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, 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.

"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!"
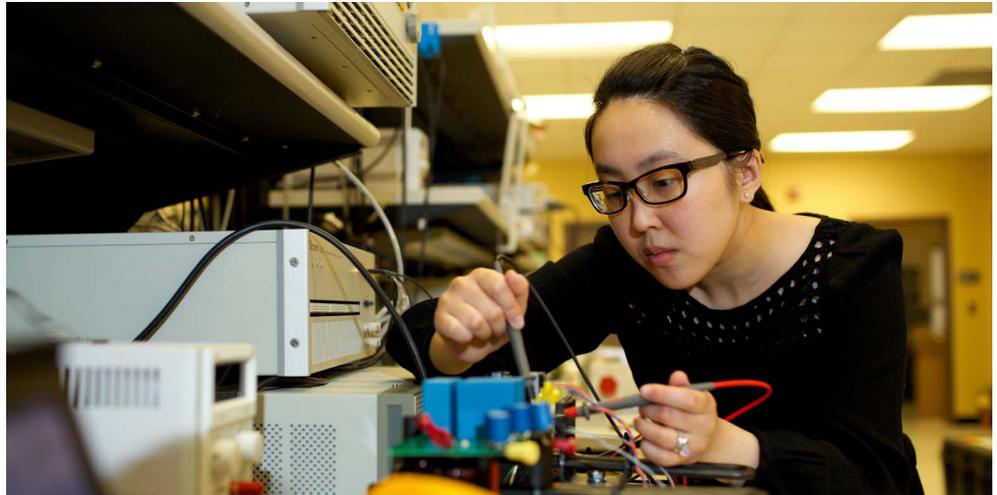
Degree OPTIONS

Bachelor of Science in Engineering

Bachelor of Science in Engineering with Professional Internship

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

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.

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

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 Queen's Engineering. Students apply directly from OUAC with admission requirements for ECEi being the same as QE.

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

2016 - 2017
Electrical Engineering MAJOR MAP

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

Queen's 175 YEARS

|	1ST YEAR	2ND YEAR	3RD YEAR	4TH OR FINAL YEAR
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!	Courses include: 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 as their Complementary Studies (CS) course.	Courses include: Signals & Systems, Electronics II, Microprocessor Interfacing & Embedded Systems, Electromagnetics, Probability & Random Processes, Engineering Economics, and Solid State Devices. You will take either the Electrical and Computer Engineering Design Course (ELEC 390) or the Entrepreneurial Electrical and Computer Engineering Design Course (for EEi students). 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.	All Electrical Engineering students follow up their ELEC 390 course with the Electrical Engineering Project course (ELEC 490). EEi students follow up their Entrepreneurial ECE Design course with the Entrepreneurial Electrical Engineering Project. 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 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 the Career Services skills workshop 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	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 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. If exchange isn't for you, come talk to QUIC about some other options.	Build your intercultural competence by getting involved with other cultures or by practicing or improving your language skills. Check QUIC's resources for ideas to go abroad, and volunteer or attend one of their events.	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.
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 *Vault Guide to Technology Careers*, 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

Where could I go after graduation?

- Advertising
- Air traffic control architecture
- Aviation and aerospace banking
- Biotechnology
- Business administration
- Communications technology
- Component design engineer
- Consumer electronics
- Data processing
- Digital design
- Disaster relief
- Education
- Electrical engineering
- Environmental sustainability
- Fibre and laser electro-optics
- Game development/design
- Information architect
- International development
- Internet and computer technologies
- Manufacturing
- Medicine
- Navigation
- Patent law
- Product specialist
- Public administration
- Public and private research
- Resource management
- Robotics
- Security services
- Software design

*some careers may require additional training

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

Electrical Engineering
MAJOR MAP
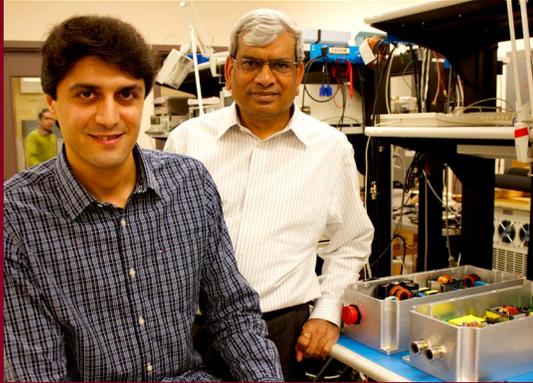
How to use this map

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 ELECTRICAL ENGINEERING?

- **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**
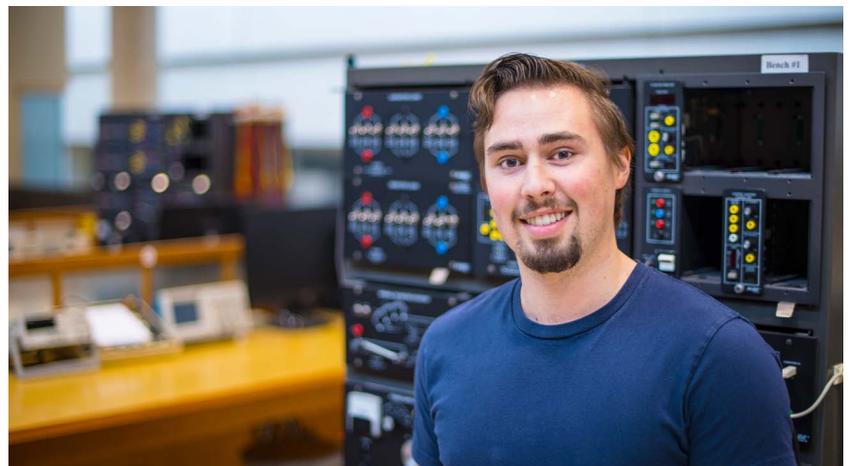
Queen's UNIVERSITY
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ELECTRICAL AND COMPUTER ENGINEERING

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