ELECTRICAL ENGINEERING HONOURS (B.ENG.) (138 CREDITS)

Offered by: Electrical & Computer Engr (Faculty of Engineering)
Degree: Bachelor of Engineering
Program credit weight: 138 credits

Program Description

Program credit weight: 138-141 credits
Program credit weight for Quebec CEGEP students: 113-116 credits

Entry into the Electrical Engineering Honours Program

The Honours program is a limited enrolment program and entry is highly competitive. There is no direct entry to the Honours program in the first year. Students may enter the Honours program in the following ways:

- Students from CEGEP will be admitted, on the basis of their grades, at the start of the third term.
- Students from outside Quebec will be admitted, on the basis of their grades, at the start of the fifth term.

To remain in the Honours program and to be awarded the Honours degree, a student must have completed at least 14 credits in each term since entering Electrical and Computer Engineering, except for the final two terms of their degree, and maintained a CGPA of at least 3.30 since entering Electrical and Computer Engineering. In either of their final two full terms (i.e., Fall and Winter, or Winter and Fall) students may drop below 14 credits, provided the combined load for the two terms is at least 16 credits. For more information, please contact the Departmental office at 514-398-3943.

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 (25 credits)

Note: Students in the Honours Electrical Engineering program complete the Year 0 (Freshman) courses before entering the Honours program, as explained above.

Generally, students admitted to Engineering from Quebec CEGEPs are granted transfer credit for these Year 0 (Freshman) courses and enter a 113- to 116-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.

Expand allContract all

Course	Title	Credits
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 (26 credits)

Expand allContract all

Course	Title	Credits
CIVE 281	Analytical Mechanics.	3
COMP 202	Foundations of Programming.	3
COMP 206	Introduction to Software Systems.	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
MIME 262	Properties of Materials in Electrical Engineering.	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 Electrical Engineering Courses (61 credits)

Expand allContract all

Course	Title	Credits
ECSE 200	Electric Circuits 1.	3
ECSE 205	Probability and Statistics for Engineers	3
ECSE 206	Introduction to Signals and Systems.	3
ECSE 210	Electric Circuits 2.	3
ECSE 211	Design Principles and Methods.	3
ECSE 222	Digital Logic.	3
ECSE 250	Fundamentals of Software Development.	3
ECSE 251	Electric and Magnetic Fields.	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 354	Electromagnetic Wave Propagation.	4
ECSE 362	Fundamentals of Power Engineering.	4
ECSE 396	Honours Research Laboratory Rotation 1.	1
ECSE 397	Honours Research Laboratory Rotation 2.	1
ECSE 478D1	Electrical Engineering Honours Thesis.	3
ECSE 478D2	Electrical Engineering Honours Thesis.	3
ECSE 496	Honours Research Laboratory Rotation 3.	1
ECSE 497	Honours Research Laboratory Rotation 4.	1

Note: ECSE 478N1 Electrical Engineering Honours Thesis. and ECSE 478N2 Electrical Engineering Honours Thesis. can be taken instead of ECSE 478D1 Electrical Engineering Honours Thesis. and ECSE 478D2 Electrical Engineering Honours Thesis..

Complementary Courses (23-26 credits)

Technical Complementaries

17-20 credits (5 courses) must be taken, chosen as follows:

8 credits (2 courses) from List A

6-8 credits (2 courses) from 500-level ECSE courses

3-4 credits (1 course) from List A, List B, List C or from 500-level ECSE courses

List A: Technical Complementaries with Laboratory Experience

8-12 credits from the following:

Expand allContract all

Course	Title	Credits
ECSE 335	Microelectronics.	4
ECSE 403	Control.[1]	4
ECSE 408	Communication Systems.[2]	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

1 ECSE 403 Control. and ECSE 501 Linear Systems. cannot both be taken.

2 ECSE 408 Communication Systems. and ECSE 511 Introduction to Digital Communication. cannot both be taken.

List B: Technical Complementaries (0-3 credits)

Expand allContract all

Course	Title	Credits
ECSE 310	Thermodynamics of Computing.	3
ECSE 325	Digital Systems.	3
ECSE 415	Introduction to Computer Vision.	3
ECSE 420	Parallel Computing.	3
ECSE 421	Embedded Systems.	3
ECSE 422	Fault Tolerant Computing.	3
ECSE 424	Human-Computer Interaction.	3
ECSE 425	Computer Architecture.	3
ECSE 427	Operating Systems.	3
ECSE 435	Mixed-Signal Test Techniques.	3
ECSE 446	Realistic Image Synthesis.	3
ECSE 451	EM Transmission and Radiation.	3
ECSE 460	Appareillage électrique (Electrical Power Equipment).[1]	3
ECSE 464	Power Systems Analysis.	3
ECSE 467	Comportement des réseaux électriques.[1]	3
ECSE 468	Electricité industrielle (Industrial Power Systems).[1]	3
ECSE 469	Protection des réseaux électriques.[1]	3

1 Courses taught in French

List C: Non-departmental Complementary Courses (0-4 credits)

Expand allContract all

Course	Title	Credits
COMP 445	Computational Linguistics.	3
COMP 549	Brain-Inspired Artificial Intelligence.	3
COMP 550	Natural Language Processing.	3
COMP 551	Applied Machine Learning.	4
COMP 562	Theory of Machine Learning.	4
COMP 579	Reinforcement Learning.	4
MATH 247	Honours Applied Linear Algebra.	3
MATH 249	Honours Complex Variables.	3
MATH 547	Stochastic Processes.	4
PHYS 357	Honours Quantum Physics 1.	3
PHYS 434	Optics.	3
PHYS 457	Honours Quantum Physics 2.	3
PHYS 558	Solid State Physics.	3

Complementary Studies (6 credits)

Group A - Impact of Technology on Society

3 credits from the following:

Expand allContract all

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 https://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:

Expand allContract all

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.	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.

Elective Course (3 credits)

One 3-credit course at the 200-level or higher from any department at McGill, approved by the Undergraduate Programs Office in the Department of Electrical and Computer Engineering.