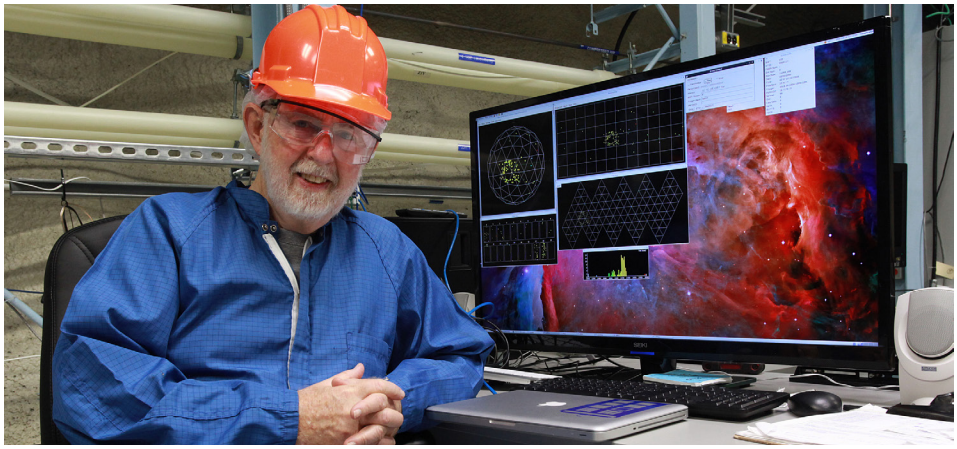
Engineering Physics

Get to know ENGINEERING PHYSICS

This program allows students to apply the knowledge of fundamental physical principles underlying modern technology and processes. You will study a strategic combination of math, physics, and engineering courses from a chosen specialty area. Courses in quantum mechanics, laser optics, and nanotechnology will help prepare you for an engineering career at the leading edge of technology. You will acquire advanced problem-solving and instrumentation skills, and will be able to apply your superior mathematical, analytical, and abstract-thinking ability to modern engineering challenges.



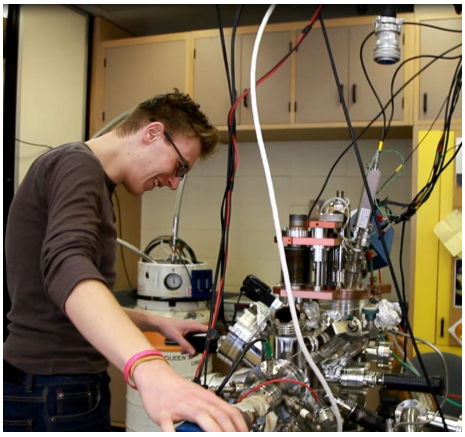
"Queen's Physics Professor Emeritus Dr. Arthur B. McDonald was awarded the 2015 Nobel Prize in Physics with Takaaki Kajita of Japan. His research, leading the Sudbury Neutrino Observatory, unlocked the mystery of neutrinos - fundamental particles created in the Sun's core. Engineering Physics students have been involved in this research since its beginning, and continue to collaborate in world leading experiments and research during their studies."

Degree OPTIONS

Bachelor of Applied Science in Engineering

Bachelor of Applied Science in Engineering with Professional Internship

All students in Engineering Physics specialize by taking one of 4 options: **Mechanical**, **Computing**, **Electrical** or **Materials Engineering**. Students in each option take a significant number of courses at the same level as those in the engineering major. Graduates of these specializations can work as engineers in their chosen specialization or continue to graduate school in either physics or their engineering option.



Queen's ADMISSIONS

Students apply to Queen's Engineering (QE) through the OUAC (Ontario University Application Centre) website. Secondary School prerequisites include these 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.

A Common START

Queens 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

In addition to a variety of technical courses in their engineering option, Engineering Physics students have the opportunity to take a wide range of physics courses to help prepare them for many possible career destinations. These courses include:

- Laser Optics
- Nanoscience and Nanotechnology
- Nuclear Physics
- Medical Physics
- Plasma Physics
- Cryogenics
- Solid State Devices
- General Relativity
- Mathematical Methods in Physics
- High Performance Computing for Engineering Physics
- Advanced Mechanics
- Quantum Physics (Mechanics or Theory)

Students also do sophisticated experiments and work together in engineering design through all four years of the program.

2026-2027

Engineering Physics 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. Also APSC10x, 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!	You will take a second engineering design course - APSC 200 - where we connect the physics you learn to the technology that helps society. More hands-on experience comes in laboratory and data management classes. You start taking courses in your option (Mechanical, Materials, Electrical or Computer engineering) alongside your courses in physics, which will include Relativity & Quanta, Electricity & Magnetism, Waves and Optics, and Computational Engineering Physics.	Courses deepen your knowledge of physics from both a theoretical and practical side. Your third EDPS design course (ENPH 354) deepens your ability to work as a team taking on technical challenges. Take 4-5 courses with engineering students in your chosen option. Courses range from digital communications to materials processing. From operating systems to heat transfer - depending on your chosen option. Consider applying to the Accelerated Master's program.	All Eng Phys students participate in the "capstone" EDPS team-based project course – ENPH454, in addition to an individual engineering thesis, an advanced laboratory course, and a high-level quantum mechanics course. Choose technical elective courses from a huge range, including Laser Optics, Robotics, Computer Vision, High Performance Computing in Engineering Physics, Aerodynamics, and General Relativity.
GET RELEVANT EXPERIENCE	Join teams or clubs on campus, or an engineering design team such as Queen's University Experimental Sustainability Team, Queen's Space Engineering Team, Queen's Solar Design Team, and the Mostly Autonomous Sailboat Team. See the AMS Clubs Directory for more ideas.	Look into summer jobs related to Engineering Physics or your engineering option 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)	Apply for NSERC USRA summer research positions at Queen's or across Canada - in physics or engineering. Consider applying to do a 12-16 month QUIP internship between your third and fourth academic year. If you are considering graduate school, look into the Accelerated Masters program where you start research the summer after year 3!	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 Let's Talk Science (LTS), Women in Science and Engineering, Science Rendezvous, and Queen's Students for Systems Change (SSC).	Get involved with the Engineering Society (ENGSOC) and the Alma Mater Society (AMS). Start or continue volunteering with organizations such as the Commerce & Engineering Environmental Conference (CEEC).	Do some targeted networking with alumni working in careers of interest through LinkedIn.	Consider joining professional associations like Canadian Association of Physics, American Physical Society, Institute of Electrical and Electronic Engineers, and American Society of Mechanical Engineers. Join groups on LinkedIn reflecting specific careers or topics of interest in Engineering Physics.
GET ENGAGED GLOBALLY	The Queen's University International Centre is your first stop to learn how to internationalize your degree or to leverage your existing cross-cultural experience. Volunteer with QUIC for the English Converstation program, planning social events and in the Intercultural Wellness Leaders Program.	Is an exchange in your future? Start thinking about where you would like to study abroad. Queen's facilitates exchanges with some of the top schools for physics in the world: University of NSW, and Delft University, among others. If exchange isn't for you, come talk to QUIC about some other options to gain international experience.	Build your intercultural competence by getting involved with other cultures or by practicing or improving your language skills. Join an intercultural club and/or go to Quic social events.	Speak to a QUIC advisor to get involved in their programs, events, and training opportunities 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. For more information check out Career Cruising or by finding and connecting with 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. Discover what skills you already have and figure out what ones you want to grow by using the Queen's Skills Cards.	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:

- Proficiency in **mathematics and numerical modelling** with courses in math and physics
- **Time and resource management** – taught formally in class and then applied in your projects
- Work independently and in a team on a project – a **group design project** is undertaken every year and a thesis in the final year
- Able to **solve complex problems** using your broad scientific knowledge
- You gain **practical skills as an engineer**, and back them up with the deep knowledge of a scientist
- Ability to make careful measurements with **sophisticated equipment** in laboratory classes
- Proficiency with **modern physics** allowing you to work with tomorrow's technologies

Career Possibilities

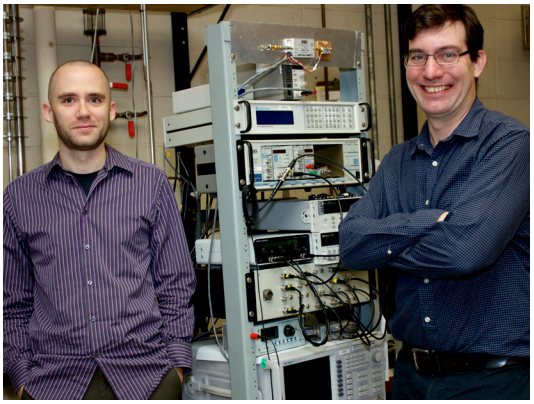
- Aerospace engineer
- Automotive industry
- Astrophysics
- Atmospheric science
- Biophysics
- Computer engineering
- Energy (nuclear, solar, wind, etc.)
- Environmental management
- Financial modeling
- Forensic science
- Management consulting
- Medicine
- Nanotechnology
- Nuclear engineering
- Oceanography
- Quantum Physics
- Semiconductors and electronics
- Software engineering

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.

Engineering Physics



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.

SMITH ENGINEERING
Queen's University

Department of Engineering Physics
Stirling Hall
64 Bader Lane
(613) 533-2707
queensu.ca/physics

QUIP

QUEEN'S UNDERGRADUATE INTERNSHIP PROGRAM

START DATES
May, September, or January

POSITIONS
are paid and full-time

WORK TERMS
are 12-16 months long

PROGRAM OVERVIEW

- Graduate with a "Professional Internship" 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.

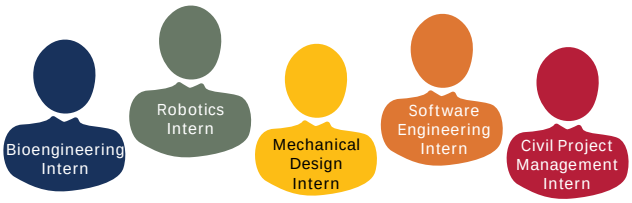
ELIGIBILITY

- 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 the job search and during the 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.