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 artificial Intelligence, quantum computing, computer vision, computer architecture, safety critical software engineering, cryptography and network security, machine learning and deep learning, operation systems, computer networks, and algorithms. 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

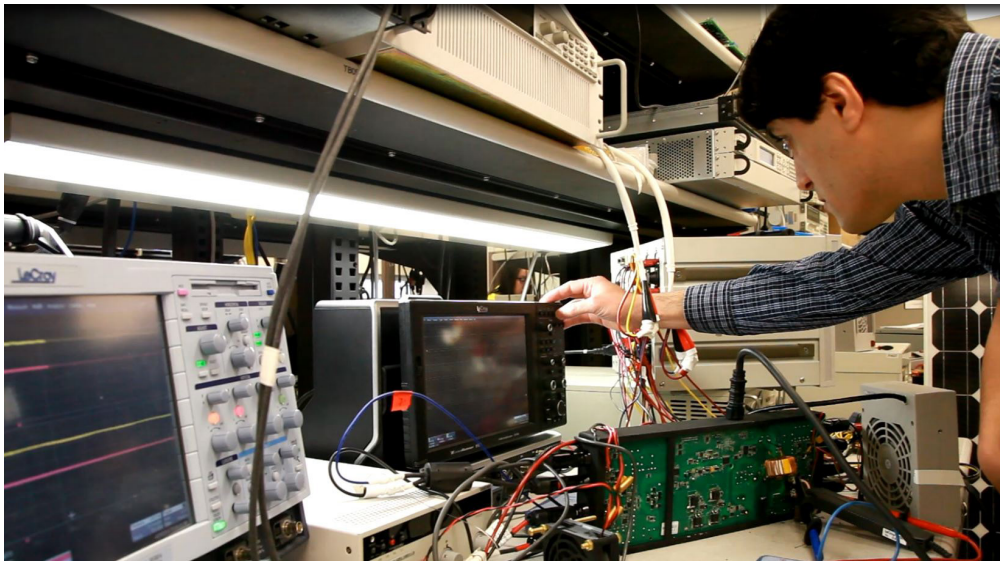
Bachelor of Applied Science in Engineering

Bachelor of Applied Science in Engineering with Professional Internship

Specialization in Artificial Intellignece / 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 courses, English 4U, Calculus and Vectors 4U, Advanced Functions 4U, Chemistry 4U, and Physics 4U. Applicants outside of Ontario may have additional requirements.



"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 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 Engineering
- Computer System Architecture
- Quantum Computing

Computer Engineering DIRECT ENTRY

Consider Computer Engineering Direct Entry, an undergraduate program if you are interested in pursuing a career in computer engineering from the start of your undergraduate studies. Whether you aim to work in artificial intelligence, software, hardware, embedded systems, or emerging technologies such as quantum computing, generative artificial intelligence, robotics, or GPUs, this program provides a strong foundation in both theoretical and applied aspects of computer engineering, preparing you for a wide range of roles in industry or further academic study.

You can receive a differentiated curriculum designed to give you an early start in your discipline. In your first year, you will take two programming courses. You will learn about probability and statistics earlier in the program, which is foundational for fields like artificial intelligence and machine learning. This specialized curriculum provides greater flexibility in choosing technical electives and pursuing internship opportunities in later years.

Acquire Skills. Gain Experience. Go Global.

That is a degree from Queen's.

ece.queensu.ca

2025-2026

Computer Engineering MAJOR MAP

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

Queen's University

	1ST YEAR	2ND YEAR	3RD YEAR	4TH OR FINAL YEAR
GET THE COURSES YOU NEED	Queen's Engineering first year is common – courses include: Physics, Chemistry, Calculus, Algebra, Graphics, Computing, and Earth Systems Engineering, and APSC101. APSC101 is the entry level course in our Engineering Design and Practice Sequence (EDPS), focusing on problem solving, experimentation principles and finishes off with a team-based engineering project. Computer Engineering (CE) Direct Entry students take Information Structures instead of Earth Systems Engineering.	Courses include: Electric Circuits, Digital Systems, Information Structures, Differential Equations, Object Oriented Programming, Python, Data Science, Electronics, Discrete Mathematics, Computer Architecture, and Electromagnetics. You will take the second EDPS course – ELEC290, plus one Complementary Studies course. CE Direct Entry students take probability & random processes, which is foundational for fields like artificial intelligence and machine learning.	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, as well as 2 Technical Electives, plus one Complementary Studies course. CE Direct Entry students take fundamentals of Quantum Computing as a core course. General CE students take it as an elective.	All Computer Engineering students follow up their ELEC 392 Engineering Design and Development course with the Computer Engineering Project course (ELEC 498). 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) or conduct research in the summer funded by NSERC USRA or USSRF.
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 through SWEP or NSERC. Take more responsibility within different clubs or extracurriculars. Consider entrepreneurial opportunities at programs like the Queen's Founders and Innovators Initiative (QFII).	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/MASc 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 ENGAGED 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 networking with alumni working in careers of interest through LinkedIn. Attend conferences like the Queen's Engineering Competition (QEC) and the annual hackathon hosted by QHacks.	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 ENGAGED 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 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 CAREER READY	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 in the Career Services Career Advising and Resource Area, by 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. Find impactful work that aligns with your values using the Queen's Career Guide to the UN Sustainable Development Goals.

CONSIDER A 12-16 MONTH QUIP INTERNSHIP

Knowledge & Workplace Skills

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

- Understanding of **artificial intelligence, 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**

Career Possibilities

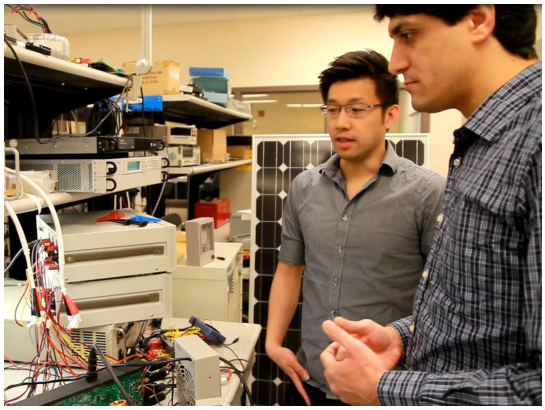
- AI innovations
- Ambient intelligence
- Autonomous control systems
- Banking Automation Systems
- Biomedical Engineering
- Computer architecture
- Computer vision and optical processing
- Cybersecurity
- Database engineering
- Game development
- High-Performance Computing (GPU)
- Integrated circuit design
- Large language models
- Medical informatics
- Mechatronics
- Quantam Computing
- 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.

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.

Computer Engineering



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.

QUIP 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
- Explore a career path, earn a salary, and build workplace skills

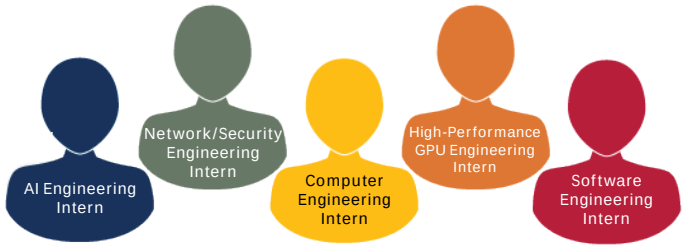
ELIGIBILITY

- Complete 1st year before you register
- Complete 2nd or 3rd year before your internship
- Minimum GPA of 1.9
- Return to Queen's after your internship to finish your degree

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**



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

Why study in Kingston?

Since 1841, 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 identified as 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. At a university with more clubs per capita than any other university in Canada, and in 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.

SMITH ENGINEERING
Queen's University

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