Mechanical and Industrial Engineering

Website (https://mie.northeastern.edu/academics/graduate-studies/)

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Mechanical engineers design, develop, and support the manufacture of machinery and devices to transmit power or to convert energy from thermal to mechanical form in order to power the modern world and its machines. Traditionally, mechanical engineers have designed and tested devices, such as heating and air-conditioning systems, machine tools, internal combustion engines, and steam power plants. Today, they also play primary roles in the development of new technologies in a variety of fields—energy conversion, solar energy utilization, environmental control, prosthetics, transportation, manufacturing, robotics, and new-materials development.

Industrial engineers design and analyze systems that include people, equipment, and materials and their interactions and performance in the workplace. An industrial engineer collects this information and evaluates alternatives to make decisions that best advance the goals of the enterprise. Industrial engineers work in manufacturing firms, hospitals, banks, public utilities, transportation, government agencies, insurance companies, and construction firms. Among the projects they undertake are design and implementation of a computer-integrated supply chain or manufacturing system, facilities planning for a variety of industries, design of a robotics system in a manufacturing environment, long-range corporate planning, development and implementation of a quality-control system, simulation analyses to improve processes and make operational decisions, design of healthcare operations to enhance patient safety and improve efficiency, productivity, and development of computer systems for information control.

Mission of the Department

The mission of the Department of Mechanical and Industrial Engineering is to educate persons for professional and technical excellence; to perform research to advance the science and practice of engineering; to engage in service activities that advance the department, the university, and the profession; and to instill in ourselves and our students habits and attitudes that promote ethical behavior, professional responsibility, and careers that advance the well-being of society.

Academic Programs

The Department of Mechanical and Industrial Engineering offers comprehensive research and educational programs for both Master of Science and Doctor of Philosophy students. Our cutting-edge and vibrant doctoral programs include PhDs in industrial engineering, mechanical engineering, and an interdisciplinary engineering PhD (housed in the College of Engineering). Our MS degree programs are offered in both traditional mechanical and industrial engineering, as well as data analytics engineering, energy systems, engineering management, human factors, operations research, and advanced and intelligent manufacturing. These extensive programs and concentrations allow for the selection of a degree that meets a wide variety of personal and professional goals. Graduate students work with our world-renowned faculty to achieve research experience and their career goals and have opportunities to participate in the graduate cooperative education program.

Graduate Certificate Options

Students enrolled in a master's degree have the opportunity to also pursue one of the many engineering graduate certificate options in addition to or in combination with the MS degree. Students should consult their faculty advisor regarding these options (https://graduate.northeastern.edu/programs/#/certificate/engineering,leadership/-/-/-/-/-).

GORDON INSTITUTE OF ENGINEERING LEADERSHIP OPTION

Students have the opportunity to pursue the Gordon Engineering Leadership Program (https://graduate.northeastern.edu/program/graduate-certificate-in-engineering-leadership-5272/) in combination with the MS degree.

ENGINEERING BUSINESS

Students have the opportunity to pursue the Galante Engineering Business Certificate (https://graduate.northeastern.edu/program/galante-engineering-business-certificate-14806/) in combination with several MS degrees.

Programs

Doctor of Philosophy (PhD)

- Industrial Engineering (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/industrial-engineering-phd/)
- Interdisciplinary Engineering (https://catalog.northeastern.edu/graduate/engineering/interdisciplinary-phd/interdisciplinary-engineering-phd/)
- Mechanical Engineering (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/mechanical-engineering-phd/)

Master of Science (MS)

- Advanced and Intelligent Manufacturing (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/advanced-intelligent-manufacturing-ms/)

- Data Analytics Engineering (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/data-analytics-engineering-ms/)
- Data Analytics Engineering—Online (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/data-analytics-engineering-online-ms/)
- Human Factors (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/human-factors-mshf/)
- Robotics (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/robotics-ms/)
- Semiconductor Engineering (https://catalog.northeastern.edu/graduate/engineering/electrical-computer/semiconductor-engineering-ms/)

Master of Science in Industrial Engineering (MSIE)

- Industrial Engineering (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/industrial-engineering-msie/)

Master of Science in Engineering Management (MSEM)

- Engineering Management (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/engineering-management-msem/)

Master of Science in Energy Systems (MSEneS)

- Energy Systems (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/energy-systems-msenes/)
- Energy Systems—Academic Link Program (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/energy-systems-msenes-academic-link-program/)

Master of Science in Mechanical Engineering (MSME)

- Mechanical Engineering with Concentration in General Mechanical Engineering (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/mechanical-engineering-concentration-general-msme/)
- Mechanical Engineering with Concentration in Mechanics and Design (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/mechanical-engineering-concentration-mechanics-design-msme/)
- Mechanical Engineering with Concentration in Materials Science (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/mechanical-engineering-concentration-material-science-msme/)
- Mechanical Engineering with Concentration in Mechatronics (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/mechanical-engineering-concentration-mechatronics-msme/)
- Mechanical Engineering with Concentration in Thermofluids (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/mechanical-engineering-concentration-thermofluids-msme/)

Master of Science in Operations Research (MSOR)

- Operations Research (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/operations-research-msor/)

Graduate Certificate

- AI Applications (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/ai-applications-graduate-certificate/)
- Data Analytics Engineering (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/data-analytics-engineering-graduate-certificate/)
- Energy Systems (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/energy-systems-graduate-certificate/)
- Energy Systems Management (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/energy-systems-management-graduate-certificate/)
- Engineering Business (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/engineering-business-graduate-certificate/)
- Engineering Economic Decision Making (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/engineering-economic-decision-making-graduate-certificate/)
- Engineering Management (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/engineering-management-graduate-certificate/)
- Lean Six Sigma (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/lean-six-sigma-graduate-certificate/)
- Renewable Energy (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/renewable-energy-graduate-certificate/)
- Software Engineering Systems (https://catalog.northeastern.edu/graduate/engineering/multidisciplinary/software-engineering-systems-graduate-certificate/)
- Sustainable Energy Systems (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/sustainable-energy-systems-graduate-certificate/)
- Supply Chain Engineering Management (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/supply-chain-engineering-management-graduate-certificate/)
- Technology Systems Management (https://catalog.northeastern.edu/graduate/engineering/mechanical-industrial/technology-systems-management-graduate-certificate/)