Undergraduate Programs

2019

BRIGHTER WORLD

eng.mcmaster.ca/future
Ranked among the world’s top engineering schools, the Faculty of Engineering plays a significant role in helping McMaster University earn its reputation as one of Canada’s most innovative universities. Our focus on experiential, problem-based learning and our interdisciplinary approach to collaboration results in smarter insights, groundbreaking ideas, and greater optimism. This approach is helping us create a brighter world.

McMaster Engineering is ranked among the top programs in the world. We foster a love of learning and sense of personal dedication to excellence within a broader societal context of engineering. Our students are motivated and inspired to become engaged citizen scholars who will transform the world.”

Ishwar K. Puri
Dean, Faculty of Engineering

“If you’re excited by the opportunity to make a difference with engineering and technology, McMaster Engineering will give you the tools to do so. We offer an engaging, collaborative environment with a wide range of programming options.”

Kenneth S. Coley
Associate Dean (Academic), Faculty of Engineering

Contents
Co-op Program ..................................................... 12
Engineering Programs .................................... 14
Chemical Engineering ........................................ 16
Chemical Engineering & Bioengineering ............ 17
Civil Engineering ............................................... 18
Computer Engineering ...................................... 19
Electrical Engineering ....................................... 20
Engineering Physics ......................................... 21
Materials Engineering ....................................... 22
Mechanical Engineering .................................... 23
Mechatronics Engineering .................................. 24
Software Engineering ...................................... 25
Engineering & Management ............................. 26
Engineering & Society ....................................... 27
Integrated Biomedical Engineering & Health Sciences 28
Bachelor of Technology .................................. 30
Computer Science .......................................... 32
Scholarships .................................................. 33
Admission Requirements ................................. 34
Hamilton
ONTARIO, CANADA

We are less than an hour’s drive from the United States border and only 45 minutes from Toronto, Niagara Falls, Waterloo, and Guelph. An on-campus GO Bus Terminal allows students to commute easily from the Greater Toronto Area.

"James Street North, Hamilton, ON is percolating with a vibrant art scene, inventive farm-to-table restaurants, edgy start-ups and cool shops."


From restaurants ranked among the best in Canada to a vibrant food-truck scene, Hamilton’s appetite for all things delicious knows no limits. International eateries, unique culinary events, and a growing craft beer scene completes the picture.

No matter your musical taste, Hamilton delivers from local clubs hosting hot bands to classical orchestras.

Natural beauty abounds throughout the city, including McMaster University’s own backyard, which abuts the Royal Botanical Gardens and includes several hiking trails.

The arts scene is booming in Hamilton from local art galleries and studios to the monthly James Street North Art Crawl and annual Supercrawl event, which attracts thousands of visitors each year.

Distinctive architecture, world-class museums and 15 National Historic Sites offer a glimpse into the city’s past and make Hamilton the fascinating community it is today.

Whether you love to bike, hike, or play organized sports, Hamilton has got it all. The city is also home to the CFL’s Hamilton Tiger-Cats and other sports teams.

A 10-minute walk from campus, Westdale Village is the hub for student off campus living.
LIVE. LEARN. PLAY.

At McMaster Engineering we know it’s important to stay balanced. Getting involved with social and extracurricular activities will help you recharge, meet other people and keep things in perspective.

When you join the #FireballFamily you will join an engineering community that promotes engagement, inclusion, and diversity. This community is kept alive by your fellow students and their abundance of school spirit, which manifests itself in an impressive array of social events and clubs. Every undergraduate student within the Faculty of Engineering is a member of the McMaster Engineering Society (MES) and benefits from its many events and services. The MES oversees all the clubs and teams and acts as a link between students and the Faculty of Engineering, the Professional Engineers of Ontario, as well as student organizations across the country such as the Canadian Federation of Engineering Students and the Engineering Societies Council of Ontario.

OTHER CLUBS AND TEAMS TO JOIN AT MCMASTER ENGINEERING:
- SumoBots
- Custom Vehicles Team
- McMaster Engineering Sports teams (i.e. Rugby, Hockey, Curling)
- McMaster Solar Car Project
- Concrete Toboggan Team
- McMaster Rocketry Team
- MacChangers

McMaster Engineering: where students come together as one #FireballFamily to learn through cooperation, not competition.

The Gerald Hatch Centre

This facility is for students to collaborate on projects and share ideas to support work being done inside and outside the classroom. It is also home to student teams, clubs, and societies.
McMaster Engineering engages and supports students by offering them many new opportunities and paths to grow into thought leaders and world changers. Experiential education provides students with hands-on learning opportunities beyond the classroom.

**THODE MAKERSPACE**
McMaster’s Thode Makerspace provides access to tools, technology, and expertise for students to explore new technologies, learn technical skills and work collaboratively to transform innovative ideas into prototypes. Available to all students, resources include a variety of high and low-tech tools and technologies as well as hands-on workshops and training for all skill levels. The facility also connects students to experts and mentors at McMaster’s start-up incubator, The Forge.

**THE FORGE**
The Forge is our on-campus start-up incubator that supports McMaster’s student entrepreneurs. Its extracurricular programs tap into the passions and interests of McMaster students who are interested in entrepreneurship as a possible career choice. Whether you want to be part of a team, attract funding, or validate an idea, The Forge is the go-to place for support on campus.

**NEW!**
Offered jointly by the Faculty of Engineering and the DeGroote School of Business, the Minor in Innovation is designed to give students the tools they need to succeed in today’s fast-paced, innovation-driven marketplace.

Calling all students who care about our world:
Participate in our new Grand Challenges Scholars Program, which empowers students to address the biggest challenges facing our planet from creating more renewable energy to building resilient infrastructure to exploring climate change solutions. Gain experience, develop global awareness, and earn a credential by completing a series of courses and participating in innovative programming outside the classroom.

McMaster Engineering: where students transform the world through innovation and entrepreneurship.
100 Undergraduate Summer Research Awards (valued at $6,000 each) available for incoming students.

Our Undergraduate Summer Researchers are students who entered McMaster’s Faculty of Engineering with top marks and scholarships. They have just finished their 1st year in the Faculty of Engineering and are now spending their summer working with professors, researchers, and entrepreneurs across campus to gain valuable work experience and create a network of contacts to grow their careers.

See page 33 for information on how to apply for scholarships and research awards.

“I’m working on a project that is improving data privacy by creating and implementing an algorithm that analyzes data and ensures that sensitive information is reduced to a high-level format so that privacy is maintained.”

Jessica de Leeuw
Graduating Year 2021
Computer Science

“I am designing a Graphical User Interface in MATLAB to aid in electric mining truck optimization as well as comparing the results to optimized diesel trucks. I will also be creating a website and conducting a literature review. All of these tasks are transferable to jobs in industry.”

Julian Morrone
Graduating Year 2021
Electrical Engineering

“We are developing a magnetically printed biosensor; the ink is made of carbon nanotubes, and the sensor detects antigens of diseased cells. This sensor, once fully developed, will be able to help find diseased cells amongst healthy ones! It could help with the detection and diagnosis of cancer.”

Rebecca Gysbers
Graduating Year 2022
Civil Engineering & Biomedical Engineering (iBioMed)
Accelerate your career with McMaster’s Co-op Program

McMaster’s Faculty of Engineering co-op students work at leading companies throughout Ontario’s Innovation Corridor and across the globe.

Students’ professional lives begin early at McMaster Engineering with career development starting in first year. All students have access to the co-op program with the freedom to design their own path enabling the greatest balance among academic interests, research opportunities, and workforce placements.

McMaster Engineering students are supported through the whole process by experienced advisors. Staff help students navigate through job applications, interviews, and reviewing and accepting offers. Professional skills development, feedback, and guidance is delivered as a core part of the program, including:

- on-campus recruitment
- professional & career development workshops
- job search strategies
- one-on-one career counselling sessions
- employer information sessions where students meet company recruiters

ENGINEERING, IBIOMED & COMPUTER SCIENCE

All work terms are optional; students must complete 12 months to gain the co-op designation.

<table>
<thead>
<tr>
<th>May 4 months</th>
<th>Year 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 12/16 months</td>
<td>Year 3-4</td>
</tr>
<tr>
<td>September 8/12 months</td>
<td>Year 3-4</td>
</tr>
<tr>
<td>January 12 months</td>
<td>Year 4-5</td>
</tr>
</tbody>
</table>

Please note: Students in a 5-year program must complete year 3 before they are eligible to go out for work terms of 8, 12 or 16 months.

CO-OP WORK TERMS: B.TECH.

B.Tech. students are required to complete 12 months of co-op employment.

<table>
<thead>
<tr>
<th>May 4 months</th>
<th>Year 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 8-16 months</td>
<td>Year 3</td>
</tr>
</tbody>
</table>

"During my 12 month co-op work term at Hydro One, I was privileged to be mentored by colleagues at every level of the organization. I gained invaluable work experience and was encouraged to develop my professional and leadership skills within and beyond the technical realm. Hydro One was truly invested in ensuring that I had an exceptional experience in my role as a Planning Analytics – Corporate Standards Co-op student."

Clare Xu
Electrical and Biomedical Engineering and Co-op Student

CO-OP Quick Facts:

- 3,800+ jobs available each year
- $50,000 average co-op work term salary (annualized)
- 50%+ co-op work terms are 8 to 16 months in duration, enabling intensive work term experiences
- 750+ hiring employers including Apple, IBM, NASA, GE, HATCH, Tesla
- Your McMaster co-op experience can count toward obtaining your P.Eng. designation (professional engineering license) after graduation
- Flexible format with longer work terms provides the highest value professional development without needing to switch between work and academic study every 4 months

Did you know?

McMaster Engineering has placed over 10,000 co-op students in 30 countries around the world!

McMaster University ranks in the Global Top 100 for Graduate Employability.

QS Graduate Employability Rankings 2018

"McMaster Engineering Program Guide 2019"
**ACADEMIC PROGRAMS OVERVIEW**

**Faculty of Engineering Undergraduate Programs**

### Engineering

**Common First Year?** Yes, enter a common exploratory program called Engineering 1. Degree specialization selections are made near the end of your first year.

**Co-op Program?** Yes, opt into the co-op program at any point in your undergrad.

**Degree(s) Awarded** Bachelor of Engineering (B.Eng.), Bachelor of Engineering and Management (B.Eng. Mgmt.), Bachelor of Engineering and Society (B.Eng.Society), Bachelor of Engineering and Biosciences (B.Eng.Biosci.)

**FIRST YEAR**

The foundational common first year program, called Engineering 1, provides you with the time, support, and resources to select your best-fit program of choice for second year and beyond. Engineering 1 enables you to bond with your peers, regardless of their future area of study. First-year students have tutorial classes with as few as 30 students which will help with the transition from high school. Engineering 1 is also designed to give students the opportunity to widen their perspective by taking electives from other faculties.

**BEYOND FIRST YEAR**

After successful completion of Engineering 1, you will transition to a level 2 discipline. Add one of the 5-year Engineering & Management or Engineering & Society options to your degree for an added specialization (not applicable for Chemical Engineering & Bioengineering program students).

- The Management option combines the requirements of the engineering program in your chosen discipline with the core requirements of a commerce degree.
- The Society option adds study in areas focusing on social implications of engineering and non-technical electives.

**LEVEL 2 PROGRAM OPTIONS:**

- Chemical Engineering
- Chemical Engineering and Bioengineering (5-year program)
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Engineering Physics
- Materials Engineering
- Mechanical Engineering
- Mechatronics Engineering
- Software Engineering

**Bachelor of Technology**

**Common First Year?** No, enter directly into an interdisciplinary specialization.

**Co-op Program?** Yes, a mandatory minimum of 12 months completed co-op is required to graduate.

**Degree(s) Awarded** Bachelor of Technology (B.Tech.) degree from McMaster University and Advanced Diploma in Technology & Business Certificate from Mohawk College

**Computer Science**

**Common First Year?** No, students enter directly into a specialization.

**Co-op Program?** Yes, opt into the co-op program at any point in your undergrad.

**Degree(s) Awarded** Bachelor of Applied Science (B.A.Sc.)

**Integrated Biomedical Engineering & Health Sciences**

**Common First Year?** Yes, enter a common first year program and select your degree specialization mid-way through the first year.

**Co-op Program?** Yes, opt into the co-op program at any point in your undergrad.

**Degree(s) Awarded** Bachelor of Engineering and Biomedical Engineering (B.Eng. BME) or Honours Bachelor of Health Sciences in Health, Engineering Science and Entrepreneurship (B.H.Sc.)

**Supporting Student Success**

Some of the services available to first year students include:

- The Faculty of Engineering Academic Advising office provides support personnel and services specifically designed to assist first year students.
- The McMaster Engineering Society (MES), one of the largest student groups on campus, is available to support you academically, professionally, and socially.
- The Student Affairs Office offers a number of supports for all McMaster students. If you need support for a diagnosed disability or disorder, please contact Student Accessibility Services (SAS).
- The Student Success Centre (SSC) provides convenient access to an array of student services in the areas of Career and Employment, Transition and Academic Success, and Community Service-Learning, Civic Engagement and Leadership.
- The Student Wellness Centre (SWC) provides support to the whole student – mind, body, and spirit through a range of wellness services such as personal and psychological counselling, medical and health services, and wellness education resources.

**Our Academic Advising office offers Paws N’ Play, a monthly dog therapy program during the school year for all students to take a break and relieve stress.**

**FIRST YEAR**

The foundational common first year program, called Engineering 1, provides you with the time, support, and resources to select your best-fit program of choice for second year and beyond.

Engineering 1 enables you to bond with your peers, regardless of their future area of study. First-year students have tutorial classes with as few as 30 students which will help with the transition from high school.

Engineering 1 is also designed to give students the opportunity to widen their perspective by taking electives from other faculties.

**BEYOND FIRST YEAR**

After successful completion of Engineering 1, you will transition to a level 2 discipline. Add one of the 5-year Engineering & Management or Engineering & Society options to your degree for an added specialization (not applicable for Chemical Engineering & Bioengineering program students).

- The Management option combines the requirements of the engineering program in your chosen discipline with the core requirements of a commerce degree.
- The Society option adds study in areas focusing on social implications of engineering and non-technical electives.

**LEVEL 2 PROGRAM OPTIONS:**

- Chemical Engineering
- Chemical Engineering and Bioengineering (5-year program)
- Civil Engineering
- Computer Engineering
- Electrical Engineering
- Engineering Physics
- Materials Engineering
- Mechanical Engineering
- Mechatronics Engineering
- Software Engineering

**Bachelor of Technology**

**Common First Year?** No, enter directly into an interdisciplinary specialization.

**Co-op Program?** Yes, a mandatory minimum of 12 months completed co-op is required to graduate.

**Degree(s) Awarded** Bachelor of Technology (B.Tech.) degree from McMaster University and Advanced Diploma in Technology & Business Certificate from Mohawk College

**Computer Science**

**Common First Year?** No, students enter directly into a specialization.

**Co-op Program?** Yes, opt into the co-op program at any point in your undergrad.

**Degree(s) Awarded** Bachelor of Applied Science (B.A.Sc.)

**Integrated Biomedical Engineering & Health Sciences**

**Common First Year?** Yes, enter a common first year program and select your degree specialization mid-way through the first year.

**Co-op Program?** Yes, opt into the co-op program at any point in your undergrad.

**Degree(s) Awarded** Bachelor of Engineering and Biomedical Engineering (B.Eng. BME) or Honours Bachelor of Health Sciences in Health, Engineering Science and Entrepreneurship (B.H.Sc.)

**Supporting Student Success**

Some of the services available to first year students include:

- The Faculty of Engineering Academic Advising office provides support personnel and services specifically designed to assist first year students.
- The McMaster Engineering Society (MES), one of the largest student groups on campus, is available to support you academically, professionally, and socially.
- The Student Affairs Office offers a number of supports for all McMaster students. If you need support for a diagnosed disability or disorder, please contact Student Accessibility Services (SAS).
- The Student Success Centre (SSC) provides convenient access to an array of student services in the areas of Career and Employment, Transition and Academic Success, and Community Service-Learning, Civic Engagement and Leadership.
- The Student Wellness Centre (SWC) provides support to the whole student – mind, body, and spirit through a range of wellness services such as personal and psychological counselling, medical and health services, and wellness education resources.

**Our Academic Advising office offers Paws N’ Play, a monthly dog therapy program during the school year for all students to take a break and relieve stress.**
Chemical Engineering

Chemical Engineering uses the basic principles of chemistry, math, physics, biology and economics to design, operate and troubleshoot processes used to manufacture materials, develop energy sources and create new products from the nanoscale to automobiles.

WHAT you’ll learn:
• A strong foundation in the basic sciences
• Problem solving, team, self-assessment and lifelong learning skills
• An understanding of the concerns of real industrial clients

WHERE you’ll go:
• Process and refine fuels (gasoline, natural gas, propane)
• Develop sustainable energy systems
• Resolve environmental problems

AREAS of SPECIALIZATION:
• Energy production and energy systems
• Biological interface engineering and nanotechnology
• Water and wastewater treatment

“My future career goals are to work in the food or cosmetic industry. I find that the process of making something is so much cooler than the actual product that’s being made. I want to be involved in designing that process and seeing it through the whole way.”

Yovana Racic
Chemical Engineering & Management

Chemical Engineering & Bioengineering

Chemical Engineering & Bioengineering combines the core chemical engineering undergraduate curriculum with courses from the biological sciences and bioengineering. These unique skills will allow graduates from this program to make significant contributions to the growing fields of biotechnology and bioengineering.

WHAT you’ll learn:
• A strong foundation in chemical and biological sciences
• Bioengineering
• Biomaterials

WHERE you’ll go:
• Pharmaceutical products with eco-friendly processes
• Biocompatible biomedical devices
• Efficient and improved food and beverage production methods

AREAS of SPECIALIZATION:
• Biomaterials
• Regenerative medicine
• Tissue engineering

“Here at McMaster we have a collaborative environment where we get to bounce ideas off of one another. Everyone is friendly, helpful, and engaging. In my program, I am able to learn about chemical engineering, chemistry, and engineering applications and systems, as well as biology, human anatomy, and microbiology. The combination of these fields makes for a really cool program at McMaster.”

Thomas Baker
Chemical Engineering & Bioengineering
Civil Engineering

Civil Engineering is the broadest of the engineering disciplines; it includes planning, designing, constructing and maintaining sustainable infrastructure. Civil Engineering addresses the interaction of people with the built and natural environment.

WHAT you’ll learn:
• Construction engineering & management
• Environment & water resources engineering
• Geotechnical engineering
• Structural engineering
• Transportation engineering

WHERE you’ll go:
• Design and construction of buildings and infrastructure systems
• Earthquake engineering
• Water resource management and treatment

AREAS of SPECIALIZATION:
• Mitigation of damage due to earthquake, blast and other extreme load situations
• Watershed planning and stormwater management
• Energy harvesting from wastewater

“Civil Engineering combines my love for geography with principles of structural engineering, and allows me to focus on problems from an environmental perspective. I want to use what I have learned in Civil Engineering to help communities that are in need around the world or in Canada.”

Gavin Boyd
Civil Engineering & Society

Computer Engineering

Computer Engineering is the field that studies the science and technology of design, implementation and validation of both hardware and software components of computing systems.

WHAT you’ll learn:
• Computer organization and architecture
• Algorithms and data structure
• Digital signal processing and computer networking

WHERE you’ll go:
• Medical devices and telecommunications
• Computer systems and consumer electronics
• Automotive industries

AREAS of SPECIALIZATION:
• Medical instrumentations and robotics
• Automotive embedded systems
• Communications and networking

“I chose Computer Engineering because I am really interested in circuitry and electromagnetics, but I also really enjoy software and programming. Computer Engineering is a nice blend of those things and a good opportunity to learn about them all at once.”

Mitchell Cooke
Computer Engineering
Electrical Engineering

Electrical Engineering involves the design of devices and systems that employ the flow of electrons to achieve useful purposes. It encompasses electrical power generation and distribution, robotics, electronics, wired and wireless communications, optoelectronics, signal processing, computers, radar, medical imaging and many other technologies.

The Department of Electrical and Computer Engineering has an exchange agreement with KTH Royal Institute of Technology in Stockholm, enabling senior students to study in Sweden.

“Electrical Engineering is unique because it is so broad and can open so many doors for the future. You can work in a variety of fields, including hydro, consumer electronics, telecommunications, and that is just naming a few.”

Tiffany Tse
Electrical Engineering

Engineering Physics

Engineering Physics involves the creation of advanced materials, devices, and systems based on our fundamental understanding of physics. These new technologies look to solve future challenges such as energy supply, human health, and information and communication technologies.

“My future career goals are to make an impact in either the nuclear or aerospace industries. I am involved with the McMaster Interdisciplinary Satellite Team, and for my research position I created a graphic interface for a simulator for the control room of the McMaster Nuclear Reactor.”

Diana Dumitrescu
Engineering Physics

WHAT you’ll learn:
• Nano- and micro-device engineering
• Energy systems and nuclear engineering
• Photonics

WHERE you’ll go:
• Biomedical engineering
• Microelectronics and optical engineering
• Renewable energy

AREAS of SPECIALIZATION:
• Nanoscience and nanotechnology
• Biosensing
• Photovoltaic systems (solar cells)
Materials Engineering

Materials Engineering students study the conversion of natural substances into products for structural, microelectronics, optical, and biomedical use by using chemical and physical methods.

WHAT you’ll learn:
- Material processing
- Advanced characterization & nanomaterials
- Mechanical and functional properties

WHERE you’ll go:
- Automotive and aerospace industry
- Energy production (nuclear, fuel cells)
- Primary and advance manufacturing

AREAS of SPECIALIZATION:
- Nano-engineering and thin films
- Structural materials
- Functional materials
- Biomaterials
- Sensors and data analytics

The Department of Materials Engineering has an exchange agreement with Grenoble Institute of Technology in France enabling 3rd year students to study and work abroad.

“I chose Materials Engineering because this program is so broad - it encompasses many of the different engineering disciplines, including mechanical, electrical, civil, and chemical. The second I walked on to the campus I felt like I was a part of an interdisciplinary community!”

Jennifer Tsui
Materials Engineering

Mechanical Engineering

Mechanical Engineering uses the principles of physics and mathematics to conceive, research, design, manufacture, test, control and maintain a wide variety of mechanical systems.

WHAT you’ll learn:
- Manufacturing and materials
- Mechanics and design
- Thermal-fluid sciences

WHERE you’ll go:
- Biomechanical engineering
- Renewable energy
- Equipment design and manufacturing

AREAS of SPECIALIZATION:
- Vibration analysis
- Biomechanics
- Engine performance controls

“I’m involved with the MAC Formula Electric team, and am one of the Mechanical Team Captains. I want to work in the automotive industry and help build the next generation of cars. Whatever is on the horizon, whatever the new technology is, I want to be there.”

Andrew Aslanidis
Mechanical Engineering & Society
Mechatronics Engineering

Mechatronics Engineering is a modern discipline that transcends the boundaries between embedded systems, mechanical, electrical and computer engineering.

“"I chose McMaster because you can achieve a balance between your academic life and your personal life. You can excel academically while still taking care of your family and friends. You can balance having a personal life and focusing on your academic career."

Mark Danial
Mechatronics Engineering & Management

WHAT you’ll learn:
- Electro-mechanical systems design
- Control systems
- Automation

WHERE you’ll go:
- Robotic surgery
- Manufacturing
- Plant control (chemical pharmaceutical industry)

AREAS of SPECIALIZATION:
- Robotics
- Microcontrollers
- Electro-mechanical devices

Software Engineering

Computing is used to solve problems, manage information, create smart products, explore the world, and connect to other people. In Software Engineering, students learn the fundamentals of engineering and specialize in the design and development of computer systems and software.

“"Two things that make Software Engineering unique are the genuine care shown by professors for their students, along with the diverse set of skills we learn that help us to impact a wide variety of people."

Stephanie Lin
Software Engineering

WHAT you’ll learn:
- Efficient human/computer interfaces
- Economically viable software product lines
- Software interfaces for team projects

WHERE you’ll go:
- Biomedical field
- Computer system development
- Power, chemical, or automotive industry

AREAS of SPECIALIZATION:
- Software development
- Biomedical engineering
- Power systems
Engineering & Management

Engineering & Management merges the technical and business perspectives and teaches skills such as effective business communication, team building, project management, creative group processes, and innovation management. Discussions include how companies develop technical products while providing benefits to their customers and financial return to the firm.

**WHAT you’ll learn:**
- Acquire both business and engineering skills; thus becoming highly valued by employers
- Have expanded career choices, particularly in management positions
- Graduates of the Engineering & Management program are eligible for an accelerated MBA

**WHERE you’ll go:**
- Project management
- Production/operations management
- Technical marketing

**Unique Extracurricular Opportunities**
Engineering & Management students have exclusive access to programs where they can leverage skills acquired in the classroom to solve cases in situations that replicate industry expectations and timelines.

This program is offered in partnership with McMaster’s AACSB-accredited DeGroote School of Business. AACSB International is widely regarded as the gold standard in business education accreditation.

“I chose McMaster because of the community and general first year. This gave me the opportunity to decide what stream of engineering I wanted to pursue. The Management option is unique and once I graduate I hope to gain experience in the Computer Engineering industry and go further to complete an MBA program.”

Jasleen Deol
Computer Engineering & Management

---

Engineering & Society

Engineering & Society is a five-year program that combines a traditional engineering education with a broader university experience. It builds on the conventional engineering curriculum through a set of core courses that are designed to develop creative, inquisitive, well-rounded, and thoughtful engineers.

**WHAT you’ll learn:**
- Communication and critical thinking skills
- Inquiry-based research
- Identify the complex interactions between technology, human life and the environment

**WHERE you’ll go:**
- Public policy
- Consulting
- Project management

**Engineering & Society courses**
- History of Technology
- Technology and Society
- Preventive Engineering
- Society Capstone Design
- Inquiry in an Engineering Context (I, II, III)

“This is a five-year program where you take inquiry-based courses that encourage critical thinking. You learn about environmental perspectives and the interconnections between technology and engineering. Every single society student has the option to take a minor or focus electives, ranging from art to music to sustainability to business.”

Thomas Siuda
Civil Engineering & Society

---

This program is offered in partnership with McMaster’s AACSB-accredited DeGroote School of Business. AACSB International is widely regarded as the gold standard in business education accreditation.
Integrated Biomedical Engineering & Health Sciences

At McMaster University, we are transforming healthcare challenges with the Integrated Biomedical Engineering & Health Sciences (iBioMed) program. We've combined the best parts of our top-ranked health sciences and engineering programs into a hands-on, project-based program with a strong focus on solving real-world problems.

The iBioMed program is an interdisciplinary undergraduate program that will give students a strong foundation in both engineering and health sciences. Students will have a common first year before choosing to specialize in either engineering or health, engineering science and entrepreneurship.

TWO DEGREE OPTIONS BASED ON SPECIALIZATION AFTER FIRST YEAR:

1. Bachelor of Engineering and Biomedical Engineering (B.Eng.BME) with a specialization in:
   - Civil
   - Chemical
   - Electrical
   - Engineering Physics
   - Materials
   - Mechanical
   - Mechatronics
   - Software

2. Honours Bachelor of Health Sciences in Health, Engineering Science and Entrepreneurship (Honours B.H.Sc. – HESE)

A Project-Based Approach

The Health Solutions Design Projects course will cover topics in engineering ethics and professionalism, design and graphics, and several engineering sciences with the key challenge being a series of biomedical related design projects.

Examples of interdisciplinary projects for first year iBioMed students could include groups working together to design a custom hip replacement or designing a wearable device that communicates with an end-user.

Potential Careers

Graduates of this program will be uniquely positioned for careers in the biomedical engineering, biotechnological, and health and biomedical science sectors of the economy.

They will also remain well-positioned for careers that fall within the spectrum of their engineering or health sciences discipline. They will be well equipped to pursue further studies in graduate research or professional health sciences careers, such as medicine, or take on entrepreneurship opportunities.

Common First Year

iBioMed students take a common Level I program with the following courses:

- CHEM 1E03 – General Chemistry
- HTHSCI 1I06 – Cellular and Molecular Biology
- MATH 1ZA3 – Engineering Mathematics I
- MATH 1ZB3 – Engineering Mathematics II-A
- MATH 1ZC3 – Engineering Mathematics II-B
- PHYSICS 1D03 – Introductory Mechanics
- PHYSICS 1E03 – Waves, Electricity and Magnetic Fields
- ELECTIVE – 3 units approved Complementary Studies electives

“Overall, I think the strength of iBioMed lies in its people. As students, we are a small tight-knit community and face our challenges together as a group. We approach real-world problems, and are given all the skills, theory, and materials we need to engineer a solution.

We also have a team of amazing instructors, mentors, administrators, and support staff who understand the challenge and excitement of being a new program.”

Mike Buren
Health, Engineering Science & Entrepreneurship (HESE)

LEARN MORE:
ibiomd.mcmaster.ca
thinkibomed@mcmaster.ca

A Project-Based Approach

The Health Solutions Design Projects course will cover topics in engineering ethics and professionalism, design and graphics, and several engineering sciences with the key challenge being a series of biomedical related design projects.

Examples of interdisciplinary projects for first year iBioMed students could include groups working together to design a custom hip replacement or designing a wearable device that communicates with an end-user.

Potential Careers

Graduates of this program will be uniquely positioned for careers in the biomedical engineering, biotechnological, and health and biomedical science sectors of the economy.

They will also remain well-positioned for careers that fall within the spectrum of their engineering or health sciences discipline. They will be well equipped to pursue further studies in graduate research or professional health sciences careers, such as medicine, or take on entrepreneurship opportunities.

Common First Year

iBioMed students take a common Level I program with the following courses:

- CHEM 1E03 – General Chemistry
- HTHSCI 1I06 – Cellular and Molecular Biology
- MATH 1ZA3 – Engineering Mathematics I
- MATH 1ZB3 – Engineering Mathematics II-A
- MATH 1ZC3 – Engineering Mathematics II-B
- PHYSICS 1D03 – Introductory Mechanics
- PHYSICS 1E03 – Waves, Electricity and Magnetic Fields
- ELECTIVE – 3 units approved Complementary Studies electives

“Overall, I think the strength of iBioMed lies in its people. As students, we are a small tight-knit community and face our challenges together as a group. We approach real-world problems, and are given all the skills, theory, and materials we need to engineer a solution.

We also have a team of amazing instructors, mentors, administrators, and support staff who understand the challenge and excitement of being a new program.”

Mike Buren
Health, Engineering Science & Entrepreneurship (HESE)

LEARN MORE:
ibiomd.mcmaster.ca
thinkibomed@mcmaster.ca

A Project-Based Approach

The Health Solutions Design Projects course will cover topics in engineering ethics and professionalism, design and graphics, and several engineering sciences with the key challenge being a series of biomedical related design projects.

Examples of interdisciplinary projects for first year iBioMed students could include groups working together to design a custom hip replacement or designing a wearable device that communicates with an end-user.

Potential Careers

Graduates of this program will be uniquely positioned for careers in the biomedical engineering, biotechnological, and health and biomedical science sectors of the economy.

They will also remain well-positioned for careers that fall within the spectrum of their engineering or health sciences discipline. They will be well equipped to pursue further studies in graduate research or professional health sciences careers, such as medicine, or take on entrepreneurship opportunities.

Common First Year

iBioMed students take a common Level I program with the following courses:

- CHEM 1E03 – General Chemistry
- HTHSCI 1I06 – Cellular and Molecular Biology
- MATH 1ZA3 – Engineering Mathematics I
- MATH 1ZB3 – Engineering Mathematics II-A
- MATH 1ZC3 – Engineering Mathematics II-B
- PHYSICS 1D03 – Introductory Mechanics
- PHYSICS 1E03 – Waves, Electricity and Magnetic Fields
- ELECTIVE – 3 units approved Complementary Studies electives

“Overall, I think the strength of iBioMed lies in its people. As students, we are a small tight-knit community and face our challenges together as a group. We approach real-world problems, and are given all the skills, theory, and materials we need to engineer a solution.

We also have a team of amazing instructors, mentors, administrators, and support staff who understand the challenge and excitement of being a new program.”

Mike Buren
Health, Engineering Science & Entrepreneurship (HESE)

LEARN MORE:
ibiomd.mcmaster.ca
thinkibomed@mcmaster.ca

A Project-Based Approach

The Health Solutions Design Projects course will cover topics in engineering ethics and professionalism, design and graphics, and several engineering sciences with the key challenge being a series of biomedical related design projects.

Examples of interdisciplinary projects for first year iBioMed students could include groups working together to design a custom hip replacement or designing a wearable device that communicates with an end-user.

Potential Careers

Graduates of this program will be uniquely positioned for careers in the biomedical engineering, biotechnological, and health and biomedical science sectors of the economy.

They will also remain well-positioned for careers that fall within the spectrum of their engineering or health sciences discipline. They will be well equipped to pursue further studies in graduate research or professional health sciences careers, such as medicine, or take on entrepreneurship opportunities.

Common First Year

iBioMed students take a common Level I program with the following courses:

- CHEM 1E03 – General Chemistry
- HTHSCI 1I06 – Cellular and Molecular Biology
- MATH 1ZA3 – Engineering Mathematics I
- MATH 1ZB3 – Engineering Mathematics II-A
- MATH 1ZC3 – Engineering Mathematics II-B
- PHYSICS 1D03 – Introductory Mechanics
- PHYSICS 1E03 – Waves, Electricity and Magnetic Fields
- ELECTIVE – 3 units approved Complementary Studies electives

“Overall, I think the strength of iBioMed lies in its people. As students, we are a small tight-knit community and face our challenges together as a group. We approach real-world problems, and are given all the skills, theory, and materials we need to engineer a solution.

We also have a team of amazing instructors, mentors, administrators, and support staff who understand the challenge and excitement of being a new program.”

Mike Buren
Health, Engineering Science & Entrepreneurship (HESE)

LEARN MORE:
ibiomd.mcmaster.ca
thinkibomed@mcmaster.ca

Prepares graduates for the developing field of Biomedical Engineering by focusing on interdisciplinary education, translational design, and innovation and entrepreneurship.

Applied learning opportunities with a strong emphasis on inquiry and problem-based learning.

DEAN’S EXCELLENCE ENTRANCE SCHOLARSHIPS:

Fourteen one-time scholarships valued at $7,500 each
Bachelor of Technology

The W Booth School of Engineering Practice and Technology offers the Bachelor of Technology program in response to the needs of today’s innovation-based industries. Earn a B.Tech. Degree from McMaster University, as well as an Advanced Technology Diploma and Business Management Certificate from Mohawk College. Employers want graduates who are versatile, innovative, and ready to hit the ground running in an evolving industry. McMaster Engineering’s B.Tech. program is designed to have students study theory and management practices in lectures, gain hands-on skills in labs, and experience the engineering industry first-hand during one 4-month and one 8-month co-op work term.

BACHELOR OF TECHNOLOGY STREAMS:

<table>
<thead>
<tr>
<th>Automotive &amp; Vehicle Engineering Technology</th>
<th>Biotechnology</th>
<th>Automation Engineering Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WHAT you’ll learn</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Design, operation and manufacturing</td>
<td>• Genetic engineering</td>
<td>• Develop analytical and design</td>
</tr>
<tr>
<td>of advanced combustion, hybrid and</td>
<td>• Cell biology, molecular and</td>
<td>skills</td>
</tr>
<tr>
<td>alternative fuel vehicles</td>
<td>microbiology, analytical</td>
<td>• Specialized knowledge in sensors,</td>
</tr>
<tr>
<td>• Work with CAD for component</td>
<td>instrumentation</td>
<td>instruments, actuators, industrial</td>
</tr>
<tr>
<td>and system design and the use of</td>
<td>• Bio processing</td>
<td>networks</td>
</tr>
<tr>
<td>simulation tools</td>
<td></td>
<td>• Process control, SCADA,</td>
</tr>
<tr>
<td>• Mechatronics, advanced electronics,</td>
<td></td>
<td>programming, robotics</td>
</tr>
<tr>
<td>control systems</td>
<td></td>
<td>• Integration of plant floor data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with business systems</td>
</tr>
</tbody>
</table>

| **WHERE you’ll go**                         |               |                                   |
| • Mechanical Designer                      | • Production Supervisor      | • Control Systems Engineer        |
| • Industrial Engineer                      | • Quality Assurance Specialist| • SCADA Integrator                |
| • Project Manager or Project Engineer      | • Manager of Clinical Marketing| • Process Engineer                |

“B.Tech. is a unique program because it is more hands-on and we focus on learning technical skills. I chose McMaster because of this program – it is different and fits my learning style and personality. You won’t find another program like this!”

Robyn Jeffrey
Automotive Engineering Technology

“I see myself working in the environmental or agricultural technology sectors. I chose Biotechnology at McMaster because I thought it really demonstrated the perfect relationship between technology and the natural world.”

Julianne Magalona
Biotechnology

“”The Bachelor of Technology program is unique because we get a lot of hands-on experience in labs and design courses and have small classes where we have the opportunity to talk more with teachers. In our co-op, we interact a lot with industry and try to understand what they need to make improvements within their fields.”

George Sinanios
Automation Engineering Technology

SMALL CLASS SIZES: Our average lecture size is 40–60 students
CO-OP WORK: 12 months of required co-op allows students to gain meaningful work experience and make career connections
QUALITY OF FACILITIES: High-tech labs and classrooms exclusively for B.Tech. students
MANAGEMENT COURSES: Approximately 25% of the curriculum is devoted to courses in business and management

Hands-on labs
Students spend 700+ hours in the lab applying engineering theory.
Computer Science

The Honours Computer Science program offers courses designed to develop students into highly knowledgeable and skilled systems analysts, database specialists, software developers, and system administrators. Additionally, it prepares students for an accelerated master’s degree. The program is built around three core areas: computing fundamentals, software design, and systems. Students are trained in modern systems-orientated topics such as distributed networks and secure, high-performance, and web-based systems.

The new Computer Science curriculum takes experiential learning to the next level! In five redesigned practice and experience courses, the emphasis is shifted from lectures to lab-based exploration and discovery, including expanded coverage of practical topics such as profiling and tuning and traditional theoretical topics such as operating systems and compilers. These new courses are in addition to the existing final year senior thesis and optional Software Entrepreneurship projects that are chosen and developed by students.

WHAT you’ll learn:
• Computing fundamentals
• Software design
• High performance and web based systems

WHERE you’ll go:
• App development
• Software analysis
• Computer system development

"You really get to know everyone in the Computer Science program and help is always there if you need it. Come to McMaster because of how great the education is... stay because of how great the community is!"

Gabriel Gebril
Computer Science

[Image 250x-12 to 613x578]

Scholarships

Apply now!

Only one application required to be considered for all! (minimum 90% average required)

Visit eng.mcmaster.ca/scholarships
Deadline: February 15, 2019

HATCH SCHOLARSHIP
1 available | $32,000 (over 4 years)

HATCH SCHOLARSHIP FOR INDIGENOUS STUDENTS
1 available | $32,000 (over 4 years)

ARCELORMITTAL DOFASCO FIRST ROBOTICS ALUMNI SCHOLARSHIP
2 available | $15,000

MCMASTER ENGINEERING FIRST ROBOTICS ALUMNI SCHOLARSHIP
4 available | $15,000

FACULTY OF ENGINEERING – BIG IDEAS ENTRANCE SCHOLARSHIP
1 available | $12,000
6 available | $3,000

SHAD FELLOW ENTRANCE SCHOLARSHIP
3 available | $5,000

DECA ALUMNI ENTRANCE SCHOLARSHIP
3 available | $5,000

OSPE ENTRANCE SCHOLARSHIP
2 available | $1,500

UNDERGRADUATE SUMMER RESEARCH AWARDS (USRA)
What is a USRA? We’ll guarantee you a job working with a professor or a start-up in the summer after your first year!
100 available | $6,000

McMaster President’s Awards
$2,500 95%+

McMaster Honour Awards
$1,000 90% - 94.99%
$750 85% - 89.99%
$500 80% - 84.99%

B.Tech. Entrance Awards
$2,000 88%+

OSPE ENTRANCE SCHOLARSHIP
2 available | $1,500

What’s your big idea?
Tell us how you plan to use engineering to make a positive impact and you could win a scholarship

More than $1 million in scholarships and research awards available from the Faculty of Engineering!

Canadian citizens, Canadian permanent residents, and international students who are completing their final year of high school in Canada are eligible for these scholarships.

Visit SchulichLeaders.com

Automatic Entrance Scholarships
(grades-based, no application required)

www.eng.mcmaster.ca/future
Admission Requirements

Before you apply, make sure you meet the admission requirements. For details visit: future.mcmaster.ca/admission

<table>
<thead>
<tr>
<th>OUAC Code</th>
<th>Minimum Anticipated Admission Average</th>
<th>Canadian Curriculum*</th>
<th>International Baccalaureate Curriculum</th>
<th>American Style Curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering (applicable to all programs)</td>
<td>ME or MEC (co-op option)</td>
<td>+87%</td>
<td>• English</td>
<td>• English *Chemistry *Physics • Math (High Studies is not accepted) 3 subjects must be at the Higher Level (HL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated Biomedical Engineering &amp; Health Sciences</td>
<td>MEH or MEI (Co-op option)</td>
<td>+90%</td>
<td>• English</td>
<td>• English *Biologia *Chemistry *Physics • Math (High Studies is not accepted) 3 subjects must be at the Higher Level (HL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Science</td>
<td>MC or MCCC (co-op option)</td>
<td>92-95%</td>
<td>• English</td>
<td>• English *Biologia *Chemistry *Physics • Math (High Studies is not accepted) 3 subjects must be at the Higher Level (HL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor of Technology</td>
<td>MAT (Automotive &amp; Vehicle Engineering Technology)</td>
<td>78-82%</td>
<td>• English</td>
<td>• English *Chemistry *Physics • Math (High Studies is not accepted) 3 subjects must be at the Higher Level (HL)</td>
</tr>
</tbody>
</table>

First Nation, Metis, and Inuit Applicants are encouraged to contact McMaster’s Indigenous Student Services office for assistance in navigating the application process. Programming and resources such as cultural and social events, Elders in Residence, and academic supports are available.

*Note: Course names may vary across provinces. For specific educational system requirements, visit us online at future.mcmaster.ca/admission

McMaster Engineering’s Youth Programs: Get started and get inspired!
McMaster Engineering offers exceptional programs throughout the year for high school and elementary school students that introduce them to computing, technology, engineering with leadership, and entrepreneurship skill building.
To learn more, visit youthprograms.eng.mcmaster.ca

How to Apply

Step 1: Apply online by January 16, 2019 through the Ontario Universities Application Centre (OUAC).
Step 2: Check your email for an acknowledgement letter (pdf). This will contain login details needed to check your application status on MOSAIC (applicants.mcmaster.ca).
Step 3: Submit additional documentation by the required deadlines:
Supplementary Application (required for Engineering & iBioMed programs) – February 1, 2019
Scholarship Application (all programs) – February 15, 2019
English Language Proficiency (if required) – April 1, 2019
Step 4: Check your email inbox and online application. Our first round of offers typically goes out in mid-March (excluding iBioMed), with another round following in early May (all programs).
Step 5: Accept your offer through OUAC by the deadline stated on your offer letter and submit your Residence Application with a deposit.

Visit future.mcmaster.ca for more details.

Questions? Contact us at thinkeng@mcmaster.ca
To visit us, book a tour online at:
www.eng.mcmaster.ca/future

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Preview</td>
<td>October 27, 2018</td>
</tr>
<tr>
<td></td>
<td>November 17, 2018</td>
</tr>
<tr>
<td>March Break Events</td>
<td>March 11-15, 2019</td>
</tr>
<tr>
<td>May@Mac Open House</td>
<td>May 11, 2019</td>
</tr>
</tbody>
</table>

Note: Current at time of printing. For the most current information please refer to the McMaster University web site.