

Mechatronics and Robotics Engineering

Get to know

MECHATRONICS AND ROBOTICS ENGINEERING

Mechatronics is the combination of mechanical, electrical and computer engineering in the design of products and manufacturing processes.

Robotics is a subset of mechatronics – all robots are mechatronic! Robotics, however, are an elevated class of mechatronics, incorporating automation, programming, and even autonomous action.

As automation and autonomous machines become increasingly important in our society, robotics – and its parent discipline, mechatronics – are more vital than ever.

Degree OPTIONS

Bachelor of Applied Science in Engineering

Bachelor of Applied Science in Engineering with Professional Internship

Recommended concentration in Biomedical / Robotics / Automation / Intelligent Systems

Queen's ADMISSIONS

The Mechatronics and Robotics Engineering program is a direct-entry program. Students apply to Queen's Mechatronics and Robotics Engineering (QEM) through the OUAC (Ontario University Application Centre) website. Secondary school prerequisites include five required 4U or 4M courses, one of which must be English 4U. Other required courses include:

- Calculus and Vectors 4U/4M
- Advanced Functions 4U/4M
- Chemistry 4U/4M
- Physics 4U/4M



A final competitive minimum grade of 80% must be obtained for all courses. Applicants outside of Ontario may have additional requirements.

Course HIGHLIGHTS

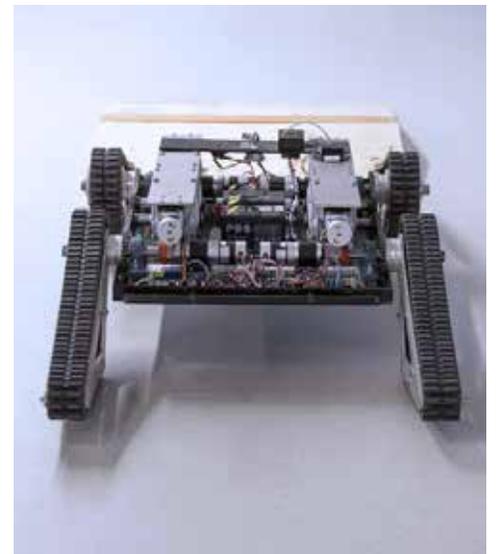
Students in the MRE program will take newly developed courses. Experts and researchers will be invited to the classroom to teach and work with students on experiential learning projects with real-world applications. Courses include:

- Introduction to Robotics
- Intelligent Machines and Autonomous Systems
- Mechatronics Design I to IV
- Data Structures and Algorithms
- Thermodynamics and Heat Transfer
- Signals and Systems
- Fluid Mechanics and Fluid Power
- Sensors and Electric Actuators
- Automation: Machine Design and Control

From advanced physics to machine movement to artificial intelligence, the MRE program delivers a rounded and demanding four-year program that covers every aspect of the field.

Careers in MRE

An MRE degree will put students at the cusp of a rapidly growing field, in international demand as automation, controls, and systems engineers. Mechatronic and robotics engineers are needed in sectors ranging from manufacturing to aerospace; from construction to telecommunications.



Acquire Skills. Gain Experience. Go Global.

That is a degree from Queen's.

mre.engineering.queensu.ca

Mechatronics and Robotics Engineering MAJOR MAP



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



CONSIDER A 12-16 MONTH QUIP INTERNSHIP

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

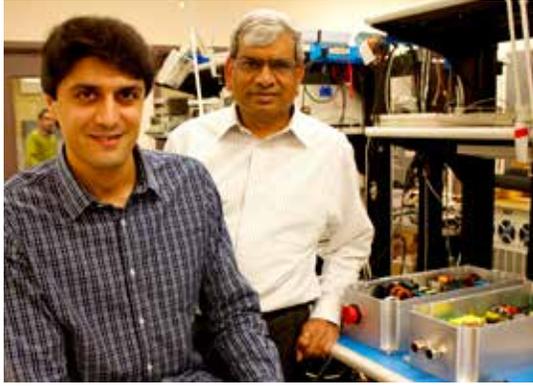
Where could I go after graduation?

- 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.

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.

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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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Walter Light Hall, Rm. 416
19 Union Street
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ece.queensu.ca

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.
- Test drive a career, earn a competitive salary, and get real world experience.

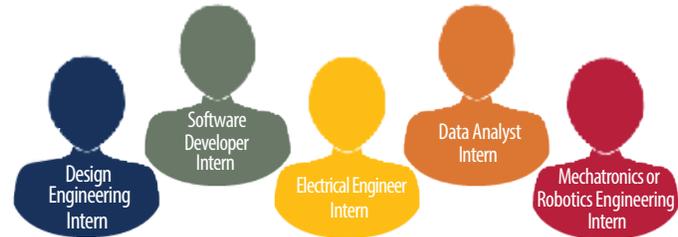
ELIGIBILITY

- 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



For more information, contact quip@queensu.ca or visit the [Program Website](#).

Why study in Kingston?

For over 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 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.

We're closer than you think

