Honours 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
MIME 262	Properties of Materials in EE	3	
ECSE 250	Fundamentals of Software Development	3	P - COMP 202 or equivalent

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) or (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
FACC 250	Resp. of the Prof. Engineer	0	P - FACC 100 or BREE 205

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 211	Design Principles and Methods	3	P - ECSE 200 and (COMP 202 or ECSE 202)
ECSE 396	Honours Research Lab Rotation 1	1	
FACC 300	Engineering Economy	3	

6th Term (Winter)		18 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 331	Electronics	4	P - ECSE 210
ECSE 397	Honours Research Lab Rotation 2	1	P - ECSE 396
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250, and 60 program credits

7th Term (Fall)		18 credits	Prerequisites/Co-requisites
ECSE 478 D1	Electrical Engineering Honours Thesis	3	P - WCOM 206, at least 42 departmental credits
XXXX xxx	Technical Complementary 1	4	
XXXX xxx	Technical Complementary 2	4	
HSS 2	Humanities & Social Sciences 2*	3	
Elective	Elective Course	3	
ECSE 496	Honours Research Lab Rotation 3	1	P - ECSE 397

8th Term (Winter)		16 credits	Prerequisites/Co-requisites
ECSE 478 D2	Electrical Engineering Honours Thesis	3	P - ECSE 478 D1
XXXX xxx	Technical Complementary 3	3	
XXXX xxx	Technical Complementary 4	3	
XXXX xxx	Technical Complementary 5	3	
ECSE 343	Numerical Methods in Engineering	3	P- ECSE 205 and (COMP 250 or ECSE 250) and MATH 263
ECSE 497	Honours Research Lab Rotation 4	1	

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 - Honours Electrical Engineering

Technical Complementaries

17 - 20 credits (5 courses) must be taken, chosen as follows:

8 credits (2 courses) from List A
6-8 credits (2 courses) from 500-level ECSE courses
3-4 credits (1 course) from List A, List B, List C or from 500-level ECSE courses

List A
8 - 12 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 - 3 credits from the following list:

ECSE 310	Thermodynamics of Computing	3	P - ECSE 200, ECSE 205, ECSE 222
ECSE 325	Digital Systems	3	P - ECSE 324
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 424	Human-Computer Interaction	3	P - (ECSE 324 and ECSE 250) or (ECSE 324 and COMP 250) or (COMP 251 and COMP
ECSE 425	Computer Architecture	3	P - ECSE 324
ECSE 427	Operating Systems	3	P - (ECSE 324 or COMP 273)
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 451	EM Transmission & Radiation	3	P - ECSE 354
ECSE 460***	Appareillage électrique	3	P - ECSE 464
ECSE 464	Power Systems Analysis	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

List C
0 - 4 credits from the following list:

COMP 370	Introduction to Data Science	3	P - COMP 206, COMP 250 or ECSE 250
COMP 445	Computational Linguistics	3	P- COMP 250 and MATH 240 or permission of instructor
COMP 549	Brain-Inspired Artificial Intelligence	3	P - MATH 222, MATH 223, MATH 323
COMP 550	Natural Language Processing	3	P - (MATH 323 or ECSE 205) and (COMP 251 or COMP 252)
COMP 551****	Applied Machine Learning	4	P - MATH 323 or ECSE 205 or equivalent
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
COMP 579	Reinforcement Learning	4	P - A university level course in machine learning such as COMP 451 or COMP 551. Background in calculus, linear algebra, probability at the level of MATH 222, MATH 223, MATH 323, respectively.
MATH 247	Honours Applied Linear Algebra	3	P - MATH 133 or equiv.
MATH 249	Honours Complex Variables	3	P - MATH 248 or MATH 358 or equiv.
MATH 547	Stochastic Processes	4	P - MATH 356 and either MATH 247 or MATH 251
MATH 560	Optimization	4	P - Undergraduate background in analysis and linear algebra, with instructor's approval
PHYS 357	Honours Quantum Physics 1	3	P - MATH 223 or equiv., and one of PHYS 230, PHYS 251, or CIVE 281
PHYS 434	Optics	3	C - PHYS 342 or PHYS 352, or permission of the instructor
PHYS 457	Honours Quantum Physics 2	3	P - PHYS 357
PHYS 558	Solid State Physics	3	

* ECSE 403 and ECSE 501 cannot both be taken
** ECSE 408 and ECSE 511 cannot both be taken
*** Courses taught in French
**** ECSE 551 and COMP 551 cannot both be taken

Last update: March 8, 2024
For the official program listing, see the *Programs, Courses and University Regulations* publication (www.mcgill.ca/study).