

Engineering

PHYSICS



Engineering physics applies fundamental physical science to the solution of technological problems. As an Engineering Physics graduate, you will be well educated in material science, applied physics, electronics and nanotechnology. You will also be highly skilled in the development of new technologies in semiconductor, optical and nanoscale integrated devices for telecommunications, biomedical and renewable energy applications.



The Carleton advantage

At Carleton University, the Bachelor of Engineering (BEng) degree program in Engineering Physics has two main areas of focus: integrated semiconductor devices, and optical devices and systems. This program offers:

- a set of options in fourth year that allow you to focus on either semiconductor devices and technology, or modern optics;
- the opportunity for you to design your own integrated circuits (ICs), which are manufactured right on campus;
- a unique team design project course in first year;
- excellent computing resources;
- an active student branch of the Institute of Electrical and Electronics Engineers; and
- excellent scholarships for high-standing students.

Carleton's location in Canada's high technology centre enables you to develop contacts that could lead to opportunities during work terms and after graduation.

Our laboratory and research facilities

At Carleton, you will benefit from outstanding computer networks and modern, well-equipped laboratories—Carleton is actually one of the few universities in the country with its own in-house IC fabrication facilities. You will also benefit from our proximity to, and close association with, the laboratories of the National Research Council Canada (NRC) and the Communications Research Centre.

Your co-op opportunities

If you choose to participate in the co-op option, you will have the opportunity to work with some of Canada's leading technology companies, many of which are located in the Ottawa region. You will also have the chance to work in state-of-the-art government labs, such as those of the NRC.

The pattern of work and study terms for the Engineering Physics co-operative education program is shown below.

Calendar Year	Fall	Winter	Summer
1	study term 1	study term 2	work term*
2	study term 3	study term 4	work term
3	work term	study term 5	study term 6
4	work term	work term	work term
5	study term 7	study term 8	

* Optional placement to be arranged directly with an employer.

Choosing the right program

The BEng degree program in Engineering Physics is fully accredited by the Canadian Engineering Accreditation Board. When you graduate from this program, you will meet the educational requirements for registration as a professional engineer.

Your program begins with a broad and fundamental background in physics and electronics. During the first year, you will have a unique opportunity to participate in a small class and collaborate closely with a senior professor on a team project that involves the design and implementation of an optical system. This course introduces you to engineering design early in your studies, making your subsequent years more relevant and interesting.

The second and third years of the program provide you with a strong background in both physics and engineering, with courses in programming, electronics and modern physics. Fourth year allows you to specialize in either semiconductor device technology or applied optics. Electives are also available in IC design, telecommunications electronics, computer-aided design, microwave engineering, integrated sensors and many other areas.

The courses of a typical Engineering Physics program are shown below.

Study Term 1	Study Term 5
<ul style="list-style-type: none"> Calculus for Engineering or Physics Linear Algebra for Engineering or Science Chemistry for Engineering Students Foundations of Physics I Complementary studies elective 	<ul style="list-style-type: none"> Basic Electromagnetic and Power Engineering Physical Electronics Electronics II Digital Electronics Elements of Quantum Mechanics Systems and Simulation
Study Term 2	Study Term 6
<ul style="list-style-type: none"> Problem Solving and Computers First Year Project Differential Equations and Infinite Series for Engineering or Physics Foundations of Physics II Communication Skills for Engineering Students 	<ul style="list-style-type: none"> Probability and Statistics Modern Physics II Mathematical Physics I Communication Theory Electromagnetic Waves
Study Term 3	Study Term 7
<ul style="list-style-type: none"> Multivariable Calculus for Engineering or Physics Numerical Methods Modern Physics I Circuits and Signals Data Structures and Algorithms 	<ul style="list-style-type: none"> Engineering Project Engineering Economics Introduction to Quantum Mechanics I Physics elective Engineering elective Complementary studies elective
Study Term 4	Study Term 8
<ul style="list-style-type: none"> Mathematical Methods I Wave Motion and Optics Switching Circuits Object-oriented Software Development Electronics I 	<ul style="list-style-type: none"> Engineering Project (continued) Professional Practice Fourth-year Physics Laboratory Physics elective Engineering elective Complementary studies elective

Note: As study terms and courses offered may vary, please refer to the Carleton University Undergraduate Calendar at carleton.ca/cuuc for specific program requirements.

Your future opportunities

As an engineering physicist, you will be well equipped for work in the biomedical, renewable energy and telecommunications high technology sectors, including IC fabrication, microelectronic devices, microwave and optical systems, and sensor technology. Some engineering physicists also develop careers in biomedical engineering and medical physics. This degree also provides an ideal background for graduate studies in either electrical engineering or physics.

Admission requirements

For admission to the Engineering Physics program, you must have an Ontario Secondary School Diploma (OSSD) or equivalent, including a minimum of six 4 U/M courses. Your six courses must include four prerequisite courses:

- Advanced Functions
- Chemistry
- Physics
- one of:
 - Calculus and Vectors*
 - Biology
 - Earth and Space Science

* Strongly recommended for applicants to all engineering programs.

Although it is not an admission requirement, at least one 4U course in either English or *français* is recommended.

Equivalent courses may be substituted at the appropriate 4U level. The overall admission cut-off average and/or the prerequisite course average may be considerably higher than the stated minimum requirements for some programs.

If you are from outside Ontario, or outside Canada, see Carleton University's website at carleton.ca/howtoapply for your specific program requirements.

Since the number of qualified applicants may be greater than the number of available spaces, cut-off averages and required marks may vary.

For more information

Please visit www.doe.carleton.ca or consult the *Carleton University Undergraduate Calendar* at carleton.ca/cuuc.

Department of Electronics
 Carleton University
 5170 Mackenzie Building
 1125 Colonel By Drive
 Ottawa ON K1S 5B6
 Canada

Tel: 613-520-5754
 Fax: 613-520-5708
 Website: www.doe.carleton.ca

Undergraduate Recruitment Office
 Carleton University
 315 Robertson Hall
 1125 Colonel By Drive
 Ottawa ON K1S 5B6
 Canada

Tel: 613-520-3663
 Toll-free in Canada:
 1-888-354-4414
 Fax: 613-520-3847
 Email: liaison@carleton.ca
 Website: carleton.ca/admissions