

# 2019 / 2020 CURRICULUM - ELECTRICAL ENGINEERING

ENTRY FROM CEGEP Total credits: 109

First Semester (Fall 2019)		15 credits	Second Semester (Winter 2020)		16 credits
<b>CIVE 281</b>	<b>Analytical Mechanics</b>	(3 cr, C - MATH 262, MATH 263)	<b>ECSE 205</b>	<b>Probability &amp; Statistics for Eng.</b>	(3 cr)
<b>ECSE 202</b>	<b>Intro. to Software Development</b>	(3 cr)	<b>ECSE 206</b>	<b>Intro. to Signals &amp; Systems</b>	(3 cr, P - ECSE 200)
<b>ECSE 200</b>	<b>Electric Circuits 1</b>	(3 cr, P - PHYS 142 or CEGEP Equivalent; C - MATH 263)	<b>ECSE 210</b>	<b>Electric Circuits 2</b>	(3 cr, P - ECSE 200)
<b>MATH 262</b>	<b>Intermediate Calculus</b>	(3 cr, P-MATH 141, MATH 133 or equiv)	<b>ECSE 211</b>	<b>Design Principles and Methods</b>	(3 cr, P - ECSE 200, ECSE 202)
<b>MATH 263</b>	<b>ODEs for Engineers</b>	(3 cr, C - MATH 262)	<b>ECSE 251</b>	<b>Electric and magnetic fields</b>	(3 cr, P - MATH 262, ECSE 200)
			<b>FACC 100</b>	<b>Intro. to Engineering Profession</b>	(1 cr)
Third Semester (Fall 2020)		16 credits	Fourth Semester (Winter 2021)		15 credits
<b>COMP 250</b>	<b>Introduction to Computer Science</b>	(3 cr)	<b>ECSE 307</b>	<b>Linear Systems &amp; Control</b>	(4 cr, P - ECSE 206, ECSE 210)
<b>ECSE 222</b>	<b>Digital Logic</b>	(3 cr, P - ECSE 202)	<b>ECSE 324</b>	<b>Computer Organization</b>	(4 cr, P - ECSE 200, ECSE 222)
<b>ECSE 362</b>	<b>Fundamentals of Power Eng.</b>	(4 cr, P - ECSE 210, ECSE 251, CIVE 281)	<b>ECSE 331</b>	<b>Electronics</b>	(4 cr, P - ECSE 210)
<b>MIME 262</b>	<b>Properties of Materials in EE</b>	(3 cr)	<b>XXXX xxx</b>	<b>Humanities &amp; Social Sciences *</b>	(3 cr)
<b>CCOM 206</b>	<b>Communication in Engineering</b>	(3 cr)	<b>FACC 250</b>	<b>Resp. of the Prof. Engineer</b>	(0 cr, P - FACC 100)
Fifth Semester (Fall 2021)		15 credits	Sixth Semester (Winter 2022)		16 credits
<b>ECSE 308</b>	<b>Intro. Comm. Sys. &amp; Networks</b>	(4 cr, P - ECSE 205, ECSE 206)	<b>ECSE 458 N1</b>	<b>Capstone Design Project</b>	(3 cr, P - CCOM 206, ECSE 211, ECSE 324, ECSE 331)
<b>ECSE xxx</b>	<b>Technical Complementary 1</b>	(4 cr)	<b>ECSE xxx</b>	<b>Technical Complementary 2</b>	(4 cr)
<b>ECSE 354</b>	<b>Electromagnetic Wave Propagation</b>	(4 cr, P - ECSE 251)	<b>ECSE xxx</b>	<b>Technical Complementary 3</b>	(3 cr)
<b>FACC 300</b>	<b>Engineering Economy</b>	(3 cr)	<b>ECSE 443</b>	<b>Intro to Numerical Methods in EE</b>	(3 cr, P - COMP 250, ECSE 331 and (ECSE 251 or ECSE 353)
			<b>XXXX xxx</b>	<b>Impact of Technology on Society **</b>	(3 cr)
Seventh Semester (Fall 2022)		16 credits			
<b>ECSE 458 N2</b>	<b>Capstone Design Project</b>	(3 cr)			
<b>ECSE xxx</b>	<b>Technical Complementary 4</b>	(3 cr)			
<b>ECSE xxx</b>	<b>Technical Complementary 5</b>	(3 cr)			
<b>ECSE xxx</b>	<b>Technical Complementary 6</b>	(3 cr)			
<b>XXXX xxx</b>	<b>Elective Course***</b>	(3 cr)			
<b>FACC 400</b>	<b>Engineering Professional Practice</b>	(1 cr, P - FACC100, FACC 250, and 60 program credits)			

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](http://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](http://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](mailto: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.**

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# ELECTRICAL ENGINEERING

## Four-credit Technical Complementaries (2 courses) 8 credits

Two courses from this list:

ECSE 335	Microelectronics	(4 cr, P - ECSE 331)
ECSE 403	Control Systems	(4 cr, P - ECSE 307)
ECSE 408	Communication Systems	(4 cr, P - ECSE 205, ECSE 308)
ECSE 416	Telecom. Networks	(4 cr, P - COMP 250, ECSE 205 and (ECSE 308 or ECSE 316)
ECSE 433	Physical Basis of Transistor Devices	(4 cr, P - MIME 262, ECSE 331, ECSE 251)
ECSE 444	Microprocessors	(4 cr, P - ECSE 324)
ECSE 470	Electromechanical Systems	(4 cr, P - ECSE 362)

## Remaining Technical Complementaries (4 courses) 12 credits

The remaining four technical complementary courses can be chosen from the previous list or the following:

ECSE 310	Thermodynamics of Computing	(3 cr, P - ECSE 200, ECSE 205, ECSE 222)
ECSE 325	Digital Systems	(3 cr, P - ECSE 324)
ECSE 405	Antennas	(3 cr, P - ECSE 206, ECSE 354)
ECSE 412	Discrete-Time Signal Processing	(3 cr, P - ECSE 206 or ECSE 306)
ECSE 413	Communications Systems 2	(3 cr, P - ECSE 411)
ECSE 415	Intro. to Computer Vision	(3 cr, P - ECSE 206 and ECSE 205)
ECSE 420	Parallel Computing	(3 cr, P - ECSE 427)
ECSE 421	Embedded Systems	(3 cr, P - ECSE 324)
ECSE 422	Fault Tolerant Computing	(3 cr, P - ECSE 324, COMP 250)
ECSE 423	Fundamentals of Photonics	(3 cr, P - ECSE 354)
ECSE 424	Human-Computer Interaction	(3 cr, P - ECSE 324, COMP 250)
ECSE 425	Computer Architecture	(3 cr, P - ECSE 324)
ECSE 427	Operating Systems	(3 cr, P - ECSE 324)
ECSE 430	Photonic Devices & Systems	(3 cr, P - ECSE 354, MIME 262)
ECSE 435	Mixed Signal Test Techniques	(3 cr, P - ECSE 206, ECSE 335)
ECSE 436	Signal Processing Hardware	(3 cr, P - ECSE 324, ECSE 325, ECSE 206)
ECSE 446	Realistic Image Synthesis	(3 cr, P - ECSE 202, ECSE 205, COMP 250)
ECSE 450	Electromagnetic Compatability	(3 cr, P - ECSE 222, ECSE 331 and (ECSE 353 or ECSE 354)
ECSE 451	EM Transmission & Radiation	(3 cr, P - ECSE 354)
ECSE 460	Appareillage électrique	(3 cr, P - ECSE 464)
ECSE 463	Electric Power Generation	(3 cr, P - ECSE 362 or ECSE 461)
ECSE 464	Power Systems Analysis	(3 cr, P - ECSE 362)
ECSE 465	Power Electronic Systems	(3 cr, P - ECSE 331, ECSE 362)
ECSE 466	Réseaux de distribution	(3 cr, P - ECSE 362)
ECSE 467	Comportement des réseaux électriques	(3 cr, P - ECSE 464)
ECSE 468	Electricité Industrielle	(3 cr, P - ECSE 362)
ECSE 469	Protection des réseaux électriques	(3 cr, P - ECSE 464)
ECSE 472	Fundamentals of Circuit Simulation and Modelling	(3 cr, P - ECSE 206, ECSE 331, ECSE 251)
PHYS 434	Optics	(3 cr, P - PHYS 342 or PHYS 352, or permission of the instructor)
PHYS 446	Majors quantum physics	(3 cr, PHYS 230, PHYS 232, or PHYS 251)

It is recommended that the technical complementary courses be chosen according to a specialization area. Suggested courses appropriate to the primary specialization areas are given in the following lists.

### Intelligent systems: control and automation

ECSE 325 Digital Systems (3)  
ECSE 403 Control Systems (4)  
ECSE 415 Intro to Computer Vision (3)  
ECSE 444 Microprocessor Systems (4)  
ECSE 421 Embedded Systems (3)  
ECSE 422 Fault-Tolerant Computing (3)  
ECSE 424 Human-Computer Interaction (3)  
ECSE 425 Computer Architecture (3)  
ECSE 427 Operating Systems (3)  
ECSE 436 Signal Processing Hardware (3)

### Telecommunications

ECSE 408 Communication Systems 1 (4)  
ECSE 413 Communication Systems 2 (3)  
ECSE 416 Intro. to Telecommunication Networks (4)  
ECSE 405 Antennas (3)  
ECSE 412 Discrete Time Signal Processing (3)  
ECSE 423 Fundamentals of Photonics (3)  
ECSE 436 Signal Processing Hardware (3)  
ECSE 450 Electromagnetic Compatibility (3)  
ECSE 451 EM Transmission and Radiation (3)

### Integrated circuits, electronics and photonics

ECSE 335 Introduction to Microelectronics (4)  
ECSE 430 Photonic Devices and Systems (3)  
ECSE 433 Physical Basis of Transistor Devices (4)  
ECSE 325 Digital Systems (3)  
ECSE 423 Fundamentals of Photonics (3)  
ECSE 431 Introduction to VLSI CAD (3)  
ECSE 435 Mixed Signal Test Techniques (3)  
ECSE 450 Electromagnetic Compatibility (3)  
ECSE 451 EM Transmission and Radiation (3)

### Power engineering

ECSE 403 Control Systems (4)  
ECSE 470 Electromechanical Systems (4)  
ECSE 460 Appareillage électrique (3)  
ECSE 463 Electric Power Generation (3)  
ECSE 464 Power System Analysis (3)  
ECSE 465 Power Electronic Systems (3)  
ECSE 466 Réseaux de distribution (3)  
ECSE 467 Comportement des réseaux électriques (3)  
ECSE 468 Electricité Industrielle (3)  
ECSE 469 Protection des réseaux électriques (3)  
ECSE 450 Electromagnetic Compatibility (3)