

GRADUATE DEGREES IN MECHANICAL ENGINEERING



MATERIALS SCIENCE AND ENGINEERING (MSE)

MSE is a University-wide program offered through the Graduate School, leading to an MS or PhD. Faculty include researchers from the departments of Mechanical Engineering, Electrical Engineering, Chemistry, Geology and Physics. Program research reflects a multidisciplinary study of physical, chemical and engineering aspects of materials at different scales (nano-, micro- and macroscopic).

Specializations include:

- mechanical, electrical and optical properties of thin films and coatings,
- analysis and synthesis of nanomaterials,
- fatigue and fracture of metals and ceramics,
- thermodynamic properties of materials,
- multiscale computational modeling, and
- materials issues in electronics packaging.

WHY BINGHAMTON?

“MEMS are very adaptable and they have tremendous utility for many different kinds of industries. It’s a very exciting technology to be working with and our investment has positioned Binghamton to be among the best universities in the nation in this burgeoning field.”

*Mohammad Younis
Associate professor, Mechanical Engineering*

The Department of Mechanical Engineering (ME) offers MS, MEng and PhD graduate degrees. The master of science (MS) program provides a balance of advanced theory and practical knowledge necessary for either practice within the profession or advancement to a doctoral program. The master of engineering (MEng) program prepares students for careers in professional practice through a flexible course selection (10 courses) and requires no thesis or project. The PhD program prepares students for basic and applied research in mechanical engineering through multidisciplinary research areas reflective of the interests of ME faculty.

Students may specialize in any one of the following areas of emphasis:

- **mechanics and design**, with emphasis on solid mechanics/stress analysis, vibrations and simulation/control;
- **thermofluids**, with emphasis on heat transfer, microfluidics and environmental/biological transport phenomena; or
- **materials**, with emphasis on nanotechnology, microstructure/property relationships, thin films and materials processing.

In addition, the ME department participates in the interdisciplinary materials science and engineering (MSE) program that allows students to complete an MS or PhD in MSE.

Electronics packaging is a research concentration in the ME department. A three-course sequence leads to a Certificate in Electronics Packaging. In addition to the fulltime faculty, the academic environment is enriched by the appointment of adjunct and research faculty members employed in local industry. Under appropriate circumstances, research may be carried out in industrial laboratories.

EMPLOYERS OF OUR GRADUATES

Analog Devices, BAE Systems, Cisco, Corning Inc., Credit Suisse, Deloitte & Touche LLP, Dover Technologies, Ford Motor Co., General Electric, IBM, Intel, Lockheed Martin, Motorola, Qualcomm, Sanmina, U.S. Department of Defense, U.S. Army, Welch Allyn, among others

CORPORATE AND GOVERNMENT SPONSORS

Analog Devices, BAE Systems, Corning, Inc., DARPA, Department of Energy, Endicott Interconnect Technologies, General Electric, Intel, NIH, NSF, NYSTAR, Samsung, Texas Instruments, Unisys, Universal, Welch Allyn, Xerox, among others

ABOUT BINGHAMTON UNIVERSITY

Binghamton University is a highly selective, mid-sized public institution, one of four research universities within the State University of New York system. Binghamton has a world-class faculty and a reputation for academic distinction.

National publications consistently place Binghamton among the elite public universities in the nation. *U.S. News & World Report* has listed Binghamton among the top 50 public doctoral universities for over a decade, and the Princeton Review includes Binghamton in its top 10.

Binghamton's innovative international programs have garnered seven national awards for excellence in internationalism. The University fosters a rich international environment that attracts students from nearly 100 different countries to our campus. One-third of our graduate students are international.

Located in the Southern Tier of upstate New York, the University sits on more than 900 acres in a beautiful hillside setting. Recreational and cultural opportunities abound in the area. Greater Binghamton is a friendly, affordable and safe community only hours away from major metropolitan areas such as New York City, Boston, Philadelphia and Washington, D.C.

FAST FACTS

Total enrollment: 14,800+

Graduate school enrollment: 3,000+

Academic colleges: 6

Specialized research centers: 26

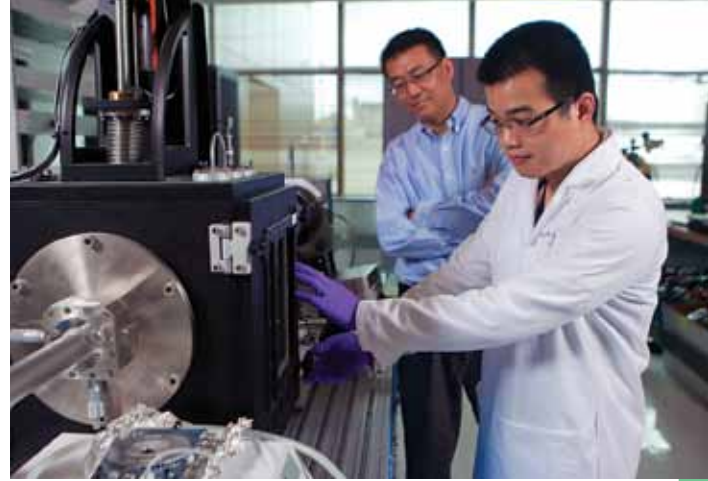
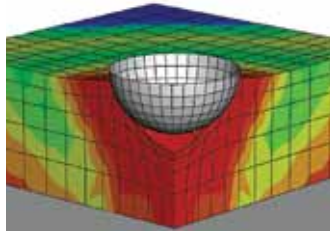
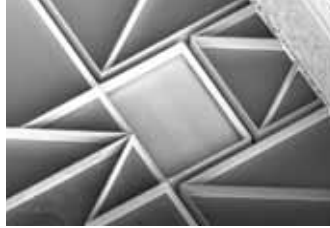
Graduate programs: more than 60 master's degree, 30 doctoral degree and numerous certificate programs

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FACULTY AND RESEARCH AREAS

Frank Cardullo, MS, Binghamton University:

Flight sim, vehicle dynamics, man-machine systems

Junghyun Cho, PhD, Lehigh University:

Microstructure design of advanced materials, ceramic thin films, processing science, mechanical behavior

Peter Huang, PhD, Brown University: Micro- and nanofluidics, cellular mechanics and applications, biophotonics

Changhong Ke, PhD, Northwestern University: NEMS and MEMS, AFM molecule imaging, nanomanipulation, spectroscopy, DNA mechanics, damage and repair

Roy McGrann, PhD, University of Tulsa: Computer-aided engineering and design, engineering education, kinematics and dynamics of machinery, thermal spray coatings

Ron Miles, PhD, University of Washington: Vibrations, acoustics, fatigue, noise, biomechanics, MEMS

Bruce Murray, PhD, University of Arizona: Materials processing, computational materials science and transport phenomena

Seungbae Park, PhD, Purdue University:

Strength and mechanics of materials, reliability of small-scale systems (MEMS, sensors), 3-D packaging, optomechanics

James Pitarresi, PhD, SUNY Buffalo:

Computational mechanics, vibration modeling and testing, electronic packaging

Bahgat Sammakia, PhD, SUNY Buffalo: Heat transfer, electronics packaging

Tim Singler, PhD, University of Rochester:

Experimental, analytical, geophysical and interfacial fluid mechanics, applied math

Howard Wang, PhD, University of

Pennsylvania: Polymers, soft materials, nanomaterials, nanotechnology, characterization, scattering, printable electronics

Mohammad Younis, PhD, Virginia Polytechnic

Institute: MEMS, NEMS, linear/nonlinear dynamics and vibrations and structural mechanics

Guangwen Zhou, PhD, University of

Pittsburgh: Gas-surface reactions, oxidation, catalysis, nanoscale structures, materials and characterization, thin films

FUNDING OPPORTUNITIES

Teaching and Research Assistantships; 2009-10 faculty research funding: \$2.5 million

CONTACT THE WATSON SCHOOL

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