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, Advanced Functions 4U, Chemistry 4U, and Physics 4U are all required. A final competitive minimum grade of 80% must be obtained for all courses. 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!"
**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 APS100, 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!

**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 ENSOC Communications Team or First Year Project Coordinators. See the AMS Clubs Directory or the Queen's Get Involved page for more ideas.

**GET CONNECTED WITH THE COMMUNITY**

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

Get involved with the Engineering Society (ENSOC).

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.

**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.

**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.

**2ND YEAR**


You will take the second EDPS course – APS200, plus one Complementary Studies course. EEI students take Introduction to Business for Entrepreneurs as their Complementary Studies (CS) course.

Get involved with the Engineering Society (ENSOC).

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.

**3RD YEAR**


You will take either the Electrical and Computer Engineering Design Course (ELEC 190) 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 EEL Entrepreneurial Sales and Marketing and Financing New Ventures are required CS courses.

**4TH OR FINAL YEAR**

All Electrical Engineering students follow up their ELEC 390 course with the Electrical Engineering Project course (ELEC 490). EEL 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 Complementary Studies course.

For EEI, this Complementary Studies course is Pitching and Launching your Venture.

**CONSIDER A 12-16 MONTH QUIP INTERNSHIP**

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.

**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
- 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. Relevant careers may require additional training. Listed careers are suggestions.

Visit careers.queensu.ca/majormaps 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. Queen’s wants you to succeed! Check out the Student Affairs website for available resources.