# 2009 / 2010 CURRICULUM - ELECTRICAL ENGINEERING

**EIGHT SEMESTER PROGRAM** **Total credits:** **138**

| First ( Fall ) Semester | | 15 credits |
|---|---|---|
| **CHEM 110** | **General Chemistry 1** | (4 cr) |
| **MATH 140** | **Calculus 1** | (3 cr, P - High school Calculus) |
| **PHYS 131** | **Mechanics & Waves** | (4 cr ) |
| **MATH 133** | **Vectors, Matrices & Geometry** | (3 cr) |
| **FACC 100** | **Intro. to Engineering Profession** | (1 cr) |

| Second ( Winter ) Semester | | 18 credits |
|---|---|---|
| **CHEM 120** | **General Chemistry 2** | (4 cr) |
| **MATH 141** | **Calculus 2** | (4 cr, P - MATH 139 or MATH 140 or MATH 150) |
| **PHYS 142** | **Electromagnetism & Optics** | (4 cr, P - PHYS 131) |
| XXXX xxx | Humanities & Social Sciences 1* | (3 cr) |
| XXXX xxx | Impact of Technology on Society ** | (3 cr) |

| Third ( Fall ) Semester | | 18 credits |
|---|---|---|
| **CIVE 281** | **Analytical Mechanics** | (3 cr, C - MATH 262 & MATH 263) |
| **COMP 202** | **Introduction to Computing 1** | (3 cr) |
| **ECSE 200** | **Electric Circuits 1** | (3 cr, P - PHYS 142 or CEGEP Equivalent; C - MATH 263) |
| **EDEC 206** | **Communication in Engineering** | (3 cr) |
| **MATH 262** | **Intermediate Calculus** | (3 cr, P - MATH 141, MATH 133 or equivalent) |
| **MATH 263** | **Ord. Differential Eqns. & Linear Alg.** | (3 cr, C - MATH 262) |

| Fourth ( Winter ) Semester | | 17 credits |
|---|---|---|
| **ECSE 210** | **Electric Circuits 2** | (3 cr, P - ECSE 200) |
| **ECSE 211** | **Design Methodology and Principles** | (3 cr, C - ECSE 291, P - ECSE 200 & COMP 202) |
| **ECSE 221** | **Intro. to Computer Engineering** | (3 cr, P - COMP 202) |
| **ECSE 291** | **Electrical Measurements Lab** | (2 cr, C - ECSE 210) |
| **MATH 264** | **Advanced Calculus** | (3 cr, P - MATH 262 or MATH 151 or MATH 152 or equiv) |
| **MATH 271** | **Linear Algebra & PDEs** | (3 cr, P - MATH 263 & MATH 264) |

| Fifth ( Fall ) Semester | | 17 credits |
|---|---|---|
| **ECSE 303** | **Signals & Systems 1** | (3 cr, P - ECSE 210 & MATH 271; C - MATH 381) |
| **ECSE 322** | **Computer Engineering** | (3 cr, P - ECSE 221 & ECSE 200 or MECH 383) |
| **ECSE 323** | **Digital Systems Design** | (5 cr, P - EDEC 206, ECSE 211, ECSE 221 & ECSE 291) |
| **ECSE 330** | **Introduction to Electronics** | (3 cr, P - ECSE 210) |
| **MATH 381** | **Complex Variables & Transforms** | (3 cr, P - MATH 264) |

| Sixth ( Winter ) Semester | | 18 credits |
|---|---|---|
| **ECSE 304** | **Signals & Systems 2** | (3 cr, P - ECSE 303) |
| **ECSE 305** | **Probability & Random Signals 1** | (3 cr, P - ECSE 303 or ECSE 306) |
| **ECSE 334** | **Introduction to Microelectronics** | (3 cr, P - ECSE 291, ECSE 330 & ECSE 303 or ECSE 306) |
| **ECSE 351** | **Electromagnetic Fields** | (3 cr, P - MATH 264 & ECSE 200) |
| **PHYS 271** | **Quantum Physics** | (3 cr, P - CIVE 281) |
| ECSE 4xx t1 | Technical Complementary 1 | (3 cr) |

| Seventh ( Fall ) Semester | | 18 credits |
|---|---|---|
| **ECSE 352** | **Electromagnetic Waves** | (3 cr, P - ECSE 351) |
| **ECSE 361** | **Power Engineering** | (3 cr, P - ECSE 210 & ECSE 351) |
| **ECSE 434** | **Microelectronics Laboratory** | (2 cr, P - EDEC 206, ECSE 334) |
| **ECSE 474** | **Design Project 1** | (1 cr, P - ECSE 211, ECSE 322, ECSE 323 & ECSE 330) |
| **MIME 262** | **Properties of Materials in EE** | (3 cr) |
| **MIME 310** | **Engineering Economy** | (3 cr) |
| ECSE 4xx t2 | Technical Complementary 2 | (3 cr) |

| Eighth ( Winter ) Semester | | 17 credits |
|---|---|---|
| **ECSE 443** | **Numerical Methods in Elect. Eng.** | (3 cr, P - ECSE 221, ECSE 330 & ECSE 351 or ECSE 353) |
| **ECSE 475** | **Design Project 2** | (2 cr, P - ECSE 474) |
| **FACC 400** | **Engineering Professional Practice** | (1 cr, P - FACC100) |
| ECSE 4xx t3 | Technical Complementary 3 | (3 cr) |
| ECSE 4xx t4 | Technical Complementary 4 | (3 cr) |
| ECSE 4xx | Lab Complementary | (2 cr or 3 cr) |
| XXXX xxx | Humanities & Social Sciences 2* | (3 cr) |

Core courses are shown in boldface above. All core courses must be passed with a grade "C" or better. Also, a grade of "C" is required for an ECSE xxx core course in order to proceed with its follow-on ECSE xxx course(s), and a grade of "C" is required for a MATH xxx course in order to proceed with its follow-on MATH xxx course(s). A grade of "D" is only acceptable for technical, lab and general complementaries.

Technical Complementary courses are selected from the list given on the next page.

The Lab Complementary course is normally taken in conjunction with a technical complementary. The courses ECSE 426 - Microprocessor Systems, ECSE 431 - Intro. to VLSI CAD, ECSE 435 - Mixed Signal Test Techniques, ECSE 436 - Signal Processing Hardware and ECSE 450 - Electromagnetic Compatibility, can be taken as a technical complementary or a lab complementary. If taken as a lab, they are still 3 credit courses.

* “Humanities and Social Sciences” courses must be chosen from subsection II of section 9.3.4 of the 2009-2010 Undergraduate Programs Calendar (www.mcgill.ca/courses/).

****** The “Impact of Technology on Society” course must be chosen from subsection I of section 9.3.4 of the 2009-2010 Undergraduate Programs Calendar (www.mcgill.ca/courses/).

**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. Academic advisors are available for help with course selection.**

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**TECHNICAL AND LAB COMPLEMENTARY COURSES - ELECTRICAL ENGINEERING PROGRAM**

## Technical Complementaries (4 courses) 12 credits

Students following the regular Electrical Engineering program must take 4 courses (12 credits) from the following list. It is possible that not all the courses listed will be offered in any given year. Please refer to the up-to-date course assignments before selecting any course. Permission will not be granted to take Technical Complementary courses that are not on this list.

| Course | Course Title | Pre-Requisites and Co-Requisites |
|---|---|---|
| ECSE 404 | Control Systems | (3 cr, C - ECSE 304 or ECSE 306) |
| ECSE 405 | Antennas | (3 cr, P - ECSE 303 & ECSE 352) |
| ECSE 411 | Communications Systems 1 | (3 cr, P - ECSE 305 & ECSE 304 or ECSE 306) |
| 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 414 | Intro. to Telecom Networks | (3 cr, P - ECSE 304 or ECSE 306 & ECSE 322) |
| 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 Org. & Architecture | (3 cr, P - ECSE 322 & ECSE 323) |
| ECSE 426 | Microprocessor Systems | (3 cr, P - ECSE 323 & EDEC 206) |
| ECSE 427 | Operating Systems | (3 cr, P - ECSE 322 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 432 | Physical Basis: Transistor Devices | (3 cr, P - ECSE 212 or MIME 262, ECSE 330, ECSE 351 & PHYS 271) |
| 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 Compatability | (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 361) |
| ECSE 462 | Electromechanical Energy Conversion | (3 cr, P - ECSE 361) |
| ECSE 463 | Matériaux de l'électrotechnique | (3 cr, P - ECSE 361) |
| ECSE 464 | Power System Analysis 1 | (3 cr, P - ECSE 361) |
| ECSE 465 | Power Electronic Systems | (3 cr, P - ECSE 334 & ECSE 361) |
| ECSE 467 | Comportement des réseaux électriques | (3 cr, P - ECSE 361) |
| ECSE 468 | Electricité Industrielle | (3 cr, P - ECSE 361) |
| ECSE 469 | Protection des réseaux électriques | (3 cr, P - ECSE 361) |

## Laboratory Complementary (one course) 2 or 3 credits

Students following the regular Electrical Engineering program must take one (1) course (2 or 3 credits) from the following list. It is possible that not all the courses listed will be offered in any given year. Please refer to the up-to-date course assignments before selecting any course. Permission will not be granted to take Laboratory Complementary courses that are not on this list.

| Course | Course Title | Pre-Requisites and Co-Requisites |
|---|---|---|
| ECSE 426 | Microprocessor Systems | (3 cr, P - ECSE 323 & EDEC 206) |
| 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 Compatability | (3 cr, P - ECSE 221, ECSE 334 & ECSE 352 or ECSE 353) |
| ECSE 485 | IC Fabrication Laboratory | (2 cr, P - ECSE 334 & EDEC 206; C - ECSE 432 or ECSE 533) |
| ECSE 486 | Power Laboratory | (2 cr, P - ECSE 334, ECSE 361 & EDEC 206) |
| ECSE 487 | Computer Architecture Laboratory | (2 cr, P - EDEC 206; C - ECSE 425) |
| ECSE 488 | High Frequency Laboratory | (2 cr, P - EDEC 206 & ECSE 291; C - ECSE 451) |
| ECSE 489 | Telecommunication Network Laboratory | (2 cr, P - EDEC 206; C - ECSE 414 or ECSE 528) |
| ECSE 490 | Digital Signal Processing Lab | (2 cr, P - ECSE 291 & EDEC 206; C - ECSE 412 or ECSE 512) |
| ECSE 491 | Communications Systems Lab | (2 cr, P - EDEC 206 & ECSE 291; C - ECSE 411 or ECSE 511) |
| ECSE 493 | Control & Robotics Lab | (2 cr, P - EDEC 206 & ECSE 291;C - ECSE 404 or ECSE 501) |

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