Why GRADUATE STUDIES in MECHANICAL 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 project has involved collaboration with a surgeon in Sweden, researchers at the U of Queensland, Australia and NRC in Ottawa. This may sound extraordinary, but it is in fact closer to the norm for our Department.”
– Melanie Thompson, MSc

Program STRUCTURE

PhD (4 years): course work, research thesis, comprehensive exams.

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.
DOCTOR OF PHILOSOPHY (PhD)

**ACHIEVE YOUR ACADEMIC GOALS**

- Meet with your supervisor to set goals for each term and discuss progress, responsibilities, program requirements, requirements, research/occupational goals, timelines, and any required accommodation plans.
- Complete Part A of the PhD Comprehensive Examination: Look to the Academic Success Services website for a variety of supports.
- Attend the Departmental Graduate Seminar Series (MECH 95T).

**MAXIMIZE RESEARCH IMPACT**

- Think about audiences for your research.
- Apply to NSERC, ODG, and other funding.
- Attend conferences in your field.
- Write and defend your thesis proposal.
- Embark on your substantive research.
- Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.
- Attend the Departmental Graduate Seminar Series (MECH 95T).

**BUILD SKILLS AND EXPERIENCE**

- Serve on departmental, faculty or university committees.
- Consider positions on student services, the SGGS or media outlets like the Queen’s Journal CFRG and the SGGS Blog. Look in the AMS Clubs Directory.
- Use a Teaching Assistant or Research Assistant position to develop your skills and experience.
- Attend or present at a graduate conference through the Canadian Association of Combustion Institute, COMED, the University of Canada, or the ACS.
- Apply for the Graduate Student Travel Grant for Doctoral Field Research.

**ENGAGE WITH YOUR COMMUNITY**

- Consider volunteering with different community organizations, such as the Fuel Cell Research Centre, the Human Mobility Research Centre, the Centre for Advanced Materials & Manufacturing.
- Connect to broader communities of engineers by joining one of the Engineering Society Design Teams.
- Participate in student competitions, the SGGS or media outlets like the Queen’s Journal CFRG, the SGGS Blog, or the ASME Club's Directory.
- Use a Teaching Assistant or Research Assistant position to develop your skills and experience.
- Attend a graduate conference through the Canadian Association of Combustion Institute, COMED, the University of Canada, or the ACS.
- Apply for the Graduate Student Travel Grant for Doctoral Field Research.

**LAUNCH YOUR CAREER**

- Finding career fit starts with knowing yourself. Take a Career Services career planning workshop or meet with a career counselor for help. Check out books like "Who Am I 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 Graduate Student Career Week to explore your career pathways.
- Start building your teaching portfolio including student evaluations, and seeking mentorship.
- Explore different careers of interest by reading alumni profiles on the SGGS website, and using QueenConnects on LinkedIn to connect to alumni. Find alumni in various careers through "Ask an Alumni." For more information check on Career Counseling.
- 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.
- Check out the free online modules at MyGradSkills to help you plan your career.

**YEAR I**

- • Meet early with your supervisor to set goals for each term and discuss progress, responsibilities, program requirements, requirements, research/occupational goals, timelines, and any required accommodation plans.
- • Write and defend your thesis proposal.
- • Embark on your substantive research.
- • Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.
- • Attend the Departmental Graduate Seminar Series (MECH 95T).

**YEAR II**

- • Meet early with your supervisor to set goals for each term and discuss progress, responsibilities, program requirements, requirements, research/occupational goals, timelines, and any required accommodation plans.
- • Write and defend your thesis proposal.
- • Embark on your substantive research.
- • Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.
- • Attend the Departmental Graduate Seminar Series (MECH 95T).

**YEAR III**

- • Continue to meet regularly with your supervisor, review research progress, and write your dissertation.
- • Check out the SGS 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.

**YEAR IV & TRANSITIONING**

- • Plan date of thesis submission for examination.
- • Present your research to graduate students and faculty or at conferences and with work with supervisor to prepare for defense.
- • Review submission and examination guidelines.
- • Secure necessary oral defence accommodations.
- • Discuss career pathways, references letters, and publication options with your supervisor.

**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
- Persistence
- 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 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 Engineer
- 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.

*This map is intended to provide suggestions for activities and careers, but everyone’s abilities, experiences, and constraints are different. Build your own Grad Map using our online My Grad Map tool. Visit careers.queensu.ca/gradmaps for the online version with links!
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 $10,000 award to winners of federal government tri-council awards for PhD studies. For more information, see the School of Graduate Studies’ information on awards and scholarships.