Get to know

CHEMICAL ENGINEERING

Society relies daily on products such as fuel, pharmaceuticals, advanced composites, semiconductors, magnetic and optical storage devices, agricultural products, light-weight materials, coatings, synthetic fibers and personal care products. Chemical Engineers develop new advanced materials and design the processes that convert raw materials into value-added products.

Chemical Engineering is a broadly based engineering discipline, which combines the study of mathematics, chemistry, physics and biology, with engineering science, design, and economics. You will learn how to design safe, efficient, environmentally-friendly and economical processes. You will also acquire direct experience with pilot-scale chemical process equipment and simulators. Queen’s Chemical Engineering offers options in Chemical Process Engineering and in Biochemical Engineering.

Areas of specialization through choice of electives: biochemical, biomedical, environmental, process systems engineering, energy, and materials.

“Semiconductor production, microchips, metals, mineral processing, paper products, petroleum and petrochemicals, plastics, forest products, pharmaceuticals and foods are just some of the sectors in which chemical engineers work.”

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.

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.

Degree OPTIONS

- Bachelor of Applied Science in Engineering
- Bachelor of Applied Science in Engineering with Professional Internship
- Option in Bioengineering / Process Engineering

Course HIGHLIGHTS

Chemical Engineering 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 include:

- Design of Manufacturing processes
- Technology, Engineering and Management
- Process Dynamics and Control
- Mitigation of Industrial Pollution
- Engineering Innovation & Entrepreneurship
- Biomedical Engineering
- Pharmaceutical Technology
- Bioremediation
- Polymer Formulations and Processing Technology


That is a degree from Queen’s.

chemeng.queensu.ca
**Chemical Engineering MAJOR MAP**

**1ST YEAR**
- Queen's Engineering first year is common – courses include: Physics, Chemistry, Calculus, Algebra, Graphics, Computing and Earth Systems Engineering.
- Also an Introduction to Design and Practice (EDPS), focusing on problem solving, experimentation principles and finishing off with a team-based engineering project.
- Discipline selection will take place in February! You will also choose a Sub-Plan: Chemical Process Engineering (CHE1) or Bioengineering (CHE2).

**2ND YEAR**
- You will also take the second EDPS course – APSC200, as well as a laboratory project course and one additional course based on your option: Transport Phenomena Fundamentals (CHE1) or Cell Based Engineering Principles (CHE2).

**3RD YEAR**
- You will also take another laboratory projects course, as well as additional courses based on your option: Environmental Biotechnology and Biomedical Engineering (CHE2) or Industrial Catalysis (CHE1).

**4TH OR FINAL YEAR**
- 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 the Canadian Society for Chemical Engineering, the Canadian Society for Chemical Technology.
- Join groups on LinkedIn reflecting specific careers or topics of interest in Chemical Engineering.

**Employability skills**
- Your time at Queen's will give you valuable skills to boost your employability, including:
  - Knowledge of chemical engineering theory and methods
  - Proficiency in mathematics
  - Ability to apply physics, chemistry and biology principles to practical engineering projects
  - Experience working on hands-on engineering projects
  - Technical knowledge - use software to create mathematical models and analyze data
  - Research skills - conduct research and collect data
  - Complex problem solving - approach problems from various perspectives
  - Ability to work independently and in teams
  - Written and oral communication - write reports and give presentations to a knowledgeable audience
  - Time and resource management
  - Sustainability and the impact of engineering on society

Where could I go after graduation?
- Agricultural sciences
- Biotechnology
- Chemical process engineering
- Cytotechnology
- Environmental management
- Fluid dynamics - aerospace
- Finance & financial analysis
- Food industry, nutrition & dietetics
- Mineral processing
- Nanotechnology
- Patent law
- Pharmaceutical engineering
- Planning - urban and regional
- Polymer/rubber/plastic technology
- Radiology
- Toxicology
- 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.

Visit careers.queensu.ca/majormaps for the online version with links!
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. Queen’s wants you to succeed! Check out the Student Affairs website for available resources.

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 Kingston as one of the GREATEST UNIVERSITY TOWNS in the world – and it is often awarded the safest city in Canada.

It is 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.