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 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, artificial intelligence or mechatronics streams of specialization, and complement your core knowledge with advanced topics in electrical and computer engineering.

Degree OPTIONS

Bachelor of Applied Science in Engineering
Bachelor of Applied 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, 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

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
- Artificial Intelligence
- Machine Learning
- 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
2021-2022

Computer Engineering MAJOR MAP

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

GET THE COURSES YOU NEED

1ST YEAR

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!

2ND YEAR


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.

3RD YEAR

Courses include: A Embedded System & Random Process Networks, Digital! Economics, and a Specifications or S

You will also take 1 Engineering Desig take 2 Technical El Studies course. CE predetermined Co

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 in ENGSOC See the AMS Clubs Directory or the Queen's Get Involved page for more ideas.

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

Take more responsibility within different clubs or extracurriculars. Consider entrepreneurial opportunities at programs like the Queen's Innovation Connector Summer Initiative (QICSI).

Stay during the summer or apply opportunity.

Consider applying program, if you m

Consider applying internship.

GET CONNECTED WITH THE COMMUNITY

Volunteer on or off campus with different community organizations, such as Science Quest, and Mostly Autonomous Sailboat Team (MAST).

Get involved with the Engineering Society (ENGSOC).

Join the Queen's Electrical and Computer Engineering Club and go to events such as the ECE Lunch with Profs.

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

Do some targeted in careers of inter Queen's Connects

Attend conference Competition (QEC by QHacks).

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.

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.

Build your intercultural involved with oth improving your lai

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 education require needed, prepare t LSAT or GMAT) an school from Caree

Visit careers.queensu.ca/majormaps for the online version with links!
**4TH OR FINAL YEAR**

- **Computer Engineering**
  - 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.
  - You will also need to choose approximately 7-8 Technical Electives (totaling 22.5 units), plus one Complementary Studies course. You may also take a Research Project course (ELEC 497).
  - For CEi, the Complementary Studies course is Pitching and Launching your Venture.

- 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**
  - 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 joining professional associations like the Institute of Electrical and Electronics Engineers and Professional Engineers Ontario.**

- **International students interested in staying in Canada can speak with an International Student Advisor.**

**Employability skills**

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

- 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

**Where could I go after graduation?**

- Aerospace software
- Ambient intelligence
- AI software
- Autonomous control systems
- Banking Automation Systems
- Biomedical Engineering
- Computer architecture
- Computer vision and optical processing
- Cyber security
- Database engineering
- Game development
- Integrated circuit design
- Medical informatics
- Mechatronics
- Natural language processing
- 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.

*some careers may require additional training. Careers listed here are only suggestions.

*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.
# Computer Engineering

## MAJOR MAP

### 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.

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## QUEEN’S UNDERGRADUATE INTERNSHIP PROGRAM

**START DATES** in May, September, or January

**POSITIONS** are paid and full-time

**WORK TERMS** are 12-16 months long

### PROGRAM OVERVIEW

- Graduate with “Professional Internship” on your degree.
- Learn about current advances, practices and technologies in business and industry.
- Test drive a career, earn a competitive salary, and get real world experience.

### ELIGIBILITY

- 2nd or 3rd Year Students
- Minimum GPA of 1.9

### WHY QUIP?

- Gain a year of career-related work experience.
- Build network connections.
- Receive support from Queen’s staff in job search and during internship.

### SAMPLE PAST INTERNSHIPS

- Planning Logistics Intern
- Communications & Market Research Intern
- Resource Conservation Technician
- Course & Program Development Intern
- Technical Writer
- Economic Analyst

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

## 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 Kingston as one of the GREATEST UNIVERSITY TOWNS in the world – and it is often awarded the safest city in Canada. It is 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.