Research Pathways

Learn More about Research in the Department of Mechanical Engineering

2026-01-14

Dr. Cheryl Quenneville, Associate Chair, Undergraduate Studies
Dr. S. Andrew Gadsden, Associate Chair, Graduate Studies

Tonight

- Inform you about what research is, and how to get involved
- Hear from current graduate students
- Network with faculty

Why is Research Fun?

- Doing things never before done – you get to drive the direction!
- Working with cool equipment
- Develop problem solving &project management skills
- Constantly learning, each day different
- Flexible &positive environment

During Undergrad…

Summer Research Positions

Technical Elective Courses

Co-Op, Volunteering

Summer Research Positions

- Most hiring done early winter term
  - Contact faculty members directly
- Generally ~16 weeks, some flexibility
- Often working with graduate students, or building equipment, or collecting pilot data
- Helps if you can get scholarship
  - Pay level up to supervisor; at least min wage, often higher for upper years

NSERC USRAs

- Federal government scholarship
- $6,000 + supervisor contribution (min 25%)
- 14-16 weeks full time
- Canadian or PR, current full-time student in Bachelor's
  - Extra awards available for self-identified Black and/or Indigenous
  - A few international USRAs available
- Heavily grade-based
- Secure supervisor, submit application &unofficial transcript
  - Deadline start of Feb

Other Scholarships

- Search around – field dependent
- McMaster Institute for Research on Aging Summer Research Fellowships
- Canadian Nuclear Laboratories Summer Research Experience

Technical Electives

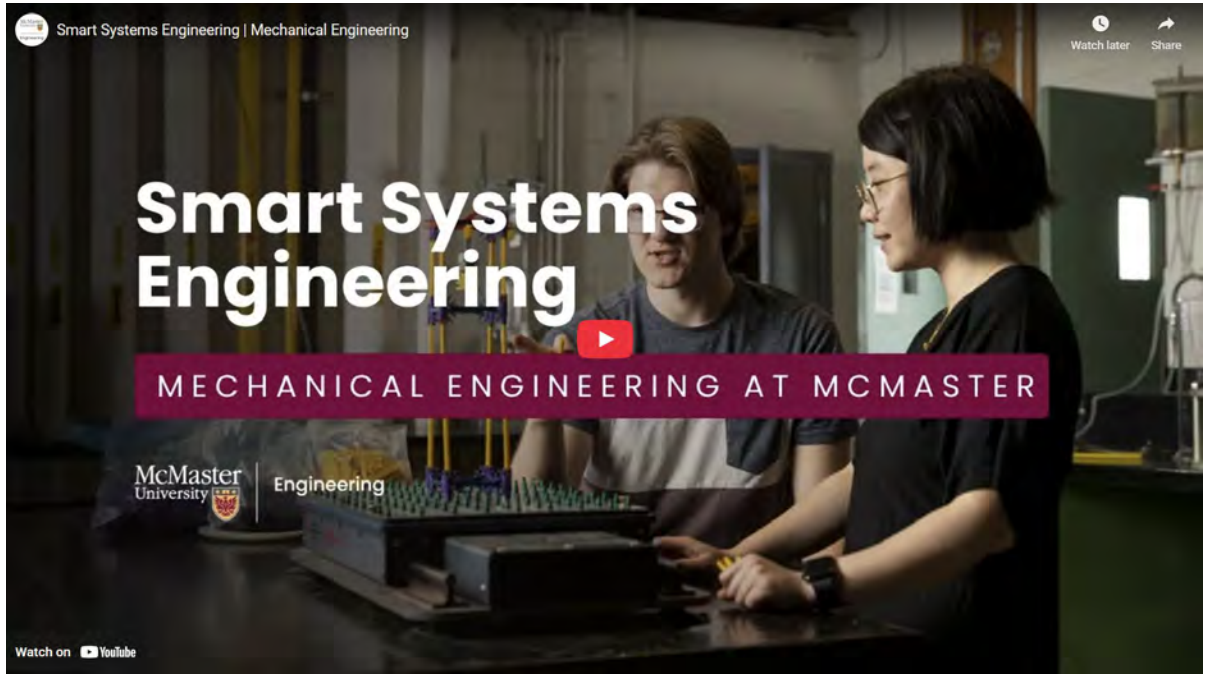
- Course credit for doing a research project with a faculty member
- MECHENG 4X04 (full year), MECHENG 4XA3 (one semester)
- Nearly all programs have these
  - E.g. IBEHS 3H03/4H03 (one semester), 3I06 (full year)
- ‘Mini Master’s’
  - Preview of graduate studies, develop research skills
  - Usually limited deliverables

Co-Op & Volunteer

- Co-op positions – check with faculty members
- Available in any semester
- Some faculty take volunteers
  - Make sure it doesn't interfere with your degree progression
  - Can build skills and build a recommendation

Graduate Studies in Mech. Eng.

- We offer both MASc and PhD options for graduate students
- Both programs can be pursued full-time or part-time
- Research areas:
  - Advanced Manufacturing
  - Biomechanics
  - Mechanics and Design
  - Energy and Fluid Systems
  - Smart Systems



MASc Program

- Thesis-based
- 2 years full-time (can be less!)
- Can continue or transfer to Ph.D. studies
- Degree Requirements:
  - 4x Level 700 courses (1 Level 600 course is allowed)
  - 4x Seminar ‘courses’ & 1 presentation
  - Supervisory Committee Meeting
- Funding includes a research scholarship, a graduate scholarship, and a teaching assistantship
- Minimum funding in the 2026-2027 academic year is $28,000

MASc Program (Accelerated)

- MASc in 12 to 16 months (!)
- Undergraduate research counts towards MASc thesis
- One class counts for both BEng and MASc
- Same academic requirements & funding as regular, full-time MASc students

PhD Program

- Thesis-based
- ~4 years full-time (can range from 3 years to 5 years – generally up to you!)
- Degree Requirements:
  - 2x Level 700 courses
  - 8x Seminar 'courses' & 1 presentation
  - 4x Supervisory Committee Meetings
  - Comprehensive exam
- Funding includes a research scholarship, a graduate scholarship, and a teaching assistantship
- Minimum funding in the 2026-2027 academic year is $30,000

PhD Program (Direct Entry)

- Outstanding students with a B.Sc./B.Eng. may be admitted directly into the Mechanical Engineering PhD program
- Degree Requirements:
  - 4x Level 700 courses
  - 8x Seminar ‘courses’ & 1 presentation
  - 4x Supervisory Committee Meetings
  - Comprehensive exam
- Same funding as regular, full-time PhD students

Why Explore Graduate Studies?

- MASc benefits…
- Specialization: Deep dive into a specific engineering field (e.g., biomechanics, AI, space-based robotics)
- Advanced Skills: Develops critical thinking, research, analytical modeling, and problem-solving
- Industry Leadership: Prepares for R&D roles or technical leadership in advanced technology companies
- Research Foundation: A strong bridge to a PhD program
- …Don't want to work in industry yet…

Why Explore Graduate Studies?

- PhD benefits…
- Pioneering Research: Conduct original research that creates new knowledge, not just applies existing knowledge
- Academic Careers: The standard path for university professorships
- Top-Tier R&D: Positions you for leading research roles in government labs or high-tech industries
- Global Recognition: Work with leading researchers and contribute to international scientific discourse
- …Reaaaally don't want to get a job yet…

Reach Out!

- Undergraduate Studies:
  - Nicole Mclean: mech@mcmaster.ca
  - Cheryl Quenneville: quennev@mcmaster.ca

- Graduate Studies:
  - Diane Siv-Parr: mechgrad@mcmaster.ca
  - S. Andrew Gadsden: gadsden@mcmaster.ca

- Mechanical Engineering Graduate Student Society (MEGS):
  - Nicholas Grzelak: grzelakn@mcmaster.ca
  - Wenlin Zhang: zhanw9@mcmaster.ca

Upcoming Event

- Curious about graduate studies? Join our STEM Discovery Night!
- Take the next step in your STEM journey! Join us for Graduate Studies in STEM Discovery Night, on Thursday January 29, 2026, from 5 p.m. - 7:00 p.m. in the Life Sciences Building (LSB) Lobby
- Event highlights include:
  - Insights from experts: Dr. Kathryn Grandfield and Dr. Laura Parker will discuss the value of graduate studies and strategies for connecting with potential supervisors.
  - Application guidance: A representative from the School of Graduate Studies will answer questions about the application process.
  - Community & networking: Enjoy food and light refreshments while connecting with current graduate students to learn about research, graduate life, and pathways to further study.
- Space is limited – please register early to secure your spot.
  - For questions, please contact enggrad@mcmaster.ca