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 Science in Engineering
Bachelor of Science in Engineering with Professional Internship
Option in Biochemical Engineering / Process Engineering

Queen’s ADMISSIONS

Students apply to Queen’s Engineering (QE) through the OUAC (Ontario University Application Centre) website. Secondary School prerequisites include six 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 J-Section, 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:

- Environmental Biotechnology
- Biomedical Engineering
- Pharmaceutical Technology
- Bioremediation
- Polymer Formulations and Process Technology
- Innovation & Entrepreneurship

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 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!

GET THE COURSES YOU NEED

GET RELEVANT EXPERIENCE
Join teams or clubs on campus such as the Queen's Solar Design Team, Fuel Cell Team or the Chemical Engineering Club.

See the Co-Curricular Opportunities Directory or AMS Clubs Directory for more ideas.

GET CONNECTED WITH THE COMMUNITY
Volunteer on or off campus with different community organizations, such as Let’s Talk Science (LTS) and Women in Science and Engineering.

Consider joining an intramural sports or an athletics team. Check out the Athletics & Recreation site.

GET THINKING GLOBALLY
The Queen’s University International Centre is your first stop to learn how to internationalize your degree or to leverage your existing cross-cultural experience.

Speak to a QUC advisor or get involved in their programs, events and training opportunities.

GET READY FOR LIFE AFTER GRADUATION
Grappling with program decisions? Go to the Orientation Evenings held by different Engineering departments and attend the various Career Fairs during the year.

Get some help wondering about career options from Career Services.

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.

GET THE COURSES YOU NEED

GET RELEVANT EXPERIENCE
Look into summer jobs by talking to the dept. or Career Services about work through SWEP or NSERC.

Take more responsibility within different clubs or extracurriculars such as the Living Energy Lab.

Consider entrepreneurial opportunities at programs like the Queen’s Innovation Connector Summer Initiative (QICI).

Stay during the summer as an assistant to a faculty member or apply for an external summer research opportunity.

Consider applying to NSERC Collaborative Research and Training Experience (CREATE) Programs such as SERA.

Consider applying to do a 12-16 month QUIP internship between your third and fourth year.

GET CONNECTED WITH THE COMMUNITY
Get involved with the Engineering Society (ENGSOC).

Start or continue volunteering with organizations such as Engineers without Borders (EWB).

Attend conferences like the Conference on Industry and Resources Queen’s University Engineering (CIRQUE) and the Queen’s Engineering Competition.

Do some targeted networking with alumni working in careers of interest by joining the LinkedIn group Queen’s Connects Career Network.

Go to the Oil and Gas Speakers Series offered by the department.

GET THINKING GLOBALLY
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GET READY FOR LIFE AFTER GRADUATION
Explore different careers of interest by reading books in the Career Services Information Area, such as Nontraditional Careers for Chemists. For more information check out Career Cruising or by finding and connecting with alumni on LinkedIn.

Start focusing on areas of interest. Research education requirements for careers of interest. If needed, prepare to take any required tests (like the LSAT or GMAT) and get help thinking about grad school from Career Services.

3RD YEAR

You will also take another laboratory projects course, as well as three additional courses based on your option.

GET THE COURSES YOU NEED

GET RELEVANT EXPERIENCE
Investigate requirements for full-time jobs or other opportunities related to careers of interest.

Assess what experience you’re lacking and fill in gaps volunteering, clubs, or internships – check out the Career Services skills workshop for help.

Consider joining professional associations like the Canadian Society for Chemical Engineering or the Canadian Society for Chemical Technology.

Join groups on LinkedIn reflecting specific careers or topics of interest in Chemical Engineering.

GET CONNECTED WITH THE COMMUNITY
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GET THINKING GLOBALLY
Is an exchange in your future? Start thinking about where you would like to study abroad. Apply in January for a 3rd year exchange through your faculty’s International Office. If exchange isn’t for you, come talk to QUC about some other options.

Build your intercultural competence by getting involved with other cultures or by practicing or improving your language skills. Check QUC’s resources for ideas to go abroad, and volunteer or attend one of their events.

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Grappling with program decisions? Go to the Orientation Evenings held by different Engineering departments and attend the various Career Fairs during the year.

Get some help wondering about career options from Career Services.

4TH OR FINAL YEAR
Courses include: Strategies for Process Investigations, Design of Manufacturing Processes, and Transport Phenomena in Chemical Engineering.

You will also choose 5-6 courses based on your option, and you are set to graduate!

GET THE COURSES YOU NEED

GET RELEVANT EXPERIENCE
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Consider joining professional associations like the Canadian Society for Chemical Engineering or the Canadian Society for Chemical Technology.

Join groups on LinkedIn reflecting specific careers or topics of interest in Chemical Engineering.

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Where could I go after graduation?
Agricultural sciences
Agrochemistry
Biomedical engineering
Business administration and management
Chemical process engineering
Consulting
Cytotechnology
Environmental management (including resource extraction, clean-up, sustainability)
Fluid dynamics - aerospace
Finance & financial analysis
Food industry, nutrition & dietetics
Fuels and petrochemicals
Government
Industrial chemicals
International development
Manufacturing
Medical technology (diagnostic, nuclear, radiography)
Mineral processing
Nanotechnology
Occupational health and safety
Oil and gas
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

Caution: *This map is meant as a guide to provide suggestions throughout your university career. The activities, resources, and careers mentioned are possibilities – you are not restricted to them and you don’t have to follow this exact timeline. Every person (including you!) will find their own unique path through their degree at Queen’s and beyond.

Visit careers.queensu.ca/majormaps.html for the online version with links!
How to use this map

- Got questions about careers and classes?
- Feeling a little lost or overwhelmed by choices?
- Wondering what you are “supposed” to be doing?

Use this map to plan for success in five overlapping areas of career and academic life. Each map helps you explore possibilities, set goals and track your accomplishments. To make your own custom map, use the My Major Map tool.

Don’t stress if you haven’t done all of the suggested activities. The map is not a prescription – it’s a tool for finding your own way at Queen’s.

Getting what you need to succeed in the workplace

WHAT DO EMPLOYERS WANT?

In a recent survey from the Canadian Council of Chief Executives the top 6 skills sought by employers were:

1. People skills
2. Communication skills
3. Problem-solving skills
4. Analytical abilities
5. Leadership skills
6. Industry-specific knowledge

HOW DO I GET THE SKILLS I NEED?

It is important to develop a balanced skill set – many of which you will develop during your studies. To stand out, take advantage of experiential learning through the multitude of clubs and activities in and around Queen’s. Check out the Get Relevant Experience section of this map.

WHAT CAN I LEARN STUDYING CHEMICAL ENGINEERING AT QUEEN’S?

- 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

WHAT MAKES ME SPECIAL?

No one will get exactly the same experience as you. Take the time to think about what skills you have developed to be able to best explain them with compelling examples in future applications to employers and further education. For help with this, check out the Career Services skills workshop.