

Breadth stream

Courses in this stream are taken from multiple departments in the McGill Faculty of Engineering, as well as the Trottier Institute for Sustainability in Engineering and Design. It offers a broad spectrum of elective courses drawn from the key courses of McGill's traditional specializations in engineering, emphasizing introductory courses on sustainability issues in engineering ("sustainability for engineering").

Breadth stream		
Year 3	Fall semester (S5)	<i>Introduction to Biomolecular Engineering (BIEN 310)</i>
		<i>Introduction to Signals and Systems (ECSE 206)</i>
		<i>Mechanics 2 (Kinematics) (MECH 220)</i>
		<i>Communication in Engineering (CCOM 206)</i>
		<i>Integrated Management Essentials 1 (INTG 201)</i>
	Winter semester (S6)	<i>Data Analysis and Design of Experiments (CHEE 231)</i>
		<i>Solid Mechanics (CIVE 207)</i>
		<i>Responsibilities of the Professional Engineer (FACC 250)</i>
		<i>Engineering Economy (FACC 300)</i>
		<i>Integrated Management Essentials 2 (INTG 202)</i>
	<i>Humanities Elective 1 (HE1)</i>	
Year 4	Fall semester (S7)	<i>TE1 (see below)</i>
		<i>TE2 (see below)</i>
		<i>Numerical Methods in Mechanical Engineering (MECH 309)</i>
		<i>Engineering Design Project 1 (FACC 463D1)</i>
		<i>SE1 (see below)</i>
	Winter semester (S8)	<i>Humanities Elective 2 (HE2)</i>
		<i>TE3 (see below)</i>
		<i>SE2 (see below)</i>
		<i>Engineering Professional Practice (FACC 400)</i>
		<i>Engineering Design Project 2 (FACC 463D2)</i>
	<i>Humanities Elective 3 (HE3)</i>	
Technical elective courses (TE)	<i>Elements of Biotechnology (CHEE 370)</i>	
	<i>Introduction to Communication Systems and Networks (ECSE 308)</i>	
	<i>Materials Science and Engineering (MIME 260) or Structure of Materials (MIME261)</i>	
	<i>Heat, Mass and Fluid Flow (MIME 356)</i>	
	<i>Electric and Magnetic Fields (ECSE 353)</i>	
Elective courses "sustainability for engineering" (SE)	<i>Foundations of Sustainability for Engineering and Design (SEAD 500)</i>	
	<i>Energy Analysis (SEAD 510)</i>	
	<i>Climate Change Adaptation and Engineering Infrastructure (SEAD 515)</i>	
	<i>Decision-Making for Sustainability in Engineering and Design (SEAD 550)</i>	

Bioengineering stream

The design of this stream is inspired by the new “Bachelor of Bioengineering” created by the McGill Faculty of Engineering five years ago. This stream is designed to offer a wide choice of elective courses covering most of McGill’s areas of its Bioengineering undergraduate program.

Bioengineering stream		
Year 3	Fall semester (S5)	<i>Introduction to Biomolecular Engineering (BIEN 310)</i>
		<i>Bioengineering Measurement Laboratory (BIEN 290)</i>
		<i>Introduction to Bioengineering (BIEN 200)</i>
		<i>Communication in Engineering (CCOM 206)</i>
		<i>Integrated Management Essentials 1 (INTG 201)</i>
	Winter semester (S6)	<i>Physical Chemistry in Bioengineering (BIEN 360)</i>
		<i>Electrical and Optical Properties of Biological Systems (BIEN 210)</i>
		<i>Responsibilities of the Professional Engineer (FACC 250)</i>
		<i>Engineering Economy (FACC 300)</i>
		<i>Integrated Management Essentials 2 (INTG 202)</i>
		<i>Humanities Elective 1 (HE1)</i>
Year 4	Fall semester (S7)	<i>Transport Phenomena in Biological Systems 1 (BIEN 314)</i>
		<i>Tissue Engineering and Regenerative Medicine (BIEN 330)</i>
		<i>Computational Methods in Biomolecular Engineering (BIEN 410)</i>
		<i>Bioengineering Design Project (BIEN 470D1)</i>
		<i>Humanities Elective 2 (HE2)</i>
	Winter semester (S8)	<i>Transport Phenomena in Biological Systems 2 (BIEN 340)</i>
		<i>TE1 (see below)</i>
		<i>TE2 (see below)</i>
		<i>Engineering Professional Practice (FACC 400)</i>
		<i>Bioengineering Design Project (BIEN 470D2)</i>
		<i>Humanities Elective 3 (HE3)</i>
Technical elective courses (TE)		<i>Molecular, Cellular, and Tissue Biomechanics (BIEN 320)</i>
		<i>Biosystems and Control (BIEN 350)</i>
		<i>Bioengineering Laboratory (BIEN 390)</i>
		<i>Biodevices Design for Diagnostics and Screening (BIEN 420)</i>
		<i>Engineering Principles in Physiological Systems (BIEN 462)</i>
		<i>Engineered Nanomaterials for Biomedical Applications (BIEN 510)</i>
		<i>High Throughput Bioanalytical Devices (BIEN 520)</i>
		<i>Imaging and Bioanalytical Instrumentation (BIEN 530)</i>
		<i>Information Storage and Processing in Biological Systems (BIEN 540)</i>
		<i>Biomolecular Devices (BIEN 550)</i>
		<i>Design of Biosensors (BIEN 560)</i>
		<i>Active Mechanics in Biology (BIEN 570)</i>
		<i>Cell Culture Engineering (BIEN 590)</i>
		<i>Bio-environmental engineering (BREE 327)</i>
	<i>Engineering for sustainability (BREE 420)</i>	

	<i>Biological material properties (BREE 423)</i>
	<i>Ecological engineering (BREE 518)</i>
	<i>Bio-based polymers (BREE 522)</i>
	<i>Elements of Biotechnology (CHEE 370)</i>
	<i>Biofluids and Cardiovascular Mechanics (MECH 563) or Biofluids and Cardiovascular Mechanics (CHEE 563)</i>
	<i>Mechanics of Biological Materials (MECH 547)</i>
	<i>Nanosciences and nanotechnology (PHYS 534)</i>

Chemical Engineering stream

The courses in this stream are principally from the Department of Chemical Engineering of McGill's Faculty of Engineering. It includes a selection of key courses from McGill's Chemical Engineering undergraduate program.

Chemical engineering stream		
Year 3	Fall semester (S5)	<u>Chemical Engineering Principles 1 (CHEE 200)</u>
		<u>Instrumentation and Measurement 1 (CHEE 291)</u>
		<u>Materials Science (CHEE 380)</u>
		<u>Communication in Engineering (CCOM 206)</u>
		<u>Integrated Management Essentials 1 (INTG 201)</u>
	Winter semester (S6)	<u>Chemical Engineering Principles 2 (CHEE 204)</u>
		<u>Topics in Organic Chemistry (CHEM 234)</u>
		<u>Responsibilities of the Professional Engineer (FACC 250)</u>
		<u>Engineering Economy (FACC 300)</u>
		<u>Integrated Management Essentials 2 (INTG 202)</u>
	<u>Humanities Elective 1 (HE1)</u>	
Year 4	Fall semester (S7)	<u>Fluid Mechanics (CHEE 314)</u>
		<u>Process Design (CHEE 453)</u>
		<u>Computational Methods in Chemical Engineering (CHEE 390)</u>
		<u>Chemical Reaction Engineering (CHEE 423)</u>
		<u>Engineering Design Project 1 (FACC 463D1)</u>
	Winter semester (S8)	<u>Heat and Mass Transfer (CHEE 315)</u>
		<u>Separation Processes (CHEE 351)</u>
		<u>Engineering Professional Practice (FACC 400)</u>
		<u>Engineering Design Project 2 (FACC 463D2)</u>
		<u>Humanities Elective 2 (HE2)</u>
	<u>Humanities Elective 3 (HE3)</u>	

Civil Engineering stream

The courses in this stream are principally from the Department of Civil Engineering of McGill's Faculty of Engineering. It includes a selection of key courses from McGill's Civil Engineering undergraduate program.

Civil engineering stream		
Year 3	Fall semester (S5)	<u>Solid Mechanics (CIVE 207)</u>
		<u>Design Graphics (MECH 289)</u>
		<u>Humanities Elective 1 (HE1)</u>
		<u>Communication in Engineering (CCOM 206)</u>
		<u>Integrated Management Essentials 1 (INTG 201)</u>
	Winter semester (S6)	<u>Construction Materials (CIVE 202)</u>
		<u>Environmental Engineering (CIVE 225)</u>
		<u>Transportation Engineering (CIVE 319)</u>
		<u>Responsibilities of the Professional Engineer (FACC 250)</u>
		<u>Engineering Economy (FACC 300)</u>
<u>Integrated Management Essentials 2 (INTG 202)</u>		
Year 4	Fall semester (S7)	<u>Structural Engineering 1 (CIVE 317)</u>
		<u>Geotechnical Mechanics (CIVE 311)</u>
		<u>Numerical Methods (CIVE 320)</u>
		<u>Engineering Design Project 1 (FACC 463D1)</u>
		<u>Humanities Elective 2 (HE2)</u>
	Winter semester (S8)	<u>Fluid Mechanics and Hydraulics (CIVE 327)</u>
		<u>TE1 (see below)</u>
		<u>TE2 (see below)</u>
		<u>Engineering Professional Practice (FACC 400)</u>
		<u>Engineering Design Project 2 (FACC 463D2)</u>
<u>Humanities Elective 3 (HE3)</u>		
Technical elective courses (TE)	<u>Dynamics (CIVE 206)</u>	
	<u>Probabilistic Systems (CIVE 302)</u>	
	<u>Structural Engineering 2 (CIVE 318)</u>	
	<u>Geotechnical Engineering (CIVE 416)</u>	

Data Science stream

The courses in this stream are principally from the Department of Electrical & Computer Engineering of McGill's Faculty of Engineering. This stream also includes several Software Engineering undergraduate courses offered by this department, as well as courses from the School of Computer Science in the McGill Faculty of Science.

Data science stream		
Year 3	Fall semester (S5)	<u>Discrete Structures 1 (MATH 240)</u>
		<u>Introduction to Software Engineering (ECSE 321)</u>
		<u>Algorithms and Data Structures (COMP 251)</u>
		<u>Communication in Engineering (CCOM 206)</u>
		<u>Integrated Management Essentials 1 (INTG 201)</u>
	Winter semester (S6)	<u>Model-Based Programming (ECSE 223)</u>
		<u>Programming Languages and Paradigms (COMP 302)</u>
		<u>Responsibilities of the Professional Engineer (FACC 250)</u>
		<u>Engineering Economy (FACC 300)</u>
		<u>Integrated Management Essentials 2 (INTG 202)</u>
		<u>Humanities Elective 1 (HE1)</u>
Year 4	Fall semester (S7)	<u>Database Systems (COMP 421)</u>
		<u>Probability and Random Signals 2 (ECSE 509)</u>
		<u>Artificial Intelligence (ECSE 526)</u> or <u>Applied Machine Learning (COMP 551)</u> or <u>Machine Learning for Engineers (ECSE 551)</u>
		<u>ECSE Design Project 1 (ECSE 458D1)</u>
		<u>Humanities Elective 2 (HE2)</u>
	Winter semester (S8)	<u>Algorithm Design (COMP 360)</u>
		<u>Numerical Methods in Engineering (ECSE 343)</u>
		<u>Multidisciplinary Design Optimization (MECH 579)</u> or <u>Engineering Systems Optimization (MECH 559)</u> or <u>Optimization and Optimal Control (ECSE 507)</u>
		<u>Engineering Professional Practice (FACC 400)</u>
		<u>ECSE Design Project 2 (ECSE 458D2)</u>
		<u>Humanities Elective 3 (HE3)</u>

Electrical Engineering stream

The courses in this stream are principally from the Department of Electrical & Computer Engineering of McGill's Faculty of Engineering. It includes a selection of key courses from McGill's Electrical Engineering undergraduate program. This concentration is designed to offer the possibility of a specialization in robotics, if desired.

Electrical engineering stream		
Year 3	Fall semester (S5)	<u>Introduction to Signals and Systems (ECSE 206)</u>
		<u>Electric Circuits 2 (ECSE 210)</u>
		<u>Digital Logic (ECSE 222)</u>
		<u>Communication in Engineering (CCOM 206)</u>
		<u>Integrated Management Essentials 1 (INTG 201)</u>
	Winter semester (S6)	<u>Linear Systems and Control (ECSE 307)</u>
		<u>Electronics (ECSE 331)</u>
		<u>Responsibilities of the Professional Engineer (FACC 250)</u>
		<u>Engineering Economy (FACC 300)</u>
		<u>Integrated Management Essentials 2 (INTG202)</u>
	<u>Humanities Elective 1 (HE1)</u>	
Year 4	Fall semester (S7)	<u>Electric and Magnetic Fields (ECSE 353)</u>
		<u>Introduction to Communication Systems and Networks (ECSE 308)</u>
		<u>Computer Organization (ECSE 324)</u>
		<u>ECSE Design Project 1 (ECSE 458D1)</u>
		<u>Humanities Elective 2 (HE2)</u>
	Winter semester (S8)	<u>Numerical Methods in Engineering (ECSE 343)</u>
		<u>TE1 (see below)</u>
		<u>TE2 (see below)</u>
		<u>Engineering Professional Practice (FACC 400)</u>
		<u>ECSE Design Project 2 (ECSE 458D2)</u>
	<u>Humanities Elective 3 (HE3)</u>	
Technical elective courses (TE)	<u>Introduction Robotics and Intelligent Systems (COMP 417)</u>	
	<u>Design Principles and Methods (ECSE 211)</u>	
	<u>System Dynamics and Control (MECH 412)</u>	
	<u>Introduction to Robotics (MECH 572)</u>	
	<u>Mechanics of Robotic Systems (MECH 573)</u>	
	<u>Properties of Materials in Electrical Engineering (MIME 262)</u>	

Entrepreneurial stream

The courses in this stream involve many teaching departments, and also includes courses offered by the Desautels Faculty of Management. This stream is designed to offer an elective courses covering several aspects, including leadership, law and innovation. In addition, the final year “capstone design” project of the other streams is replaced by a project covering two courses (FACC 500 and FACC 501) focused on drafting, developing and composing a business plan for a client seeking to finance a new technology.

Entrepreneurship stream		
Year 3	Fall semester (S5)	<u>Introduction to Biomolecular Engineering (BIEN 310)</u>
		<u>Introduction to Signals and Systems (ECSE 206)</u>
		<u>Mechanics 2 (Kinematics) (MECH 220)</u>
		<u>Communication in Engineering (CCOM 206)</u>
		<u>Integrated Management Essentials 1 (INTG 201)</u>
	Winter semester (S6)	<u>Data Analysis and Design of Experiments (CHEE 231)</u>
		<u>Solid Mechanics (CIVE 207)</u>
		<u>Responsibilities of the Professional Engineer (FACC 250)</u>
		<u>Engineering Economy (FACC 300)</u>
		<u>Integrated Management Essentials 2 (INTG 202)</u>
	<u>Humanities Elective 1 (HE1)</u>	
Year 4	Fall semester (S7)	<u>Fundamentals of Entrepreneurship (MGPO 362)</u>
		<u>Introduction to Communication Systems and Networks (ECSE 308)</u>
		<u>Numerical Methods in Mechanical Engineering (MECH 309)</u>
		<u>Technology Business Plan Design (FACC 500)</u>
		<u>Humanities Elective 2 (HE2)</u>
	Winter semester (S8)	<u>Materials Science and Engineering (MIME 260) or Structure of Materials (MIME261)</u>
		<u>Heat, Mass and Fluid Flow (MIME 356)</u>
		<u>TE1 (see below)</u>
		<u>Engineering Professional Practice (FACC 400)</u>
		<u>Technology Business Plan Project (FACC 501)</u>
	<u>Humanities Elective 3 (HE3)</u>	
Technical elective courses (TE)	<u>Technological Entrepreneurship (BUSA 465)</u>	
	<u>Innovation for Non-Law Students (LAWG 570)</u>	
	<u>Entrepreneurship in Practice (MGPO 364)</u>	
	<u>Social Entrepreneurship and Innovation (MGPO 438)</u>	
	<u>Leadership (ORGB 321)</u>	

Materials Engineering stream

The courses in this stream are principally from the Department of Mining and Material Engineering of McGill's Faculty of Engineering. It includes a selection of key courses from McGill's Materials Engineering undergraduate program.

Materials engineering stream		
Year 3	Fall semester (S5)	<u>Structure of Materials (MIME 261)</u>
		<u>Extractive Metallurgical Engineering (MIME 350)</u>
		<u>Phase Transformation: Solids (MIME 360)</u>
		<u>Communication in Engineering (CCOM 206)</u>
		<u>Integrated Management Essentials 1 (INTG 201)</u>
	Winter semester (S6)	<u>Design Graphics for Mechanical Engineering (MECH 290)</u>
		<u>Applications of Polymers (MIME 345)</u>
		<u>Humanities Elective 1 (HE1)</u>
		<u>Humanities Elective 2 (HE2)</u>
		<u>Engineering Economy (FACC 300)</u>
	<u>Integrated Management Essentials 2 (INTG 202)</u>	
Year 4	Fall semester (S7)	<u>Analytical and Characterization Techniques (MIME 317)</u>
		<u>Heat, Mass and Fluid Flow (MIME 356)</u>
		<u>Hydrochemical Processing (MIME 352)</u>
		<u>Mechanical Properties (MIME 362)</u>
		<u>Engineering Design Project 1 (FACC 463D1)</u>
		<u>Responsibilities of the Professional Engineer (FACC 250)</u>
	Winter semester (S8)	<u>Introduction to Computational Materials Design (MIME 473)</u>
		<u>TE1 (see below)</u>
		<u>TE2 (see below)</u>
		<u>Engineering Professional Practice (FACC 400)</u>
<u>Engineering Design Project 2 (FACC 463D2)</u>		
	<u>Humanities Elective 3 (HE3)</u>	
Technical elective courses (TE)	<u>Modelling and Automatic Control (MIME 311)</u>	
	<u>Advanced Process Engineering (MIME 455)</u>	
	<u>Metallic and Ceramic Powders Processing (MIME 465)</u>	
	<u>Electronic Properties of Materials (MIME 467)</u>	
	<u>Engineering Biomaterials (MIME 470)</u>	

Mechanical Engineering stream

The courses in this stream are principally from the Department of Mechanical Engineering of McGill's Faculty of Engineering. It includes a selection of key courses from McGill's Mechanical Engineering undergraduate program. This concentration is designed to offer a wide choice of elective courses covering most of McGill's areas of specialization in its Mechanical Engineering undergraduate program.

Mechanical engineering stream		
Year 3	Fall semester (S5)	<u>Introduction to Signals and Systems (ECSE 206)</u>
		<u>Mechanics 2 (Kinematics) (MECH 220)</u>
		<u>Design Graphics for Mechanical Engineering (MECH 290)</u>
		<u>Communication in Engineering (CCOM 206)</u>
		<u>Integrated Management Essentials 1 (INTG 201)</u>
	Winter semester (S6)	<u>Statistics and Measurement Laboratory (MECH 262)</u>
		<u>Solid Mechanics (CIVE 207)</u>
		<u>Responsibilities of the Professional Engineer (FACC 250)</u>
		<u>Engineering Economy (FACC 300)</u>
		<u>Integrated Management Essentials 2 (INTG 202)</u> <u>Humanities Elective 1 (HE1)</u>
Year 4	Fall semester (S7)	<u>Design 1: Conceptual Design (MECH 292)</u>
		<u>Fluid Mechanics 1 (MECH 331)</u>
		<u>Numerical Methods in Mechanical Engineering (MECH 309)</u>
		<u>Design 3: Mechanical Engineering Project (MECH 463D1)</u>
		<u>Humanities Elective 2 (HE2)</u>
	Winter semester (S8)	<u>Materials Science and Engineering (MIME 260)</u>
		<u>TE1 (see below)</u>
		<u>TE2 (see below)</u>
		<u>Engineering Professional Practice (FACC 400)</u>
		<u>Design 3: Mechanical Engineering Project (MECH 463D2)</u> <u>Humanities Elective 3 (HE3)</u>
Technical elective courses (TE)	<u>Introduction Robotics and Intelligent Systems (COMP 417)</u>	
	<u>Linear Systems and Control (ECSE 307)</u>	
	<u>Electric Machinery (ECSE 461)</u>	
	<u>Dynamics of Mechanisms (MECH 314)</u>	
	<u>Mechanics 3 (MECH 315)</u>	
	<u>Mechanics of Deformable Solids (MECH 321)</u>	
	<u>Thermodynamics 2 (MECH 341)</u>	
	<u>Heat Transfer (MECH 346)</u>	
	<u>Principles of Manufacturing (MECH 360)</u>	
	<u>Applied Electronics and Instrumentation (MECH 383)</u>	
	<u>Design 2: Machine Element Design (MECH 393)</u>	
	<u>System Dynamics and Control (MECH 412)</u>	
	<u>Introduction to Robotics (MECH 572)</u>	
<u>Mechanics of Robotic Systems (MECH 573)</u>		

Humanities electives

Each stream includes three elective courses in the humanities (HE1, HE2 and HE3). These courses are operated by different faculties and departments at McGill and are based on a principle of **guided choice**, empowering the student.

1. The first course (HE1) is part of the theme: **impact of technology on society**. It is to be selected from the courses in the following course catalog:

<i>Anthropology of Development (ANTH 212)</i>
<i>Biotechnology Ethics and Society (BTEC 502)</i>
<i>Infrastructure and Society (CIVE 469)</i>
<i>Economics of the Environment (ECON 225)</i>
<i>Economics of Climate Change (ECON 347)</i>
<i>Society, Environment and Sustainability (ENVR 201)</i>
<i>Geographical Perspectives: World Environmental Problems (GEOG 200)</i>
<i>Environmental Systems (GEOG 203)</i>
<i>Global Change: Past, Present and Future (GEOG 205)</i>
<i>Environmental Management 1 (GEOG 302)</i>
<i>Strategies for Sustainability (MGPO 440)</i>
<i>Biomedical Ethics (PHIL 343)</i>
<i>Religious Ethics and the Environment (RELG 270)</i>
<i>Technology and Society (SOC1 235)</i>
<i>Sociology of Work and Industry (SOC1 312)</i>
<i>Planning the 21st Century City (URBP 201)</i>

2. The other two courses (HE2 and HE3) are part of the broad spectrum of themes: **humanities, social sciences, management and law**. They are selected from a broad portfolio of courses offered by many faculties and teaching departments across McGill University, including, for example, the Faculty of Arts.