

# Bachelor of Global Engineering



université  
PARIS-SACLAY



McGill



# Spirit of the program



The Bachelor of Global Engineering aims to reinvent undergraduate engineering programs.

CentraleSupélec and McGill created this program around strong core values: excellence, multiculturalism, and sustainable social and corporate impact.

Designed for a fast-changing world, the Bachelor of Global Engineering addresses corporations' needs for engineers and trains future leaders. Over and above a classic engineering curriculum, students will develop and further study relevant issues and develop critical skills during the four years: climate change, new technologies, digitalization and programming, innovation, complex problem solving, teamwork, cross-culturality, communication, corporate behavior, and analytical capabilities.

# Bachelor Global of Engineering gathers what's best from these two top universities worldwide while benefiting from an utterly remastered pedagogy and spirit.

For four years, an international class of learners will study an intensive and multi-disciplinary engineering curriculum entirely taught in English within a French-speaking environment.

Students spend the first two years at CentraleSupélec, where they follow a curriculum benefiting from the French excellence in mathematics and sciences within a Grande École.

They then spend two years at McGill University, specializing in one of the nine streams offered as part of the program.

The curriculum includes three internships to facilitate a transition towards the industrial and corporate world. Students will also be able to partake in sustainable development challenges, giving them the keys to effect social impact.

Following the first two years of scientific fundamentals, students will enter one of nine streams: Bioengineering, Chemical, Civil, Electrical, Mechanical, Materials Engineering, Data Science, Entrepreneurial and Breadth.

Beyond the intense curriculum, students will enjoy two very different campuses. In France, CentraleSupélec is just 20 km from Paris, in the heart of the “French Silicon Valley”. McGill’s campus is in the heart of downtown Montreal, one of the world’s most multicultural and vibrant cities. Both campus host numerous sports facilities and student clubs.

Upon graduation, students can join the industry in a broad spectrum of capacities (whether consulting or engineering firms or as an entrepreneur). Or they can continue their studies at the master’s level worldwide.

- **2 years in France**
- **2 years in Canada**
- **3 internships**
- **9 streams of specialization**



# CentraleSupélec

## The legacy of French scientific excellence



### **Mission:**

The training and empowerment of our graduates to enter professional life with a strong focus on ethics, responsibility, and a commitment to addressing urgent societal challenges.

CentraleSupélec lies on a stimulating, large and quiet campus 20 km south of Paris, at the heart of the Saclay plateau, known as the “French Silicon Valley”. This unique ecosystem of academic institutions - Université Paris-Saclay, Schools of Engineering - research centers and R&D laboratories embodies the spirit that CentraleSupélec built over the years. The Institution has strong historical ties to business and industry and is a pioneer and leader in engineering in France and Europe.

CentraleSupélec is a founding member of Université Paris-Saclay and the coordinator of its Graduate School of Engineering and Systems Sciences.

International students represent **26%** of the entire student body.

### **Ranking:**

**2<sup>nd</sup>** best School of Engineering in France - *Le Figaro*

- **72<sup>nd</sup>** in Engineering worldwide (QS 2021)

### **Université Paris-Saclay:**

- **16<sup>th</sup>** worldwide;
- **1<sup>st</sup>** in Mathematics and **9<sup>th</sup>** in Physics worldwide (ARWU 2022)

# McGill

## A pioneer of international and Canadian research

### **Mission:**

The advancement of learning and the creation and dissemination of knowledge by offering the best possible education, by carrying our research and scholarly activities judged to be excellent by the highest international standards, and by providing service to society.

McGill campus is in the heart of Montreal and embodies the “global” aspect of the program. Students will benefit from a multicultural and bilingual city and enjoy a place where it is easy to live alongside a top-notch culture and nightlife. During the two years at McGill, students will be among the 40,000 majoring in any topic, from business to pure mathematics, including engineering, politics, medicine and languages.

McGill undergraduates have the highest average entering grades of any Canadian university. McGill is consistently ranked in the top 3 nationwide. And this will make you part of a stimulating community seeking excellence.



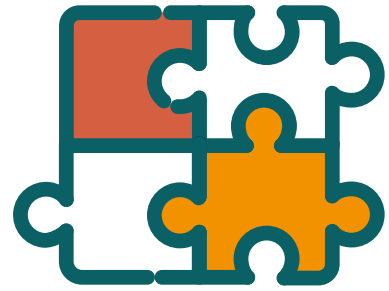
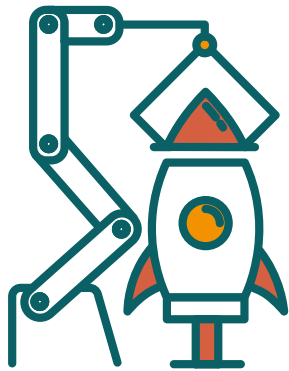
International students represent **30%** of the entire student body.

### **Ranking:**

**1<sup>st</sup>** Canadian university,  
QS (2023)

- **31<sup>st</sup>** worldwide (QS 2023)
- **73<sup>rd</sup>** worldwide (ARWU 2022)
- **53<sup>rd</sup>** in Engineering worldwide (QS 2022)

# Shaping International and Dedicated Scientists



At the end of the Bachelor's degree, graduates will be aware of intertwined emerging challenges on the social, environmental, scientific, and technological levels and be able to work on complex projects with a solution-oriented mindset.

Graduates will have an excellent understanding of company and business mechanisms and practices on both the local and global scales.

Thanks to the international dimension of our program, graduates will be agile while working in teams, with the capacity to adapt their communication styles with collaborators from different cultures.

“ *The Global Bachelor of Engineering is an ambitious new program from two world-renowned engineering institutions: CentraleSupélec-Université Paris-Saclay and the Faculty of Engineering at McGill University.*

*The two institutions have taken the liberty of starting from scratch to design an original Bachelor's degree program that combines scientific excellence and broad knowledge of the challenges of the 21<sup>st</sup> century in a professional context. The result is an English-taught program with an international outlook, with two years of experience on the CentraleSupélec campus in Paris-Saclay and two years in the heart of Montreal at the McGill Faculty of Engineering.*

*We have the firm conviction that mathematics and physics are the fundamental basis for all scientific work but that these two disciplines cannot be sufficient to meet the challenges of society. We therefore designed a curriculum to provide skills in all areas of engineering, life sciences, digital and management. Students will learn science by being in contact with research laboratories and companies and have many opportunities to apply their learning during projects and internships, starting in the first year. We are delighted to offer a rich program for future professionals with solid scientific foundations and awareness of current transitions and challenges.* ”

**Franck Richecoeur**

Dean of Studies - Bachelor Programs, CentraleSupélec, Université Paris-Saclay



# Program Overview

The Bachelor of Global Engineering is a hybrid undergraduate program that takes elements from the best of both European and North-American engineering education traditions, resulting in a new paradigm between “breadth” (generalization) and “depth” (specialization).

The four-year program takes place in France for the first two years and then in Canada for the last two.

**Strong link with companies and businesses** throughout the whole program. Students will do three mandatory internships during the four years.

#### **Multicultural**

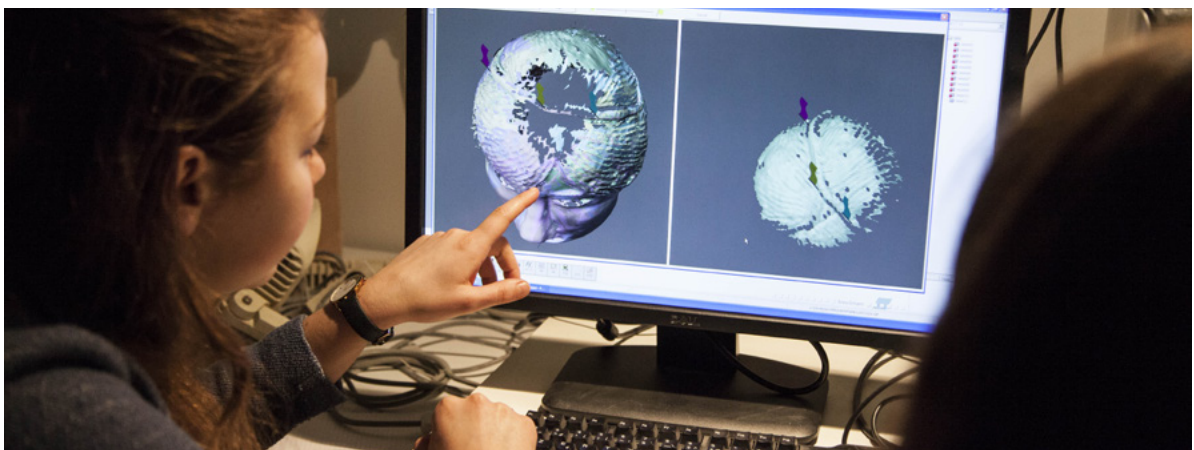
The Bachelor’s takes place in two countries (France and Canada). It is a 100% English-taught curriculum taking place in a French-speaking environment.

#### **Generalist Education (1<sup>st</sup> and 2<sup>nd</sup> year)**

French engineering curricula are well known for their generalist approach.

#### **Specialized Education (3<sup>rd</sup> and 4<sup>th</sup> year)**

North-American educational systems are renowned for their specialized approach.



# Courses at CentraleSupélec

## 1<sup>st</sup> & 2<sup>nd</sup> year

Renowned for its excellence in **Mathematics** and **Physics**, CentraleSupélec's Bachelor courses focus on developing and sharpening your knowledge and skills in these subject areas during the first 2 years of the program.

### Basic Sciences

#### MATHEMATICS

- One-dimensional analysis
- Multi-dimensional analysis
- Asymptomatic analysis
- Discrete probabilities
- Linear algebra
- Topology and functional analysis
- Numerical analysis
- Continuous probability & Introduction to statistical modelling

#### PHYSICS

- Introduction to classical mechanics
- Electric circuits
- Thermodynamics
- Waves Physics
- Electromagnetism & conduction
- Electromagnetism & waves
- Wave optics

#### COMPUTER SCIENCE

- Introduction to programming
- Coding Weeks
- Algorithms
- Fundamentals of programming
- Advanced programming
- Machine learning

#### CHEMISTRY

- General chemistry
- Chemistry of solutions
- Oxidation, reduction, and electrochemistry
- Thermochemistry

#### BIOLOGY

- Cell biology
- Genetics
- Biology of organisms

### Engineering Sciences

#### MODELLING

- Introduction to modelling
- Data and modelling weeks

#### AUTOMATION

- Introduction to automation and control
- Robotics bootcamp

#### PROJECTS

- Sustainable development issues
- Research project

### Professionalization & soft skills

#### HUMAN & SOCIAL SCIENCES

- Philosophy, ethics and critical thinking
- Topics in international sustainable development
- Perspectives of modern geopolitics
- Ecosystems and biodiversity

#### PROJECT MANAGEMENT, CORPORATION AND SOFT SKILLS

- Project management
- Structure of corporations
- Organizational behaviour week
- Business games week
- Economy

#### INTERNSHIPS

- Societal impact internship
- Professional discovery
- Global project internship

#### LANGUAGES

- French or a 2<sup>nd</sup> foreign language



# Courses at McGill

## 3<sup>rd</sup> & 4<sup>th</sup> year

When at McGill, students can select one of **nine streams**:

### 1. Breadth

This multidisciplinary program allows students to acquire fundamental knowledge in all engineering disciplines, complemented by elective courses on sustainable development and additional courses in the humanities and social sciences. The training provided in the Breadth stream will prepare students for careers requiring the supervision and management of various technical teams, projects, and organizations.

### 2. Bioengineering

This stream is designed to offer a wide choice of elective courses covering most of McGill's areas of its Bioengineering undergraduate program. Bioengineering is unique in that it combines the fundamental principles of engineering with biology. Therefore bioengineers must acquire a strong mathematics, physics, and chemistry background.

### 3. Chemical Engineering

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 engineers are involved in the entire life cycle of products, from raw material extraction to recycling and safe disposal, through processing and integration into commercial goods and equipment.

### 4. Civil Engineering

The civil engineering program trains engineers with varied profiles who create the infrastructures of modern society, from roads to water management to the buildings in which we live. Environmental engineers ensure the sustainable development of water, land, and air resources while minimizing the impact on our environment, climate, and public health.

### 5. Data Science

Students in this stream study algorithms, model-based programming methods, data structures, database systems, and artificial intelligence to prepare them to manipulate, analyze, and draw conclusions from the large data sets collected in modern information. This training will prepare them for jobs in a variety of industries: artificial intelligence, information technology, management consulting...

### 6. Electrical Engineering

This stream provides a broad range of experience in various topics, including electrical and electronic systems and software and hardware design. Electrical engineers design and develop electronic systems that underlie technologies such as autonomous vehicles, robotics, telephony, video games, automation, and home power. It is designed to offer the possibility of a specialization in robotics, if desired.

### 7. Entrepreneurial

Students in the Entrepreneurship stream receive a broad technical education complemented by business and management training, all with a focus on entrepreneurship. In addition to a solid foundation in the engineering sciences, students take courses in entrepreneurship, business plan design, etc. The complete training is designed to train engineers with the ambition to pursue a career as an entrepreneur or capable of innovating within companies

### 8. Materials

Materials engineers are trained to understand the relationship between the structure and function of materials. Materials engineering education provides skills for a wide range of employment opportunities. Graduates may work in mineral processing or metal production companies, be hired by engineering or management consulting firms to work on local and global projects, and test and design materials for the aerospace, battery, or automotive industries.

### 9. Mechanical Engineering

Mechanical engineers work to design and operate systems in many aspects of life, from airplanes and space shuttles to bicycles and coffee machines. Typical applications include aerospace, energy, apparel, machinery, and transportation. The general nature of the discipline leads to high demand for mechanical engineers. Still, some mechanical engineers pursue other career paths, including sales, finance and management.

## Internships, Special Weeks & Projects

Throughout the four years, students will work on several projects and undertake internships, allowing them to practice hard and soft skills learned during and outside classes, discover the professional world, and enable rapid training on critical issues.

## Internships and summer schools during summer semesters

Between years 1 and 2, students must spend at least five weeks at a humanitarian, non-profit or non-governmental organization as part of the Social Impact Internship. The objective is for students to be confronted directly to real-life social issues and in a context that is, if possible, international or multicultural.



The Professional Discovery Internship between years 2 and 3 and the Global Project Internship between years 3 and 4 are designed to be meaningful and consistent with students' choice of stream. Where appropriate, it will emphasize international aspects and be impactful. The Professional Discovery Internship must last at least six weeks, where students are immersed in a business with a solid international or multicultural focus, possibly with a rotation of positions. The Global Project Internship lasts three months alongside a project advisor who offers a subject with high potential for concrete results and having, if possible, an international component.

After the first and third years, there will be optional two-week Summer Schools focusing on sustainability issues. To keep a link with the university students are not staying at, the first summer school will be held online by CentraleSupélec and the second by McGill.

36 000€

# Tuition Fees

**Standard rate: 36 000€ / year**

**Reduced rate: 7 500€ / year** - For **students from the European Union\*** (including **France** and **Canada** (including **Québec**). Students with dual nationality will pay the most advantageous rate.

- **For years 1 and 2**, tuition fees will be paid in euros (€) to **CentraleSupélec**.
- **For years 3 and 4**, tuition fees will be those in effect for the fall 2023 academic year. They will be paid in Canadian dollars (\$) to **McGill**.

\* *Requirements and supporting documents are available online for exemption from part of the registration fees for international students for whom it is their first registration.*

7 500€

## Living costs & housing

### Housing

At CentraleSupélec, Bachelor students are strongly encouraged to live in the dedicated residence on campus.

At McGill, students usually live off campus in Montréal. McGill will offer on-campus housing to 3<sup>rd</sup>-year students.

### Campuses

CentraleSupélec campus is at the heart of the **Paris-Saclay** cluster. It comprises three main buildings and hosts a research centre, workspaces, lecture halls and classrooms, student club offices, restaurants, gyms and a fab lab.

McGill's main campus lies in **downtown Montreal**, at the foot of Mount Royal. Mixing historical and modern architecture, you will find research centres, faculty members' offices, lecture halls and workspaces on the campus. Most of the student life happens in downtown Montréal.

### Living costs

To help with your financial planning, you can find below estimated expenses for students at CentraleSupélec and McGill.

Expenses	Price range
<b>At CentraleSupélec</b>	
Accommodation on campus	400€ - 650€ / month
Full meal at campus cafeteria	3.25€ ( <i>academic year 2022-2023</i> )
<b>At McGill</b>	
Accommodation on campus	\$650 - \$1100 / month
Food on campus	\$15 / day



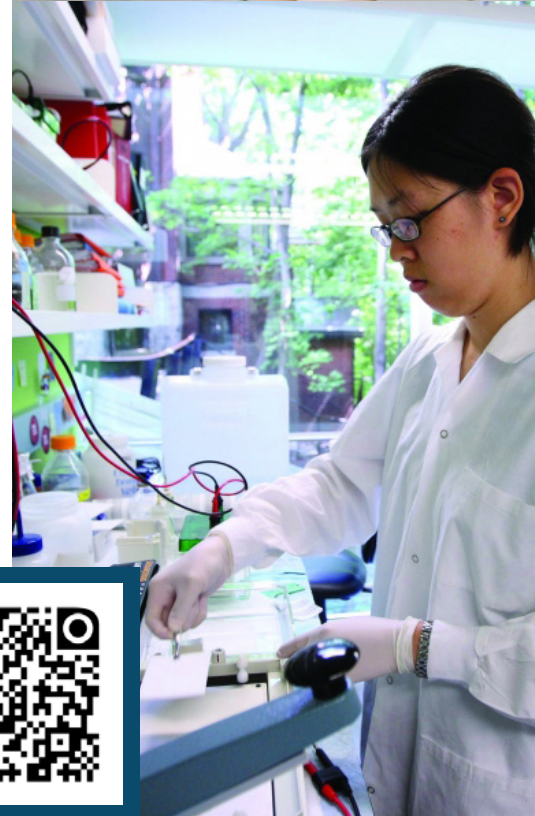
# Eligibility & Admission

## Requirements

- Excellent scientific background
- Interested in learning and living in an international and multicultural environment
- Demonstrated proficiency in English
- Open-mindedness and dedication

## Application

- **Centralesupélec platform** (for students completing or having completed any pre-university diploma, including a French baccalaureate)
- **Parcoursup** (only for students completing a French baccalaureate)



**Contacts:** [globalbachelor@centralesupelec.fr](mailto:globalbachelor@centralesupelec.fr)  
[www.centralesupelec.fr](http://www.centralesupelec.fr)  
[@centralesupelec](https://twitter.com/centralesupelec)

