

Materials Engineering Curriculum - Fall 2020

Non-CEGEP Entry

| 1st Term (Fall) | | 15 credits | Prerequisites/Co-requisites |
|---------------------------|--|-------------------|--|
| CHEM 110 | General Chemistry 1 | 4 | P - College level mathematics and physics or permission of instructor |
| 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] |
| 2nd Term (Winter) | | 15 credits | Prerequisites/Co-requisites |
| CHEM 120 | General Chemistry 2 | 4 | P - College level mathematics and physics or permission of instructor |
| MATH 141 | Calculus 2 | 4 | P - MATH 140 |
| PHYS 142 | Electromagnetism and Optics | 4 | P - PHYS 131 / C - MATH 141 |
| CS | Complementary Studies Group B (HSSML) - 1* | 3 | - |
| 3rd Term (Fall) | | 15 credits | Prerequisites/Co-requisites |
| CCOM 206 | Communication in Engineering | 3 | - |
| MATH 262 | Intermediate Calculus | 3 | P - MATH 133, MATH 141 |
| MECH 289 | Design Graphics | 3 | - |
| MIME 250 | Introduction to Extractive Metallurgy | 3 | C - CCOM 206 |
| MIME 261 | Structure of Materials | 3 | - |
| 4th Term (Winter) | | 15 credits | Prerequisites/Co-requisites |
| CHEM 233 | Topics in Physical Chemistry | 3 | - |
| CIVE 205 | Statics | 3 | - |
| MIME 209 | Mathematical Applications | 3 | - |
| MIME 212 | Engineering Thermodynamics | 3 | - |
| MIME 341 | Introduction to Mineral Processing | 3 | P - MIME 200 or MIME 250 |
| 5th Term (Summer) | | 3 credits | Prerequisites/Co-requisites |
| MATH 263 | Ordinary Differential Equations for Engineers | 3 | C - MATH 262 |
| 6th Term (Fall) | | 17 credits | Prerequisites/Co-requisites |
| CIVE 207 | Solid Mechanics | 4 | P - CIVE 205 or MECH 210 |
| COMP 208 | Computers in Engineering | 3 | P - differential and integral calculus [MATH 140 and MATH 141] / C - linear algebra [MATH 133] |
| FACC 250 | Responsibilities of the Professional Engineer | 0 | P - FACC 100 or BREE 250 |
| MIME 317 | Analytical and Characterization Techniques | 3 | P - MIME 261 |
| MIME 356 | Heat, Mass and Fluid Flow | 4 | P - MIME 212 |
| MIME 360 | Phase Transformations: Solids | 3 | P - MIME 260 or MIME 261 / P or C - MIME 212 |
| 7th Term (Winter) | | 2 credits | Prerequisites/Co-requisites |
| MIME 280 | Industrial Training 1 | 2 | P - 40 program credits |
| 8th Term (Summer) | | 12 credits | Prerequisites/Co-requisites |
| FACC 300 | Engineering Economy | 3 | - |
| MIME 345 | Applications of Polymers | 3 | P - MIME 261 or instructor permission |
| MIME 350 | Extractive Metallurgical Engineering | 3 | P - MIME 200 or MIME 250, MIME 212 |
| MIME 467 | Electronic Properties of Materials | 3 | P - MIME 261, MATH 263 |
| 9th Term (Fall) | | 18 credits | Prerequisites/Co-requisites |
| ECSE 461 | Electric Machinery | 3 | - |
| MIME 352 | Hydrochemical Processing | 3 | P - CHEM 233, MIME 200 or MIME 250, MIME 212, MIME 356 |
| MIME 362 | Mechanical Properties | 3 | P - MIME 360 |
| MIME 465 | Metallic and Ceramic Powders Processing | 3 | P - MIME 360 |
| MIME 470 | Engineering Biomaterials | 3 | P - MIME 261 |
| MIME xxx | Technical Complementary | 3 | - |
| 10th Term (Winter) | | 15 credits | Prerequisites/Co-requisites |
| MATH 264 | Advanced Calculus for Engineers | 3 | P - MATH 262 / C - MATH 263 |
| MIME 311 | Modelling and Automatic Control | 3 | P - MIME 356 |
| MIME 455 | Advanced Process Engineering | 3 | P - MIME 356 |
| MIME xxx | Technical Complementary | 3 | - |
| CS | Complementary Studies Group A (Impact)* | 3 | - |
| 11th Term (Summer) | | 2 credits | Prerequisites/Co-requisites |
| MIME 380 | Industrial Training 2 | 2 | P - MIME 280 |
| 12th Term (Fall) | | 2 credits | Prerequisites/Co-requisites |
| MIME 480 | Industrial Training 3 | 2 | P - MIME 380 |
| 13th Term (Winter) | | 17 credits | Prerequisites/Co-requisites |
| FACC 400 | Engineering Professional Practice | 1 | P - FACC 100, FACC 250**, and 60 program credits |
| MIME 452 | Process and Materials Design | 4 | - |
| MIME 456 | Steelmaking and Steel Processing | 3 | P - MIME 360 / P or C - MIME 455 |
| MIME 473 | Introduction to Computational Materials Design | 3 | P - MIME 209 and MIME 261, or permission of instructor |
| MIME xxx | Technical Complementary | 3 | - |
| CS | Complementary Studies Group B (HSSML) - 2* | 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) (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) 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 - Materials Engineering

6 - 9 credits from the following:

| | | Credits | Prerequisites/Co-requisites |
|-------------|---|---------|--|
| CIVE 512 | Advanced Civil Engineering Materials | 3 | P - CIVE 202 |
| MECH 530 | Mechanics of Composite Materials | 3 | P - MECH 321 |
| MIME 410 | Research Project | 3 | P - Recommendation of instructor |
| MIME 442 | Analysis, Modelling and Optimization in Mineral Processing | 3 | P - MIME 341 |
| MIME 512 | Corrosion and Degradation of Materials | 3 | P - MIME 261 and MIME 352 or permission of instructor |
| MIME 515 | Material Surfaces: A Biomimetic Approach | 3 | P - (CHEE 310, CHEE 380) or (CHEM 233, MIME 261, MIME 317) or permission of instructor |
| or CHEE 515 | Material Surfaces: A Biomimetic Approach | 3 | permission of instructor |
| MIME 526 | Mineral Economics | 3 | P - Permission of instructor; background in economics required |
| MIME 542 | Transmission Electron Microscopy | 3 | P - Permission of instructor |
| MIME 544 | Analysis: Mineral Processing Systems 1 | 3 | P - MIME 341 |
| MIME 545 | Analysis: Mineral Processing Systems 2 | 3 | P - MIME 341 |
| MIME 551 | Electrochemical Processing | 3 | P - MIME 352 |
| MIME 556 | Sustainable Materials Processing | 3 | P - Permission of instructor |
| MIME 558 | Engineering Nanomaterials | 3 | P - (MIME 260 or MIME 261) and MIME 362 or equivalent, or instructor permission |
| MIME 559 | Aluminum Physical Metallurgy | 3 | P - MIME 360 and MIME 362 or instructor permission |
| MIME 560 | Joining Processes | 3 | P - MIME 250, MIME 360 |
| MIME 561 | Advanced Materials Design | 3 | P - MIME 362 or equivalent |
| MIME 563 | Hot Deformation of Metals | 3 | P - MIME 360, MIME 362 |
| MIME 565 | Aerospace Metallic-Materials and Manufacturing Processes | 3 | P - MIME 260 or MIME 261 or instructor permission |
| MIME 568 | Topics in Advanced Materials | 3 | P - MIME 362 or equivalent |
| MIME 569 | Electron Beam Analysis of Materials | 3 | P - MIME 317 |
| MIME 570 | Micro- and Nano-Fabrication Fundamentals | 3 | P - MIME 467 or ECSE 330 or equivalent, or permission of instructor |
| MIME 571 | Surface Engineering | 3 | P - MIME 362 |
| MIME 572 | Computational Thermodynamics | 3 | P - MIME 212 or equivalent |
| MIME 580 | Additive Manufacturing Using Metallic and Ceramic Materials | 3 | P - MIME 465 or instructor permission |

0 - 3 credits from courses outside of the Department of Mining and Materials Engineering, with departmental approval.

Last update: March 10, 2020

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