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 you prepare 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.

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 and continue to graduate school in the option.

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 in all courses. Applicants outside of Ontario may have additional requirements.

Course HIGHLIGHTS

Engineering Physics 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 including:

- Laser Optics
- Nanoscience and Nanotechnology
- Nuclear Physics
- Medical Physics
- Solid State Devices
- General Relativity
- Mathematical Methods in Physics
- High Performance Computing for Engineering Physics
- Advanced Mechanics

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

“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.”
2021-2022
Engineering Physics MAJOR MAP *

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 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.

3RD YEAR
Courses deepen your theoretical and practical course (ENPH 354) team taking on technical challenges.
Take 5-6 courses within your chosen option. Consider entrepreneurizing opportunities at programs like the Queen's Innovation Connector Summer Initiative (QICSI).
Consider applying to another program. In this program, students start research in their chosen option. Courses range from digital communications to materials processing. From operating systems to heat transfer - depending on your chosen option. Take 5-6 courses with engineering students in your discipline.

GET THE COURSES YOU NEED

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 or the Queen's Get Involved page for more ideas.

GET CONNECTED 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 Engineers without Borders (EWB).

GET THINKING 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.
Speak to a QUIC advisor or get involved in their programs, events and training opportunities.

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.

Visit careers.queensu.ca/majormaps for the online version with links!
The coronavirus pandemic may impact how some activities are delivered in 2021-2022. Please check directly with the host of any activity on the map for the latest information.

**4TH OR FINAL YEAR**

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 electromagnetic theory 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.

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 Canadian Association of Physics (CAP), American Physical Society (APS), Institute of Electrical and Electronic Engineers (IEEE), and American Society of Mechanical Engineers (ASME).

Join groups on LinkedIn reflecting specific careers or topics of interest in Engineering Physics.

Prepare for work or studies in a multi-cultural environment by taking the Intercultural Awareness Training Certificate and research possible immigration regulations.

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

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.

**Where could I go after graduation?**

- Aerospace engineer
- Automotive industry
- Astrophysics
- Atmospheric science
- Biophysics
- Computer engineering
- Energy (nuclear, solar, wind, etc.)
- Environmental management
- Financial modelling
- Forensic science
- Management consulting
- Medicine
- Nanotechnology
- Nuclear engineering
- Oceanography
- 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.

*some careers may require additional training. Listed careers are only suggestions.

**Employability skills**

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

- Proficiency in mathematics and numerical modeling 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

**CONSIDER A 12-16 MONTH QUIP INTERNSHIP**

The USRA summer research positions at Queen’s Canada - in physics or engineering. Ring to do a 12-16 month QUIP internship third and fourth academic year.

Iderring graduate school, look into the asters program where you start research ter year 3!

Jeted networking with alumni working interest by joining the LinkedIn groupects.

Contricultural competence by getting tr other cultures or by practicing our language skills. Consider taking the Awareness Training Certificat hosted

* 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.
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.