Why GRADUATE STUDIES in CHEMICAL ENGINEERING?

As a PhD student in the field of Chemical Engineering, you can play a vital role in future developments in such areas as biological conversion, pollution degradation, tissue engineering, process control and optimization, (bio)chemical sensing, nanocomposites, and many of other areas. Chemical Engineering has a wide range of applications that contribute to modern life and its technologies.

Graduate students and their work are an important part of an ongoing research process that provides the community with ways of understanding natural, cultural, imaginative, social and technological phenomena. Check out whygradstudies.ca for more reasons to choose graduate studies in engineering.

Why QUEEN’S?

Queen’s University is one of Canada’s leading research-intensive universities, with over $14 million in sponsored research funding and almost $5 million in revenues from technology transfer. It consistently ranks as one of the top three medical/doctoral universities in Canada and offers an unparalleled environment to facilitate academic development. Among Queen’s goals is to attract and retain students with outstanding potential from across Canada and around the world.

The Department of Chemical Engineering at Queen’s University is based in Dupuis Hall and the Biosciences Complex, which are multipurpose facilities with extensive research laboratories, and large- and small-group teaching classrooms.

Areas of intense research in the department include: Biomedical engineering, polymer and reaction engineering, process systems engineering, sustainable energy sources and environmental engineering. Activities range from developing new bio- and polymeric materials and production techniques, to understanding how the dynamic structure of a chemical process limits the performance that can be achieved. Significant collaborations across these fields exist within the department, and faculty members also collaborate extensively with other researchers across Queen's and at other institutions.

Program STRUCTURE

PhD (4 years): course work, research thesis, comprehensive exam, and two seminars.

RESEARCH Areas

- Biochemical Engineering
- Macromolecular Science and Technology
- Process Analytics, Optimization, and Control
- Microfluidics, Colloids, and Biosensors
- Sustainable energy sources, processes, products, and environmental remediation

We suggest that you review the specific research projects currently being investigated by faculty members to identify a potential supervisor. Please note, however, that contacting a faculty member does not guarantee acceptance and you will need to submit your full application in order to be considered.

Visit the Chemical Engineering Department website to read faculty profiles and learn more about faculty members’ research areas.

The Chemical Engineering Department offers opportunities to collaborate with scientists in the Human Mobility Research Centre and Computational Science and Engineering, as well as with co-supervising faculty in other departments.
**DOCTOR OF PHILOSOPHY (PhD)**

**Chemical Engineering**

**PhD MAP**

**YEAR I**

**ACHIEVE YOUR ACADEMIC GOALS**
- Key priorities include forming your committee, coursework, field exams, and language exam.
- Meet early with your supervisor to set expectations and discuss roles, responsibilities, program requirements, research opportunities, and deadlines.
- Look to Student Academic Success Services for a variety of supports.
- Attend the Departmental Speaker Series (CHEE 897).

**MAXIMIZE RESEARCH IMPACT**
- Think about audiences for your research.
- Complete ROMEO online module on research ethics.
- Consider publishing elements of your research. Learn from the Expanding Horizons Publishing workshop.
- Apply for the Graduate Dean’s Travel Grant for Doctoral Field Research.

**BUILD SKILLS AND EXPERIENCE**
- Serve on departmental, faculty or university committees. Talk to the Chemical Engineering Graduate Student Association (CEGSA) about getting involved.
- Consider positions in student services, the SOPS, or media outlets like the Queen’s Journal. Look in the AMS Clubs Directory.
- Attend conferences in your field.

**ENGAGE WITH YOUR COMMUNITY**
- Consider volunteering with different community organizations.
- Connect to broader communities of engineers.

**LAUNCH YOUR CAREER**
- Finding career fit starts with knowing yourself. Take a Career Services career planning workshop or meet with a career counselor for help. Check out books like So What Are You Going to Do With That? for advice on various career options.
- Start reading publications like University Affairs and the Chronicle of Higher Education. Browse non-academic labor market websites.
- Stay on the lookout for special events like Graduate Student Career Forum to explore your career pathways.

**YEAR II**

**WRITE**
- Write and defend your thesis proposal.
- Embark on your substantive research.
- Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.
- Find your way through the academic process with help from Expanding Horizons workshops.
- Seek external/professional development opportunities.

**YEAR III**

**UPDATE WORK**
- Continue to meet regularly with your supervisor, review research progress, and write your dissertation. Check out the SGS Dissertation Boot Camp or Dissertation on the Lake.
- Use conference presentations to create, discuss, and explore ways to disseminate research findings. Learn from the Expanding Horizons Publishing workshop.
- Begin discussion of potential thesis defence examiners.

**YEAR IV & TRANSITIONING**
- Plan date of thesis submission for examination.
- Present your research to graduate Chem Eng students and faculty at or at conferences and work with supervisor to prepare for defence.
- Review submission and examination guidelines.
- Secure necessary oral defence accommodations.
- Discuss career pathways, references letters, and publication options with your supervisor.

**WHAT WILL I LEARN?**
- A graduate degree in Chemical Engineering can equip you with valuable and versatile skills, such as:
  - Knowledge and technical skills
  - Effective communication skills in multiple forms for diverse audiences
  - Information management: prioritize, organize, and synthesize large amounts of information
  - Time management: Meet deadlines and manage responsibilities despite competing demands
  - Project management: develop ideas, gather information, analyze, critique, assess findings, draw and act on conclusions
  - Creativity and innovation
  - Perseverance
  - Independence and experience as a collaborative worker
  - Awareness, an understanding of sound ethical practices, social responsibility, responsible research and cultural sensitivity
  - Professionalism in all aspects of work, research, and interactions
  - Leadership: initiative and vision leading people and discussion

WHERE CAN I GO?
- A PhD in Chemical Engineering can take your career in many directions. In Canada, less than 40% of all PhDs will work in post-secondary education – the majority will work in industry, government, or non-profits. Graduates from the Chemical Engineering PhD program have found careers in:
  - Biochemical Engineering
  - Biomedical Engineering
  - Environmental Engineering
  - Fuel Cells
  - Macro-molecular Processes and Products
  - Microfluidics & Biomembranes
  - Process Systems Engineering

- Taking time to explore career options, build experience, and network can help you have a smooth transition to the world of work after graduation.

Visit careers.queensu.ca/gradmaps for the online version with links!
Application FAQs

What do I need to know to APPLY?

ACADEMIC REQUIREMENTS
- Master of Applied Science or Master of Science.
- Grade requirements: minimum cumulative average of B+, with a minimum of 77% in last year of study.

ADDITIONAL REQUIREMENTS
- If English is not a native language, prospective students must meet the English language proficiency requirements in writing, speaking, reading, and listening. The School of Graduate Studies requires the following minimum scores: TOEFL (paper-based): 550, (2) TOEFL iBT: Writing (24/30); Speaking (22/30); Reading (22/30); Listening (20/30), for a total of 88/120 (applicants must have the minimum score in each test as well as the minimum overall score), or (3) IELTS: 7.0 (academic module overall band score), or (4) PTE Academics: 65.

KEY DATES & DEADLINES
- Application deadline: There is a constant intake so there is no set deadline for application. If you are international, we recommend that you have completed your application at least 4 months ahead of your admission cycle.

Before you start your application, please review the Graduate studies application process.

What about FUNDING?

The level of financial support consequently varies among graduate students in the Department, with a guaranteed minimum level of $25,000 (Masters and PhD) for 2016-2017. As part of the minimum funding package, you may serve as a Teaching Assistant for at least one term per year.

We encourage all students to apply for external funding from OGS, SSHRC and other sources. Queen’s will automatically issue a $10,000 award to incoming PhD students who have won federal government tri-council awards. For more information, see the School of Graduate Studies’ information on awards and scholarships.