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

Smith Engineering ADMISSIONS

Students apply to Smith Engineering (QE) through the OUAC (Ontario University Application Centre) website. Secondary School prerequisites include these five 4U courses, English 4U, Calculus and Vectors 4U, Advanced Functions 4U, Chemistry 4U, and Physics 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

Smith Engineering 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. Smith Engineering 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:

- Control Theory
- Continuum Mechanics with Applications
- Information Theory
- Data Compression and Source Coding
- Optimization and Control of Stochastic Systems
- Optimization Theory with Applications to Machine Learning
- Stochastic Processes and Applications
- Introduction to Coding Theory
- Number Theory and Cryptography
- Statistical Learning

Acquire Skills. Gain Experience. Go Global.

That is a degree from Queen's.

queensu.ca/mathstat/mthe

Mathematics and Engineering MAJOR MAP

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

	1ST YEAR	2ND YEAR	3RD YEAR	4TH OR FINAL YI
GET THE COURSES YOU NEED	 Smith 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. 	Courses 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.	Courses include: Functions of a Complex Variable, Mathematics of Engineering Systems, Probability, Engineering Design & Practice, and Engineering Economics. Your other 6-7 courses depend on your option.	Courses include: Mathematics Engineering Seminar and the E Mathematics Design Project co Your remaining courses will de your option! Complete all the required cour on your academic plan and op you are set to graduate.
	Discipline selection will take place in February!			ш
GET RELEVANT EXPERIENCE	Join teams or clubs on campus such as the Space Engineering Team (QSET), the Queen's First Robotics Team (QFRT), and the Math Investigations. See the AMS Clubs Directory or the Queen's Get Involved page for more ideas.	Look into summer jobs related to mathematics and engineering by talking to the department or Career Services about work through <u>SWEP</u> or <u>NSERC</u> . Take more responsibility within different clubs or extracurriculars. Consider entrepreneurial opportunities at programs like the <u>Queen's</u> <u>Innovation Connector Summer Initiative</u> .	Stay during the summer as an assistant to a faculty member or apply for external research opportunities. Apply for <u>NSERC</u> USRA positions in the department of Mathematics and Statistics. Consider applying to do a 12-16 month <u>QUIP internship</u> between your third and fourth year.	 Investigate requirements for fuor other opportunities related interest. Assess what experience you're and fill in gaps with volunteerin or internships – check out Care workshops for help.
GET				
CONNECTED WITH THE COMMUNITY	Volunteer on- or off-campus with different community organizations, <u>Engineers without</u> <u>Borders</u> (EWB). Consider joining an intramural sports or an athletics team. Check out the <u>Athletics &</u> <u>Recreation site</u> .	Get involved with the Engineering Society (ENGSOC) 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.	Do some targeted networking with alumni working in careers of interest by joining the LinkedIn group <u>Queen's Connects</u> <u>Career Network</u> . Attend the <u>Canadian Undergraduate</u> <u>Mathematics Conference (CUMC)</u> .	 Consider joining professional a Ontario Society for Professiona Canadian Applied and Industria Society, and IEEE Robotics and Society. Join groups on LinkedIn reflecti careers or topics of interest in I Engineering.
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GLOBALLY	Speak to a QUIC advisor or get involved in their programs, events, and training opportunities. Prepare for work or studies in a multi-cultural environment by taking the <u>Intercultural</u> . <u>Awareness Training Certificate</u> hosted by QUIC and FDISC.	Is an exchange in your future? Start thinking about where you would like to <u>study abroad</u> .	Build your intercultural competence by getting involved with other cultures or by practicing or improving your <u>language</u> <u>skills</u> .	International students interest in Canada can speak with an J Student Advisor.
GET READY				
FOR LIFE AFTER GRADUATION	Grappling with program decisions? Go to the <u>Orientation Evenings</u> held by different Engineering departments and attend the various <u>Career Fairs</u> during the year. Get some help deciding by visiting <u>Career</u> <u>Services</u> .	 Explore different careers of interest in the Career Services Career Advising and Resource Area. For more information check out <u>Career Cruising</u>. Attend the <u>Engineering and Technology Fair</u> held by Career Services. 	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 <u>help thinking about grad school</u> from Career Services and the Mathematics and Engineering faculty.	Apply to jobs or future educat plans for other adventures. Ge from Career Services with job resumes, interviews, grad sche applications, or other decision

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 <u>My Major Map</u> tool.



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Employability skills

Smith Engineering will give you valuable skills to boost your employability:

- 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 here

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.

Mathematics and Engineering



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 <u>Student Affairs website</u> for available resources.



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QUEEN'S UNDERGRADUATE

START DATES in May, September, or January	POSITIONS are paid and full-time	WORK TERMS are 12-16 months long			
 Graduate with a "Professional Internship" degree Learn about current advances, practices and technologies in business and industry. Test drive a career, earn a competitive salary, and get real world experience. 					
	!nd or 3rd Year Studen Minimum GPA of 1.9	ts			
 Gain a year of career-related work experience. Build network connections. Receive support from Queen's staff in job search and during internship. 					
SAMPLE PAST INTERNSHIPS					
Bioengineering Intern Engineering & Business Developer Intern					

For more information, contact quip@queensu.ca or visit the Program Website.

Why study in Kingston?

For over 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 researchintensive university focused on the undergraduate experience. The BBC has identified Kingston as one of the GREATEST UNIVERSITY TOWNS in the world a unive Lawa s doser than you the Nere - and it is often identified as 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. At a university with more clubs per capita than any other university in Canada, and in a city with more restaurants per capita than any other city in North America, you will have the experience of London / 7 hrs CANADA Queen's Beijing / 15 hrs a lifetime at Queen's Dubai / 14 hrs - and graduate Calgary / 4 hrs Vancouver / 5 hrs with a degree that is globally Halifax / 2 hrs San Francisco / 5.5 hrs Kingston recognized Toronto Denver/3 hrs among the New York / 1.5 hrs UNITED best. STATES Dallas / 3.5 hrs

Atlanta / 2 hrs

Bermuda / 2 hrs