

Chemical Engineering PhD Map

Applying to and Navigating Graduate Studies

GRAD MAP FOR PhD STUDENTS 

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 prevention and treatment, tissue engineering, process control and optimization, (bio)chemical sensing, nanocomposites, and many 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.



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 Chemical Engineering Department offers opportunities to collaborate with scientists in the Centre for Health Innovation and Computational Science and Engineering, as well as with co-supervising faculty in other departments.

The Department of Chemical Engineering at Queen's University is based in Dupuis Hall and the Biosciences Complex, which are multi-purpose 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): 3 courses work, research thesis, comprehensive exam, and two seminars.

RESEARCH Areas

- Bioengineering
- Clean Energy and Sustainable Environment
- Materials and Interfaces
- Process Systems Engineering and Systems Biology

We suggest that you review the specific research interests of individual 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.



GRADUATE STUDIES AND POSTDOCTORAL AFFAIRS

queensu.ca/grad-postdoc

Chemical Engineering PhD Map

DOCTOR OF PHILOSOPHY (PhD)

YEAR I

YEAR II

YEAR III

YEAR IV

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, resources, research/occupational goals, timelines, and any required accommodation plans.
- Look to Student Academic Success Services for a variety of supports.

- 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 the help of the School of Graduate Studies and Postdoctoral Affairs (SGSPA) professional development workshops.

- Continue to meet regularly with your supervisor, review research progress, and write your dissertation. Check out the SGSPA writing camps, such as Dissertation on the Lake.
- Use conference presentations to create, discuss, and explore ways to disseminate research findings.

- Plan date of thesis submission for examination.
- Present your research to graduate Chem Eng students and faculty 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.

MAXIMIZE RESEARCH IMPACT

- Think about audiences for your research.
- Complete the CORE online module on research ethics if doing research with living people or sensitive topics.
- Apply to NSERC, OGS, and other funding.
- Attend conferences in your field.

- Present your work at graduate conferences.
- Expand your research audience through social media.
- Consider publishing elements of your research
- Apply for the Graduate Dean's Travel grant for Doctoral Field Research.

- Continue to present at conferences.
- Consider participating in the 3 Minute Thesis (3MT) or GRADflix competition.
- Contact the Queen's Media Centre for guidance on speaking to news outlets about your work. List yourself on the Faculty of Engineering and Applied Science Research website.

- Connect with scholars in your field and with community partners. Continue to attend conferences, such as the Canadian Chemical Engineering Conference. Speak with your supervisor about options for conferences in your area of research.
- Continue public outreach through social media and the Queen's Media Centre.

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 SGPS, or media outlets like the Queen's Journal, CFRC, and the SGSPA Blog. Look in the AMS Clubs Directory.
- Use a Teaching Assistant or Research Assistant position to develop your skills and experience.

- Hone skills for non-academic employment by continuing involvement on committees and in community.
- Start keeping an eportfolio of your skills, experiences, and competencies.
- For help with teaching, get support from the Centre for Teaching and Learning. Enrol in SGS902 or the PUTL Certificate for more professional development in teaching and learning.

- Investigate internships from MITACS and other sources.
- Find opportunities for extra training through CTL, School of Graduate Studies and Postdoctoral Affairs professional development, MITACS, or other sources to boost your skills.
- Prepare for work or studies in a multi-cultural environment by taking the Intercultural Awareness Training Certificate hosted by QUIC and Four Directions.

- Practice articulating the skills you have been developing in settings outside the university, such as casual conversation, networking, and interviews. Get help from a Career Services workshop.

ENGAGE WITH YOUR COMMUNITY

- Consider volunteering with different community organizations.
- Connect to broader communities of engineers.

- Participate in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups.
- If pursuing research abroad or outside Kingston, investigate options.

- Do some targeted networking with people working in careers of interest, through Queen's Connects on LinkedIn, the Queen's Alumni Association, professional associations, and at conferences. Get help from a Career Services workshop.
- Consider signing up for the PhD-Community Initiative program run by the SGSPA.

- Consider joining professional associations like the Canadian Society for Chemical Engineering.
- Continue targeted networking with people working in careers of interest. Join groups on LinkedIn reflecting specific careers or topics of interest in Chemical Engineering.

LAUNCH YOUR CAREER

- Finding career fit starts with knowing yourself. Take a Career Services workshop or meet with a career educator and coach for help.
- Start reading publications like University Affairs and the Chronicle of Higher Education. Browse non-academic labour market websites.

- Start building your teaching portfolio including student evaluations, and seeking mentorship.
- Explore different careers of interest by using Queen's Connects on LinkedIn to connect with Queen's alumni. For more information check out Career Cruising.
- Investigate requirements for professional positions or other opportunities related to careers of interest.

- Participate in hiring committees and attend job talks. Research academic careers of interest. Craft your CV and job application materials.
- Start focusing on non-academic areas of interest. Research organizations of interest and start putting together your industry resume and begin your job search plan.

- Build connections with faculty outside of your department. Pursue interviews for faculty positions and apply for post-doc fellowships and positions.
- Apply to jobs or make plans for other adventures. Get help from Career Services with job searching resumes, and interviews.

Knowledge & Workplace Skills

A graduate degree in Chemical Engineering will empower you with:

- **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, critically appraise 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

Career Possibilities

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 & Biosensors
- 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.

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. To make your own custom map, use the My Grad Map tool: careers.queensu.ca/gradmaps.

Graduate Studies FAQs

How do I make the most of my time at Queen's?

Use the Grad Map to plan for success in five overlapping areas of your career and academic life. Everyone's journey is different - the ideas on the maps are just suggestions to help you explore possibilities. For more support with your professional development, take advantage of the SGSPA professional development framework and the new Professional Development Plan (PDP) process to set customized goals to help you get career ready when you graduate.

Where can I get help?

Queen's provides you with a broad range of support services from your first point of contact with the university through to graduation. Ranging from help with academics and careers, to physical, emotional, or spiritual resources - our welcoming environment offers the programs and services you need to be successful, both academically and personally. Check out the SGSPA website for available resources.

What is the community like?

At Queen's, graduate students from all disciplines learn and discover in a close-knit intellectual community. You will find friends, peers and support among the graduate students enrolled in Queen's more than 130 graduate programs within 50+ departments & research centres. With the world's best scholars, prize-winning professional development opportunities, excellent funding packages and life in the affordable, historic waterfront city of Kingston, Queen's offers a wonderful environment for graduate studies. Queen's is an integral part of the Kingston community, with the campus nestled in the core of the city, only a 10-minute walk to downtown with its shopping, dining and waterfront. For more about Kingston's history and culture, see Queen's University's Discover Kingston page.

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 following minimum scores are required: (1) TOEFL iBT: Writing (24/30); Speaking (22/30); Reading (22/30); Listening (20/30). Applicants must have the minimum score in each test as well as the minimum overall score, or (2) IELTS: 7.0 (academic module overall band score and a 7.0 for each test band), or (3) PTE Academics: 65, or (4) CAEL CE -70 (minimum overall score).

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 \$28,000 (PhD) for 2024-2025. 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, NSERC, and other sources. For the 2025-26 academic year, Queen's will automatically issue a one time \$5,000 award to Doctoral students who have won federal government tri-council awards. For more information, see the School of Graduate Studies and Postdoctoral Affairs' information on awards and scholarships.



Laurie Phillips, Graduate Assistant
Tel: (613) 533-6000 ext. 74830
Email: phillipl@queensu.ca
chemeng.queensu.ca