Electrical Engineering Curriculum - Fall 2024

1st Term (Fall)		14 credits	Prerequisites/Co-requisites
HSS 1	Humanities & Social Sciences 1*	3	
MATH 140	Calculus 1	3	P- High school calculus
PHYS 131	Mechanics & Waves	4	C - MATH 139 or higher level calculus course.
MATH 133	Linear Algebra and Geometry	3	P- A course in functions
FACC 100	Intro. to Engineering Profession	1	

2nd Term (Winter)		18 credits	Prerequisites/Co-requisites
CHEM 120	General Chemistry 2	4	P - College level mathematics and physics or permission of instructor
MATH 141	Calculus 2	4	P - (MATH 139 or MATH 140 or MATH 150)
PHYS 142	Electromagnetism & Optics	4	P - PHYS 131; C - MATH 141 or higher level calculus course
COMP 202	Foundations of Programming	3	
Impact	Impact of Technology on Society **	3	

3rd Term (Fall)		18 credits	Prerequisites/Co-requisites
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 or equiv, MATH 141
MATH 263	ODEs for Engineers	3	C - MATH 262
ECSE 250	Fundamentals of Software Development	3	P - COMP 202 or equivalent
MIME 262	Properties of Materials in EE	3	

4th Term (Winter)		18 credits	Prerequisites/Co-requisites
ECSE 205	Probability & Statistics for Eng.	3	P - MATH 262
ECSE 210	Electric Circuits 2	3	P - ECSE 200
COMP 206	Introduction to Software Systems	3	P - (COMP 202 or ECSE 202) and (COMP 250 or ECSE 250)
ECSE 222	Digital Logic	3	P - COMP 202 or ECSE 202
WCOM 206	Communication in Engineering	3	
ECSE 206	Intro. to Signals & Systems	3	P - ECSE 200

5th Term (Fall)		18 credits	Prerequisites/Co-requisites
ECSE 307	Linear Systems & Control	4	P - ECSE 206, ECSE 210
ECSE 251	Electric and Magnetic Fields	3	P - MATH 262, ECSE 200
ECSE 324	Computer Organization	4	P - ECSE 200 and ECSE 222 and COMP 206
ECSE 331	Electronics	4	P - ECSE 210
ECSE 211	Design Principles and Methods	3	P - ECSE 200 and (COMP 202 or ECSE 202)

6th Term (Winter)		15 credits	Prerequisites/Co-requisites
ECSE 308	Intro. Comm. Sys. & Networks	4	P - ECSE 205, ECSE 206
ECSE 354	Electromagnetic Wave Propagation	4	P - ECSE 251
ECSE 362	Fundamentals of Power Eng.	4	P - ECSE 210 and ECSE 251; C - CIVE 281
ECSE 343	Numerical Methods in Engineering	3	P- ECSE 205 and (COMP 250 or ECSE 250) and MATH 263
FACC 250	Resp. of the Prof. Engineer	0	

7th Term (Fall)		18 credits	Prerequisites/Co-requisites
ECSE 458 D1	Capstone Design Project	3	P - ECSE 211, ECSE 324, WCOM 206, ECSE 331
XXXX xxx	Technical Complementary 1	4	
XXXX xxx	Technical Complementary 2	4	
XXXX xxx	Technical Complementary 3	3	
HSS 2	Humanities & Social Sciences 2*	3	
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250, and 60 program credits

8th Term (Winter)		15 credits	Prerequisites/Co-requisites
ECSE 458 D2	Capstone Design Project	3	P - ECSE 458 D1
XXXX xxx	Technical Complementary 4	3	
XXXX xxx	Technical Complementary 5	3	
Elective	Elective Course	3	
FACC 300	Engineering Economy	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 one course (3 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).

Elective course (3 credtis) must be taken at the 200 level or higher from any depaprtment at McGill, approved by the Undergraduate Programs Office in the Department of Electrical and Computer Engineering. For approval, please contact undergrad.ece@mcgill.ca.

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

17 - 20 credits (courses) must be taken, chosen as follows:

8 credits (2 courses) from List A
9 - 12 credits (3 courses) from List A or List B

List A
8 - 20 credits from the following list

		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	Telecom. Networks	4	P - (ECSE 250 or COMP 250) and ECSE 205 and (ECSE 308 or ECSE 316)
ECSE 433	Physical Basis of Transistor Devices	4	P - MIME 262, ECSE 331, ECSE 251
ECSE 444	Microprocessors	4	P - ECSE 324
ECSE 470	Electromechanical & Static Conversion Systems	4	P - ECSE 362

List B
0 - 12 credits from the following list:

		Credits	Prerequisites/Co-requisites
COMP 370	Introduction to Data Science	3	P - COMP 206, COMP 250 or ECSE 250
COMP 549	Brain-Inspired Artificial Intelligence	3	P - MATH 222, MATH 223, MATH 323
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
COMP 562	Theory of Machine Learning	4	P - MATH 462 or COMP 451 or (COMP 551, MATH 222, MATH 223, MATH 324) or ECSE 551
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	Intro. to Computer Vision	3	P - ECSE 205, (ECSE 206 or ECSE 316)
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 (ECSE 250 or COMP 250)
ECSE 423	Fundamentals of Photonics	3	P - ECSE 354
ECSE 424	Human-Computer Interaction	3	P - (ECSE 324 and ECSE 250) or (ECSE 324 and COMP 250) 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 & Systems	3	P - ECSE 354, MIME 262
ECSE 431	Introduction to VLSI CAD.	3	P - ECSE 324, ECSE 331
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 446	Realistic Image Synthesis	3	P - (ECSE 205 and ECSE 250) or (ECSE 202 and ECSE 205 and COMP 250)
ECSE 450	Electromagnetic Compatability	3	P - ECSE 222, ECSE 331, (ECSE 353 or ECSE 354)
ECSE 451	EM Transmission & Radiation	3	P - ECSE 354
ECSE 460	Appareillage électrique	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, 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	3	P - ECSE 362
ECSE 469	Protection des réseaux électriques	3	P - ECSE 464
ECSE 472	Fundamentals of Circuit Simulation & Modelling	3	P - ECSE 206, ECSE 331; ECSE 597 cannot be taken
ECSE 500	Mathematical Foundations of Systems	3	
ECSE 501	Linear Systems	3	C - ECSE 500 or permission from the instructor
ECSE 507	Optimization & Optimal Control	3	P - (ECSE 343 or ECSE 543 or ECSE 501 or COMP 540 or MATH 247 or permission of instructor)
ECSE 508	Multi-Agent Systems	3	P - ECSE 205 or equivalent
ECSE 509	Probability & Random Signals 2	3	P - (ECSE 206 or ECSE 316), ECSE 205
ECSE 510	Filtering & Prediction for Stochastic Systems	3	P - ECSE 500, ECSE 509 or equivalent
ECSE 516	Nonlinear and Hybrid Control Systems	3	P - ECSE 500, ECSE 501 or equivalent
ECSE 519	Semiconductor Nanstructures & Nanophotonic Devices	3	P - ECSE 354, (ECSE 433 or ECSE 533)
ECSE 521	Digital Communications 1	3	P - ECSE 408 or ECSE 511; C- ECSE 509
ECSE 526	Artificial Intelligence	3	P - ECSE 324
ECSE 532	Computer Graphics	4	P - ECSE 324
ECSE 534	Analog Microelectronics	3	P - ECSE 335
ECSE 543	Numerical Methods in EE	3	P - ECSE 324, ECSE 331, ECSE 251
ECSE 544	Computational Photography	4	P - ECSE 205, ECSE 206
ECSE 551***	Machine Learning for Engineers	4	P - (ECSE 250 or COMP 250) and (ECSE 205 or MATH 323); C- ECSE 343 or ECSE 543 or MATH 247
ECSE 552	Deep Learning	4	P - (ECSE 551 or COMP 551)
ECSE 554	Applied Robotics	4	P - ECSE 205, COMP 206, ECSE 250, (ECSE 343 or MATH 247) or equivalents
ECSE 556	Machine Learning in Network Biology	4	P - Permission of the instructor
ECSE 562*	Low-Carbon Power Generation Engineering	4	P - (ECSE 362 or ECSE 461)
ECSE 563	Power Systems Operation & Planning	3	P - ECSE 362
ECSE 565**	Introduction to Power Electronics	3	P - ECSE 335, ECSE 362
ECSE 575	Heterogenous Integration Systems	3	P - ECSE 335 or permission of the instructor
PHYS 346	Majors Quantum Physics	3	P - PHYS 230, PHYS 232 or PHYS 251
PHYS 434	Optics	3	C - PHYS 342 or PHYS 352, or permission of the instructor

* 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 4, 2024
For the official program listing, see the *Programs, Courses and University Regulations* publication (www.mcgill.ca/study).