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, fuel cells, fluid flow, gas turbines, design optimization, robotics, ceramics and polymers, and many other areas. Mechanical 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.

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.

“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

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, research thesis.
# Mechanical & Materials Engineering PhD Map

**DOCTOR OF PHILOSOPHY (PhD)**

## YEAR I

**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. Link to Student Academic Success Services for a variety of supports.
- Attend the Departmental Graduate Seminar Series (MECH 997).

**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.

**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 SGS 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. Enroll in SG590 or the PULI Certificate for more professional development in teaching and learning.

**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.

**LAUNCH YOUR CAREER**
- Finding 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 academic and labour market websites.
- Stay on the lookout for special events like School of Graduate Studies 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 Queen's 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.
- Start participating in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups.

## YEAR II

**ACHIEVE YOUR ACADEMIC GOALS**
- 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.

**MAXIMIZE RESEARCH IMPACT**
- Attend or present at a graduate conference through the Canadian Section of Combustion Institute, FED 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.

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## YEAR III

**ACHIEVE YOUR ACADEMIC GOALS**
- Continue to meet regularly with your supervisor, review research progress, and write your dissertation. Check out SGS Writing camps like Dissertation Boot Camp or Dissertation on the Lake.
- Consider publishing elements of your research. Learn from the Expanding Horizons Publishing Workshop.
- Use conference presentations to create and refine dissertation material.

**MAXIMIZE RESEARCH IMPACT**
- 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.

**BUILD SKILLS AND EXPERIENCE**
- Begin teaching as a departmental Teaching Fellow.
- Find opportunities for extra training through CTL, Expanding Horizons, 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 hosted by QUIC and Four Directions Indigenous Student Centre.

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## YEAR IV & TRANSITIONING

**ACHIEVE YOUR ACADEMIC GOALS**
- Plan date of thesis submission for examination.
- Present your research to graduate students and faculty at or 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.

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

**BUILD SKILLS AND EXPERIENCE**
- 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.
- Investigate requirements for professional positions 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.
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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 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
  - Perserverance
  - 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

**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 – Professors
  - Research Science - Simulation Engineering
  - Government
  - Industry – Design Engineer
  - Consulting
- Taking time to explore career options, build experience, and network can help you have a smooth transition to the world of work after graduation.

Learn more about opportunities for extra training through CTL, Expanding Horizons, Mitacs, and other sources to boost your skills.

For help with teaching, get support from the Centre for Teaching and Learning. Enroll in SGS902 or the Student Academic Success Training Certificate hosted by QUIC and Four Directions Indigenous Student Centre.

Contact the Faculty of Engineering and Applied Science research website.

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.

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## My Grad Map
- The My Grad Map tool allows you to explore options for extra training through CTL, Expanding Horizons, Mitacs, and other sources to boost your skills.
- For help with teaching, get support from the Centre for Teaching and Learning. Enroll in SGS902 or the Student Academic Success Training Certificate hosted by QUIC and Four Directions Indigenous Student Centre.
- Contact the Faculty of Engineering and Applied Science research website.

Visit careers.queensu.ca/gradmaps for the online version with links! 

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Graduate Studies FAQs

How do I use this map?
Whether you are considering or have embarked on graduate studies at Queen's, use this map to plan for success in five overlapping areas of your career and academic life. The map helps you explore possibilities, set goals and track your individual accomplishments. Everyone's journey is different – the guide offers options for finding your way at Queen's and setting the foundation for your future. To make your own customized map, use the online My Grad Map tool.

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 Habitat 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.

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 School of Graduate Studies requires the following minimum scores: TOEFL (paper-based): 550, (2) TOEFL iBT: Writing (24/30); Speaking (22/30); Reading (22/30); Listening (20/30), for a total of 88/120 (applicants must have the minimum score in each test as well as the minimum overall score), or (3) IELTS: 7.0 (academic module overall band score), or (4) PTE Academics: 65.

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 usually funded through a combination of research assistantships, teaching assistantships, and/or scholarships. Funding levels differ for international students.

We encourage all students to apply for external funding from OGS 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.

DEPARTMENT OF MECHANICAL & MATERIALS ENGINEERING
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