Mathematics and Engineering

Get to know

MATHEMATICS AND ENGINEERING

This one-of-a-kind program in Canada teaches highly sophisticated mathematical approaches to engineering issues. As a Mathematics and Engineering student, you will study pure and applied mathematics along with engineering courses in your chosen area of specialization. You will learn to analyze and solve engineering problems requiring superior mathematics skills, such as those involving modern communications and control systems.

Degree OPTIONS

Bachelor of Applied Science in Engineering
Bachelor of Applied Science in Engineering with Professional Internship

Option in Applied Mechanics / Computing and Communications / Systems and Robotics

Queen's ADMISSIONS

Students apply to Queen's Engineering (QE) through the OUAC (Ontario University Application Centre) website. Secondary School prerequisites include five 4U and 4M courses, one of which must be English 4U. Calculus and Vectors 4U, Advanced Function 4U, Chemistry 4U, and Physics 4U are all required. A final competitive minimum grade of 80% must be obtained in all courses. Applicants outside of Ontario may have additional requirements.

A Common START

Queen's is unique in offering a common First Year along with an open discipline choice. When you do choose your program, you don’t have to worry about caps or quotas. Provided you pass all of your First Year courses, you are guaranteed a place in your engineering program of choice. Queen's also offers Section 900, a special extended program for students struggling with First Year courses. Take things at a slower pace and recover in time for Second Year.

Course HIGHLIGHTS

Mathematics and Engineering students have the opportunity to take a wide range of technical courses to help prepare them for the many possible career destinations available. Such courses include:

• Modern Control Theory
• Lagrangian Mechanics, Dynamics, and Control
• Information Theory
• Data Compression and Source Coding
• Control of Stochastic Systems
• Optimization Theory with Applications to Machine Learning
• Stochastic Processes and Applications
• Introduction to Coding Theory
• Number Theory and Cryptography

“Our program’s versatile graduates have the solidity of an engineering degree, plus the flexibility afforded by their having the exceptional analytical skills demanded by the strong mathematics component of the program.”

That is a degree from Queen’s.
queensu.ca/mathstat/mthe
# Mathematics and Engineering

**BACHELOR OF APPLIED SCIENCE | BACHELOR OF APPLIED SCIENCE WITH PROFESSIONAL INTERNSHIP**

## 1ST YEAR

*Queen’s Engineering first year is common – courses include: Physics, Chemistry, Calculus, Algebra, Graphics, Computing and Earth Systems Engineering.*

*Also APC100, the entry level course in our Engineering Design and Practice Sequence (EDPS), focusing on problem solving, experimentation principles and finishing off with a team-based engineering project.*

*Discipline selection will take place in February!*

### GET THE COURSES YOU NEED

- Join teams or clubs on campus such as the Space Engineering Team (SET), the Queen’s First Robotics Team (QFRT), and the Math Investigations.
- Get involved with the Engineering Society (ENG-SOC) and the Alma Mater Society (AMS).
- Consider joining an intramural sports or an athletics team. Check out the Athletics & Recreation site.
- Volunteering opportunities: Engineer Without Borders (EWB), Engineers Without Borders International (EWB), and Canadian Applied and Industrial Mathematics Society (CAIMS).
- Volunteer on or off-campus with different community organizations, Engineers Without Borders (EWB).
- Speak to a QUIC advisor or get involved in their programs, events, and training opportunities.
- Prepare for success in a multi-cultural environment by taking the Intercultural Awareness Training Certificate hosted by QUIC and FDISC.

### GET RELEVANT EXPERIENCE

- Join a team or club on campus such as the Space Engineering Team (SET), the Queen’s First Robotics Team (QFRT), and the Math Investigations.
- Get involved with the Engineering Society (ENG-SOC) and the Alma Mater Society (AMS).
- Start or continue volunteering with local organizations. Attend conferences such as the Queen's Engineering Competition (QEC).
- Attend information sessions and industry events on campus.
- Prepare for work or study in a multi-cultural environment by taking the Intercultural Awareness Training Certificate hosted by QUIC and FDISC.

### GET CONNECTED WITH THE COMMUNITY

- Take more responsibility within different clubs or extracurriculars. Consider entrepreneurial opportunities at programs like the Queen’s Innovation Connector Summer Initiative (QICSI).
- Join groups on LinkedIn reflecting specific careers or topics of interest in Mathematics and Engineering.
- Volunteer on or off-campus with different community organizations, Engineers Without Borders (EWB).
- Consider joining an intramural sports or an athletics team. Check out the Athletics & Recreation site.
- Volunteer on or off-campus with different community organizations, Engineers Without Borders (EWB).

### GET THINKING GLOBALLY

- Is there an exchange in your future? Start thinking about where you would like to study abroad.
- Is there an exchange in your future? Start thinking about where you would like to study abroad.
- Prepare for work or study in a multi-cultural environment by taking the Intercultural Awareness Training Certificate hosted by QUIC and FDISC.
- Prepare for work or study in a multi-cultural environment by taking the Intercultural Awareness Training Certificate hosted by QUIC and FDISC.

### GET READY FOR LIFE AFTER GRADUATION

- Grappling with program decisions? Go to the Orientation Evenings held by different Engineering departments and attend the various Career Fairs during the year.
- Get some help deciding by visiting Career Services.
- Attend the Engineering and Technology Fair held by Career Services.
- Attend the Engineering and Technology Fair held by Career Services.
- Explore different careers of interest by reading books in the Career Services Career Advising and Resource Area, such as Career Opportunities in Engineering.
- Explore different careers of interest by reading books in the Career Services Career Advising and Resource Area, such as Career Opportunities in Engineering.
- Start focusing on areas of interest. Research education requirements for careers of interest. If needed, prepare to take any required tests (like the LSAT or GMAT) and get help thinking about grad school from Career Services and the Mathematics and Engineering faculty.
- Start focusing on areas of interest. Research education requirements for careers of interest. If needed, prepare to take any required tests (like the LSAT or GMAT) and get help thinking about grad school from Career Services and the Mathematics and Engineering faculty.

## 2ND YEAR

### Courses Include:

- Algebraic Structures, Differential Equations, Advanced Calculus, Real Analysis, and Linear Algebra.
- Functions of a Complex Variable, Control, Mathematical Methods for Engineering & Physics, Engineering Design & Practice, and Engineering Economics.
- Your other 5-6 courses depend on your option.

### 3RD YEAR

- You will take the second EDPS course – APC200.
- Your other 5-6 courses depend on your option.
- Your other 5-6 courses depend on your option.

### 4TH OR FINAL YEAR

- Consider taking the Intercultural Awareness Training Certificate.
- Consider joining professional associations like the Canadian Applied and Industrial Mathematics Society (CAIMS) and the IEEE Robotics and Automation Society.
- Consider joining professional associations like the Canadian Applied and Industrial Mathematics Society (CAIMS) and the IEEE Robotics and Automation Society.
- Investigate requirements for full-time jobs or other opportunities related to careers of interest.
- Assess what experience you’re lacking and fill in gaps with volunteering, clubs, or internships. Check out Career Services workshops for help.
- Investigate requirements for full-time jobs or other opportunities related to careers of interest.
- Assess what experience you’re lacking and fill in gaps with volunteering, clubs, or internships. Check out Career Services workshops for help.

### Employability Skills

Your time at Queen’s will give you valuable skills to boost your employability, including:

- **Proficiency in mathematics and quantitative analysis**
- **Understand the links between advanced mathematical concepts and their practical engineering applications**
- **Knowledge of theory and methods in applied mathematics**
- **Ability to create and use sophisticated mathematical models**
- **Communicate quantitative ideas with clarity through writing and speaking**
- **Analytical mindset** – develop mathematical habits of mind and a logical approach to problem solving
- **Persistence** – approach problem solving with persistence and a willingness to try multiple approaches
- **Communication skills** – effectively communicate your ideas and solutions
- **Analytical skills** – develop mathematical habits of mind and a logical approach to problem solving
- **Adaptability** – adjust to new situations and challenges

### What could I do after graduation?

- **Aerospace Systems**
- **Artificial Intelligence and Machine Learning**
- **Biomedical Engineering**
- **Computer Engineering**
- **Computer Vision and Image processing**
- **Control Systems Engineering**
- **Cryptography**
- **Data Analysis and Data Mining**
- **Fibre and Laser Electro-Optics**
- **Financial Analysis**
- **Mechatronics**
- **Satellite Communications**
- **Securities**
- **Software Design**

Taking time to explore career options, build experience, and network can help you have a smoother transition to the world of work after graduation.

*Some careers may require additional training. Listed careers are suggestions only.*

Visit careers.queensu.ca/majormap for the online version with links!

*This map is intended to provide suggestions for activities and careers, but everyone's abilities, experiences, and constraints are different. Build your own Major Map using our online My Major Map tool.*

© Career Services, Queen's University, 2021-2022

The coronavirus pandemic may impact some activities are delivered in 2021-2022. Please check directly with the host of any activity on the map for the latest information.
How to use this map

Use the 5 rows of the map to explore possibilities and plan for success in the five overlapping areas of career and academics. The map just offers suggestions – you don’t have to do it all! To make your own custom map, use the My Major Map tool.

Get started thinking about the future now – where do you want to go after your degree? Having tentative goals (like careers or grad school) while working through your degree can help with short-term decisions about courses and experiences, but also help you keep motivated for success.

Get the help you need

Queen’s provides you with a broad range of support services from your first point of contact with the university through to graduation. At Queen’s, you are never alone. We have many offices dedicated to helping you learn, think and do.

Ranging from help with academics and careers, to physical, emotional, or spiritual resources – our welcoming living and learning environment offers the programs and services you need to be successful, both academically and personally. Queen’s wants you to succeed! Check out the Student Affairs website for available resources.

Why study in Kingston?

For 175 years, our community has been more than a collection of bright minds – Queen’s has attracted students with an ambitious spirit. Queen’s has the highest retention rates, the highest graduation rates, and one of the highest employment rates among recent graduates. We are a research intensive university focused on the undergraduate experience. The BBC has identified Kingston as one of the GREATEST UNIVERSITY TOWNS in the world – and it is often awarded the safest city in Canada. It is a university city at the core; just a quick drive to Toronto, Montreal, Ottawa and even New York. A university with more clubs per capita than any other university in Canada, and a city with more restaurants per capita than any other city in North America – you will have the experience of a lifetime at Queen’s – and graduate with a degree that is globally recognized among the best.