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.

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

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, 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 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 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.

“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!”

That is a degree from Queen’s.

ece.queensu.ca
### 1ST 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: Electrical 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.

- Stay during the summer as an assistant to a faculty member or apply for an external summer research opportunity.

### 2ND YEAR

**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 Co-ordinators. See the AMS Clubs Directory or the Queen's Get Involved page for more ideas.

- 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 Pros. Join the Queen's student branch of the Institute of Electrical and Electronics Engineers.

- Consider applying for the combined BASc/MASc program, if you meet the minimum requirements.

### 3RD YEAR

**GET CONNECTED WITH THE COMMUNITY**

- Get involved with the Engineering Society (ENGSOC).

- 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.

- Volunteer on or off campus with different community organizations, such as EngWeek Committee or the ENGSOC Committee on Inclusivity.

- Investigate requirements for full-time jobs or other opportunities related to careers of interest.

### 4TH OR FINAL YEAR

**GET THINKING GLOBALLY**

- Speak to a QUIC advisor or get involved in their programs, events and training opportunities.

- Prepare for work or study in a multi-cultural environment by taking QUIC's Intercultural Competency Certificate, 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.

- 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.

- 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.

- 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.

- Build your intercultural competence by getting involved with other cultures or by practicing or improving your language skills.

- 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.

### Where could I go after graduation?

- • Security systems
- • Semiconductor design
- • Information architecture
- • Green power systems
- • Game development/design
- • Fibre and laser electro-optics
- • Electrical distribution engineer
- • Digital systems design
- • Component design engineer
- • Consumer electronics
- • Environmental engineering
- • Electrical distribution engineer
- • Building automation
- • Biotechnology
- • Manufacturing and automation
- • Sensory systems engineer
- • Semiconductor design
- • Security systems
- • Wearable technology
- • Game development/design

### Employability skills

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

- 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

### How to find out more information

Visit careers.queensu.ca/majormap for the online version with links!
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, and 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 us as one of the GREATEST UNIVERSITY TOWNS in the world – and is often awarded the safest city in Canada. We are 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.

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