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 systems, microprocessors, computer architecture, data structures, algorithms, computer networks, operating systems, and software specification and development. You may choose to specialize in computer hardware, computer systems, software engineering, or mechatronics streams of specialization, and complement your core knowledge with advanced topics in electrical and computer engineering.

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 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
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 Vision
• Game Architecture
• Software Architecture
• Advanced User Interface Design
• Advanced Database Systems
• Software Requirements
• Computer System Architecture

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.

“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.”

That is a degree from Queen’s.

ece.queensu.ca
2017 - 2018

Computer Engineering MAJOR MAP*

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

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, Differential Equations, Computing Science, Mechatronics Project, Electronics, Discrete Mathematics, Computer Architecture and Electromagnetics. You will take the second EDPS course - APSC200, plus one Complementary Studies course. For CEi students, the Complementary Studies course required is Introduction to Business for Entrepreneurs.

Courses include: Microprocessor Interfacing & Embedded Systems, Operating Systems, Probability & Random Processes, Algorithms, Computer Networks, Digital Systems Engineering, Engineering Economics, and a course in either Software Specifications or Software Development. You will also take the Electrical and Computer Engineering Design Course. You will also need to take 2 Technical Electives, plus one Complementary Studies course. CEi students take two predetermined Complementary Studies courses.

All Computer Engineering students follow up their ELEC 390 ECE Design course with the Computer Engineering Project course (ELEC 498). CEi students follow up their Entrepreneurial ECE Design course with Entrepreneurial Computer Engineering Project.

GET RELEVANT EXPERIENCE

Join teams or clubs on campus such as Engweek Committee, QCBT, and the Solar Design Team (QSDT). Apply for first year positions such as ENGSO Sociology Committee. Volunteer on or off campus with different community organizations, such as Queen’s Game Developers Club, Science Quest, and Mostly Autonomous Sailboat Team (MAST).

Look into summer jobs related to computer engineering by talking to the department or Career Services about work through SWEP or NSERC.

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

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.

GET CONNECTED WITH THE COMMUNITY

 Volunteer on or off campus with different community organizations, such as Queen’s Game Developers Club, Science Quest, and Mostly Autonomous Sailboat Team (MAST).

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.

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

Where could I go after graduation?

Aerospace software
Ambient intelligence
AI software
Autonomous control systems
Banking Automation Systems
Big Data Analyst
Biomedical Engineering
Business systems consultant
Chip architect
Computer architecture
Computer vision and optical processing
Cyber security
Data compression
Database engineering
Deep Learning
Electronic commerce
Financial technology
Game development
Health analytics
Internet of Things
Integrated circuit design
Machine learning
Medical informatics
Mechatronics
Natural language processing
Network security
Robotics
Telecommunications
Wearyable technology

Wearable technology
Robotics
Professional Engineers Ontario
Queen’s Connects Career Network

CONSIDER A 12-16 MONTH QUIP INTERNSHIP

Electrical and Computer
Engineering Project

Speaker on or off campus with different community organizations, such as Queen’s Game Developers Club, Science Quest, and Mostly Autonomous Sailboat Team (MAST).

Think about where you would like to study abroad. Apply in January for a 3rd year exchange through your faculty’s International Office.

Is an exchange in your future? Start thinking about

GET THINKING GLOBALLY

Speak to a QUIP advisor or get involved in their programs, events and training opportunities. Prepare for work or studies in a multi-cultural environment by taking QUIP’s Intercultural Competency Certificate, and research possible immigration regulations.

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

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.

* This map is intended to provide suggestions for activities and careers, but everyone’s abilities, experiences, and constraints are different. Build your own Major Map using our online My Major Map tool.

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

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.

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 Career Services workshops.

What can I learn studying COMPUTER ENGINEERING?
- 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

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.