Chemical Engineering

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.”

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

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

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,
• Intermediation,
• Polymer Formulations and Processing Technology

Acquire Skills. Gain Experience. Go Global. That is a degree from Queen’s.

chemeng.queensu.ca
GET THE COURSES YOU NEED

**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**

Courses include: Analysis of Process Data, Chemical Processes & Systems, Main Group Chemistry, Chemical Reactivity, Differential Equations, Thermodynamic Properties of Fluids, Process Dynamics & Numerical Methods, Fluid Mechanics and Organic Chemistry. You will also take the second EDPS course – APSC200, as well as a laboratory project course and one additional course based on your option.

**3RD YEAR**

Courses include: Engineering Innovation & Entrepreneurship, Fluid Phase & Reaction Equilibrium, Chemical Reaction Engineering, Heat & Mass Transfer, Biochemical Engineering, Process Dynamics & Control, Design of Unit Operations, Engineering Communications, Ethics, and Professionalism, and Mitigation of Industrial Pollution. You will also take another laboratory projects course, as well as three additional courses based on your option.

**4TH OR FINAL YEAR**

Courses include: Strategies for Process Investigations, Design of Manufacturing Processes, or Transport Phenomena in Physiological Systems. You will also choose 5-6 courses based on your option, and you are set to graduate!

Visit careers.queensu.ca/majormaps for the online version with links!

Where could I go after graduation?

- Agricultural sciences
- Agrochemicals
- Biochemistry
- Biomedical engineering
- Business administration and management
- Chemical process engineering
- Consulting
- Cytochemistry
- Environmental management
- Fluid dynamics - aerospace
- Finance & financial analysis
- Food industry, nutrition & dietetics
- Fuels and petrochemicals
- Government
- International development
- Manufacturing
- Medical technology
- Mineral processing
- Nanotechnology
- Occupational health and safety
- Oil and gas, alternative energy sources
- Patent law
- Pharmaceutical engineering
- Planning - urban and regional
- Polymer/rubber/plastic technology
- Private and public research
- Pulp and paper
- Radiology
- Tissue engineering
- Toxicology
- Waste management
- Water conservation

*Some careers may require additional training. Listed careers are suggestions only.

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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 CHEMICAL ENGINEERING?

- 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
- 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

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.

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, and Queen’s wants you to succeed! Check out the Student Affairs website for available resources.