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.

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 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.

Program STRUCTURE

PhD (4 years): course work, comprehensive exams, seminar course (MECH 997) which is “pass/fail” only, and the research thesis.
2021-2022
Mechanical & Materials Engineering PhD Map

**YEAR I**
- 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 Expanding Horizons website.
- Complete Part B of the PhD Comprehensive Examination within 16 months of registration into the program.

**YEAR II**
- Attend or present at a graduate conference through the Canadian Section of Combustion Institute, CFE, Society of Canada, etc. Talk to your supervisor.
- Expand your research audience through social media such as Twitter or a blog.
- Attend 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.
- Attend Career Services workshops or meet with a career counsellor for help. Check out books like Career Cruising or other opportunities related to careers of interest.
- Practice articulating the skills you have been developing in settings outside the university, such as causal conversation, networking, and interviews. Get help from a Career Services workshop.

**YEAR III**
- 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.
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- 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 SGS.
- Do some targeted networking with people working in careers of interest, through Queen’s Connects or LinkedIn, the Queen’s Alumni Association professional associations, and at conferences. Get help from a Career Services workshop.
- 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.
- Discuss career pathways, references letters, and publication options with your supervisor.

**YEAR IV & TRANSITIONING**
- Consider volunteering with different community organizations, such as the Human Mobility Research Centre, and the Centre for Advanced Materials & Manufacturing.
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**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
- Ineffective communication skills in multiple forms for diverse audiences
- 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 social ethnocultural practices, social responsibility, responsible research and ethical
- Professionalism in all aspects of work, research, and interactions
- Leadership: initiative and vision leading people and discussion

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. For help with teaching, get support from the Queen’s Media Centre.

**BUILD SKILLS AND EXPERIENCE**
- Serve on departmental, faculty or university committees.
- Consider positions in student services, the SGS, or media outlets like the Queen’s Journal, CFCR, and the SGS Blog. Look in the AMS Clubs Directory.
- Use a Teaching Assistant or Research Assistant position to develop your skills and experience.
- Practice articulating the skills you have been developing in settings outside the university, such as causal conversation, networking, and interviews. Get help from a Career Services workshop.
- Develop your research audience through social media such as Twitter or a blog.
- Attend or present at a graduate conference through the Canadian Section of Combustion Institute, CFE, Society of Canada, etc. Talk to your supervisor.
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**ENGAGE WITH YOUR COMMUNITY**
- Consider volunteering with different community organizations, such as the Human Mobility Research Centre, and the Centre for Advanced Materials & Manufacturing.
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**LAUNCH YOUR CAREER**
- Finding a career fit starts with knowing yourself. Take a Career Services workshop or meet with a career counselor for help. Check out books like So What Are You Going to Do With That? for advice on various career options.
- Start reading publications like University Affairs and the Chronicle of Higher Education. Browse non-academic labour market websites.
- Stay on the lookout for special events like School of Graduate Studies Career Week to explore your career pathways.
- Build connections with faculty outside of your department. Pursue interviews for faculty positions and apply for post-doc fellowships and positions.
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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 SGS 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 SGS 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. 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: $18,000/year throughout years 1-4. Students are typically funded through a combination of research assistantships, teaching assistantships, and/or scholarships. Funding packages differ for domestic and international students. As of September 2021, tuition rates will be the same for both domestic and international PhD students.

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’ for more information on awards and scholarships.