

# Computer Engineering Curriculum - Fall 2019

## Non-CEGEP Entry

| <b>1st Term (Fall)</b>   |                                                    | 14 credits | Prerequisites/Co-requisites                                                                                |
|--------------------------|----------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------|
| FACC 100                 | Introduction to the Engineering Profession         | 1          | -                                                                                                          |
| MATH 133                 | Linear Algebra and Geometry                        | 3          | P - A course in functions                                                                                  |
| MATH 140                 | Calculus 1                                         | 3          | P - High school calculus                                                                                   |
| PHYS 131                 | Mechanics and Waves                                | 4          | C - Calculus course [MATH 140]                                                                             |
| CS                       | Complementary Studies Group B (HSSML) - 1*         | 3          | -                                                                                                          |
| <b>2nd Term (Winter)</b> |                                                    | 18 credits | Prerequisites/Co-requisites                                                                                |
| CHEM 120                 | General Chemistry 2                                | 4          | P - College level mathematics and physics or permission of instructor                                      |
| ECSE 202                 | Introduction to Software Development               | 3          | -                                                                                                          |
| MATH 141                 | Calculus 2                                         | 4          | P - MATH 140                                                                                               |
| PHYS 142                 | Electromagnetism and Optics                        | 4          | P - PHYS 131 / C - MATH 141                                                                                |
| CS                       | Complementary Studies Group A (Impact)*            | 3          | -                                                                                                          |
| <b>3rd Term (Fall)</b>   |                                                    | 15 credits | Prerequisites/Co-requisites                                                                                |
| CCOM 206                 | Communication in Engineering                       | 3          | -                                                                                                          |
| ECSE 200                 | Electric Circuits 1                                | 3          | P - PHYS 142 / C - MATH 263                                                                                |
| ECSE 222                 | Digital Logic                                      | 3          | P - ECSE 202                                                                                               |
| FACC 250                 | Responsibilities of the Professional Engineer      | 0          | P - FACC 100 or BREE 250                                                                                   |
| MATH 262                 | Intermediate Calculus                              | 3          | P - MATH 133, MATH 141                                                                                     |
| MATH 263                 | Ordinary Differential Equations for Engineers      | 3          | C - MATH 262                                                                                               |
| <b>4th Term (Winter)</b> |                                                    | 18 credits | Prerequisites/Co-requisites                                                                                |
| COMP 250                 | Introduction to Computer Science                   | 3          | P - Familiarity with a high level programming language and CEGEP level Math [MATH 133, MATH 140, MATH 141] |
| ECSE 211                 | Design Principles and Methods                      | 3          | P - ECSE 200, ECSE 202                                                                                     |
| ECSE 210                 | Electric Circuits 2                                | 3          | P - ECSE 200                                                                                               |
| FACC 300                 | Engineering Economy                                | 3          | -                                                                                                          |
| ECSE 223                 | Model-Based Programming                            | 3          | P - ECSE 202                                                                                               |
| CS                       | Complementary Studies Group B (HSSML) - 2*         | 3          | -                                                                                                          |
| <b>5th Term (Fall)</b>   |                                                    | 17 credits | Prerequisites/Co-requisites                                                                                |
| ECSE 205                 | Probability and Statistics for Engineers           | 3          | -                                                                                                          |
| ECSE 206                 | Introduction to Signals and Systems                | 3          | P - ECSE 200                                                                                               |
| ECSE 324                 | Computer Organization                              | 4          | P - ECSE 200, ECSE 222                                                                                     |
| ECSE 331                 | Electronics                                        | 4          | P - ECSE 210                                                                                               |
| ECSE 353                 | Electromagnetic Fields and Waves                   | 3          | P - ECSE 210, MATH 262, MATH 263                                                                           |
| <b>6th Term (Winter)</b> |                                                    | 18 credits | Prerequisites/Co-requisites                                                                                |
| COMP 251                 | Algorithms and Data Structures                     | 3          | P - COMP 250 / C - MATH 240                                                                                |
| ECSE 310                 | Thermodynamics of Computing                        | 3          | P - ECSE 200, ECSE 205, ECSE 222                                                                           |
| ECSE 321                 | Introduction to Software Engineering               | 3          | P - ECSE 202                                                                                               |
| ECSE 325                 | Digital Systems                                    | 3          | P - ECSE 324                                                                                               |
| ECSE 427                 | Operating Systems                                  | 3          | P - ECSE 322 or ECSE 324 or COMP 273                                                                       |
| MATH 240                 | Discrete Structures 1                              | 3          | C - MATH 133                                                                                               |
| <b>7th Term (Fall)</b>   |                                                    | 17 credits | Prerequisites/Co-requisites                                                                                |
| ECSE 308                 | Introduction to Communication Systems and Networks | 4          | P - ECSE 205, ECSE 206                                                                                     |
| ECSE 444                 | Microprocessors                                    | 4          | P - ECSE 324                                                                                               |
| ECSE 458D1               | ECSE Design Project 1                              | 3          | P - ECSE 211 and (ECSE 323 or ECSE 324) and CCOM 206 and (ECSE 330 or ECSE 331 or COMP 302)                |
| ECSE xxx                 | Technical Complementary                            | 3          | -                                                                                                          |
| ECSE xxx                 | Technical Complementary                            | 3          | -                                                                                                          |
| <b>8th Term (Winter)</b> |                                                    | 16 credits | Prerequisites/Co-requisites                                                                                |
| ECSE 425                 | Computer Architecture                              | 3          | P - (ECSE 322 and ECSE 323) or ECSE 324                                                                    |
| ECSE 458D2               | ECSE Design Project 2                              | 3          | P - ECSE 458D1                                                                                             |
| FACC 400                 | Engineering Professional Practice                  | 1          | P - FACC 100, FACC 250**, and 60 program credits                                                           |
| ECSE xxx                 | Technical Complementary                            | 3          | -                                                                                                          |
| ECSE xxx                 | Technical Complementary                            | 3          | -                                                                                                          |
| XXXX xxx                 | Elective Course***                                 | 3          | -                                                                                                          |

Technical 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 two courses (6 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](http://www.mcgill.ca/study)) (see your program listing in the "Browse Academic Units & Programs" section).

\*\*FACC 250 is not yet indicated as a prerequisite in the eCalendar course information ([www.mcgill.ca/study](http://www.mcgill.ca/study)) but it will be before FACC 400 is taken.

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 - Computer Engineering

## Technical Complementaries

12-15 credits

4 courses must be taken, chosen as follows:

- 3 courses (minimum 9 credits) from List A
- The remaining 1 course (minimum 3 credits) from List A or List B

### List A

9-11 credits from the following:

|          |                                 | Credits | Prerequisites/Co-requisites                                       |
|----------|---------------------------------|---------|-------------------------------------------------------------------|
| COMP 424 | Artificial Intelligence         | 3       | P - COMP 206 / ECSE 321, MATH 323 or equivalent, and COMP 251     |
| ECSE 335 | Microelectronics                | 4       | P - ECSE 331                                                      |
| ECSE 412 | Discrete Time Signal Processing | 3       | P - ECSE 206 or ECSE 304 or ECSE 306.                             |
| ECSE 416 | Telecommunication Networks      | 4       | P - COMP 250, ECSE 205, ECSE 308 / ECSE 316                       |
| ECSE 420 | Parallel Computing              | 3       | P - ECSE 427                                                      |
| ECSE 421 | Embedded Systems                | 3       | P - ECSE 322 and ECSE 323 or ECSE 324                             |
| ECSE 422 | Fault Tolerant Computing        | 3       | P - ECSE 322 or ECSE 324 and COMP 250                             |
| ECSE 424 | Human-Computer Interaction      | 3       | P - ECSE 322 or (ECSE 324 and COMP250) or (COMP 251 and COMP 273) |
| ECSE 428 | Software Engineering Practice   | 3       | P - ECSE 321 or COMP 335                                          |
| ECSE 429 | Software Validation             | 3       | P - ECSE 321 or COMP 303                                          |
| ECSE 439 | Software Language Engineering   | 3       | P - ECSE 321 or COMP 303                                          |

### List B

0-4 credits from the following:

|          |                                                  |   |                                                                                              |
|----------|--------------------------------------------------|---|----------------------------------------------------------------------------------------------|
| COMP 557 | Fundamentals of Computer Graphics                | 3 | P - COMP 206, COMP 250, MATH 222/262, MATH 223                                               |
| ECSE 307 | Linear Systems and Control                       | 4 | P - ECSE 206, ECSE 210                                                                       |
| ECSE 403 | Control                                          | 4 | P - ECSE 307                                                                                 |
| ECSE 408 | Communication Systems                            | 4 | P - ECSE 205, ECSE 308                                                                       |
| ECSE 415 | Introduction to Computer Vision                  | 3 | P - ECSE 304 or ECSE 306 or ECSE 206                                                         |
| ECSE 435 | Mixed-Signal Test Techniques                     | 3 | P - (ECSE 206 or ECSE 304) and (ECSE 334 or ECSE 335)                                        |
| ECSE 436 | Signal Processing Hardware                       | 3 | (ECSE 322 or ECSE 324), (ECSE 323 or ECSE 325) and (ECSE 304 or ECSE 306 or ECSE 206)        |
| ECSE 446 | Realistic Image Synthesis                        | 3 | P - ECSE 202, ECSE 205, and COMP 250                                                         |
| ECSE 450 | Electromagnetic Compatibility                    | 3 | P - (ECSE 221 or ECSE 222) and (ECSE 334 or ECSE 331) and (ECSE 352 or ECSE 353 or ECSE 354) |
| ECSE 472 | Fundamentals of Circuit Simulation and Modelling | 3 | P - (ECSE 303 or ECSE 306 or ECSE 206) and (ECSE 330 or ECSE 331) and (ECSE 351 or ECSE 251) |
| COMP 551 | Applied Machine Learning                         | 4 | P - MATH 323 or ECSE 205 or ECSE 305 or equivalent)                                          |

**Last update: April 30, 2019**

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