Electrical Engineering

Get to know ELECTRICAL ENGINEERING

Electrical engineers are specialists who provide essential support for the conveniences and services related to electric power and communications, and take leading roles in the design of new products and services. As an electrical engineering student, you will study electric circuits and motors, electromagnetics, microelectronics, signal processing, communications, robotics and control, mechatronics, digital logic, and microprocessors. You will build on a base of applied mathematics and physics, and learn to use the laws of physics that govern electrical systems to design new products and services.

Degree OPTIONS

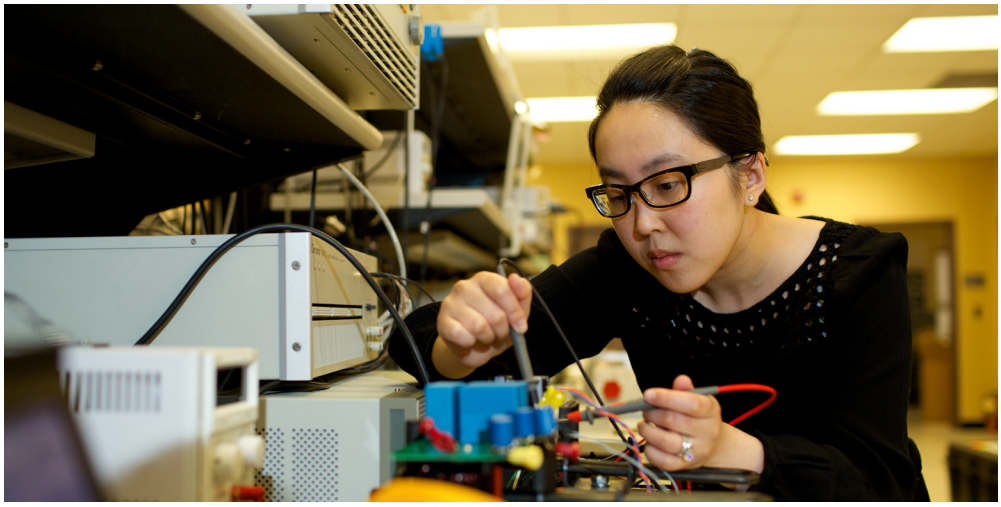
Bachelor of Applied Science in Engineering

Bachelor of Applied Science in Engineering with Professional Internship

Specialization in Biomedical Engineering/ Communications & Signal Processing / Communications Systems & Networks / Microelectronics & Photonics / Mechatronics / Power Electronics & Systems / Robotics & Control

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.



"If you can imagine working with robots or solar-powered vehicles, or envision a career in the field of power engineering or high-tech communications - you are in the right place!"

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

Electrical 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:

- Biomedical Signal and Image Processing
- Introduction to Robotics
- Bioinformatic Analytics
- Fiber Optic Communications
- Machine Vision
- Microwave and RF Circuits and Systems
- Energy and Power Systems
- Wireless Communications

ECEi - INNOVATION STREAM

Consider Queen's Electrical & Computer Innovation Stream, focused on developing entrepreneurial skills, alongside the in-depth, world-class technical education that is the hallmark of Smith Engineering. Students apply directly from OUAC with admission requirements for ECEi being the same as QSE.

With admission limited to 50 students, you will receive an enriched curriculum that builds on Engineering's common first year, participate in team-based learning that focuses on product development and prototype demonstration, and network with like-minded students and present your unique ideas. If you pass all of your first year courses you are guaranteed a place in 2nd year in either the Electrical Engineering Innovation (EEi) stream or Computer Engineering Innovation (CEi) stream.

Acquire Skills. Gain Experience. Go Global.

That is a degree from Queen's.

ece.queensu.ca

2023-2024

Electrical Engineering MAJOR MAP

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

Queen's University

	1ST YEAR	2ND YEAR	3RD YEAR	4TH OR FINAL YEAR
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: Signals & Systems I, Electric Circuits, Digital Systems, Information Structures, Mechatronics Project, Electronics I, Numerical Methods & Optimization, Computer Architecture, Electromagnetics, Differential Equations, and Complex Analysis. You will take the second EDPS course – APSC200, plus one Complementary Studies course. EEi students take Introduction to Business for Entrepreneurs, plus an additional Complementary Studies Course.	Courses include: Signals & Systems II, Electronics II, Microprocessor Interfacing & Embedded Systems, Electromagnetics, Probability & Random Processes, Engineering Economics, and Solid State Devices. You will also need to take 2 Technical Electives plus one CS course. For EEi, Entrepreneurial Sales and Marketing and Financing New Ventures are required CS courses.	You will take either the Electrical and Computer Engineering Design Course (ELEC 490) or the Entrepreneurial Electrical and Computer Engineering Design Course (for EEi students). You will also need to choose approximately 7-8 Technical Electives (totaling 21.25 units), plus one Complimentary Studies course. For EEi, this Complimentary Studies course is Pitching and Launching your Venture.
GET RELEVANT EXPERIENCE	Join teams or clubs on campus such as Queen's First Robotics Team and the Solar Design Team (QSDT). Apply to committees and positions that are open to first year students, such as the ENGSOC Communications Team or First Year Project Coordinators. See the AMS Clubs Directory or the Queen's Get Involved page for more ideas.	Look into summer jobs related to electrical 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 an external summer research opportunity. Consider applying for the combined BASc/MASc program, if you meet the minimum requirements. Consider applying to do a 12-16 month QUIP internship between your third and fourth year.	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.
GET CONNECTED WITH THE COMMUNITY	Volunteer on- or off-campus with different community organizations, such as EngWeek Committee or the ENGSOC Committee on Inclusivity.	Get involved with the Engineering Society (ENGSOC). Consider joining the Queen's Electrical and Computer Engineering Club and attending events such as the ECE Lunch with Profs. Join the Queen's student branch of the Institute of Electrical and Electronics Engineers.	Do some targeted networking with alumni working in careers of interest by joining the LinkedIn group Queen's Connects Career Network. Attend conferences like the Queen's Engineering Competition (QEC) and the Electrical and Computer Engineering Competition.	Consider joining professional associations like the Institute of Electrical and Electronics Engineers and Professional Engineers Ontario. Join groups on LinkedIn reflecting specific careers or topics of interest in Electrical Engineering.
GET THINKING 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 Intercultural Awareness Training Certificate hosted by QUIC and FDISC, and research possible immigration regulations.	Is an exchange in your future? Start thinking about where you would like to study abroad. Apply in January for a 3rd year exchange through your faculty's International Office.	Build your intercultural competence by getting involved with other cultures or by practicing or improving your language skills.	International students interested in staying in Canada can speak with an International Student Advisor.
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 in the Career Services Career Advising and Resource Area, by talking to people whose jobs interest you, or finding engineering alumni on LinkedIn.	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 Service.	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.

CONSIDER A 12-16 MONTH QUIP INTERNSHIP

Employability skills

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

- Understanding of **electronic circuit design, network analysis** and object-oriented programming
- **Data analysis skills** - use current software to analyze data and model processes
- Proficiency in **mathematics**
- Attention to detail
- **Research skills** - conduct scientific research and analyze quantitative information
- **Problem solving** - approach problems from different perspectives and analyze individual facets of a problem
- Ability to **work independently** and in a team on a project
- **Oral and written communication** – write clearly on technical topics and give presentations
- Time and **resource management**

Where could I go after graduation?

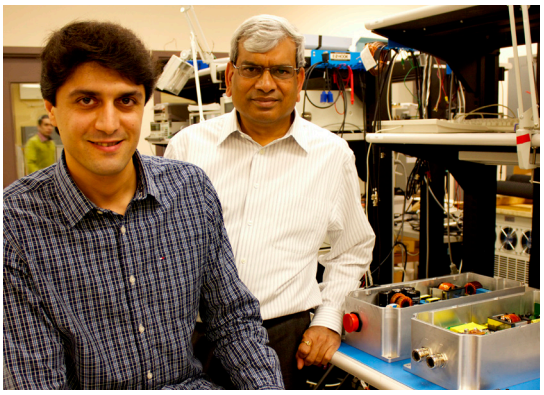
- Autonomous robotics
- Ambient intelligence
- Aviation and aerospace design
- Biotechnology
- Component design engineer
- Consumer electronics
- Digital systems design
- Electrical distribution engineer
- Fibre and laser electro-optics
- Game development/design
- Green power systems
- Information architecture
- Manufacturing and automation
- Sensory systems engineer
- Semiconductor design
- Security systems
- Wearable technology

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

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.

Electrical 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 Student Affairs website for available resources.

SMITH ENGINEERING
Queen's University

Department of Electrical and Computer Engineering
Walter Light Hall, Rm. 416
19 Union Street
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QUIP QUEEN'S UNDERGRADUATE INTERNSHIP PROGRAM

START DATES in May, September, or January

POSITIONS are paid and full-time

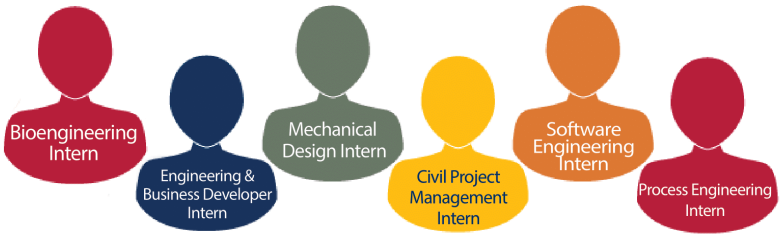
WORK TERMS are 12-16 months long

PROGRAM OVERVIEW
- 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.

ELIGIBILITY
- 2nd or 3rd Year Students
- Minimum GPA of 1.9

WHY QUIP?
- 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



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 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 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 a lifetime at Queen's – and graduate with a degree that is globally recognized among the best.