Computer Engineering

Get to know

COMPUTER ENGINEERING

The information and communication technology of our knowledge-based society places computer engineers at the hub of a computing revolution that is constantly changing the way people live and work. In this program, you will study circuits, electronics, digital logic, micro-processors, computer architecture, hardware design techniques, and master the principles of software engineering. You may choose to specialize in software engineering or complement your core knowledge with expertise in areas such as integrated circuit engineering, digital signal processing or communications systems.

Degree OPTIONS

Bachelor of Science in Engineering
Bachelor of Science in Engineering with Professional Internship
Specialization in Computer Hardware / Computer Systems / Software Engineering / Mechatronics

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 Our undergraduate faculty-to-student ratio is among the highest in the country and translates to a very direct and personal educational experience for our students.”

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

Computer 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:

• Computer Graphics
• Game Architecture
• Software Architecture
• Advanced User Interface Design
• Advanced Database Systems
• Algorithms
• Computer Networks

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.

That is a degree from Queen’s.

ece.queensu.ca
Caution: *This map is meant as a guide to provide suggestions throughout your university career. The activities, resources, and careers mentioned are possibilities – you are not restricted to them and you don’t have to follow this exact timeline. Every person (including you) will find their own unique path through their degree at Queen’s and beyond.

**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 APCS100, 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**

**GET CONNECTED WITH THE COMMUNITY**
- Get involved with the Engineering Society (ENGSO).
- Join the Queen’s Electrical and Computer Engineering Club and go to events such as the ECE Lunch with Pros.
- Join the Queen’s student branch of the Institute of Electrical and Electronics Engineers.
- 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 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.
- Building 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 Events held by different Engineering departments and attend the various Career Fairs during the year.
- 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.
- 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**
- All Computer Engineering students follow up their ELEC 390 course with the Electrical Engineering Project course (ELEC 490). CEi students follow up their Entrepreneurial ECE Design course with Entrepreneurial Computer Engineering Project. You will also need to choose approximately 6-8 Technical Electives (totaling 21.25 units), plus one Complementary Studies course. CEi students take two Complementary Studies courses: Entrepreneurial Sales and Marketing and Financing New Ventures.
- Look for summer jobs related to computer engineering. Consider applying to do a 12-16 month QUIP internship between your third and fourth year.

**WHERE COULD I GO AFTER GRADUATION?**
- Applications developer
- Banking
- Business administration
- Business analyst
- Chip architect
- Computer architect
- Computer engineer
- Consumer services
- Data processing
- Database administration
- Education
- Electronic commerce
- Finance
- Game development
- Informatics
- Integrated circuit design
- Law
- Manufacturing
- Mechatronics
- Medical research
- Network engineer
- Online security
- Power generation
- Public administration
- Robotics
- Security
- Software and hardware analysis and design
- System support
- Telecommunications

*Some careers may require additional training.

Visit careers.queensu.ca/majormap.html for the online version with links!
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MAJOR MAP

How to use this map

• Got questions about careers and classes?
• Feeling a little lost or overwhelmed by choices?
• Wondering what you are “supposed” to be doing?

Use this map to plan for success in five overlapping areas of career and academic life. Each map helps you explore possibilities, set goals and track your accomplishments. To make your own custom map, use the My Major Map tool.

Don’t stress if you haven’t done all of the suggested activities. The map is not a prescription – it’s a tool for finding your own way at Queen’s.

Getting what you need to succeed in the workplace

WHAT DO EMPLOYERS WANT?

In a recent survey from the Canadian Council of Chief Executives the top 6 skills sought by employers were:

1 People skills
2 Communication skills
3 Problem-solving skills
4 Analytical abilities
5 Leadership skills
6 Industry-specific knowledge

HOW DO I GET THE SKILLS I NEED?

It is important to develop a balanced skill set – many of which you will develop during your studies. To stand out, take advantage of experiential learning through the multitude of clubs and activities in and around Queen’s. Check out the Get Relevant Experience section of this map.

WHAT CAN I LEARN STUDYING COMPUTER ENGINEERING AT QUEEN’S?

• Understanding of computer systems, computer hardware, electronics, and software engineering
• Knowledge of research techniques and methods of data analysis
• Analytical and logical thinking
• Problem solving
• Conduct scientific research and summarize findings
• Proficiency in mathematics – solve mathematical problems and analyze quantitative information
• Oral and written communication – explain technical information to others in reports and presentations
• Work independently and in a team on a project
• Time and resource management

WHAT CAN I LEARN STUDYING CEI AT QUEEN’S?

• Ability to start your own venture
• Innovation in larger companies: Intrapreneurship
• Social Entrepreneurship

WHAT MAKES ME SPECIAL?

No one will get exactly the same experience as you. Take the time to think about what skills you have developed to be able to best explain them with compelling examples in future applications to employers and further education. For help with this, check out the Career Services skills workshop.