# Software Engineering Co-op Curriculum - Fall 2021

## 1st Term (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 140</td>
<td>Calculus 1</td>
<td>3</td>
<td>P - High school calculus</td>
</tr>
<tr>
<td>MATH 133</td>
<td>Linear Algebra and Geometry</td>
<td>3</td>
<td>P - A course in functions</td>
</tr>
<tr>
<td>PHYS 131</td>
<td>Mechanics &amp; Waves</td>
<td>4</td>
<td>C - MATH 139 or higher level calculus course.</td>
</tr>
<tr>
<td>FACC 100</td>
<td>Intro. to Engineering Profession</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>HSS 1</td>
<td>Humanities &amp; Social Sciences 1&quot;</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

## 2nd Term (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 120</td>
<td>General Chemistry 2</td>
<td>4</td>
<td>P - College level mathematics and physics or permission of instructor</td>
</tr>
<tr>
<td>MATH 141</td>
<td>Calculus 2</td>
<td>4</td>
<td>P - (MATH 139 or MATH 140 or MATH 150)</td>
</tr>
<tr>
<td>PHYS 142</td>
<td>Electromagnetism &amp; Optics</td>
<td>4</td>
<td>P - PHYS 131; C - MATH 141 or higher level calculus course</td>
</tr>
<tr>
<td>ECSE 202</td>
<td>Intro. to Software Development</td>
<td>3</td>
<td></td>
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</table>

## 3rd Term (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 250</td>
<td>Introduction to Computer Science</td>
<td>3</td>
<td>P - Familiarity with a high level programming language and CEGEP level MATH (MATH 133, MATH 140, MATH 141)</td>
</tr>
<tr>
<td>MATH 262</td>
<td>Intermediate Calculus</td>
<td>3</td>
<td>P - MATH 133 or equiv, MATH 141</td>
</tr>
<tr>
<td>MATH 263</td>
<td>ODEs for Engineers</td>
<td>3</td>
<td>C - MATH 262</td>
</tr>
<tr>
<td>CCOM 206</td>
<td>Communication in Engineering</td>
<td>3</td>
<td>Note: Must be passed two terms prior to ECSE 201</td>
</tr>
<tr>
<td>HSS 2</td>
<td>Humanities &amp; Social Sciences 2&quot;</td>
<td>3</td>
<td></td>
</tr>
</tbody>
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## 4th Term (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSE 200</td>
<td>Electric Circuits 1</td>
<td>3</td>
<td>P - PHYS 142 ; C - MATH 263</td>
</tr>
<tr>
<td>ECSE 223</td>
<td>Model-based Programming</td>
<td>3</td>
<td>P - ECSE 202</td>
</tr>
<tr>
<td>ECSE 222</td>
<td>Digital Logic</td>
<td>3</td>
<td>P - ECSE 202</td>
</tr>
<tr>
<td>COMP 205</td>
<td>Introduction to Software Systems</td>
<td>3</td>
<td>P - ECSE 202 or COMP 250</td>
</tr>
<tr>
<td>MATH 240</td>
<td>Discrete Structures</td>
<td>3</td>
<td>C - MATH 133</td>
</tr>
</tbody>
</table>

## 5th Term (Summer)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSE 201</td>
<td>Software Engineering Co-op 1</td>
<td>2</td>
<td>P - ECSE 223 or COMP 250 and CCOM 206</td>
</tr>
</tbody>
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## 6th Term (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 251</td>
<td>Algorithms and Data Structures</td>
<td>3</td>
<td>P - COMP 250, C - MATH 240</td>
</tr>
<tr>
<td>ECSE 205</td>
<td>Probability &amp; Statistics for Eng</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ECSE 211</td>
<td>Design Principles and Methods</td>
<td>3</td>
<td>P - ECSE 200, ECSE 202</td>
</tr>
<tr>
<td>ECSE 321</td>
<td>Intro. to Software Engineering</td>
<td>3</td>
<td>P - ECSE 223, (COMP 202 or COMP 208 or ECSE 202)</td>
</tr>
<tr>
<td>NS</td>
<td>Natural Science Complementary</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>FACC 250</td>
<td>Resp. of the Prof. Engineer</td>
<td>0</td>
<td>P - FACC 100 or BREE 205</td>
</tr>
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## 7th Term (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>FACC 300</td>
<td>Engineering Economy</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ECSE 310</td>
<td>Thermodynamics of Computing</td>
<td>3</td>
<td>P - ECSE 200, ECSE 205, ECSE 222</td>
</tr>
<tr>
<td>ECSE 428</td>
<td>Software Engineering Practice</td>
<td>3</td>
<td>P - (ECSE 321 or COMP 335)</td>
</tr>
<tr>
<td>ECSE 324</td>
<td>Computer Organization</td>
<td>4</td>
<td>P - ECSE 200, ECSE 222</td>
</tr>
<tr>
<td>Impact</td>
<td>Impact of Technology on Society **</td>
<td>3</td>
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</tr>
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</table>

## 8th Term (Summer)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSE 301</td>
<td>Software Engineering Co-op 2</td>
<td>2</td>
<td>P - ECSE 201</td>
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## 9th Term (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 302</td>
<td>Prog. Languages &amp; Paradigms</td>
<td>3</td>
<td>P - COMP 250, MATH 240</td>
</tr>
<tr>
<td>COMP 360</td>
<td>Algorithm Design</td>
<td>3</td>
<td>P - COMP 251, MATH 240</td>
</tr>
<tr>
<td>ECSE 316</td>
<td>Signals and Networks</td>
<td>3</td>
<td>P - MATH 263, ECSE 200, COMP 251</td>
</tr>
<tr>
<td>ECSE 326</td>
<td>Software Requirements Eng.</td>
<td>3</td>
<td>P - (ECSE 223 or COMP 303)</td>
</tr>
<tr>
<td>ECSE 427</td>
<td>Operating Systems</td>
<td>3</td>
<td>P - (ECSE 324 or COMP 273)</td>
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</table>

## 10th Term (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
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</thead>
<tbody>
<tr>
<td>ECSE 401</td>
<td>Software Engineering Co-op 3</td>
<td>2</td>
<td>P - ECSE 301</td>
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## 11th Term (Summer)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSE 402</td>
<td>Software Engineering Co-op 4</td>
<td>2</td>
<td>P - ECSE 401</td>
</tr>
</tbody>
</table>

## 12th Term (Fall)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSE 458 D1</td>
<td>Capstone Design Project</td>
<td>3</td>
<td>P - ECSE 211, ECSE 324, CCOM 206, COMP 302</td>
</tr>
<tr>
<td>ECSE 429</td>
<td>Software Validation</td>
<td>3</td>
<td>P - (ECSE 321 or COMP 303)</td>
</tr>
<tr>
<td>ECSE 420</td>
<td>Parallel Computing</td>
<td>3</td>
<td>P - ECSE 427</td>
</tr>
<tr>
<td>FACC 400</td>
<td>Engineering Professional Practice</td>
<td>1</td>
<td>P - FACC 100, FACC 250, and 60 program credits</td>
</tr>
<tr>
<td>XXXX xxx</td>
<td>Technical Complementary 1</td>
<td>3</td>
<td></td>
</tr>
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</table>

## 13th Term (Winter)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSE 458 D2</td>
<td>Capstone Design Project</td>
<td>3</td>
<td>P - ECSE 458 D1</td>
</tr>
<tr>
<td>COMP 421</td>
<td>Database Systems</td>
<td>3</td>
<td>P - COMP 250, COMP 251, COMP 302</td>
</tr>
<tr>
<td>XXXX xxx</td>
<td>Technical Complementary 2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>XXXX xxx</td>
<td>Technical Complementary 3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>Elective Course</td>
<td>3</td>
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</tbody>
</table>
Technical and Natural Science Complementary courses are selected from an approved list given on the next page.

*The Complementary Studies (CS) courses are Impact of Technology courses (Group A) and Humanities & Social Sciences, Management Studies and Law courses (Group B). Students must take one course (3 credits) from Group A and one course (3 credits) from Group B. The curriculum above includes suggested terms during which these courses can be taken. These must be chosen from an approved list of courses/departments, found in the program list under "Complementary Studies" in the Faculty of Engineering Undergraduate section of the Programs, Courses and University Regulations publication (www.mcgill.ca/study) (see your program listing in the "Browse Academic Units & Programs" section).

Elecive course (3 credits) must be taken 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. Students are responsible for satisfying pre-co-requisites and verifying with their department that they are meeting the requirements of their program.

### Technical Complementary Courses - Software Engineering Co-op

**Technical Complementaries**
15 - 18 credits (courses) must be taken, chosen as follows:

3-4 credits (1 course) from List A
6 - 8 credits (2 courses) from List A or List B

#### List A
3-4 credits from the following list

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECSE 325</td>
<td>Digital Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 343*</td>
<td>Numerical Methods in Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 415</td>
<td>Intro. to Computer Vision</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 416</td>
<td>Telecom. Networks</td>
<td>4</td>
</tr>
<tr>
<td>ECSE 422</td>
<td>Fault Tolerant Computing</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 425</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 437</td>
<td>Software Delivery</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 439</td>
<td>Software Language Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 444</td>
<td>Microprocessors</td>
<td>4</td>
</tr>
<tr>
<td>ECSE 446</td>
<td>Realistic Image Synthesis</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 544</td>
<td>Computational Photography</td>
<td>4</td>
</tr>
<tr>
<td>ECSE 551*</td>
<td>Machine Learning for Engineers</td>
<td>4</td>
</tr>
<tr>
<td>ECSE 552</td>
<td>Deep Learning</td>
<td>4</td>
</tr>
</tbody>
</table>

#### List B
6 - 8 credits from the following list:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP 330</td>
<td>Theory of Computation</td>
<td>3</td>
</tr>
<tr>
<td>COMP 350*</td>
<td>Numerical Computing</td>
<td>3</td>
</tr>
<tr>
<td>COMP 409</td>
<td>Concurrent Programming</td>
<td>3</td>
</tr>
<tr>
<td>COMP 417</td>
<td>Intro. Robotics and Intelligent Systems</td>
<td>3</td>
</tr>
<tr>
<td>COMP 424***</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>COMP 445</td>
<td>Computational Linguistics</td>
<td>3</td>
</tr>
<tr>
<td>COMP 512</td>
<td>Distributed Systems</td>
<td>4</td>
</tr>
<tr>
<td>COMP 520</td>
<td>Compiler Design</td>
<td>4</td>
</tr>
<tr>
<td>COMP 521</td>
<td>Modern Computer Games</td>
<td>4</td>
</tr>
<tr>
<td>COMP 525</td>
<td>Formal Verification</td>
<td>3</td>
</tr>
<tr>
<td>COMP 529</td>
<td>Software Architecture</td>
<td>4</td>
</tr>
<tr>
<td>COMP 533</td>
<td>Model-Driven Software Development</td>
<td>3</td>
</tr>
<tr>
<td>COMP 550</td>
<td>Natural Language Processing</td>
<td>3</td>
</tr>
<tr>
<td>COMP 551**</td>
<td>Applied Machine Learning</td>
<td>4</td>
</tr>
<tr>
<td>COMP 559</td>
<td>Fundamentals of Computer Animation</td>
<td>4</td>
</tr>
<tr>
<td>COMP 575</td>
<td>Fundamentals of Distributed Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>COMP 579</td>
<td>Reinforcement Learning</td>
<td>4</td>
</tr>
<tr>
<td>ECSE 421</td>
<td>Embedded Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 424</td>
<td>Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 507</td>
<td>Optimization &amp; Optimal Control</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 508</td>
<td>Probability &amp; Random Signals 2</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 526***</td>
<td>Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>ECSE 532</td>
<td>Computer Graphics</td>
<td>4</td>
</tr>
<tr>
<td>MATH 247</td>
<td>Honours Applied Linear Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

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The Complementary Studies (CS) courses are Impact of Technology courses (Group A) and Humanities & Social Sciences, Management Studies and Law courses (Group B). Students must take one course (3 credits) from Group A and one course (3 credits) from Group B. The curriculum above includes suggested terms during which these courses can be taken. These must be chosen from an approved list of courses/departments, found in the program list under "Complementary Studies" in the Faculty of Engineering Undergraduate section of the Programs, Courses and University Regulations publication (www.mcgill.ca/study) (see your program listing in the "Browse Academic Units & Programs" section).

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### Natural Science Complementary Courses - Software Engineering

**Natural Science complementary courses must be chosen from the approved Natural Science Complementary List.**

If you would like to take a Science course at the 200-level or higher that is NOT listed in the link provided above, this may be considered, but must be approved by the Undergraduate Programs Office in the Department of Electrical and Computer Engineering.

**Last update: March 4, 2021**

For the official program listing, see the [Programs, Courses and University Regulations](https://www.mcgill.ca/study) publication (www.mcgill.ca/study).