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.

Degree OPTIONS

Bachelor of Science in Engineering
Bachelor of 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, Chemistry 4U, and Physics 4U are all required along with one of Advanced Functions 4U, Biology 4U, Data Management 4U, Computer Science 4U, Earth and Space Science 4U. A final grade of 70% must be obtained in English 4U. 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

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

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.”

That is a degree from Queen’s.

physics.queensu.ca
**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 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 5-6 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. In this program, students start research in the summer after their third year, and take graduate courses concurrently with the fourth year program.

**4TH OR FINAL YEAR**
- All Eng Phys students participate in the "Capstone" EDPS team based project course – ENPH494, 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, Nuclear Reactors, Aerosdynamics and General Relativity.

**GET THE COURSES YOU NEED**
- Visit careers.queensu.ca/majormaps for the online version with links!

**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 involved with the Engineering Society (ENGSSC) and the Alma Mater Society (AMS). Start or continue volunteering with organizations such as the Commerce & Engineering Environmental Conference (CEECC).
- Do some targeted networking with alumni working in careers of interest by joining the LinkedIn group Queen’s Connects Career Network.

**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.
- 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.

**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.
- Explore different careers of interest by reading books in the Career Services Career Advising and Resource Area, such as Career Opportunities in Engineering. For more information check out Career Cruising by talking to the department or Career Services about work through SWEP or NSERC.
- 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.

**WHERE COULD I GO AFTER GRADUATION?**
- Acoustics
- Aerospace engineer
- Astronaut
- Automotive industry
- Astrophysics
- Atmospheric science
- Biophysics
- Computer engineering
- Education
- Engineering consulting
- Energy (nuclear, solar, wind, etc.)
- Entrepreneurship
- Environmental management
- Environmental conservation
- Financial modeling
- Forensic science
- Geophysics
- Imaging
- Patent law
- Management consulting
- Medical physicist
- Medicine
- Nanotechnology
- Nuclear engineering
- Oceanography
- Occupational health and safety
- Radiology
- Remote sensing
- Semiconductors and electronics
- Software engineering

*Some careers may require additional training. Listed careers are only suggestions.*
Succeed in the workplace

What employers want
The Canadian Council of Chief Executives list the top 6 skills sought by employers as:
1. People skills
2. Communication skills
3. Problem-solving skills
4. Analytical abilities
5. Leadership skills
6. Industry-specific knowledge

Take the time to think about the unique skills you have developed at Queen’s, starting with the skills list here for ideas. Explaining your strengths with compelling examples will be important for applications to employers and further education. For help, check out Career Services workshops.

What can I learn studying ENGINEERING PHYSICS?
• 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

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 us as one of the GREATEST UNIVERSITY TOWNS in the world – and is often awarded the safest city in Canada. We are 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.