that has it as a prerequisite, provided that the failed course is retaken at the same time. Students thinking of doing this should meet with a Departmental advisor).

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

* For instructions on selecting valid "Humanities and Social Sciences" courses, see www.mcgill.ca/ece, then: Undergraduate Studies > Program Information > Complementary Studies.

** For instructions on selecting valid "Impact of Technology on Society" courses, see www.mcgill.ca/ece, then: Undergraduate Studies > Program Information > Complementary Studies.

**** One 3-credit course at the 200-level or higher from any department at McGill, approved by the Undergraduate Programs Office in the Department of Electrical and Computer Engineering. For approval, please contact undergrad.ece@mcgill.ca.

ECSE 458, Capstone Design Project course is a spanned course given in both the fall and winter terms. A course that spans across two semesters may be taken in Fall-Winter or Winter-Fall. Students wishing to take the Fall-Winter sequence will need to register for ECSE 458 D1/D2. For a Winter-Fall sequence, students need to register for ECSE 458 N1/N2.

This sample curriculum is for students who wish to complete their degree requirements in 7 semesters. Students may, at any time, deviate from this structure. However, it is the student's responsibility to devise a study plan that has no course conflicts or prerequisite/corequisite violations. Academic advisors are available for help with course selection.

Revised May 2020

SOFTWARE ENGINEERING

A: Technical Complementaries (1 course) 3 credits (minimum)

One technical complementary course must be chosen from the following list.

ECSE 500 level technical complementaries are restricted to students with a minimum CGPA of 3.0 and B+ or better in the prerequisites.

ECSE 325	Digital Systems	(3 cr, P - ECSE 324)
ECSE 343*	Numerical Methods in Engineering	(3 cr, P - ECSE 205, COMP 250, MATH 263)
ECSE 415	Intro. to Computer Vision	(3 cr, P - ECSE 205, ECSE 206 or ECSE 316)
ECSE 416	Telecom. Networks	(4 cr, P - ECSE 205, ECSE 308 or ECSE 316, COMP 250)
ECSE 422	Fault Tolerant Computing	(3 cr, P - ECSE 324, COMP 250)
ECSE 425	Computer Architecture	(3 cr, P - ECSE 324)
ECSE 437	Software Delivery	(3 cr, P - ECSE 321 or COMP 303)
ECSE 439	Software Language Engineering	(3 cr, P - ECSE 321 or COMP 303)
ECSE 444	Microprocessors	(4 cr, P - ECSE 324)
ECSE 446	Realistic Image Synthesis	(3 cr, P - ECSE 202, ECSE 205, COMP 250)
ECSE 544	Computational Photography	(4 cr, P - ECSE 205 and ECSE 206)
ECSE 551**	Machine Learning for Engineers	(4 cr - P - COMP 250 and ESCE 205 or MATH 323; C- ESCE 443 or ESCE 543 or MATH 247)

B: Technical Complementaries (3 courses) 9 credits (minimum)

Three other technical complementary courses must be chosen from list A or from list B:

COMP 330	Theory of Computation	(3 cr, P - COMP 251, MATH 240)
COMP 350*	Numerical Computing	(3 cr, P - MATH 222 or MATH 262, MATH 223 & (ECSE 202 or COMP 208 or COMP 250 or equiv))
COMP 409	Concurrent Programming	(3 cr, P - COMP 251, COMP 302 & COMP 310 or ECSE 427)
COMP 417	Intro. Robotics and Intelligent Systems	(3 cr, P - COMP 251, MATH 223 & (ECSE 321 or COMP 206)
COMP 424***	Artificial Intelligence	(3 cr, P - COMP 206/ECSE 321, MATH 323 or equivalent, COMP 251)
COMP 512	Distributed Systems	(4 cr, P - COMP 310, COMP 251 or equivalent)
COMP 520	Compiler Design	(4 cr, P - COMP 273, COMP 302)
COMP 521	Modern Computer Games	(4 cr, P - COMP 251, MATH 223 & (COMP 303 or COMP 361)
COMP 525	Formal Verification	(3 cr, P - COMP 251, COMP 330)
COMP 529	Software Architecture	(4 cr, P - COMP 303)
COMP 533	Model-Driven Software Development	(3 cr, P - ECSE 321 or COMP 303 or COMP 361)
COMP 551**	Applied Machine Learning	(4 cr, MATH 323 or ECSE 205 or ESCE 305 or equivalent)
COMP 559	Fundamentals of Computer Animation	(4 cr - P MATH 222, MATH 223, COMP 206, COMP 250)
COMP 575	Fundamentals of Distributed Algorithms	(3 cr, P - COMP 310)
ECSE 421	Embedded Systems	(3 cr, P - ECSE 324)
ECSE 424	Human-Computer Interaction	(3 cr, P - ECSE 324, COMP 250 or COMPE 251, COMP 273)
ECSE 507	Optimization & Optimal Control	(3 cr, P - (ECSE 343 or ECSE 443) or ESCE 543 or ECSE 501 or COMP 540 or permission of instructor)
ECSE 509	Probability & Random Signals 2	(3 cr, P - (ECSE 206 or ESCE 316) and ECSE 205)
ECSE 526***	Artificial Intelligence	(3 cr, P - ECSE 324)
ECSE 532	Computer Graphics	(4 cr, P - ECSE 324)
MATH 247	Honours Applied Linear Algebra	(3 cr, P - MATH 133 or equiv.)

*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.