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. Check out whygradstudies.ca for more reasons to choose graduate studies in 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

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.

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.

Program STRUCTURE

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

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 him/her 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.
### Mechanical & Materials Engineering PhD Map

#### DOCTOR OF PHILOSOPHY

**2022-2023**

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<th>YEAR I</th>
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<tr>
<td><strong>ACQUIRE YOUR ACADEMIC GOALS</strong></td>
<td><strong>MAXIMIZE RESEARCH IMPACT</strong></td>
<td><strong>BUILD SKILLS AND EXPERIENCE</strong></td>
<td><strong>ENGAGE WITH YOUR COMMUNITY</strong></td>
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<tr>
<td>• Meet early with your supervisor to set expectations and discuss roles, responsibilities, program requirements, resources, research/occupational goals, timelines, and any required accommodation plans.</td>
<td>• Think about audiences for your research.</td>
<td>• Serve on departmental, faculty or university committees.</td>
<td>• Consider volunteering with different community organizations, such as the Human Mobility Research Centre, and the Centre for Advanced Materials &amp; Manufacturing.</td>
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<td>• Complete Part A of the PhD Comprehensive Examination; look to Student Academic Success Services for a variety of supports.</td>
<td>• Apply to National Sciences and Engineering Research Council, Ontario Graduate Scholarship, and other funding sources.</td>
<td>• Consider positions in student services, the SGSPA, or media outlets like the Queen’s Journal, CFRC, and the SGSPA Blog. Look in the AMS Clubs Directory.</td>
<td>• Connect to broader communities of engineers by joining one of the Engineering Society Design Teams.</td>
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<td>• Attend the Departmental Graduate Seminar Series (MECH 997)</td>
<td>• Attend or present at a graduate conference through the Canadian Section of Combustion Institute, CFD Society of Canada, etc. Talk to your supervisor.</td>
<td>• Serve on departmental, faculty or university committees.</td>
<td>• Participate in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups.</td>
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<td><strong>ACHIEVE YOUR ACADEMIC GOALS</strong></td>
<td>• Expand your research audience through social media such as Twitter or a blog.</td>
<td>• Hone skills for non-academic employment by continuing involvement on committees and in the Queen’s Alumni Association, professional associations, and at conferences. Get help from a Career Services workshop.</td>
<td>• Participate in the 3 Minute Thesis (3MT) competition.</td>
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<td>• Write and defend your thesis proposal, and embark on your substantive research.</td>
<td>• Begin teaching as a departmental Teaching Fellow.</td>
<td>• Locate 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  attending the Intercultural Awareness Training Certificate.</td>
<td>• Join professional associations like the Canadian Society for Mechanical Engineers, CEMP, or the Professional Engineers of Ontario (PEO).</td>
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<td>• Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.</td>
<td>• Start keeping an ePortfolio of your skills, experiences, and competencies.</td>
<td>• 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.</td>
<td>• Join groups on LinkedIn reflecting specific careers or topics of interest.</td>
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<td>• Find your way through the academic process with the help of the School of Graduate Studies and Postdoctoral Affairs professional development website.</td>
<td>• For help with teaching, get support from the Centre for Teaching and Learning. Enroll in SG$920 or the PUTL Certificate for more professional development.</td>
<td>• 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.</td>
<td>• Build connections with faculty outside of your department. Pursue interviews for faculty positions and apply for post-doc fellowships and positions.</td>
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<td>• Complete Part B of the PhD Comprehensive Examination within 16 months of registration into the program.</td>
<td>• Prepare for work or studies in a multi-cultural environment by taking the Intercultural Awareness Training Certificate.</td>
<td>• 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.</td>
<td>• Apply to jobs or make plans for other adventures. Get help from Career Services with job searching, resumes, and interviews.</td>
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<td><strong>WHAT WILL I LEARN?</strong></td>
<td><strong>KEEP UP WITH YOUR CAREER DEVELOPMENT</strong></td>
<td><strong>transition to the world of work after PhD</strong></td>
<td><strong>WHERE CAN I GO?</strong></td>
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<td>A graduate degree in Mechanical and Materials Engineering can equip you with valuable and versatile skills, such as:</td>
<td>• 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.</td>
<td>• Build connections with faculty outside of your department. Pursue interviews for faculty positions and apply for post-doc fellowships and positions.</td>
<td>• A PhD in Mechanical &amp; 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.</td>
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<td>• Knowledge and technical skills</td>
<td>• Continue to attend conferences and connect with scholars in your field and with partners.</td>
<td>• 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.</td>
<td>• Academia – Professors</td>
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<td>• Effective communication skills in multiple forms for diverse audiences</td>
<td>• Continue public outreach through social media and the Queen’s Media Centre.</td>
<td>• 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.</td>
<td>• Research Science – Simulation Engineer</td>
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<td>• Information management: prioritize, organize, and synthesize large amounts of information</td>
<td>• Set up a meeting with the School of Graduate Studies and Postdoctoral Affairs for a Grad Chat to discuss your research interests.</td>
<td>• 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.</td>
<td>• Government Industry – Design Engineer</td>
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<td>• Time management: meet deadlines and manage responsibilities despite competing demands</td>
<td>• Attend or present at a graduate conference through the Canadian Section of Combustion Institute, CFD Society of Canada, etc. Talk to your supervisor.</td>
<td>• 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.</td>
<td>• Consulting</td>
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<tr>
<td>• Project management: develop ideas, gather information, analyze, critically appraise findings, draw and act on conclusions</td>
<td>• Prepare for work or studies in a multi-cultural environment by attending the Intercultural Awareness Training Certificate.</td>
<td>• 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.</td>
<td>• Taking time to explore career options, build experience, and network can help you have a smooth transition to the world of work after graduation.</td>
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**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. The field of Mechanical and Materials Engineering offers a variety of career paths, including:

- **Academia – Professors**
- **Research Science – Simulation Engineer**
- **Government Industry – Design Engineer**
- **Consulting**

These career paths can lead to roles such as professors, researchers, engineers, and consultants. The skills you develop during your PhD will be valuable in these positions, allowing you to apply your knowledge in practical and impactful ways.
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 $22,500/year (increasing to $25,000 Sept. 2023 and $27,000 Sept. 2024) 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 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.

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