

# Mechanical & Materials Engineering PhD Map

## Applying to and Navigating Graduate Studies

GRAD MAP FOR PhD STUDENTS 

### Why GRADUATE STUDIES in MECHANICAL & MATERIALS ENGINEERING?

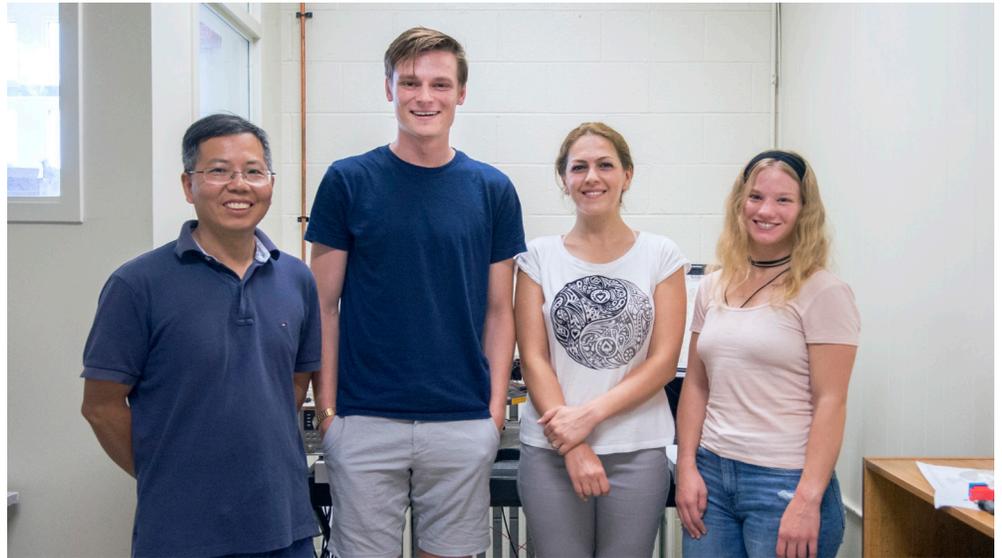
As a PhD student in the field of Mechanical and Materials Engineering (MME), you can play a vital role in future developments in such areas as: ergonomics, biomechanics and tissue engineering, assistive technologies, emerging techniques in MRI and CTI imaging, fuel cells, fluid flow, gas turbines, design optimization, robotics, atomistic simulations on long and short timescales, corrosion and environmental degradation of materials, development of improved materials for nuclear reactor applications, laser additive manufacturing of metals, and many other areas. Mechanical & Materials Engineering continues to play a vital role in modern life.

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?

As a PhD student in Mechanical and Materials Engineering at Queen's you are part of one of the most research intensive universities in Canada. Our research program is internationally renowned with a wide range of research activities in all of the major specialization areas of Mechanical and Materials Engineering.



*"My research work provides me with skills and experience working on cutting edge healthcare technology which in the future I will be able to apply in industrial or academic positions."*

*- Rick Helgason , PhD*

The Mechanical and Materials graduate program has been recognized for the quality of its academic and research programs. It also focuses on multidisciplinary, collaborative research with faculty in other departments, other faculties, and other universities.

### RESEARCH Areas

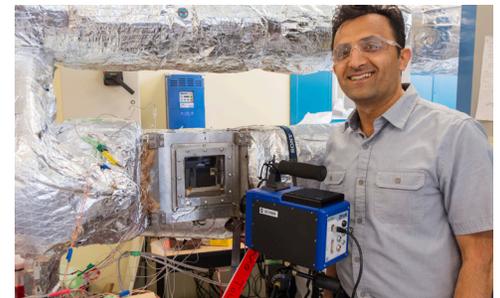
- Biomechanical
- Energy and Fluid Systems
- Manufacturing and Dynamic Systems
- Materials Engineering

We encourage you to identify an area of research interest and contact a potential supervisor before applying.

Visit the [Mechanical and Materials Engineering website](#) to read about research groups and faculty profiles. When you find a faculty member with similar research interests to yours, contact them and tell them about your interest in graduate work and related experience. This is also an opportunity for you to find out if the faculty member is accepting new graduate students to supervise. Meet with your potential supervisor at departmental events for prospective students.

### Program STRUCTURE

PhD (4 years): course work, comprehensive exams, seminar course (MECH 997) which is "pass/fail" only, and the research thesis.



# Mechanical & Materials Engineering PhD Map

DOCTOR OF PHILOSOPHY (PhD)



## YEAR I

## YEAR II

## YEAR III

## YEAR IV

### ACHIEVE YOUR ACADEMIC GOALS

- Meet early with your supervisor to set expectations and discuss roles, responsibilities, program requirements, resources, research/occupational goals, timelines, and any required accommodation plans.
- Complete Part A of the PhD [Comprehensive Examination](#). Look to [Student Academic Success Services](#) for a variety of supports.
- Attend the Departmental Graduate Seminar Series (MECH 997)

- Write and defend your thesis proposal, and 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 professional development](#) website.
- Complete Part B of the PhD [Comprehensive Examination](#) within 16 months of registration into the program.

- Continue to meet regularly with your supervisor, review research progress, and write your dissertation. Check out [SGSPA writing camps](#) like Dissertation Boot Camp or Dissertation on the Lake.
- Consider publishing elements of your research.
- Use conference presentations to create and refine dissertation material.

- Plan date of thesis submission for examination.
- Present your research to graduate students and faculty or at conferences and work with supervisor to prepare for defence.
- Review submission and examination guidelines.
- Secure necessary oral defence accommodations.

### WHAT WILL I LEARN?

A graduate degree in Mechanical and Materials 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, 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

### MAXIMIZE RESEARCH IMPACT

- Think about audiences for your research.
- Apply to National Sciences and Engineering Research Council, Ontario Graduate Scholarship, and other funding sources.
- Attend conferences in your field.

- Attend or present at a graduate conference through the Canadian Section of Combustion Institute, [CFD Society of Canada](#), etc. Talk to your supervisor.
- Expand your research audience through social media such as Twitter or a blog.
- Apply for the Graduate Dean's Travel Grant for Doctoral Field Research.

- Consider participating in the [3 Minute Thesis \(3MT\)](#) 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](#).

- Continue to attend conferences and connect with scholars in your field and with partners.
- Continue public outreach through social media and the Queen's Media Centre.
- Set up a meeting with the School of Graduate Studies and Postdoctoral Affairs for a Grad Chat to discuss your research interests.

### BUILD SKILLS AND EXPERIENCE

- Serve on departmental, faculty, or university committees.
- 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.

- Begin teaching as a departmental Teaching Fellow.
- Find opportunities for extra training through CTL, School of Graduate Studies and Postdoctoral Affairs professional development, Mitacs, or other sources to boost your skills. Investigate internships from [MITACS](#) and other sources.
- Prepare for work or studies in a multi-cultural environment by taking the Intercultural Awareness Training Certificate.

- 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, such as the Human Mobility Research Centre, and the Centre for Advanced Materials & Manufacturing.
- Connect to broader communities of engineers by joining one of the [Engineering Society Design Teams](#).

- Participate in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups.
- Consider signing up for the PhD-Community Initiative program run by the SGSPA.

- 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.

- Join professional associations like the [Canadian Society for Mechanical Engineers \(CSME\)](#) or the [Professional Engineers of Ontario \(PEO\)](#).
- Join groups on LinkedIn reflecting specific careers or topics of interest.

### WHERE CAN I GO?

A PhD in Mechanical & Materials 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.

- Academia – Professorships
- Consulting
- Government
- Industry – Design Engineer
- Research Science – Simulation Engineer

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

### LAUNCH YOUR CAREER

- Finding a career fit starts with knowing yourself. Take a [Career Services workshop](#) or meet with a career educator and coach for help.
- Browse non-academic labour market websites.
- Stay on the lookout for special events like School of Graduate Studies and Postdoctoral Affairs Career Week to explore your career pathways.

- Start building your teaching portfolio including student evaluations, and seeking mentorship.
- Explore different careers of interest by using [Queens 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.
- If considering jobs abroad, research possible immigration regulations. If you are an international student interested in staying in Canada, consider speaking with an [International Student Advisor](#).

### 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. The map just offers suggestions – you don't have to do it all! To make your own custom map, use the [My Grad Map](#) tool.

# 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 [Individual Development Plan \(IDP\)](#) 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 and 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's degree in Applied Science or Engineering.
- Exceptional BSc students may be admitted directly to the PhD program.

### 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:** No hard deadline. It is encouraged that prospective domestic and international students apply before March 1st to qualify for internal awards or to allow time to receive Visas.
- **Notification of acceptance:** End of March to July for September admissions.

Before you start your application, please review the [Graduate studies application process](#).

## What about FUNDING?

Minimum funding guarantee for PhD students \$25,000/year (increasing to \$27,000 for September 2024 start) throughout years 1-4 which includes mandatory teaching assistantships. Students are typically funded through a combination of research assistantships, teaching assistantships, and/or scholarships.

We encourage all students, if eligible, to apply for external funding – for example tri-council (NSERC) during the Fall semester, Ontario Graduate Scholarships (OGS) during February/March, and from other sources. Queen's will automatically issue a one-time \$10,000 award to incoming PhD students who have won federal government tri-council awards. See the School of Graduate Studies and Postdoctoral Affairs' for more information on [awards and scholarships](#).



Jane Davies, Graduate Assistant  
(613) 533-6928

mme.graduate@queensu.ca  
me.queensu.ca/graduate