<table>
<thead>
<tr>
<th>First Semester (Fall 2020)</th>
<th>15 credits</th>
<th>Second Semester (Winter 2021)</th>
<th>16 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE 281 Analytical Mechanics</td>
<td>(3 cr, C - MATH 262, MATH 263)</td>
<td>ECSE 205 Probability &amp; Statistics for Eng.</td>
<td>(3 cr)</td>
</tr>
<tr>
<td>ECSE 202 Intro. to Software Development</td>
<td>(3 cr)</td>
<td>ECSE 206 Intro. to Signals &amp; Systems</td>
<td>(3 cr, P - ECSE 200)</td>
</tr>
<tr>
<td>ECSE 200 Electric Circuits 1</td>
<td>(3 cr, P - PHYS 142, C - MATH 263)</td>
<td>ECSE 210 Electric Circuits 2</td>
<td>(3 cr, P - ECSE 200)</td>
</tr>
<tr>
<td>MATH 262 Intermediate Calculus</td>
<td>(3 cr, P-MATH 141 or equiv, MATH 133)</td>
<td>ECSE 211 Design Principles and Methods</td>
<td>(3 cr, P - ECSE 200, ECSE 202)</td>
</tr>
<tr>
<td>MATH 263 ODEs for Engineers</td>
<td>(3 cr, C - MATH 262)</td>
<td>ECSE 251 Electric and Magnetic Fields</td>
<td>(3 cr, P - MATH 262, ECSE 200)</td>
</tr>
<tr>
<td>FACC 100 Intro. to Engineering Profession</td>
<td>(1 cr)</td>
<td>ECSE xxx Technical Complementary 1</td>
<td>(4 cr)</td>
</tr>
<tr>
<td>COMP 250 Introduction to Computer Science</td>
<td>(3 cr, P - Familiarity with a high level programming language and CEGEP level)</td>
<td>ECSE 307 Linear Systems &amp; Control</td>
<td>(4 cr, P - ECSE 200, ECSE 210)</td>
</tr>
<tr>
<td>ECSE 222 Digital Logic</td>
<td>(3 cr, P - ECSE 202)</td>
<td>ECSE 324 Computer Organization</td>
<td>(4 cr, P - ECSE 200, ECSE 222)</td>
</tr>
<tr>
<td>ECSE 362 Fundamentals of Power Eng.</td>
<td>(4 cr, P - ECSE 210, ECSE 251, C-CHE 281)</td>
<td>ECSE 331 Electronics</td>
<td>(4 cr, P - ECSE 210)</td>
</tr>
<tr>
<td>MIME 262 Properties of Materials in EE</td>
<td>(3 cr)</td>
<td>XXXX xxx Humanities &amp; Social Sciences *</td>
<td>(3 cr)</td>
</tr>
<tr>
<td>CCOM 206 Communication in Engineering</td>
<td>(3 cr)</td>
<td>FACC 250 Resp. of the Prof. Engineer</td>
<td>(0 cr, P - FACC 100 or BREE 250)</td>
</tr>
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<tr>
<th>Third Semester (Fall 2021)</th>
<th>16 credits</th>
<th>Fourth Semester (Winter 2022)</th>
<th>15 credits</th>
</tr>
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<tbody>
<tr>
<td>COMP 250 Introduction to Computer Science</td>
<td>(3 cr, P - Familiarity with a high level programming language and CEGEP level)</td>
<td>ECSE 308 Intro. Comm. Sys. &amp; Networks</td>
<td>(4 cr, P - ECSE 205, ECSE 206)</td>
</tr>
<tr>
<td>ECSE 202 Intro. to Software Development</td>
<td>(3 cr)</td>
<td>ECSE xxx Technical Complementary 2</td>
<td>(4 cr)</td>
</tr>
<tr>
<td>ECSE 200 Electric Circuits 1</td>
<td>(3 cr, P - PHYS 142, C - MATH 263)</td>
<td>ECSE xxx Technical Complementary 3</td>
<td>(3 cr)</td>
</tr>
<tr>
<td>MATH 262 Intermediate Calculus</td>
<td>(3 cr, P-MATH 141 or equiv, MATH 133)</td>
<td>ECSE 343 Numerical Methods in Engineering</td>
<td>(3 cr, P - ECSE 205, COMP 250, MATH 263)</td>
</tr>
<tr>
<td>MATH 263 ODEs for Engineers</td>
<td>(3 cr, C - MATH 262)</td>
<td>XXXX xxx Impact of Technology on Society **</td>
<td>(3 cr)</td>
</tr>
<tr>
<td>FACC 100 Intro. to Engineering Profession</td>
<td>(1 cr)</td>
<td>ECSE xxx Technical Complementary 4</td>
<td>(3 cr)</td>
</tr>
<tr>
<td>COMP 250 Introduction to Computer Science</td>
<td>(3 cr, P - Familiarity with a high level programming language and CEGEP level)</td>
<td>ECSE 308 Intro. Comm. Sys. &amp; Networks</td>
<td>(4 cr, P - ECSE 205, ECSE 206)</td>
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<td>ECSE 200 Electric Circuits 1</td>
<td>(3 cr, P - PHYS 142, C - MATH 263)</td>
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<td>(3 cr, C - MATH 262)</td>
<td>XXXX xxx Impact of Technology on Society **</td>
<td>(3 cr)</td>
</tr>
</tbody>
</table>

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, then: Undergraduate Studies > Program Information > Complementary Studies.

** For instructions on selecting valid “Impact of Technology on Society” courses, see 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.

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.

Revised May 2020
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 (4 cr, P - ECSE 307)
- ECSE 408 Communication Systems (4 cr - P - ECSE 205, ECSE 308)
- ECSE 416 Telecomm. Networks (4 cr - P - ECSE 205, ECSE 308 or ECSE 316, COMP 250)
- 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 (minimum)

ECSE 500 level technical complementaries are restricted to students with a minimum CGPA of 3.0 and B+ or better in the prerequisites.

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

- COMP 551*** Applied Machine Learning (4 cr - MATH 323 or ECSE 205 or ECSE 305 or equivalent)
- COMP 559 Fundamentals of Computer Animation (4 cr - P - MATH 222, MATH 223, COMP 206, COMP 250)
- 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)
- ECSE 415 Intro. to Computer Vision (3 cr - P - ECSE 205, ECSE 308 or ECSE 316)
- 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 362)
- ECSE 424 Human-Computer Interaction (3 cr - P - ECSE 324, COMP 250 or COMP 251, COMP 273)
- 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 304, MIME 262)
- ECSE 431 Introduction to VLSI CAD. (3 cr - P - ECSE 324, ECSE 331)
- ECSE 435 Mixed Signal Test Techniques (3 cr - P - ECSE 206, ECSE 335)
- ECSE 436 Signal Processing Hardware (3 cr - P - ECSE 206, ECSE 324, ECSE 351)
- ECSE 446 Realistic Image Synthesis (3 cr - P - ECSE 202, ECSE 205, COMP 250)
- ECSE 450 Electromagnetic Compatibility (3 cr - P - ECSE 222, ECSE 351, ECSE 353 or ECSE 354)
- ECSE 451 EM Transmission & Radiation (3 cr - P - ECSE 204)
- ECSE 460 Appareillage électrique (3 cr - P - ECSE 362 or ECSE 461)
- ECSE 463 Electric Power Generation (3 cr - P - ECSE 324)
- 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 362)
- ECSE 468 Electricité industrielle (3 cr - P - ECSE 362)
- ECSE 469 Protection des réseaux électriques (3 cr - P - ECSE 206, ECSE 331, (ECSE 251 or ECSE 353)
- ECSE 472 Fundamentals of Circuit Simulation & Modelling (3 cr - P - ECSE 206, ECSE 353)
- ECSE 500 Mathematical Foundations of Systems (3 cr - P - ECSE 324, ECSE 331)
- ECSE 501 Linear Systems (3 cr - C - ECSE 500 or permission from the instructor)
- ECSE 507 Optimization & Optimal Control (3 cr - P - ECSE 543 or ECSE 443 or ECSE 543 or-compensation or omission of the instructor)
- ECSE 508 Multi-Agent Systems (3 cr - P - ECSE 205 or equivalents)
- ECSE 509 Probability & Random Signals 2 (3 cr - P - ECSE 206 or ECSE 318 and ECSE 205)
- ECSE 510 Filtering & Prediction for Stochastic Systems (3 cr - P - ECSE 500, ECSE 509 or equivalents)
- ECSE 516 Nonlinear and Hybrid Control Systems (3 cr - P - ECSE 500 and ECSE 501 or equivalents)
- ECSE 519 Semiconductor Nanstructures & Nanophotonic Devices (3 cr - P - ECSE 304 and (ECSE 433 or ECSE 533)
- ECSE 521 Digital Communications 1 (3 cr - P - ECSE 411 or ECSE 366 or ECSE 511 or - ECSE 509)
- ECSE 526 Artificial Intelligence (3 cr - P - ECSE 324)
- ECSE 532 Computer Graphics (4 cr - P - ECSE 324)
- ECSE 543 Numerical Methods in EE (3 cr - P - ECSE 324, ECSE 331, ECSE 251)
- ECSE 544 Computational Photography (4 cr - P - ECSE 205 and ECSE 206)
- ECSE 551*** Machine Learning for Engineers (3 cr - P - COMP 250 and ECSE 205 or MATH 323, COMP 250 or ECSE 443 or ECSE 543 or COMP 250)
- ECSE 562 Low-Carbon Power Generation Engineering (4 cr - P - ECSE 382 or ECSE 461)
- ECSE 563 Power Systems Operation & Planning (3 cr - P - ECSE 362)
- ECSE 565** Introduction to Power Electronics (3 cr - P - PHYS 342 or PHYS 352, or permission of the instructor)
- PHYS 434 Optics (3 cr - P - PHYS 220, PHYS 232, or PHYS 251)
- PHYS 446 Majors quantum physics (3 cr - P - PHYS 230, PHYS 232, or PHYS 234)

***ECSE 551 and COMP 551 cannot both be taken.

*ECSE 463 and ECSE 562 cannot both be taken.

**ECSE 465 and ECSE 565 cannot both be taken.
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)

### 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)