

2015 / 2016 CURRICULUM - ELECTRICAL ENGINEERING

EIGHT SEMESTER PROGRAM Total credits: 134

First Semester (Fall 2015)		14 credits	Second Semester (Winter 2016)		18 credits
FACC 100	Intro. to Engineering Profession	(1 cr)	CHEM 120	General Chemistry 2	(4 cr)
MATH 133	Linear Algebra and Geometry	(3 cr)	COMP 202	Foundations of Programming	(3 cr)
MATH 140	Calculus 1	(3 cr)	MATH 141	Calculus 2	(4 cr, P - MATH 140)
PHYS 131	Mechanics & Waves	(4 cr, C - MATH 140)	PHYS 142	Electromagnetism & Optics	(4 cr, P - PHYS 131; C - MATH 141)
XXXX xxx	Humanities & Social Sciences 1*	(3 cr)	XXXX xxx	Impact of Technology on Society **	(3 cr)
Third Semester (Fall 2016)		18 credits	Fourth Semester (Winter 2017)		18 credits
CCOM 206	Communication in Engineering	(3 cr)	COMP 250	Introduction to Computer Science	(3 cr)
CIVE 281	Analytical Mechanics	(3 cr, C - MATH 262 & MATH 263)	ECSE 205	Probability & Statistics for Eng.	(3 cr)
ECSE 200	Electric Circuits 1	(3 cr, P - PHYS 142 or CEGEP Equivalent; C - MATH 263)	ECSE 206	Fund. of Signals & Systems	(3 cr, P - ECSE 200)
MATH 262	Intermediate Calculus	(3 cr, P - MATH 141 & MATH 133 or equiv)	ECSE 210	Electric Circuits 2	(3 cr, P - ECSE 200)
MATH 263	ODEs for Engineers	(3 cr, C - MATH 262)	ECSE 222	Digital Logic	(3 cr, P - COMP 202)
XXXX xxx	Humanities & Social Sciences 2*	(3 cr)	MIME 262	Properties of Materials in EE	(3 cr)
Fifth Semester (Fall 2017)		18 credits	Sixth Semester (Winter 2018)		15 credits
ECSE 211	Design Principles and Methods	(3 cr, P - ECSE 200 & COMP 202)	ECSE 308	Intro. Comm. Sys. & Networks	(4 cr, P - ECSE 205 & ECSE 206)
ECSE 251	Electric and magnetic fields	(3 cr, P - MATH 262 & ECSE 200)	ECSE 354	Electromagnetic Waves	(4 cr, P - ECSE 251)
ECSE 307	Linear Systems & Control	(4 cr, P - ECSE 206, ECSE 210)	ECSE 362	Fundamentals of Power Eng.	(4 cr, P - ECSE 210, ECSE 251 & CIVE 281)
ECSE 324	Computer Organization	(4 cr, P - ECSE 200 & ECSE 222)	ECSE 443	Intro to Numerical Methods in EE	(3 cr, P - COMP 250, ECSE 331 & ECSE 251 or ECSE 353)
ECSE 331	Electronics	(4 cr, P - ECSE 210)			
Seventh Semester (Fall 2018)		18 credits	Eighth Semester (Winter 2019)		15 credits
ECSE 456	ECSE Design Project 1	(3 cr, P - CCOM 206 & ECSE 211 & ECSE 331)	ECSE 457	ECSE Design Project 2	(3 cr, P - ECSE 456)
ECSE 4xx 41	Technical Complementary 1	(4 cr)	ECSE 4xx t5	Technical Complementary 5	(3 cr)
ECSE 4xx 42	Technical Complementary 2	(4 cr)	ECSE 4xx t6	Technical Complementary 6	(3 cr)
ECSE 4xx t3	Technical Complementary 3	(3 cr)	ECSE 4xx t7	Technical Complementary 7	(3 cr)
ECSE 4xx t4	Technical Complementary 4	(3 cr)	FACC 300	Engineering Economy	(3 cr)
FACC 400	Engineering Professional Practice	(1 cr, P - FACC100, 60 program credits)			

TRANSITION TO NEW PROGRAM

Starting in September 2016, students will be admitted to a new Electrical Engineering program, which will replace what we presently offer. The 8-semester curriculum above has been devised so that students admitted in September 2015 can transition smoothly into the new program. Many of the courses indicated for semester 3 onwards are also new and will not be listed in the McGill eCalendar until the 2016-17 edition.

The "Total credits" above are correct if you transfer to the new program. For the old Electrical Engineering program, the credits are 138.

If you have advanced credit for some of the Year 0 (Freshman) courses, the transition mentioned above may not be possible without an excessive delay to graduation, because the courses you need may not be available when you need them. The alternative is to continue to follow the old program. Academic advisers are available with course selection. For an appointment, please contact our Undergraduate Program Office at undergrad.ece@mcgill.ca or call 514-398-3943 for a phone appointment.

OTHER NOTES

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 normally 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 re-taken 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, then: Programs and Courses > Undergraduate > Complementary Studies.

** For instructions on selecting valid "Impact of Technology on Society" courses, see 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 8 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. Also, some of the courses are new and will not be offered before certain semesters – consult the table below. 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)
ECSE 403	Control Systems	(4 cr)
ECSE 408	Communication Systems	(4 cr)
ECSE 416	Telecom. Networks	(4 cr)
ECSE 433	Physical Basis: Transistor Devices	(4 cr)
ECSE 444	Microprocessors	(4 cr)
ECSE 470	Electromechanical Systems	(4 cr)

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)
ECSE 325	Digital Systems	(3 cr)
ECSE 405	Antennas	(3 cr)
ECSE 412	Discrete-Time Signal Processing	(3 cr)
ECSE 413	Communications Systems 2	(3 cr)
ECSE 415	Introduction to Computer Vision	(3 cr)
ECSE 420	Parallel Computing	(3 cr)
ECSE 421	Embedded Systems	(3 cr)
ECSE 422	Fault Tolerant Computing	(3 cr)
ECSE 423	Fundamentals of Photonics	(3 cr)
ECSE 424	Human-Computer Interaction	(3 cr)
ECSE 425	Computer Architecture	(3 cr)
ECSE 427	Operating Systems	(3 cr)
ECSE 430	Photonic Devices & Systems	(3 cr)
ECSE 431	Introduction to VLSI CAD.	(3 cr)
ECSE 435	Mixed Signal Test Techniques	(3 cr)
ECSE 436	Signal Processing Hardware	(3 cr)
ECSE 450	Electromagnetic Compatability	(3 cr)
ECSE 451	EM Transmission & Radiation	(3 cr)
ECSE 460	Appareillage électrique	(3 cr)
ECSE 463	Matériaux de l'électrotechnique	(3 cr)
ECSE 464	Power Systems Analysis	(3 cr)
ECSE 465	Power Electronic Systems	(3 cr)
ECSE 466	Réseaux de distribution	(3 cr)
ECSE 467	Comportement des réseaux électriques	(3 cr)
ECSE 468	Electricité Industrielle	(3 cr)
ECSE 469	Protection des réseaux électriques	(3 cr)
PHYS 434	Optics	(3 cr)
PHYS 446	Majors quantum physics	(3 cr)

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)
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
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)

When new courses will be offered

Over the next few years the Department will be introducing a number of new courses. The following table shows when the new required courses will be offered. Some of these courses are part of your program and so you should consult the table if you depart from the sample curriculum and want to move courses around.

		F16	W17	F17	W18	F18
ECSE 200	Electric Circuits 1 (new version)	x	x	x	x	x
ECSE 202	Intro. to Software Development	x	x	x	x	x
ECSE 205	Probability & Statistics for Eng.	x	x	x	x	x
ECSE 206	Fund. of Signals & Systems		x	x	x	x
ECSE 210	Electric Circuits 2 (new version)		x	x	x	x
ECSE 222	Digital Logic		x	x	x	x
ECSE 223	Model-based Programming		x		x	
ECSE 251	Electric and Magnetic Fields		x	x	x	x
ECSE 307	Linear Systems & Control			x	x	x
ECSE 308	Intro. Comm. Systems & Networks				x	x
ECSE 310	Thermodynamics of Computing				x	
ECSE 316	Intro. Signals and Networks				x	
ECSE 324	Computer Organization			x	x	x
ECSE 325	Digital Systems				x	
ECSE 326	Software Requirements Engineering			x		x
ECSE 331	Electronics			x	x	x
ECSE 354	Electromagnetic Waves				x	x
ECSE 362	Fundamentals of Power Engineering			x	x	x
ECSE 444	Microprocessors					x