



## GRADUATE OPPORTUNITIES

### Graduate Professional Degree Program (MEng)

#### Master of Engineering (MEng)

The normal admission requirement for the course-based Professional MEng degree is a four-year bachelor's degree in Mechanical Engineering or an equivalent degree from an accredited University with a minimum of 70% (B) grade average (North American). In some cases, students with a similar degree from another scientific discipline may be admitted, with appropriate approval. Official academic transcripts and an electronic application completed through the Ontario Universities Application Centre (OUAC) are required. International students must provide proof of English language proficiency. If enrolled full-time, a student can complete the degree in one year.

Mechanical & Materials Engineering MEng programs include:

- Mechanical Engineering (general)
- Automation Technologies & Systems
- Heating, Ventilating & Air Conditioning (HVAC) Systems
- Materials & Solid Mechanics
- Thermofluids
- Engineering in Medicine (Interdisciplinary)

### Graduate Research Degree Programs (MEng and PhD)

#### Master of Engineering Science (MEngSc)

A thesis-based master's research program leads to an MEngSc degree. The normal admission requirement is a four-year bachelor's degree (or equivalent) in engineering or physical sciences with a minimum of 78% (B+) grade average (North American). The typical completion time of the MEngSc program is two years.

#### Doctor of Philosophy (PhD)

The thesis-based doctor of philosophy research program leads to a PhD degree. Admission to the PhD program typically requires successful completion of a research master's degree with a grade average of at least 78% (B+) (North American). Direct entry into the PhD program is also available to outstanding students who have completed their undergraduate degrees. The typical completion time of the PhD program is four years.

For admission into the MEngSc or PhD program the following are required: two reference letters, official academic transcripts and an electronic application completed through the Ontario Universities Application Centre (OUAC). International students must provide proof of English language proficiency.

#### Funding for MEngSc and PhD

Western is committed to providing a competitive financial package for graduate research students. For more information please visit

[www.eng.uwo.ca/gradstudies/grad\\_funding.htm](http://www.eng.uwo.ca/gradstudies/grad_funding.htm)

## RESEARCH FACILITIES

MME graduate students have access to outstanding facilities in the department and across campus, including:

#### Departmental Laboratories

- Dynamic and Sensing Systems Research Laboratory
- The Jack McBain Biomechanical Testing Lab
- Laboratory for Complex Flow Systems and Cyber Engineering
- Advanced Materials Modeling Research Laboratory
- Micro Mechanical Testing Research Laboratory
- Opto-Mechatronics Research Laboratory
- Sensing and Mechatronic Systems Research Laboratory
- Experimental Fluid Dynamics Research Laboratory
- Polymeric Materials Processing Research Laboratory
- Nanomaterials and Clean Energy Laboratory
- Computer Numerical Control Laboratory
- Bionanotechnology Research Laboratory
- Computational Fluid Dynamics Research Laboratory
- The Wolf Orthopedic Biomechanics Laboratory

#### Campus-wide Laboratories

- Canadian Surgical Technologies and Advanced Robotics (CSTAR)
- Shared Hierarchical Academic Research Computing Network (SHARCNET)
- Boundary Layer Wind Tunnel Laboratory
- Advanced Facility for Avian Research
- WindEEE Dome
- Lawson Health Research Institute
- Western Nanofabrication Facility
- Surface Science Western

## Contact Us

#### Mechanical & Materials Engineering

Spencer Engineering Building, room 3002A  
T: 519.850.2939 | F: 519.661.3020

Graduate Professional Degree Program (MEng)

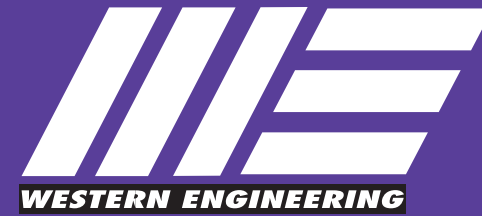
[mmeprofessionalgrad@uwo.ca](mailto:mmeprofessionalgrad@uwo.ca)

Graduate Research Degree Programs (MEngSc & PhD)

[mmeresearchgrad@uwo.ca](mailto:mmeresearchgrad@uwo.ca)

[www.eng.uwo.ca/mechanical](http://www.eng.uwo.ca/mechanical)

Printed December 2011



# Graduate Studies in Mechanical & Materials Engineering



# RESEARCH WHAT WESTERN ENGINEERING CAN DO FOR YOU

## GRADUATE STUDIES IN MECHANICAL & MATERIALS ENGINEERING

Western's Department of Mechanical & Materials Engineering (MME) has 24 faculty members excelling in a variety of research and teaching subjects. There are two streams of graduate studies: Graduate Professional Degree Programs and Graduate Research Degree Programs. Graduates from these MME programs are versatile professionals who are prepared for careers in industry and academia.

The **Graduate Professional Degree Program** is a course-based stream leading to a Master of Engineering (MEng) degree, which allows students to specialize in any one of the following areas:

- Mechanical Engineering (general)
- Automation Technologies & Systems
- Heating, Ventilating & Air Conditioning (HVAC) Systems
- Materials & Solid Mechanics
- Thermofluids

We also offer an **Interdisciplinary Professional Degree Program in Engineering in Medicine**. This program combines expertise from the Departments of Chemical & Biochemical Engineering, Electrical & Computer Engineering and Mechanical & Materials Engineering. Engineering in Medicine offers students the opportunity to understand the role of engineers in modern medicine, explore innovative technologies that impact medical advancement and recognize opportunities for product development. Learn more at [www.eng.uwo.ca/gradstudies/MEng\\_Medicine.htm](http://www.eng.uwo.ca/gradstudies/MEng_Medicine.htm)

The **Graduate Research Degree Programs** are thesis-based research streams leading to either a Master of Engineering Science (MESC) or a Doctor of Philosophy (PhD) degree, which provides cutting-edge research opportunities to students using state-of-the-art experimental or computational research facilities under the close supervision of a faculty member(s). MME's research strengths are in diverse areas addressing present day challenges, as well as developing technologies for the future. The five broader areas of specialization are listed below. Students interested in any one of these areas should also visit the websites of the individual faculty members to learn more about specific research topics and interests.

## AREAS OF SPECIALIZATION

### Mechanical Engineering

#### *Biomechanics*

Research in this area broadly covers orthopaedic biomechanics, joint replacement (implant) design and analysis, joint motion, impact loading and analysis, advanced medical imaging, injury causation biomechanics and sport science. Students working in this area may have the opportunity to participate in the combined research projects with Western's departments of Surgery and Kinesiology.

**Faculty Members:** C. Dunning, L. Ferreira, T. Jenkyn, J. Johnson

#### *Design & Manufacturing*

Research in this area focuses on design methodologies and tools, multi-axis CNC machining, computer-aided design and manufacturing, and intelligent machining systems.

**Faculty Members:** R. Buchal, O.R. Tutunea-Fatan

### Automation Technologies & Systems

#### *Mechatronics, robotics, sensors and controls*

Research in this broad area includes mechatronic systems, dynamics and control, robotics, sensors and actuators, real time control, micromechanics and geometric computing. Students interested in this area of study have the opportunity to investigate novel techniques, devices and systems to address challenging problems related to automation technologies, computer-assisted surgical robots, machine vision, geometric inspection, scientific visualization, and sensor development.

**Faculty Members:** S. Asokanthan, L. Ferreira, G. Knopf, M. Naish, S. Salisbury

### Materials & Solid Mechanics

Research in this area covers broad topics related to microstructure and properties of metals, polymers, composite materials, nanomaterials, and fuel cells. Both industrially relevant and fundamental aspects of the science and engineering of materials are covered. Materials & Solid Mechanics also incorporates aspects of continuum mechanics, mechanical engineering structures, and material processing.

**Faculty Members:** J. Dryden, L. Jiang, R. Klassen, A. Singh, X. Sun, J. Wood, J. Yang

### Thermofluids

Thermofluids research utilizes theoretical, numerical and experimental techniques to explore both fundamental and applied problems. Theoretical and numerical research broadly focuses on hydrodynamic stability, flow control, free surface flows, complex fluids, porous materials, two-phase flows, combustion, algorithm development, and convective heat transfer. The experimental research covers broader areas of interfacial fluid mechanics and heat transfer, turbulence, alternative energy systems, biological and environmental flows, and micro-systems.

**Faculty Members:** J.M. Floryan, R. Khayat, E. Savory, K. Siddiqui, A. Straatman, J. Yang, C. Zhang

## RESEARCH GROUPS

Students also benefit from the various research groups Western Engineering faculty members are affiliated with in the Department of Mechanical & Materials Engineering, including:

- Advanced Fluid Mechanics Group (AFM)
- Biomaterials and Medical Devices Research Group (BM2D)
- Biomechanics
- Dynamic and Sensing Systems Laboratory
- Nanomaterials and Energy Group