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 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 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
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!

Join teams or clubs on campus such as Queen's First Robotics Team and the Solar Design Team (QSDT).

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.

Look into summer jobs related to electrical engineering by talking to the department or Career Services about work through SWEP or YSEER. Take more responsibility within different clubs or extracurriculars. Consider entrepreneurial opportunities at programs like the Queen's Innovation Connector Summer Initiative (QICI).

Stay during the summer as an assistant to a faculty member or apply for an external summer research opportunity. Consider applying for the combined BSc/MSc program, if you meet the minimum requirements. Consider applying to do a 12-16 month QUIP internship between your third and fourth year.

Do some targeted networking with alumni working in careers of interest by joining the LinkedIn group ENGSOC Committee on Inclusivity.

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.

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 Electronic Engineers and Professional Engineers Ontario. Join groups on LinkedIn reflecting specific careers or topics of interest in Electrical Engineering.

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.

Consider a 12-16 month QUIP internship.

Where could I go after graduation?

- Autonomous navigation
- Autonomous robotics
- Ambient intelligence
- Air traffic control architecture
- Aviation and aerospace design
- Biotechnology
- Business infrastructure
- Communications technology
- Component design engineer
- Computer-assisted surgery
- Consumer electronics
- Data processing
- Digital systems design
- Embedded systems
- Electrical distribution engineer
- Fibre and laser electro-optics
- Game development/design
- Green power systems
- Information architecture
- Internet and computer technologies
- Manufacturing and automation
- Mechatronics
- Microwave circuitry
- Microcontrollers
- Patent law
- Robotics
- Sensory systems engineer
- Semiconductor design
- Security systems
- Wearable technology

Individual career may require additional training. Listed careers are suggestions.

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

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

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

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.