

Graduate Programs in Industrial and Manufacturing Engineering

The industrial and manufacturing (IME) department at WSU is committed to instruction and research on the design, analysis, improvement, and management of systems in manufacturing and service organizations. The graduate programs are directed toward both full-time and part-time students with a special emphasis on providing training and experience in performing independent research on topics with theoretical as well as applied interest. Students are encouraged to conduct research or take courses on topics that overlap several disciplines.

The IME department offers Master of Engineering Management (MEM), Master of Science, and Doctor of Philosophy degree programs in industrial engineering (MSIE and PhDIE, respectively). The department also offers six graduate certificate programs.

Admission Requirements

In order to be admitted in the MSIE program, applicants must:

1. possess an undergraduate degree in engineering, science, business, or other related discipline;
2. have satisfactorily completed MATH 344, Calculus III; IEN 255, Engineering Economy; a natural science course equivalent to that of the undergraduate engineering requirement;
3. have programming competence in C, C++, Visual Basic, or FORTRAN;
4. have a minimum GPA of 3.000, on a 4.000 scale, in the last 60 hours of undergraduate courses and in all graduate courses (students with a lower GPA may be considered only for probationary or nondegree admission); and
5. indicate one of the following as a concentration area: engineering systems, ergonomics/human factors, or manufacturing systems engineering.

In order to be admitted to the PhDIE program, applicants must:

1. have completed (or about to complete) a master's degree in engineering or physical science.
2. have a 3.250 GPA or better in all graduate coursework

In order to be admitted to the MEM program, applicants must:

1. possess an undergraduate degree in engineering, technology, science, mathematics, or computer science (some additional courses may be needed to make up background deficiencies, if any)
2. prefer two years of acceptable professional work experience (enclose a resume with admission application to provide experience information)
3. have familiarity with and experience in using a personal computer and spreadsheet and database software (such as MS Excel and MS Access)
4. have satisfactorily completed or have credit in MATH 243, Calculus II, and IME 255, Engineering Economy
5. have a minimum GPA of 3.000 in the last 60 hours of coursework, and in all graduate coursework

In addition – for all degree programs

Students with English as a second language must have a minimum score of 550 on the paper based TOEFL or 79 on the internet based TOEFL, or an overall band score of 6.5 on the IELTS exam; students requesting financial assistance should have achieved a 23 on the speaking portion of the internet based TOEFL; and students with an undergraduate degree from a program not accredited by ABET are encouraged to submit GRE scores.

Curriculum and Research Concentrations

The industrial and manufacturing engineering teaching and research concentrations are clustered around the following three areas.

Engineering Systems. Emphasis include optimization; multi-criteria decision making; modeling and analysis of manufacturing/service systems; management of engineering enterprises; decision analysis; total quality management; application of intelligent systems and simulation in manufacturing; and activity-based costing.

Ergonomics/Human Factors. Emphases include industrial ergonomics; bio-mechanics; human-machine systems; occupational safety and other industrial hygiene issues; and ergonomics and human factors issues in aviation/space systems. Another area of continued research involvement is rehabilitation engineering, especially dealing with persons with severe physiological disabilities.

Manufacturing Systems Engineering. Emphasis include facilities planning, design, and control of manufacturing systems; CAD/CAM/CIM systems; measurement/inspection; GD&T; supply chain management; manufacturing processes; forming; composites manufacturing; and free form surfaces manufacturing.

Facilities

The following facilities used in teaching and research are available for graduate students:

Cessna Manufacturing Laboratory supports all courses offered in the areas of manufacturing engineering, tool design, advanced and nontraditional machining, composite machining, and computer-aided manufacturing. The lab is also used by other departments, mainly the ME department, for its educational and research needs. The Mini Baja team makes extensive use of this lab which also supports multi-disciplinary courses and senior design projects.

Composites Manufacturing Laboratory is designed to provide students with hands-on experience in composites manufacturing and testing methods used in the aerospace industry.

Reliability and Maintenance Engineering Laboratory Its main goal is to provide students with hands-on experiences in modeling accelerated life testing and degradation testing, optimal design of testing plans, robust reliability design, system reliability optimization, condition-based maintenance (CBM), and engineering risk assessment. To carry out these teaching-related activities, the lab hosts

accelerated life/degradation testing equipment and several test beds for CBM.

Ergonomics and Occupational Biomechanics

Laboratory supports teaching and research in fields related to industrial ergonomics.

CAD/Systems Laboratory is a teaching lab that supports a number of courses including engineering graphics, systems simulation, and neural networks. The lab is also used on a regular basis by the ME and other departments to support a number of courses.

Rapid Prototyping and Product Development

Laboratory Activities include research and teaching, and support courses in all IME areas as well as the senior design course.

Manufacturing Process Laboratory is used to carry out research in machining, sheet metal forming, and in support of manufacturing engineering courses.

Laboratory for Sustainable Engineered Systems promotes the advancement of knowledge, understanding, and education of environmentally sustainable engineered systems (manufacturing and production systems, and renewable energy systems) through interdisciplinary teams of faculty, students, industrial partners and community volunteers. The Lab's research objective is to create or modify existing physical, chemical, biological or operational systems such that they either have a minimal or favorable impact on health and the environment. The lab conducts research in energy efficiency, healthcare and the environment, life cycle analysis, green manufacturing and sustainability.

Graduate Certificate programs offered:

- Advanced Manufacturing Analysis
 - Industrial Ergonomics and Safety
 - Systems Engineering and Management
 - Lean Systems
 - Foundations of Six Sigma & Quality Improvement
- And, jointly with the MIS Department:
- Enterprise Systems and Supply Chain Management

For more details on the certificate programs, please visit the website at www.wichita.edu/ime

Faculty

Esra Buyuktahtakin, PhD, University of Florida. Optimization, invasive species management, bioinformatics, power grid design, production planning, supply chain management, and logistics

Nils Hakansson, PhD, University of California, Davis. Musculoskeletal biomechanics, rehabilitation engineering, modeling and simulation of human movement, neuromuscular control, assistive technology design

Michael Jorgensen, PhD, Ohio State University. Work-related low back disorders, musculoskeletal disorder epidemiology, low-back biomechanical modeling, risk and exposure assessment methodology, and occupational safety

Krishna K. Krishnan, PhD, Virginia Tech. Manufacturing systems, facilities planning, material handling design, CAD/CAM Systems, design for manufacturability, virtual reality applications in manufacturing

Viswanathan Madhavan, PhD, Purdue University. Manufacturing process in the areas of traditional and non-traditional machining, cutter technology, forming process, and tools and jigs design

Anil Mahapatro, PhD, Polytechnic University. Design and engineering of bio-devices, cardiovascular and orthopedic biomaterials, nanotechnology and drug delivery

Don E. Malzahn, PhD, Oklahoma State University. Decision analysis, project management, human factors and engineering management

Abu S. M. Masud, PE, PhD, Kansas State University. Operations research, multi criteria decision making, decision analysis and support systems, forecasting, and QFD

Janet Twomey, PhD, University of Pittsburg. Intelligent data processing systems (neural networks, knowledge-based engineering, simulation, information systems, and statistics) applied to manufacturing and service systems

Pingfeng Wang, PhD, University of Maryland. Reliability Analysis and Risk Management, Probabilistic Analysis and Design, Maintainability, Prognostics and Health Management

Gamal Weheba, PhD, University of Central Florida. Quality and reliability engineering, statistical process control, economics of quality, precision measurements, and rapid prototyping

Larry Whitman, PE, PhD, The University of Texas at Arlington. Enterprise modeling and analysis, supply chain design, manufacturing systems applications, and production systems

M. Bayram Yildirim, PhD, University of Florida. Applied optimization, network optimization, supply chain management, scheduling, transportation planning, pricing on congestible networks

For More Information

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<http://webs.wichita.edu/?u=apply&p=/OnlineApplicationGateway>