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, control, and mechatronic systems.

**Degree OPTIONS**

- Bachelor of Science in Engineering
- Bachelor of 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 six 4U and 4M courses, one of which must be English 4U. Calculus and Vectors 4U, Chemistry 4U, and Physics 4U are all required along with one of Advanced Functions 4U, Biology 4U, Data Management 4U, Computer Science 4U, Earth and Space Science 4U. A final grade of 70% must be obtained in English 4U. Applicants outside of Ontario may have additional requirements.

“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.”

**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 J-Section, 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:

- Number Theory and Cryptography
- Lagrangian Mechanics, Dynamics, and Control
- Coding Theory
- Stochastic Processes and Applications
- Modern Control Theory
- Information Theory
- Optimization Theory and Applications

**Acquire Skills. Gain Experience. Go Global.**

That is a degree from Queen’s.

mast.queensu.ca/meng
**2016 - 2017**

**Mathematics and Engineering MAJOR MAP**

**1ST YEAR**

- Course include: Physics, Chemistry, Calculus, Algebra, Graphs, Computing and Earth Systems Engineering.
- Also APSC100, 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!

**2ND YEAR**

- Course include: Algebraic Structures, Differential Equations, Advanced Calculus, Real Analysis, and Linear Algebra.
- You will take the second EDPS course – APSC200.
- Your other 5-6 courses depend on your option.

**3RD YEAR**

- Course include: Functions of a Complex Variable, Control, Mathematical Methods for Engineering & Physics, Engineering Design & Practice, and Engineer- ing Economics.
- Your other 6-7 courses depend on your option.

**4TH OR FINAL YEAR**

- Course include: Mathematics & Engineering Seminar and the Engineering Mathematics Design Project course.
- Your remaining courses will depend on your option!
- Complete all the required courses based on your academic plan and options, and you are set to graduate.

**GET THE COURSES YOU NEED**

- Queen’s Engineering first year is common – courses include: Physics, Chemistry, Calculus, Algebra, Graphics, Computing and Earth Systems Engineering.
- Also APSC100, 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 RELEVANT EXPERIENCE**

- Join teams or clubs on campus such as the Space Engineering Team (SET), the Queen’s First Robotics Team (QFRT), and the Math Investigations Program.
- Look into summer jobs related to mathematics and engineering by talking to the department or Career Services about work through SwEP or NSERC.
- Take more responsibility within different clubs or extracurriculars. Consider entrepreneurial opportunities at programs like the Queen’s Innovation Connector Summer Initiative (QICSI).
- Stay during the summer as an assistant to a faculty member or apply for external research opportunities. Apply for NSERC USRA positions in the department of Mathematics and Statistics.
- Consider applying to do a 12-16 month QUIP internship between your third and fourth year.

**GET CONNECTED WITH THE COMMUNITY**

- Volunteer on or off campus with different community organizations, such as ENGSOC (Engineering Commit- tee) and Engineers without Borders (EWB).
- Consider joining an intramural sports or an athletics team. Check out the Athletics & Recreation site.
- Get involved with the Engineering Society (ENGSO) and the Alma Mater Society (AMS).
- Start or continue volunteering with local organi- zations. Attend conferences such as the Queen’s Engineering Competition (QEC). Attend information sessions and industry events on campus.
- Do some targeted networking with alumni working in careers of interest by joining the LinkedIn group Queen’s Connects Career Network.
- Attend the Canadian Undergraduate Mathematics Conference (CUMC).

**GET THINKING GLOBALLY**

- The Queen’s University International Centre is your first stop to learn how to internationalize your degree or to leverage your existing cross-cultural experience.
- Speak to a QUIC advisor or get involved in their programs, events and training opportunities.
- Is there an exchange in your future? Start thinking about where you would like to study abroad.
- If exchange isn’t for you, come talk to QUIC about some other options to gain international experience.

**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.
- Explore different careers of interest by reading books in the Career Services Career Advising and Resource Area, such as Career Opportunities in Engineering. For more information check out Career Cruising or by finding and connecting with alumni on LinkedIn.
- Start focusing on areas of interest. Research education requirements for careers of interest. If needed, pre- pare 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.
- Apply to jobs or future education, or make plans for other adventures. Get help from Career Services with job searching, resumes, interviews, grad school applications, or other decisions.

**VISIT CAREERS.QUEENSU.CA/MAJORMAPS FOR THE ONLINE VERSION WITH LINKS!**

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**Where could I go after graduation?**

- Aerospace Systems
- Artificial Intelligence
- Astronomy
- Biomedical Engineering
- Business Administration and Management
- Computer Engineering
- Computer Programming
- Computer Vision and Image processing
- Control Systems Engineering
- Cryptography
- Data Analysis
- Data Mining
- Data Processing
- Electronics
- Fibre and Laser Electro-Optics
- Financial Analysis
- Information Systems
- International Development
- Law
- Machine Learning
- Management Consulting
- Mechatronics
- Medicine
- Robotics
- Satellite Communications
- Securities
- Signal Processing
- Software Design
- Telecommunications

*some careers may require additional training

**CONSIDER A 12-16 MONTH QUIP INTERNSHIP**

- 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 the Career Services skills workshop for help.
- Consider joining professional associations like Ontario Society for Professional Engineers, the Canadian Applied and Industrial Mathematics Society and IEEE Robotics and Automation Society.
- Join groups on LinkedIn reflecting specific careers or topics of interest in Mathematics and Engineering.
- Prepare for work or studies in a multi-cultural environment by taking QUIC’s Intercultural Competency Certificate, and research possible immigration regulations.
- International students interested in staying in Canada can speak with an International Student Advisor.

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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.

A balanced approach leads to long-term success. While you will learn a lot from your studies, taking time to get relevant experience outside of the classroom, build your network, and gain international experience, will position you to be more competitive in your job search or grad school applications.

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, and Queen’s wants you to succeed! Check out the Student Affairs website for available resources.

Succeed in the workplace

What employers want

The Canadian Council of Chief Executives list the top 6 skills sought by employers as:
1. People skills
2. Communication skills
3. Problem-solving skills
4. Analytical abilities
5. Leadership skills
6. Industry-specific knowledge

Take the time to think about the unique skills you have developed at Queen’s, starting with the skills list here for ideas. Explaining your strengths with compelling examples will be important for applications to employers and further education. For help, check out the Career Services skills workshop.

What can I learn studying MATHEMATICS AND ENGINEERING?

- 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 mechanics, computing and communications, control and communications or robotics
- 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
- Check out testimonials at mast.queensu.ca/meng/undergrad/testimonials.php