

CAREER OPPORTUNITIES

McMaster University is home to the University Network of Excellence in Nuclear Engineering, a network dedicated to the education of students for the nuclear industry.

Graduates from the Engineering Physics Nuclear Engineering & Energy Systems stream have a solid scientific background and a thorough knowledge of engineering analysis and design skills. The broad nature of the Engineering Physics degree allows graduates to pursue a career of interest in any division of the energy sector.

Graduates have excelled as problem solvers in many sectors including:

- Electrical Power Generation Utilities
- Nuclear Power Plant Design
- Nuclear Safety & Policy
- Consulting Firms
- Private Industry
- Research Institutions

With the problem solving skills and resourcefulness obtained in Engineering Physics, graduates may succeed in any career path of their choice.



ABOUT THE DEPARTMENT

The Department of Engineering Physics offers 30 undergraduate courses for the 4 stream options. Programs offered include:

- Interdisciplinary Engineering
- Nuclear Engineering & Energy Systems
- Nano and Micro Device Engineering
- Photonics Engineering

Undergraduate class sizes range from 30-60 students, varying per year, with an average of 32 hours of classes per week, six to nine of which are in a hands-on or laboratory setting.

In addition to undergraduate studies, the department offers a variety of programs for graduate studies, and conducts cutting edge research, developing tomorrow's advanced technologies.



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Engineering Physics

Nuclear Engineering & Energy Systems



NUCLEAR ENGINEERING & ENERGY SYSTEMS

Nuclear engineering involves the application of scientific principles, engineering design and analysis, computer modeling and simulation, and government regulation for the peaceful use of nuclear energy.

In the Nuclear Engineering & Energy Systems Stream an understanding of the fundamentals of energy technology are explored in depth. Courses cover a broad range of skills which are transferable among all the energy sectors. Principles of alternative energy sources such as photovoltaics (solar cells), fuel cells, and wind power are explored in depth.

The nuclear engineering component of the McMaster program was one of the first of its kind created in Canada, and is one of the most prestigious in the country. Students also have the opportunity to complete labs in McMaster's very own nuclear reactor.

STREAM CURRICULUM

The Engineering Physics core curriculum offers a broad education in the physical and engineering sciences. Topics in the core curriculum include:

- Engineering & Classical Mechanics
- Quantum Mechanics & its Applications
- Electronic Devices & Circuit Design
- Computer Modeling & Signal Processing
- Mathematics & Mathematical Physics
- Thermodynamics & Heat Transfer
- A Variety of Engineering Design Projects

Topics in the Energy stream include:

- Principles of Nuclear Engineering
- Introduction to Energy Systems
- Industrial Monitoring & Detection
- Nuclear Reactor Analysis
- Special Topics in Energy Systems

All streams offer the opportunity to take 5-7 technical electives, which may be chosen among Engineering Physics courses, or from other Engineering departments to allow for a broadened Engineering education and diverse set of technical skills.

INDUSTRIAL RELEVANCE

The energy industry as a whole is currently undergoing major changes as international demands for energy rise, and senior engineers are approaching the age of retirement. Several organizations are hiring many entry level engineers every year, as there is a great need for problem solvers who know how to tackle global energy problems.

Increasing population, decreasing supply and escalating costs of some of the traditional energy sources are posing demanding technical and social challenges. These challenges, coupled with environmental concerns, provide a complex set of issues and creative opportunities for the nuclear and energy systems engineers of tomorrow.

The Nuclear Engineering & Energy Systems stream is ideal for the student who aspires to get involved in the energy sector, as it prepares the student with relevant technical skills used in industry, along with providing industrial insight through company tours and field trips.



OTHER OPTIONS

All Engineering Physics streams include the following options:

Engineering & Management
(5 year program)

Engineering & Society
(5 year program)

Co-op or Internships
(4-6 year program)

