MECHANICAL ENGINEERING HONOURS (B.ENG.) (142 CREDITS)

Offered by: Mechanical Engineering (Faculty of Engineering)
Degree: Bachelor of Engineering
Program credit weight: 142 credits

Program Description

This program is not currently offered

Program credit weight for Quebec CEGEP students: 113 credits

Program credit weight for out-of-province students: 142 credits

To prepare the mechanical engineer for a wide range of career possibilities, there is a heavy emphasis in our curriculum on the fundamental analytical disciplines. This is balanced by a sequence of experimental and design Engineering courses, which include practice in design, manufacturing, and experimentation. In these courses, students learn how to apply their analytical groundwork to the solution of practical problems.

The Honours program is particularly suitable for those with a high aptitude in mathematics and physics and gives a thorough grounding in the basic engineering sciences.

Special interests are satisfied by selecting appropriate complementary courses from among those offered with a specific subject concentration, such as management, industrial engineering, computer science, controls and robotics, bio-engineering, aeronautics, combustion, systems engineering, etc.

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 may be granted transfer credit for these Year 0 courses and enter a 113-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 (27 credits)

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Course	Title	Credits
CIVE 207	Solid Mechanics.	4
COMP 208	Computer Programming for Physical Sciences and Engineering .	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
MATH 271	Linear Algebra and Partial Differential Equations.	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 Mechanical Engineering Courses (62 credits)

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Course	Title	Credits
MECH 215	Statics	3
MECH 220	Mechanics 2.	4
MECH 241	Fundamentals of Thermodynamics	4
MECH 262	Statistics and Measurement Laboratory.	3
MECH 292	Design 1: Conceptual Design.	3
MECH 309	Numerical Methods in Mechanical Engineering.	3
MECH 321	Mechanics of Deformable Solids.	3
MECH 331	Fluid Mechanics 1.	3
MECH 341	Thermodynamics 2.	3
MECH 346	Heat Transfer.	3
MECH 360	Principles of Manufacturing.	3
MECH 362	Mechanical Laboratory 1.	2
MECH 383	Applied Electronics and Instrumentation.	3
MECH 390	Computer Aided Design	3

MECH 403D1	Thesis (Honours).	3
MECH 403D2	Thesis (Honours).	3
MECH 404	Honours Thesis 2.	3
MECH 419	Advanced Mechanics of Systems.	4
MECH 430	Fluid Mechanics 2.	3
MECH 494	Honours Design Project.	3

Technical Complementary Courses (18 credits)

3 credits from the following, chosen with the approval of either the thesis supervisor or the coordinator of the Honours program, when a thesis supervisor has not yet been secured:

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Course	Title	Credits
MATH 316	Complex Variables.	3
MATH 323	Probability.	3
MATH 326	Nonlinear Dynamics and Chaos.	3
MATH 327	Matrix Numerical Analysis.	3
MATH 417	Linear Optimization.	3
MATH 478	Computational Methods in Applied Mathematics .	3

6 credits from the following:

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Course	Title	Credits
MECH 513	Control Systems.	3
MECH 546	Finite Element Methods in Solid Mechanics.	3
MECH 559	Engineering Systems Optimization.[1]	3
MECH 562	Advanced Fluid Mechanics.	3
MECH 578	Advanced Thermodynamics.	3
MECH 579	Multidisciplinary Design Optimization.[1]	3

[1] Note: Students select either MECH 559 Engineering Systems Optimization. or MECH 579 Multidisciplinary Design Optimization..

6 credits at the 300 level or higher, chosen from Mechanical Engineering courses (subject code MECH). One of these two courses (3 credits) must be from the following list:

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Course	Title	Credits
CHEE 563	Biofluids and Cardiovascular Mechanics.[1]	3
MECH 497	Value Engineering.	3
MECH 498	Interdisciplinary Design Project 1.	3
MECH 499	Interdisciplinary Design Project 2.	3
MECH 513	Control Systems.	3
MECH 530	Mechanics of Composite Materials.	3
MECH 532	Aircraft Performance, Stability and Control.	3
MECH 535	Turbomachinery and Propulsion.	3
MECH 536	Aerospace Structures.	3
MECH 543	Design with Composite Materials.	3
MECH 544	Processing of Composite Materials.	3
MECH 553	Design and Manufacture of Microdevices.	3
MECH 559	Engineering Systems Optimization.	3
MECH 560	Eco-design and Product Life Cycle Assessment .	3
MECH 563	Biofluids and Cardiovascular Mechanics.[1]	3
MECH 564	Thermal Radiation and Solar Energy Systems.	3
MECH 565	Fluid Flow and Heat Transfer Equipment.	3
MECH 573	Mechanics of Robotic Systems.	3

[1] Students choose either CHEE 563 Biofluids and Cardiovascular Mechanics. or MECH 563 Biofluids and Cardiovascular Mechanics.

3 credits chosen from courses at the 300-level or higher (approved by the Department) in the Faculty of Engineering (including MECH courses) or fromMIME 260 Materials Science and Engineering. or from courses at the 300 level or higher in the Faculty of Science, including MATH courses.

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 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 one of 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.

Typical Program of Study

Students entering the program from CEGEP follow a different course of study from those entering from out of province. Students will be advised by the Department as to which courses they should select from the course lists above.

For a detailed curriculum, see http://www.mcgill.ca/mecheng/undergrad/curriculum.

For all minors and concentrations, students should complete a Course Authorization Form, available from the McGill Engineering Student Centre (Student Affairs Office) (Frank Dawson Adams Building, Room 22) or from the Undergraduate Program Coordinator, indicating their intention to take the minor or concentration.