

Electrical 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
CS	Complementary Studies Group A (Impact)*	3	-
3rd Term (Fall)		18 credits	Prerequisites/Co-requisites
CCOM 206	Communication in Engineering	3	-
CIVE 281	Analytical Mechanics	3	C - MATH 262, MATH 263
ECSE 200	Electric Circuits 1	3	P - PHYS 142 / C - MATH 263
MATH 262	Intermediate Calculus	3	P - MATH 133, MATH 141
MATH 263	Ordinary Differential Equations for Engineers	3	C - MATH 262
CS	Complementary Studies Group B (HSSML) - 2*	3	-
4th Term (Winter)		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 205	Probability and Statistics for Engineers	3	-
ECSE 206	Introduction to Signals and Systems	3	P - ECSE 200
ECSE 210	Electric Circuits 2	3	P - ECSE 200
ECSE 222	Digital Logic	3	P - ECSE 200
MIME 262	Properties of Materials in Electrical Engineering	3	-
5th Term (Fall)		18 credits	Prerequisites/Co-requisites
ECSE 211	Design Principles and Methods	3	P - ECSE 200, ECSE 202
ECSE 251	Electric and Magnetic Fields	3	P - ECSE 200, MATH 262
ECSE 307	Linear Systems and Control	4	P - ECSE 206, ECSE 210
ECSE 324	Computer Organization	4	P - ECSE 200, ECSE 222
ECSE 331	Electronics	4	P - ECSE 210
6th Term (Winter)		15 credits	Prerequisites/Co-requisites
ECSE 308	Introduction to Communication Systems and Networks	4	P - ECSE 205, ECSE 206
ECSE 354	Electromagnetic Wave Propagation	4	P - ECSE 251
ECSE 362	Fundamentals of Power Engineering	4	P - ECSE 210, ECSE 251 / C - CIVE 281
ECSE 343	Numerical Methods in Electrical Engineering	3	P - ECSE 205, COMP 250, MATH 263
FACC 250	Responsibilities of the Professional Engineer	0	P - FACC 100 or BREE 250
7th Term (Fall)		18 credits	Prerequisites/Co-requisites
ECSE 458D1	Capstone Design Project	3	P - ECSE 211 and ECSE 324 and CCOM 206 and (ECSE 331 or COMP 302)
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250**, and 60 program credits
ECSE xxx	Technical Complementary	4	-
ECSE xxx	Technical Complementary	4	-
ECSE xxx	Technical Complementary	3	-
ECSE xxx	Technical Complementary	3	-
8th Term (Winter)		15 credits	Prerequisites/Co-requisites
ECSE 458D2	Capstone Design Project	3	P - ECSE 458D1
FACC 300	Engineering Economy	3	-
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) (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 - Electrical Engineering

Technical Complementaries

6 courses (20-24 credits) must be taken, chosen as follows:

- 2 courses (minimum 8 credits) from List A
- The remaining 4 courses (minimum 12 credits) from List A or List B

List A

8-24 credits from the following:

		Credits	Prerequisites/Co-requisites
ECSE 335	Microelectronics	4	P - ECSE 331
ECSE 403	Control	4	P - ECSE 307
ECSE 408	Communication Systems	4	P - ECSE 205, ECSE 308
ECSE 416	Telecommunication Networks	4	P - COMP 250, ECSE 205, ECSE 308 / ECSE 316
ECSE 433	Physical Basis of Transistor Devices	4	P - ECSE 251, ECSE 331, MIME 262
ECSE 444	Microprocessors	4	P - ECSE 324
ECSE 470	Electromechanical Systems	4	P - ECSE 362

List B

0-12 credits from the following:

		Credits	Prerequisites/Co-requisites
COMP 551	Applied Machine Learning ****	4	P - MATH 323 or ECSE 205 or equivalent
COMP 559	Fundamentals of Computer Animation	4	P - MATH 222, MATH 223, COMP 206, COMP 250
ECSE 310	Thermodynamics of Computing	3	P - ECSE 200, ECSE 205, ECSE 222
ECSE 325	Digital Systems	3	P - ECSE 324
ECSE 405	Antennas	3	P - ECSE 206, ECSE 354
ECSE 412	Discrete Time Signal Processing	3	P - ECSE 206
ECSE 415	Introduction to Computer Vision	3	P - (ECSE 206 or ECSE 316) and ECSE 205
ECSE 420	Parallel Computing	3	P - ECSE 427
ECSE 421	Embedded Systems	3	P - ECSE 324
ECSE 422	Fault Tolerant Computing	3	P - ECSE 324 and COMP 250
ECSE 423	Fundamentals of Photonics	3	P - ECSE 354
ECSE 424	Human-Computer Interaction	3	P - ECSE 324 and COMP250) or (COMP 251 and COMP 273)
ECSE 425	Computer Architecture	3	P - ECSE 324
ECSE 427	Operating Systems	3	P - ECSE 324 or COMP 273
ECSE 430	Photonic Devices and Systems	3	P - ECSE 354 and MIME 262
ECSE 431	Introduction to VLSI CAD	3	P - ECSE 324 and ECSE 331
ECSE 435	Mixed-Signal Test Techniques	3	P - ECSE 206 and ECSE ECSE 335
ECSE 436	Signal Processing Hardware	3	P - ECSE 324, ECSE 325, and ECSE 206
ECSE 446	Realistic Image Synthesis	3	P - ECSE 202, ECSE 205, and COMP 250
ECSE 450	Electromagnetic Compatibility	3	P - ECSE 222, ECSE 331, and (ECSE 353 or ECSE 354)
ECSE 451	EM Transmission and Radiation	3	P - ECSE 354
ECSE 460	Appareillage électrique (Electrical Power Equipment) *	3	P - ECSE 464
ECSE 463	Electric Power Generation **	3	P - ECSE 362 or ECSE 461
ECSE 464	Power Systems Analysis	3	P - ECSE 362
ECSE 465	Power Electronic Systems ***	3	P - ECSE 331 and ECSE ECSE 362
ECSE 466	Réseaux de distribution *	3	P - ECSE 362
ECSE 467	Comportement des réseaux électriques *	3	P - ECSE 464
ECSE 468	Electricité industrielle (Industrial Power Systems) *	3	P - ECSE 362
ECSE 469	Protection des réseaux électriques *	3	P - ECSE 464
ECSE 472	Fundamentals of Circuit Simulation and Modelling	3	P - ECSE 206, ECSE 331, and ECSE 251
ECSE 500	Mathematical Foundations of Systems	3	P - permission from instructor
ECSE 501	Linear Systems	3	Corequisite: ECSE 500 or permission of instructor P - (ECSE 343 or ECSE 443) or ECSE 543 or ECSE 501 or COMP 540 or permission of instructor.
ECSE 507	Optimization and Optimal Control	3	P - ECSE 205 or equivalent.
ECSE 508	Multi-Agent Systems	3	P - (ECSE 206 or ECSE 316) and ECSE 205
ECSE 509	Probability and Random Signals 2	3	P - ECSE 500 and ECSE 509 or equivalent.
ECSE 510	Filtering and Prediction for Stochastic Systems	3	P - ECSE 500 and ECSE 501 or equivalent
ECSE 516	Nonlinear and Hybrid Control Systems	3	P - ECSE 354 and (ECSE 433 or ECSE 533)
ECSE 519	Semiconductor Nanostructures and Nanophotonic Devices	3	P - ECSE 411 or ECSE 408 or ECSE 511 / C - ECSE 509
ECSE 521	Digital Communications 1	3	P - ECSE 324
ECSE 526	Artificial Intelligence	4	P - ECSE 324
ECSE 532	Computer Graphics	3	P - ECSE 324, ECSE 331 and ECSE 251
ECSE 543	Numerical Methods in Electrical Engineering	4	P - ECSE 205 and ECSE 206 P - COMP 250 and ECSE 205 or MATH 323; C - ECSE 443 or ECSE 543 or MATH 247
ECSE 544	Computational Photography	4	P - ECSE 362 or ECSE 461
ECSE 551	Machine Learning for Engineers ****	3	P - ECSE 362
ECSE 562	Low-Carbon Power Generation Engineering **	3	P - ECSE 335 and ECSE 362
ECSE 563	Power Systems Operation and Planning	3	P - ECSE 335 and ECSE 362
ECSE 565	Introduction to Power Electronics ***	3	P - PHYS 342 or PHYS 352, or permission of the instructor
PHYS 434	Optics	3	P - PHYS 230 and PHYS 232, or PHYS 251
PHYS 446	Majors Quantum Physics	3	

* Courses taught in French

** ECSE 463 and ECSE 562 cannot both be taken.

*** ECSE 465 and ECSE 565 cannot both be taken.

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

Last update: March 10, 2020

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