

# 2016 / 2017 CURRICULUM - ELECTRICAL ENGINEERING

ENTRY FROM CEGEP Total credits: 109 (presently 109 cr.)

First Semester (Fall 2016)		15 credits	Second Semester (Winter 2017)		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/COMP 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 2017)		16 credits	Fourth Semester (Winter 2018)		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)			
Fifth Semester (Fall 2018)		15 credits	Sixth Semester (Winter 2019)		16 credits
<b>ECSE 308</b>	<b>Intro. Comm. Sys. &amp; Networks</b>	(4 cr, P - ECSE 205 & ECSE 206)	<b>ECSE 456</b>	<b>ECSE Design Project 1</b>	(3 cr, P - CCOM 206 & ECSE 211 & ECSE 331)
<b>ECSE 4xx 41</b>	<b>Technical Complementary 1</b>	(4 cr)	<b>ECSE 4xx 42</b>	<b>Technical Complementary 2</b>	(4 cr)
<b>ECSE 354</b>	<b>Electromag. Wave Propagation</b>	(4 cr, P - ECSE 251)	<b>ECSE 4xx t3</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 & ECSE 251 or ECSE 353)
			<b>XXXX xxx</b>	<b>Impact of Technology on Society **</b>	(3 cr)
Seventh Semester (Fall 2019)		16 credits			
<b>ECSE 457</b>	<b>ECSE Design Project 2</b>	(3 cr, P-ECSE 456)			
<b>ECSE 4xx t4</b>	<b>Technical Complementary 4</b>	(3 cr)			
<b>ECSE 4xx t5</b>	<b>Technical Complementary 5</b>	(3 cr)			
<b>ECSE 4xx t6</b>	<b>Technical Complementary 6</b>	(3 cr)			
<b>ECSE 4xx t7</b>	<b>Technical Complementary 7</b>	(3 cr)			
<b>FACC 400</b>	<b>Engineering Professional Practice</b>	(1 cr, P - FACC100, 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: Programs and Courses > Undergraduate > Complementary Studies.

\*\* For instructions on selecting valid "Impact of Technology on Society" courses, see [www.mcgill.ca/ece](http://www.mcgill.ca/ece), then: Programs and Courses > Undergraduate > Complementary Studies.

**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.**

# 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 & 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 (5 courses) 15 credits

The remaining five 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 303 & ECSE 352)
ECSE 412	Discrete-Time Signal Processing	(3 cr, P - ECSE 304 or ECSE 306)
ECSE 413	Communications Systems 2	(3 cr, P - ECSE 411)
ECSE 415	Introduction to Computer Vision	(3 cr, P - ECSE 304 or ECSE 306)
ECSE 420	Parallel Computing	(3 cr, P - ECSE 427)
ECSE 421	Embedded Systems	(3 cr, P - ECSE 322 & ECSE 323)
ECSE 422	Fault Tolerant Computing	(3 cr, P - ECSE 322)
ECSE 423	Fundamentals of Photonics	(3 cr, P - ECSE 352)
ECSE 424	Human-Computer Interaction	(3 cr, P - ECSE 322)
ECSE 425	Computer Architecture	(3 cr, P - ECSE 324)
ECSE 427	Operating Systems	(3 cr, P - ECSE 324 or COMP 273)
ECSE 430	Photonic Devices & Systems	(3 cr, P - ECSE 352 & PHYS 271)
ECSE 431	Introduction to VLSI CAD.	(3 cr, P - ECSE 323 & ECSE 330)
ECSE 435	Mixed Signal Test Techniques	(3 cr, P - ECSE 304 & ECSE 334)
ECSE 436	Signal Processing Hardware	(3 cr, P - ECSE 322, ECSE 323 & ECSE 304 or ECSE 306)
ECSE 450	Electromagnetic Compatibility	(3 cr, P - ECSE 221, ECSE 334 & ECSE 352 or ECSE 353)
ECSE 451	EM Transmission & Radiation	(3 cr, P - ECSE 352)
ECSE 460	Appareillage électrique	(3 cr, P - ECSE 464)
ECSE 463	Matériaux de l'électrotechnique	(3 cr, P - ECSE 361)
ECSE 464	Power Systems Analysis	(3 cr, P - ECSE 361)
ECSE 465	Power Electronic Systems	(3 cr, P - ECSE 334 & ECSE 361)
ECSE 466	Réseaux de distribution	(3 cr, P - ECSE 361)
ECSE 467	Comportement des réseaux électriques	(3 cr, P - ECSE 462 or ECSE 464)
ECSE 468	Electricité Industrielle	(3 cr, P - ECSE 361)
ECSE 469	Protection des réseaux électriques	(3 cr, P - ECSE 464)
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 Energy Conversion (4)
- ECSE 460 Appareillage électrique (3)
- ECSE 463 Matériaux de l'électrotechnique (3)
- ECSE 464 Power System Analysis (3)
- ECSE 465 Power Electronic Systems (3)
- ECSE 466 Réseaux de distribution (3)
- ECSE 467 Comportement des réseaux électrique (3)
- ECSE 468 Electricité Industrielle (3)
- ECSE 469 Protection des réseaux électrique (3)
- ECSE 450 Electromagnetic Compatibility (3)