GLOBAL ENGINEERING (B.G.E.) (127 CREDITS)

Offered by: Engineering - Dean's Office (Faculty of Engineering)
Degree: Bachelor of Global Engineering
Program credit weight: 120-127 credits

Program Description

The Bachelor of Global Engineering is designed to provide a combination of hard, technical skills in science and engineering, combined with soft, non-technical skills in the humanities, business/management, and languages. The program focuses on: 1) a strong foundation in mathematics, and all three principal scientific disciplines (physics, chemistry and biology), and 2) specialized engineering training in one of nine streams (Breadth, Biological, Chemical, Civil, Data Science, Electrical, Entrepreneurship, Materials and Mechanical). Moreover, the program is offered, by design, in an international setting (two years at CentraleSupélec in France, and two years at McGill University in Canada), to provide training in the solution of complex scientific/engineering problems that can be undertaken in interdisciplinary teams, in global settings.

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.

Years 0 and 1 of the program take place at CentraleSupélec, in France. Years 2 and 3 of the program take place at McGill University, in Canada.

Required Year 0 and Year 1 Courses

60 credits (120 ECTS credits)

The following required Year 0 and Year 1 courses will be taken at CentraleSupélec, in France.

ACE211 Introduction to Automation and Control (3 ECTS)
ACE212 Robotics Bootcamp (3 ECTS)
BIO111 Cell Biology (3 ECTS)
BIO121 Genetics (2.5 ECTS)
BIO211 Introduction to Bioengineering (2.5 ECTS)
BIO221 Ecosystems and Biodiversity (2 ECTS)
CHEM111 General Chemistry (1 ECTS)
CHEM112 Chemistry of Solutions (1.5 ECTS)
CHEM121 Oxidation, Reduction and Electrochemistry (1.5 ECTS)
CHEM211 Thermochemistry (1.5 ECTS)
CSE111 Introduction to Programming (2 ECTS)
CSE112 Coding Week (3 ECTS)
CSE121 Algorithms (1.5 ECTS)
CSE122 Fundamentals of Programming (1.5 ECTS)
CSE221 Advanced Programming (1.5 ECTS)
CSE222 Machine Learning (1.5 ECTS)
ECO221 Organizational Behaviour Week (1 ECTS)
ECO222 Economics of Corporations (2 ECTS)
ECO223 Business Games Week (1 ECTS)
EE221 Elective (2 ECTS)
HSS111 Philosophy, Ethics and Critical Thinking (2 ECTS)
HSS121 Topics in International Sustainable Development (2 ECTS)
HSS211 Perspectives of Modern Geopolitics (2 ECTS)
HSS221 Structure of Corporations (2 ECTS)
INTERN121 Internship - Social and Environmental Community Internship (SECI) (2.5 ECTS)
INTERN 221 Internship - Enterprise Discovery Internship (EDI) (2.5 ECTS)
MAA111 Analysis 1 (3.5 ECTS)
MAA112 Analysis 2 (3.5 ECTS)
MAA121 Analysis 3 (3.5 ECTS)
MAA122 Probability (3.5 ECTS)
MAA211 Linear Algebra (3.5 ECTS)
MAA212 Topology and Functional Analysis (3.5 ECTS)
MAA221 Numerical Analysis (3 ECTS)
MAA222 Continuous Probability and Introduction to Statistical Modelling (3 ECTS)
ML111 Modern Languages 1 (1.5 ECTS)
ML121 Modern Languages 2 (1.5 ECTS)
ML211 Modern Languages 3 (1.5 ECTS)
ML221 Modern Languages 4 (1.5 ECTS)
MOD111 Introduction to Modelling (3 ECTS)
MOD211 Data and Modelling Week (3 ECTS)
PHY111 Mechanics (3 ECTS)
PHY112 Electric Circuits (2.5 ECTS)
PHY121 Thermodynamics (2.5 ECTS)
PHY122 Physics of Waves (2.5 ECTS)
PHY211 Electromagnetism and Conduction (3 ECTS)
PHY212 Electromagnetism and Waves (3 ECTS)
PHY221 Waves and Optics (2.5 ECTS)
PM121 Project Management 1 (1.5 ECTS)
PM122 Project Management 2 (1.5 ECTS)
PRO121 Short Project - Sustainable Development (1.5 ECTS)
PRO221 Research Project (4 ECTS)
SP111 Sport 1 (0.5 ECTS)
SP121 Sport 2 (0.5 ECTS)
SP211 Sport 3 (0.5 ECTS)
SP221 Sport 4 (0.5 ECTS)

Year 2 and Year 3 Courses

60-67 credits

The following Year 2 and Year 3 courses will be taken at McGill University.

Required Non-Departmental Courses

6 credits

Expand allContract all

Course	Title	Credits
INTG 215	Entrepreneurship Essentials for Non-Management Students.	3
WCOM 206	Communication in Engineering.	3

Required Faculty of Engineering Courses

4 credits

Expand allContract all

Course	Title	Credits
FACC 200	Industrial Practicum 1.	0
FACC 250	Responsibilities of the Professional Engineer.	0
FACC 300	Engineering Economy.	3
FACC 400	Engineering Professional Practice.	1

Complementary Courses (50-57 credits)

Global Engineering Technical Complementary Courses

41-53 credits

Upon their arrival at McGill in the third year, each student will take 41-53 credits in one of nine streams:

1. Breadth (p. 2)
2. Biological (p. 2)
3. Chemical (p. 2)
4. Civil (p. 3)
5. Data Science (p. 3)
6. Electrical (p. 3)
7. Entrepreneurship (p. 4)
8. Materials (p. 4)
9. Mechanical (p. 4)

The choice of stream will have been determined in advance, at the end of their second year of studies at CentraleSupélec. All streams have (stream-specific) core courses. Some streams have stream-specific technical complementaries and/or sustainability complementaries.

Stream 1: Breadth

45-48 credits (14 courses) must be taken, chosen as follows:
30 credits (9 courses) from List A
9-11 credits (3 courses) from List B
6-7 credits (2 courses) from List C

List A: Breadth Stream Core

30 credits

Expand allContract all

Course	Title	Credits
BIEN 219	Introduction to Physical Molecular and Cell Biology.	4
CHEE 231	Data Analysis and Design of Experiments.	3
CIVE 207	Solid Mechanics.	4
ECSE 206	Introduction to Signals and Systems.	3
FACC 463D1	Engineering Design Project.	3
FACC 463D2	Engineering Design Project.	3
MECH 220	Mechanics 2.	4
MECH 309	Numerical Methods in Mechanical Engineering.	3
MIME 260	Materials Science and Engineering.[1]	3
MIME 261	Structure of Materials.[1]	3

[1] If chosen, students select either MIME 260 or MIME 261.

List B: Breadth Stream Technical Complementaries

9-11 credits

Expand allContract all

Course	Title	Credits
BIEN 320	Molecular, Cellular and Tissue Biomechanics.	3
CHEE 370	Elements of Biotechnology.	3
ECSE 308	Introduction to Communication Systems and Networks.	4
ECSE 353	Electromagnetic Fields and Waves.	3
MECH 331	Fluid Mechanics 1.	3
MIME 356	Heat, Mass and Fluid Flow.	4

List C: Breadth Stream Sustainability Complementaries

6-7 credits

Expand allContract all

Course	Title	Credits
SEAD 500	Foundations of Sustainability for Engineering and Design.	3
SEAD 510	Energy Analysis.	4
SEAD 515	Climate Change Adaptation and Engineering Infrastructure .	3
SEAD 550	Decision-Making for Sustainability in Engineering and Design.	3

Stream 2: Biological

41 credits

Expand allContract all

Course	Title	Credits
BIEN 210	Electrical and Optical Properties of Biological Systems.	3
BIEN 219	Introduction to Physical Molecular and Cell Biology.	4
BIEN 267	Bioanalytical Methods in Bioengineering.	3
BIEN 290	Bioengineering Measurement Laboratory.	3
BIEN 300	Thermodynamics in Bioengineering.	3
BIEN 314	Transport Phenomena in Biological Systems 1.	3
BIEN 340	Transport Phenomena in Biological Systems 2.	3
BIEN 350	Biosignals, Systems and Control.	4
BIEN 360	Physical Chemistry in Bioengineering.	3
BIEN 390	Bioengineering Laboratory.	3
BIEN 420	Biodevices Design for Diagnostics and Screening.	3
BIEN 470D1	Bioengineering Design Project.	3
BIEN 470D2	Bioengineering Design Project.	3

Stream 3: Chemical

44 credits

Expand allContract all

Course	Title	Credits
CHEE 200	Chemical Engineering Principles 1.	3
CHEE 204	Chemical Engineering Principles 2.	3
CHEE 220	Chemical Engineering Thermodynamics.	3
CHEE 291	Instrumentation and Measurement 1.	4
CHEE 314	Fluid Mechanics.	3
CHEE 315	Heat and Mass Transfer.	3
CHEE 351	Separation Processes.	3
CHEE 380	Materials Science.	3
CHEE 390	Computational Methods in Chemical Engineering.	3
CHEE 423	Chemical Reaction Engineering.	3
CHEE 453	Process Design.	4
CHEM 234	Topics in Organic Chemistry.	3
FACC 463D1	Engineering Design Project.	3
FACC 463D2	Engineering Design Project.	3

Stream 4: Civil

47 credits

Expand allContract all

Course	Title	Credits
CIVE 202	Construction Materials.	4
CIVE 207	Solid Mechanics.	4
CIVE 225	Environmental Engineering.	4
CIVE 311	Geotechnical Mechanics.	4
CIVE 317	Structural Engineering 1.	3
CIVE 318	Structural Engineering 2.	3
CIVE 319	Transportation Engineering.	3
CIVE 323	Hydrology and Water Resources.	3
CIVE 324	Sustainable Project Management.	3
CIVE 327	Fluid Mechanics and Hydraulics.	4
EPSC 221	General Geology.	3
FACC 463D1	Engineering Design Project.	3
FACC 463D2	Engineering Design Project.	3
MECH 289	Design Graphics.	3

Stream 5: Data Science

43-44 credits

Expand allContract all

Course	Title	Credits
COMP 251	Algorithms and Data Structures.	3
COMP 360	Algorithm Design.	3
COMP 421	Database Systems.	3
ECSE 223	Model-Based Programming.	3
ECSE 321	Introduction to Software Engineering.	3
ECSE 343	Numerical Methods in Engineering.	3
ECSE 428	Software Engineering Practice.	3
ECSE 458D1	Capstone Design Project.	3
ECSE 458D2	Capstone Design Project.	3
ECSE 507	Optimization and Optimal Control.[1]	3
ECSE 509	Probability and Random Signals 2.	3
ECSE 526	Artificial Intelligence.[2]	3
ECSE 551	Machine Learning for Engineers.[2]	4
ECSE 552	Deep Learning.	4
MATH 240	Discrete Structures.	3
MECH 559	Engineering Systems Optimization.[1]	3
MECH 579	Multidisciplinary Design Optimization.[1]	3

1 If chosen, students select one of ECSE 507, MECH 559 or MECH 579.

2 If chosen, students select either one of ECSE 526 or ECSE 551.

Stream 6: Electrical

47-48 credits (14 courses) must be taken, chosen as follows:

44 credits (13 courses) from List A
3-4 credits (1 course) from List B

List A: Electrical Stream Core

44 credits

Expand allContract all

Course	Title	Credits
ECSE 206	Introduction to Signals and Systems.	3
ECSE 210	Electric Circuits 2.	3
ECSE 222	Digital Logic.	3
ECSE 307	Linear Systems and Control.	4
ECSE 308	Introduction to Communication Systems and Networks.	4
ECSE 324	Computer Organization.	4
ECSE 331	Electronics.	4
ECSE 343	Numerical Methods in Engineering.	3
ECSE 353	Electromagnetic Fields and Waves.	3
ECSE 362	Fundamentals of Power Engineering.	4
ECSE 412	Discrete Time Signal Processing.	3
ECSE 458D1	Capstone Design Project.	3
ECSE 458D2	Capstone Design Project.	3

List B: Electrical Stream Technical Complementaries

3-4 credits

Expand allContract all

Course	Title	Credits
COMP 417	Introduction Robotics and Intelligent Systems.	3
ECSE 335	Microelectronics.	4
ECSE 403	Control.[1]	4
ECSE 408	Communication Systems.	4
ECSE 416	Telecommunication Networks.	4
ECSE 433	Physical Basis of Transistor Devices.	4

ECSE 444	Microprocessors.	4
ECSE 470	Electromechanical and Static Conversion Systems.	4
MECH 412	System Dynamics and Control.[1]	3
MECH 572	Mechanics and Control of Robotic Manipulators.	3
MECH 573	Mechanics of Robotic Systems.	3
MIME 262	Properties of Materials in Electrical Engineering.	3

[1] If chosen, students select one of ECSE 403 or MECH 412.

Stream 7: Entrepreneurship

53 credits (16 courses) must be taken, chosen as follows:
50 credits (15 courses) from List A
3 credits (1 course) from List B

List A: Entrepreneurship Stream Core

50 credits

Expand allContract all

Course	Title	Credits
BIEN 310	Introduction to Biomolecular Engineering.	3
CHEE 231	Data Analysis and Design of Experiments.	3
CIVE 207	Solid Mechanics.	4
ECSE 206	Introduction to Signals and Systems.	3
ECSE 308	Introduction to Communication Systems and Networks.	4
FACC 463D1	Engineering Design Project.	3
FACC 463D2	Engineering Design Project.	3
FACC 500	Technology Business Plan Design.	3
FACC 501	Technology Business Plan Project.	3
MECH 220	Mechanics 2.	4
MECH 289	Design Graphics.	3
MGPO 362	Fundamentals of Entrepreneurship.	3
MIME 260	Materials Science and Engineering.[1]	3
MIME 261	Structure of Materials.[1]	3
MIME 356	Heat, Mass and Fluid Flow.	4
MECH 309	Numerical Methods in Mechanical Engineering.	3

[1] If chosen, students select either MIME 260 or MIME 261.

List B: Entrepreneurship Stream Technical Complementaries

3 credits

Expand allContract all

Course	Title	Credits
BUSA 465	Technological Entrepreneurship.	3
LAWG 570	Innovation for Non-Law Students.	3
MGPO 364	Entrepreneurship in Practice.	3
MGPO 438	Social Entrepreneurship and Innovation.	3
ORGB 321	Leadership.	3

Stream 8: Materials

46 credits (15 courses) must be taken, chosen as follows:

40 credits (13 courses) from List A
6 credits (2 courses) from List B

List A: Materials Stream Core

40 credits

Expand allContract all

Course	Title	Credits
FACC 463D1	Engineering Design Project.	3
FACC 463D2	Engineering Design Project.	3
MECH 290	Design Graphics for Mechanical Engineering.	3
MIME 212	Engineering Thermodynamics.	3
MIME 250	Introduction to Extractive Metallurgy.	3
MIME 261	Structure of Materials.	3
MIME 311	Modelling and Automatic Control.	3
MIME 317	Analytical and Characterization Techniques.	3
MIME 341	Introduction to Mineral Processing.	3
MIME 352	Hydrochemical Processing.	3
MIME 356	Heat, Mass and Fluid Flow.	4
MIME 360	Phase Transformations: Solids.	3
MIME 455	Advanced Process Engineering.	3

List B: Materials Stream Technical Complementaries

6 credits

Expand allContract all

Course	Title	Credits
MIME 345	Applications of Polymers.	3
MIME 350	Extractive Metallurgical Engineering.	3
MIME 362	Mechanical Properties.	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

Stream 9: Mechanical

44-46 credits (14 courses) must be taken, chosen as follows:

38 credits (12 courses) from List A
6-8 credits (2 courses) from List B

List A: Mechanical Stream Core

8 credits

Expand allContract all

Course	Title	Credits
CIVE 207	Solid Mechanics.	4
ECSE 206	Introduction to Signals and Systems.	3
MECH 220	Mechanics 2.	4
MECH 262	Statistics and Measurement Laboratory.	3
MECH 290	Design Graphics for Mechanical Engineering.	3
MECH 309	Numerical Methods in Mechanical Engineering.	3

MECH 331	Fluid Mechanics 1.	3
MECH 360	Principles of Manufacturing.	3
MECH 393	Design 2: Machine Element Design.	3
MECH 463D1	Design 3: Mechanical Engineering Project.	3
MECH 463D2	Design 3: Mechanical Engineering Project.	3
MIME 260	Materials Science and Engineering.	3

List B: Mechanical Stream Technical Complementaries

6-8 credits

Expand allContract all

Course	Title	Credits
COMP 417	Introduction Robotics and Intelligent Systems.	3
ECSE 307	Linear Systems and Control.	4
ECSE 461	Electric Machinery.	3
MECH 292	Design 1: Conceptual Design.	3
MECH 314	Dynamics of Mechanisms.	3
MECH 315	Mechanics 3.	4
MECH 321	Mechanics of Deformable Solids.	3
MECH 341	Thermodynamics 2.	3
MECH 346	Heat Transfer.	3
MECH 383	Applied Electronics and Instrumentation.	3
MECH 412	System Dynamics and Control.	3
MECH 572	Mechanics and Control of Robotic Manipulators.	3
MECH 573	Mechanics of Robotic Systems.	3

Complementary Studies

3-9 credits

Group A – Impact of Technology on Society (All streams)

3 credits from the following:

Expand allContract all

Course	Title	Credits
ANTH 212	Anthropology of Development.	3
BTEC 502	Biotechnology Ethics and Society.	3
CIVE 469		
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 (All streams except Entrepreneurship stream)

0-6 credits

Students in all streams except the Entrepreneurship stream must take 6 credits at the 200 level or higher from the following departments:

Anthropology (ANTH)
Economics (ECON; any 200- or 300-level course excluding ECON 227 and ECON 337)
History (HIST)
Philosophy (PHIL; excluding PHIL 210 and PHIL 310)
Political Science (POLI)
Psychology (PSYC; excluding PSYC 204 and PSYC 305, but including PSYC 100)
Religious Studies (RELG; excluding courses that principally impart language skills, such as Sanskrit, Tibetan, Tamil, New Testament Greek, and Biblical Hebrew)**
School of Social Work (SWRK)
Sociology (SOCI; excluding SOCI 350)

OR from the following courses:

Expand allContract all

Course	Title	Credits
ARCH 528	History of Housing.	3
BUSA 465	Technological Entrepreneurship.[1]	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.[1]	3
MATH 338	History and Philosophy of Mathematics.	3
MGCR 222	Introduction to Organizational Behaviour.[1]	3
MGCR 352	Principles of Marketing.[1]	3
ORGB 321	Leadership.[1]	3
ORGB 423	Human Resources Management.[1]	3

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

**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.

Note regarding language courses: Language courses are not accepted to satisfy the Complementary Studies Group B requirement.