# Chemical Engineering and Applied Chemistry, PhD

**Faculty of Applied Science and Engineering**

## ABOUT THIS PROGRAM

Chemical Engineering and Applied Chemistry impacts much of our modern world. We seek to integrate chemistry, biology, and engineering to work towards technological solutions to global challenges in energy, the environment, and health. Research with us will give you the opportunity to partner with world leaders to build new scientific knowledge and will not reflect everyone’s experiences.

* This resource offers guidance and will not reflect everyone’s experience of the program.

### QUESTIONS?

Contact: Graduate Administrator

Telephone: 416-978-7137

Email: gradchem@chem-eng.utoronto.ca

Department Website: [www.chem-eng.utoronto.ca](http://www.chem-eng.utoronto.ca)

### FUTURE STUDENTS

Admissions to U of T for full details, please contact the relevant faculty.

University website: [www.utoronto.ca](http://www.utoronto.ca)

**Chemical Engineering & Applied Chemistry (PhD)**

Faculty of Applied Science and Engineering, University of Toronto

---

## OVERVIEW

**MIDDLE YEARS**

Completing CHE 300xH (both terms each year)

Final Oral Exam (oral defence)

Complete SGS Final Exam (final defence)

## STRATEGIES FOR SUCCESS

### BUILD YOUR PROFESSIONAL SKILLS

- **First Year**
  - CHE 222H (lab or tutorial)
  - CHE 1102H — Research Methods & Project Execution
  - CHE 300xH (both terms)

- **Middle Years**
  - Qualifying Exam
  - Achieve PhD Candidacy by:
    - Completing CHE 300xH (both terms each year)
    - Controlling all academic courses
    - Participating in supervisory committee meetings every 6-12 months.

- **Final Year/Transition**
  - Holding supervisory committee meetings
  - Write final thesis
  - Complete departmental oral defence
  - Complete SGS Final Exam (final defence)

### BUILD YOUR NETWORK, BROADEN YOUR OUTLOOK

- **First Year**
  - CHE 222H (lab or tutorial)

- **Middle Years**
  - Qualifying Exam
  - Achieve PhD Candidacy by:
    - Completing CHE 300xH (both terms each year)
    - Controlling all academic courses
    - Participating in supervisory committee meetings every 6-12 months.

- **Final Year/Transition**
  - Holding supervisory committee meetings
  - Write final thesis
  - Complete departmental oral defence
  - Complete SGS Final Exam (final defence)

---

### Your Degree Timeline

<table>
<thead>
<tr>
<th>Plan</th>
<th>Master</th>
<th>Achieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 222H (lab or tutorial)</td>
<td>CHE 1102H — Research Methods &amp; Project Execution</td>
<td>CHE 300xH (both terms)</td>
</tr>
<tr>
<td>CHE 300xH (both terms)</td>
<td>Qualifying Exam</td>
<td>Complete departmental oral defence</td>
</tr>
<tr>
<td>CHE 300xH (both terms)</td>
<td>Achieve PhD Candidacy by:</td>
<td>Complete SGS Final Exam (final defence)</td>
</tr>
</tbody>
</table>

---

### Strategies for Success

- **Maximize Your Research Impact**
  - Identify a research question that makes a gap in the field noticeable.
  - Frame your research objectives.
  - Learn how to design, conduct, interpret and communicate your results confidently.
  - Learn how to best communicate your PhD outcomes to support your needs.

- **Build Your Professional Skills**
  - Complete CHE 222H — Research Methods & Project Execution.
  - Make a plan for understanding professional development goals and why each skill will help you achieve them in your professional (and sometimes your personal) life.
  - Create a system to manage your time.
  - Learn how to refer — it’s a new skill for some and it takes practice.
  - Maintain your technical skills required for your project requirements.
  - Transition from collecting preliminary skills to creating publication quality data.
  - Develop a plan to get feedback on your research that is new to you.
  - Refine your research question and how it’s relevant to a real world problem.
  - Develop the critical thinking skills to answer your own and other’s research.
  - Co-author a paper to understand the publishing process.
  - Follow up with your advisor regularly.

- **Build Your Network, Broaden Your Outlook**
  - Intentionally develop professional skills to answer gaps in a gap in the field.
  - Identify opportunities to build your confidence and understand your role.
  - Engage in leadership, communication, and teamwork skills you’ve developed, especially in your first year.
  - Take leadership roles in professional societies (e.g., volunteer at a conference).
  - Request to attend/present at meetings with industry partners or collaborators.
  - Intentionally develop professional skills to achieve goals set in Year 1.

---

### How to Use This Resource:

Read the chart both by row and by column. You’ll discover opportunities to enhance your experience of graduate school and ease your transition into a rewarding career.*

---

### About the University of Toronto

Graduate Administrator

Telephone: 416-978-7137

Email: gradchem@chem-eng.utoronto.ca

Department Website: [www.chem-eng.utoronto.ca](http://www.chem-eng.utoronto.ca)
I found the support during my PhD really was unparalleled, both in terms of my colleagues as well as the institutional resources available. I was able to network with other industry leaders who eventually joined the board of the biotechnology company I co-founded with the help of the University from work I did during my PhD.

— Vik Pandit, PhD 2017

IDENTIFY YOUR TRANSFERABLE SKILLS

With a PhD in Chemical Engineering, you will take these valuable skills into the workforce:

- Advanced critical thinking and analysis
- Quantitative decision making
- Experimental design
- Project definition and prioritization
- Strategic planning
- Project management and execution
- Communication & interpersonal relationship-building
- Mentoring, leadership, and team building

Top Employers by Sector

- Post-Secondary Sector
  - Faculty of Arts & Science
  - Faculty of Applied Science & Engineering
  - School of Continuing Studies
- Private Sector
  - Rio Tinto
  - TD Canada Trust
- Public Sector
  - Ministry of the Environment and Climate Change
- Other Sub-sectors
  - Private Sector Breakdown
  - Biotechnology/Pharmaceuticals
  - Trade/Logistics/Manufacturing
  - Engineering/Computing/Technology
  - Other Services

Top Employers by Sector

- Post-Secondary Sector
  - Faculty of Arts & Science
  - Faculty of Applied Science & Engineering
  - School of Continuing Studies
- Private Sector
  - Rio Tinto
  - TD Canada Trust
- Public Sector
  - Ministry of the Environment and Climate Change
- Other Sub-sectors
  - Private Sector Breakdown
  - Biotechnology/Pharmaceuticals
  - Trade/Logistics/Manufacturing
  - Engineering/Computing/Technology
  - Other Services

Physical Sciences PhDs

According to the 2021 Global Employability Rankings for Public Universities, 36% of PhD graduates work in the private sector.

Chemical Engineering and Applied Chemistry, PhD

Faculty of Applied Science and Engineering

“...in the private sector, of the 10,886 PhDs who graduated from U of T between 2000 and 2015 in all disciplines. The study was conducted by the University of Toronto, using Internet company websites to gather data sources such as job boards, news articles, and LinkedIn profiles. The University of Toronto conducted the study with the objective of understanding the employment status of PhD graduates.

POPULAR SKILLS AND CAREER BUILDING OPPORTUNITIES

- Project definition and prioritization
- Social problem-solving
- Communication & interpersonal relationship-building
- Mentoring, leadership, and team building

BUILD YOUR PROFESSIONAL SKILLS AND CAREER

- Graduate Centre for Academic Communication (GCAC)
- Graduate Professional Skills Program (GPS)
- Career Exploration & Education
- Alumni Mentorship Program
- Graduate Engineering Career Fair (GECF)
- Professional Engineers Ontario
- Insight Data Science Fellows Program
- Insight Data Science Fellows Program
- Professional Engineers Ontario
- Professional Engineers Ontario
- Professional Engineers Ontario
- Professional Engineers Ontario
- Professional Engineers Ontario
- Professional Engineers Ontario