## Chemical Engineering PhD Map

Applying to and Navigating Graduate Studies

# 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. It consistently ranks as one of the top 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 <u>Chemical Engineering Department</u> <u>website</u> to read faculty profiles and learn more about faculty members' research areas.



queensu.ca/grad-postdoc

# Chemical Engineering PhD Map

DOCTOR OF PHILOSOPHY (PhD



#### YEAR I YEAR II YEAR III YEAR IV **ACHIEVE YOUR** · Write and defend your thesis proposal. Key priorities include forming your committee **ACADEMIC** Plan date of thesis submission for examination. · Continue to meet regularly with your coursework, field exams, and language exam. supervisor, review research progress, and · Embark on your substantive research. **GOALS** Present your research to graduate Chem Eng write your dissertation. Check out the Meet early with your supervisor to set students and faculty or at conferences and work Set up regular meetings with your supervisor expectations and discuss roles, responsibilities, SGSPA writing camps, such as Dissertation with supervisor to prepare for defence. to discuss progress and obstacles to timely program requirements, resources, research/ completion. · Review submission and examination guidelines. occupational goals, timelines, and any required Use conference presentations to create, Find your way through the academic process accommodation plans. Secure necessary oral defence accommodations. discuss, and explore ways to disseminate with the help of the School of Graduate Studies Look to Student Academic Success Services for a research findings. Discuss career pathways, references letters, and and Postdoctoral Affairs (SGSPA) professional variety of supports. publication options with your supervisor. development workshops. MAXIMIZE · Think about audiences for your research. **RESEARCH** · Present your work at graduate conferences. · Connect with scholars in your field and with Continue to present at conferences. community partners. Continue to attend **IMPACT** Complete the CORE online module on · Expand your research audience through social · Consider participating in the 3 Minute Thesis conferences, such as the Canadian Chemical research ethics if doing research with living (3MT) or GRADflix competition. Engineering Conference. Speak with your people or sensitive topics. Consider publishing elements of your research supervisor about options for conferences in your Contact the Queen's Media Centre for · Apply to NSERC, OGS, and other funding. area of research. guidance on speaking to news outlets about Apply for the Graduate Dean's Travel grant for · Attend conferences in your field. your work. List yourself on the Faculty of Doctoral Field Research. · Continue public outreach through social media Engineering and Applied Science Research and the Queen's Media Centre. website. Serve on departmental, faculty, or university Investigate internships from MITACS and other Hone skills for non-academic employment by Practice articulating the skills you have been **SKILLS AND** committees. Talk to the Chemical Engineering continuing involvement on committees and in developing in settings outside the university, **EXPERIENCE** Graduate Student Association (CEGSA) about such as casual conversation, networking, and community. Find opportunities for extra training through getting involved. interviews. Get help from a Career Services CTL, School of Graduate Studies and Start keeping an eportfolio of your skills, workshop Consider positions in student services, the Postdoctoral Affairs professional development experiences, and competencies. SGPS, or media outlets like the Queen's MITACS, or other sources to boost your skills. For help with teaching, get support from Journal, CFRC, and the SGSPA Blog. Look in the Prepare for work or studies in a multi-cultural the Centre for Teaching and Learning. Enrol AMS Clubs Directory. environment by taking the Intercultural in SGS902 or the PUTL Certificate for more Use a Teaching Assistant or Research Assistant Awareness Training Certificate hosted by QUIC professional development in teaching and position to develop your skills and experience. and Four Directions. learning. **ENGAGE** Consider joining professional associations Consider volunteering with different Do some targeted networking with people · Participate in your graduate and professional **WITH YOUR** like the Canadian Society for Chemical community organizations. community through activities such as graduate working in careers of interest, through COMMUNITY student outreach programs, organizing LinkedIn, the Queen's Alumni Association, Engineering. Connect to broader communities of engineers. professional associations, and at conferences. conferences, and research groups. Continue targeted networking with people Get help from a Career Services workshop. working in careers of interest. Join groups on If pursuing research abroad or outside LinkedIn reflecting specific careers or topics of Consider signing up for the PhD-Community Kingston, investigate options. Initiative program run by the SGSPA. interest in Chemical Engineering. LAUNCH YOUR Finding career fit starts with knowing yourself. Start building your teaching portfolio including Build connections with faculty outside of your Participate in hiring committees and attend **CAREER** Take a Career Services workshop or meet with student evaluations, and seeking mentorship. department. Pursue interviews for faculty job talks. Research academic careers of a career educator and coach for help. positions and apply for post-doc fellowships interest. Craft your CV and job application · Explore different careers of interest by using and positions. materials. Start reading publications like University LinkedIn to connect with Queen's alumni. For

more information check out Career Cruising.

Investigate requirements for professional

careers of interest.

positions or other opportunities related to

### 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

Biochemical Engineering

program have found careers in:

- Biomedical Engineering
- Environmental Engineering
- Fuel Cells

· Apply to jobs or make plans for other

UN Sustainable Development Goals.

adventures. Get help from Career Services

· Find impactful work that aligns with your

with job searching resumes, and interviews.

values using the Queen's Career Guide to the

Start focusing on non-academic areas of

and start putting together your industry

resume and begin your job search plan.

interest. Research organizations of interest

- 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

Affairs and the Chronicle of Higher Education.

Browse non-academic labour market

websites.

## 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 closeknit 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.



### 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 current guaranteed minimum level of \$28,000 (PhD). 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 more information, see the School of Graduate Studies and Postdoctoral Affairs' information on awards and scholarships.



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