CO-OP IN MATERIALS ENGINEERING (B.ENG.) (148 CREDITS)

Offered by: Mining & Materials Engineering (Faculty of Engineering)
Degree: Bachelor of Engineering
Program credit weight: 148 credits

Program Description

Program credit weight for Quebec CEGEP students: 119 credits

The Department offers a Co-op in Materials Engineering program leading to an accredited B.Eng. degree in Materials Engineering. Materials are used to enact every human technology and have shaped key areas of history. In the Co-op in Materials Engineering, students will have the opportunity to learn the fundamental science and engineering of materials and complete three work-term semesters. The program spans the materials processing pipeline, teaching students how to enrich mineral-poor ore, then to process the materials into the desired microstructures and compositions and finally how to use these materials in various applications (aerospace, electronics and biological systems). With the choice of technical complementary courses, students have an opportunity to specialize and strengthen key materials technologies or broaden their horizons and take courses from several interdisciplinary areas.

Students entering this program must plan their schedule of studies in consultation with a departmental advisor.

Note: For information about Fall 2025 and Winter 2026 course offerings, please check back on May 8, 2025. Until then, the "Terms offered" field will appear blank for most courses while the class schedule is being finalized.

Required Year 0 (Freshman) Courses (29 credits)

Generally, students admitted to Engineering from Quebec CEGEPs are granted transfer credit for these Year 0 (Freshman) courses and enter a 119-credit program.

For information on transfer credit for French Baccalaureate, International Baccalaureate exams, Advanced Placement exams, Advanced Levels, and Science Placement Exams, see http://www.mcgill.ca/engineering/current-students/undergraduate/new-stud... and select your term of admission.

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Course	Title	Credits
CHEM 110	General Chemistry 1.	4
CHEM 120	General Chemistry 2.	4
MATH 133	Linear Algebra and Geometry.	3
MATH 140	Calculus 1.	3
MATH 141	Calculus 2.	4
PHYS 131	Mechanics and Waves.	4
PHYS 142	Electromagnetism and Optics.	4

AND 3 credits selected from the approved list of courses in Humanities and Social Sciences, Management Studies, and Law, listed below under Complementary Studies (Group B).

Note: FACC 100 Introduction to the Engineering Profession. must be taken during the first year of study.

Required Non-Departmental Courses (36 credits)

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Course	Title	Credits
CHEM 233	Topics in Physical Chemistry.	3
CIVE 205	Statics.	3
CIVE 207	Solid Mechanics.	4
COMP 208	Computer Programming for Physical Sciences and Engineering .	3
ECSE 209	Electrotechnology.	3
FACC 100	Introduction to the Engineering Profession.[1]	1
FACC 250	Responsibilities of the Professional Engineer.	0
FACC 300	Engineering Economy.	3
FACC 400	Engineering Professional Practice.	1
MATH 262	Intermediate Calculus.	3
MATH 263	Ordinary Differential Equations for Engineers.	3
MATH 264	Advanced Calculus for Engineers.	3
MECH 289	Design Graphics.	3
WCOM 206	Communication in Engineering.	3

[1] Note: FACC 100 Introduction to the Engineering Profession. must be taken during the first year of study.

Required Materials Engineering Courses (65 credits)

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Course	Title	Credits
MIME 209	Mathematical Applications.	3
MIME 212	Engineering Thermodynamics.	3
MIME 250	Introduction to Extractive Metallurgy.	3
MIME 261	Structure of Materials.	3
MIME 280	Industrial Training 1.	2
MIME 311	Modelling and Automatic Control.	3
MIME 317	Analytical and Characterization Techniques.	3
MIME 341	Introduction to Mineral Processing.	3
MIME 345	Applications of Polymers.	3
MIME 350	Extractive Metallurgical Engineering.	3
MIME 352	Hydrochemical Processing.	3
MIME 356	Heat, Mass and Fluid Flow.	4

MIME 360	Phase Transformations: Solids.	3
MIME 362	Mechanical Properties.	3
MIME 380	Industrial Training 2.	2
MIME 452	Process and Materials Design.	4
MIME 455	Advanced Process Engineering.	3
MIME 465	Metallic and Ceramic Powders Processing.	3
MIME 467	Electronic Properties of Materials.	3
MIME 470	Engineering Biomaterials.	3
MIME 473	Introduction to Computational Materials Design.	3
MIME 480	Industrial Training 3.	2

Complementary Courses (15 credits)

Technical Complementaries (12 credits)

9-12 credits from the following:

Expand allContract all

Course	Title	Credits
CHEE 515	Interface Design: Biomimetic Approach.[1]	3
CIVE 512	Advanced Civil Engineering Materials.	3
MECH 530	Mechanics of Composite Materials.	3
MIME 410	Materials Research Project.	3
MIME 442	Analysis, Modelling and Optimization in Mineral Processing.	3
MIME 456	Steelmaking and Steel Processing.	3
MIME 512	Corrosion and Degradation of Materials.	3
MIME 515	(Bio)material Surface Analysis and Modification.[1]	3
MIME 526	Mineral Economics.	3
MIME 542	Transmission Electron Microscopy.	3
MIME 544	Analysis: Mineral Processing Systems 1.	3
MIME 545	Analysis: Mineral Processing Systems 2.	3
MIME 553	Impact of Materials Production.	3
MIME 556	Sustainable Materials Processing.	3
MIME 559	Aluminum Physical Metallurgy.	3
MIME 560	Joining Processes.	3
MIME 561	Advanced Materials Design.	3
MIME 563	Hot Deformation of Metals.	3
MIME 565	Aerospace Metallic-Materials and Manufacturing Processes.	3
MIME 568	Topics in Advanced Materials.	3
MIME 569	Electron Beam Analysis of Materials.	3
MIME 570	Micro- and Nano-Fabrication Fundamentals.	3
MIME 571	Surface Engineering.	3
MIME 572	Computational Thermodynamics.	3
MIME 580	Additive Manufacturing Using Metallic and Ceramic Materials.	3

[1] Students choose either CHEE 515 Interface Design: Biomimetic Approach. or MIME 515 (Bio)material Surface Analysis and Modification., offered in alternate years.

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

Complementary Studies (6 credits)

Group A - Impact of Technology on Society

3 credits from the following:

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Course	Title	Credits
ANTH 212	Anthropology of Development.	3
BTEC 502	Biotechnology Ethics and Society.	3
ECON 225	Economics of the Environment.	3
ECON 347	Economics of Climate Change.	3
ENVR 201	Society, Environment and Sustainability.	3
GEOG 200	Geographical Perspectives: World Environmental Problems.	3
GEOG 203	Environmental Systems.	3
GEOG 205	Global Change: Past, Present and Future.	3
GEOG 302	Environmental Management 1.	3
MGPO 440	Strategies for Sustainability.[1]	3
PHIL 343	Biomedical Ethics.	3
RELG 270	Religious Ethics and the Environment.	3
SOCI 235	Technology and Society.	3
SOCI 312	Sociology of Work and Industry.	3
URBP 201	Planning the 21st Century City.	3

[1] Note: Management courses have limited enrolment and registration dates. See Important Dates at http://www.mcgill.ca/importantdates.

Group B - Humanities and Social Sciences, Management Studies, and Law

3 credits at the 200 level or higher from the following departments:

Anthropology (ANTH)

Economics (any 200- or 300-level course excluding ECON 227 Economic Statistics., and ECON 337 Introductory Econometrics 1.)

History (HIST)

Philosophy (excluding PHIL 210 Introduction to Deductive Logic 1. and PHIL 310 Intermediate Logic.)

Political Science (POLI)

Psychology (excluding PSYC 204 Introduction to Psychological Statistics. and PSYC 305 Statistics for Experimental Design., but including PSYC 100 Introduction to Psychology.)

Religious Studies (RELG) (excluding courses that principally impart language skills, such as Sanskrit, Tibetan, Tamil, New Testament Greek, and Biblical Hebrew)[1]

School of Social Work (SWRK)

Sociology (excluding SOCI 350 Statistics in Social Research.)

OR 3 credits from the following:

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Course	Title	Credits
ARCH 528	History of Housing.	3
BUSA 465	Technological Entrepreneurship.[2]	3
CLAS 203	Greek Mythology.	3
ENVR 203	Knowledge, Ethics and Environment.	3
ENVR 400	Environmental Thought.	3
FACC 220	Law for Architects and Engineers.	3
FACC 500	Technology Business Plan Design.	3
FACC 501	Technology Business Plan Project.	3
HISP 225	Hispanic Civilization 1.	3
HISP 226	Hispanic Civilization 2.	3
INDR 294	Introduction to Labour-Management Relations.[2]	3
INTG 215	Entrepreneurship Essentials for Non-Management Students.[3]	3
MATH 338	History and Philosophy of Mathematics.	3
MGCR 222	Introduction to Organizational Behaviour.[2]	3
MGCR 352	Principles of Marketing.[2]	3
ORGB 321	Leadership.[2]	3
ORGB 423	Human Resources Management.[2]	3

1 If you are uncertain whether or not a course principally imparts language skills, please see an adviser in the McGill Engineering Student Centre (Frank Dawson Adams Building, Room 22) or email an adviser.

2 Note: Management courses have limited enrolment and registration dates. See Important Dates at http://www.mcgill.ca/importantdates.

3 INTG 215 Entrepreneurship Essentials for Non-Management Students. is not open to students who have taken INTG 201 Integrated Management Essentials 1. and INTG 202 Integrated Management Essentials 2..

Note regarding language courses: Language courses are not accepted to satisfy the Complementary Studies Group B requirement, effective for students who entered the program as of Fall 2017.