

# Mathematics and Engineering at Queen's University

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In response to the need in industrial research and development for engineers with a greater knowledge of applied mathematics and modelling techniques, Queen's University offers a unique program in Mathematics and Engineering. This program, the only one of its kind in North America, is fully accredited by the Canadian Council of Professional Engineers. Students develop advanced skills in practical and theoretical engineering, based on solid foundations in pure and applied mathematics.

After a common first year taken by all engineering students at Queen's, students admitted to the Mathematics and Engineering program devote studies to their chosen engineering option, along with core courses in abstract algebra, probability and statistics, ordinary and partial differential equations, boundary value problems, complex analysis, and classical control theory. Students also take a variety of fourth year/graduate courses in their respective field of specialization, such as modern control theory, Lagrangian mechanics, dynamics and control, information theory, data compression, telecommunication and data network modeling, and statistical signal processing.

## Computing and Communications Option

This option produces engineers with expertise in mathematics, computer science (in the areas of formal analysis, protocols, algorithm analysis and software engineering methods), and communications. Students also take a core of electrical engineering courses. The program fits ideally with the strong mathematical background and interests of our students, and with the expanding department involvement in communications, coding, network analysis, information theory, signal processing, and control systems. Students develop a deeper understanding of the theoretical basis underlying the various design techniques taught in standard engineering courses. This added insight provides our graduates with the ability to adapt and develop techniques for solving a wide range of engineering problems and to keep up with a rapidly changing technology.

In addition to the courses in mathematics and engineering, students are required to take several courses in the humanities and social sciences, as well as engineering management and economics.

It is an ambitious program whose successful completion requires a combination of engineering and problem solving ability as well as dedication and sustained effort. A graduate of this program will have an unusually diverse background, and will be able to function effectively in many engineering environments.