The Biological Engineering program at Guelph is one of a kind program that has graduated students since the 1980's. Our graduates find employment opportunities in various roles both in Canada and around the world. As an interdisciplinary subject, our students have the opportunity to work with various departments on campus including the Veterinary College, and The Ontario Agriculture College.

**Biological Engineering Faculty Research**

**Bob Dony, Ph.D., P.Eng**
rdony@uoguelph.ca
- Medical imaging including image compression multimodal image registration
- Image mosaicing and 3D reconstruction
- Adaptive techniques for image and signal processing

**Karen Gordon, Ph.D., P.Eng**
kgordon@uoguelph.ca
- Orthopaedic biomechanics
- Soft tissue mechanics
- Aetiology of osteoarthritis progression

**Manjusri Misra, Ph.D.**
mmisra@uoguelph.ca
- Polymer Nanotechnology
- Nanostructured Materials & Devices
- Nano Particles & Applications
- Biobased Polyesters and their Composites

**Amar Mohanty, Ph.D.**
mohanty@uoguelph.ca
- Natural Fiber Composites and All Green Composites
- Functionalization of Carbon Nanotubes and Clays
- Biodegradable Polymers and Sustainable Packaging
- Soy-based Bioplastic

**Suresh Neethirajan, Ph.D., P.Eng**
sneethir@uoguelph.ca
- Bionanotechnology and microfluidics
- Bio-instrumentation and Bio-imaging and agricultural systems
- Nanoscale science and engineering for biological

**Michele Oliver, Ph.D., P.Eng**
omoliver@uoguelph.ca
- Joystick and heavy machine operator biomechanics, whole body vibration, development of virtual prototyping tools to reduce repetitive strain injuries

**John Runciman, Ph.D., P.Eng**
jruncima@uoguelph.ca
- Biomechanics and design of orthopaedic implants and instruments
- Biomechanics of articular joints and soft tissues
- Water skiing biomechanics and equipment design

**Questions about Admissions and Applications?**
Graduate Secretary:
soegrad@uoguelph.ca
519-824-4120 ext. 56187

**www.uoguelph.ca/engineering/graduate**

**Want to be introduced to a Professor?**
Recruitment Officer:
Jason Tyszka
jtyszka@uoguelph.ca
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Mechanical Engineering Faculty Research

Mohammad Biglarbegian, Ph.D., P.Eng
mbiglarb@uoguelph.ca
- Dynamics: vehicle dynamics
- Intelligent and nonlinear control
- Robotics (manipulators and mobile robots)
- Design, modeling, & control of mechatronics systems

Ryan M. C. Clemmer, Ph.D., P.Eng
rcllemmer@uoguelph.ca
- Characterization & processing of metal-ceramic
- Alternative energy and energy conversion systems
- Development of new materials
- Processing and sintering of porous powder compacts

Fantahun M. Defersha, Ph.D.
ndefersh@uoguelph.ca
- Manufacturing system analysis
- Flexible and cellular manufacturing systems
- Fractal, distributed, holonic and modular manufacturing systems

Animesh Dutta, PhD., P.Eng
adutta@uoguelph.ca
- Life cycle analysis and thermodynamic optimization
- Design and assessment of advanced energy systems
- Renewable and cleaner energy technologies
- Supercritical water gasification for energy and fuel

Marwan Hassan, Ph.D., P.Eng
mahassan@uoguelph.ca
- Finite element analysis
- Fluid-structure interaction
- Material deformation and modelling
- Design

Shohel Mahmud, Ph.D., P.Eng
smahmud@uoguelph.ca
- Thermoacoustic engine and refrigeration systems
- Complex geometry convection entropy generation
- Transport in porous media
- Thermal remote sensing

Soha Moussa, Ph.D., P.Eng
smoussa@uoguelph.ca
- Flexible and cellular manufacturing systems
- Part sequencing and scheduling
- Production and inventory control
- Supply chain management

Jonathan VanderSteen, Ph.D., P.Eng
vandersj@uoguelph.ca
- Humanitarian engineering applications and design
- Engineering design education and problem solving
- Creative capacity, innovation, learning alliances, and the design process

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The Water Resource Engineering program at Guelph is a “one of a kind” program that has graduated students since the 1970’s. Our graduates find employment opportunities in various roles both in Canada and internationally. As an interdisciplinary subject, our students have the opportunity to take courses in: Environmental Engineering, Land Resources Science, Geography and Environmental Biology.

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For more information contact
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Water Resources Engineering Faculty Research

Andrea Bradford, Ph.D., P.Eng
abradfor@uoguelph.ca
• Water resources and ecosystem protection policy
• Wetland hydroecology
• Stormwater management
• Ecological flow assessment

Bahram Gharabaghi, Ph.D., P.Eng
bgharaba@uoguelph.ca
• Stormwater and Aquatic Habitat Monitoring
• Development of Flood Forecasting Tools
• Prediction of Climate Change Effects on
• Water Quantity & Quality

Kevin Hall, Ph.D., P.Eng
k.hall@exec.uoguelph.ca
• Regional watershed modelling
• Bioengineering in the coastal zone
• Wave dynamics and coastal zone processes
• Point of use water treatment systems in marginalized communities

Douglas M. Joy, Ph.D., P.Eng
djoy@uoguelph.ca
• Bacterial transport in hydrologic systems
• River processes on-site system design and regulation
• Impact of on-site systems on ground and surface water systems

Jana Levison, PhD, EIT
jlevison@uoguelph.ca
• Agricultural impacts on groundwater
• Source water protection
• Impacts of climate change on hydrological systems
• Renewable energy production

Ed McBean, Ph.D., P.Eng
cmbea@uoguelph.ca
• Water supply security
• Municipal infrastructure integrity
• Risk assessment and management
• International water issues and climate change

Beth Parker, Ph.D
bparker@uoguelph.ca
• Groundwater contaminant transport and fate
• In site remediation of groundwater systems
• Field instrumentation in aquifer and aquitard regimes

Ramesh P. Rudra, Ph.D., P.Eng
rrudra@uoguelph.ca
• Development of water resources management tools
• Watershed modeling (quantity and quality) for source water protection
• Mechanics of non-point source pollution

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Environmental Engineering research involves the development of methods or processes to minimize the impact of human activities on the environment. Research at the School of Engineering focuses on the development of sustainable systems to prevent environmental degradation or to remediate existing environmental problems associated with industrial, agricultural and municipal activities.

Environmental Engineering Faculty Research

Andrea Bradford, Ph.D., P.Eng
abradfor@uoguelph.ca
- Water resources and ecosystem protection policy
- Wetland hydroecology
- Stormwater management
- Ecological flow assessment

Khosrow Farahbakhsh, Ph.D., P.Eng
khosrowf@uoguelph.ca
- Sustainable water management and water reuse
- Pollution prevention and cleaner production
- Knowledge translation & transfer for sustainable practices
- Balancing Indigenous and scientific knowledge

Sheng Chang, Ph.D., P.Eng
schang01@uoguelph.ca
- Membrane process mass transfer mechanisms
- Water reuse
- Membrane module and system optimization
- Membrane applications in environmental engineering

Brajesh Dubey, Ph.D.
bdubey@uoguelph.ca
- Sustainable environmental technologies
- Water quality and sanitation issues of developing countries and small islands
- Integrated solid waste management issues

William Lubitz, Ph.D., P.Eng
wlubitz@uoguelph.ca
- Wind energy resource assessment
- Wind energy forecasting
- Environmental aerodynamics
- Improved instruments for near-surface study

Warren Stiver, Ph.D., P.Eng
wstiver@uoguelph.ca
- Sustainable energy
- Urban systems environmental design
- Environmental applications of supercritical fluids
- Prion protein detection

Bill Van Heyst, Ph.D., P.Eng
bvanheys@uoguelph.ca
- Exchange of elemental and reactive mercury
- Air quality policy and regulations
- Characterizing process emission factors and developing emission inventories from agriculture

Hongde Zhou, Ph.D., P.Eng
hzhou@uoguelph.ca
- Energy & resource recovery from wastewater & waste
- UV and advanced oxidation processes
- Ozonation and advanced oxidation processes
- Fate and control of emerging contaminants

Richard G. Zytner, Ph.D., P.Eng, FEC
rzytner@uoguelph.ca
- Soil remediation technology
- Treatment of food processing wastewater
- Treatment of vegetable and fruit wash-water and residues

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Graduate Studies in Engineering
MEng, MASc, PhD

The integration of systems, the interaction of components, from mechanical to electrical, and the achievement of efficient and reliable operation are the aim of the Engineering Systems & Computer Engineering research carried out at the graduate level.

Engineering Systems and Computing Faculty Research

Hussein A. Abdullah, Ph.D., P.Eng
haabdulla@uoguelph.ca
• Mechatronic systems design
• Manufacturing systems
• Rehabilitation robots
• Computer integrated manufacturing (CIM), CAD\CAM,

Arafat Al-Dweik, Ph.D
aaldweik@uoguelph.ca
• Wireless communications
• Communication networks
• Digital transmission techniques
• Signal processing for communications,

Shawki M. Areibi, Ph.D., P.Eng
sareibi@uoguelph.ca
• Physical design automation
• Reconfigurable computing systems
• Hardware/software co-design for embedded systems

Fadi Al-Turjman, Ph.D.
fadi@uoguelph.ca
• Integration of heterogeneous enabling technologies in IoT
• Deployment planning in next generation networks (NGN)
• Design and implementation of wireless sensor networks (WSNs) platforms

Dalia Fayek, Ph.D., P.Eng
dfayek@uoguelph.ca
• QoS traffic engineering in wireless networks
• Video compression, streaming and signal processing
• Mathematical modeling and cross layer design

Stefano Gregori, Ph.D.
sgregori@uoguelph.ca
• Micro and nano-scale integrated circuit design
• Analog and mixed-signal systems
• Integrated sensors and sensor networks

Medhat Moussa, Ph.D., P.Eng
mmoussa@uoguelph.ca
• Robotics grasping and manipulation
• Human-robot interaction and user-adaptive robots
• Robot learning and embedded machine learning
• Computer vision and pattern recognition

Radu Muresan, Ph.D., P.Eng
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• SOC and ASIC designs and implementations
• Cryptographic hardware
• Real-Time embedded hardware
• Intelligent and nonlinear control

Graham W. Taylor, Ph.D.
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• Deep learning and representation learning
• Learning from sequences (time series)
• Applications to computer vision, motion capture, climate modeling, language, finance, crowd gaming

Julie Vale, Ph.D., EIT
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• Optimal control of uncertain systems
• Sampled data systems and control
• Control of switched system
• Fault tolerant control

Anthony Vannelli, Ph.D., P.Eng
vannelli@uoguelph.ca
• Development of circuit layout algorithms
• Interior point algorithms in engineering design
• Tabu search and annealing approaches for combinatorial optimization

Simon X. Yang, Ph.D.
syang@uoguelph.ca
• Real-time sensing, navigation, and teleoperation of robotic systems
• Intelligent control systems and applications
• Sensors, Multi-sensor fusion, and signal processing

Stefano Gregori, Ph.D.
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• Analog and mixed-signal systems
• Integrated sensors and sensor networks

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