Department of Industrial and Manufacturing Engineering

Department Information

- Civil & Industrial Engineering 202, 701-231-9818, www.ndsu.edu/ime (http://www.ndsu.edu/ime/)

Undergraduate Programs of Study

- Industrial Engineering and Management (major, minor)
- Manufacturing Engineering (major, minor)
- Reliability Engineering (minor)

Graduate Programs of Study

- Industrial Engineering and Management (MS)
- Manufacturing Engineering (MS)
- Industrial and Manufacturing Engineering (Ph.D.)

Degrees Offered

- Bachelor of Science in Industrial Engineering and Management (B.S.I.E.Mgt.)
- Bachelor of Science in Manufacturing Engineering (B.S. Mfg.E.)
- Master of Science (M.S.)
- Doctor of Philosophy (Ph.D.)

Department Description

The Bachelor of Science degrees in Industrial Engineering and Management and in Manufacturing Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Career opportunites for graduates of the two programs are often similar in nature which results in similar curriculum requirements. The difference between the two programs is manufacturing engineers ultimately "make things" and their work is tied to the production of goods. Industrial engineers use a systems approach to focus on the "process" of manufacturing goods to provide high quality products at affordable prices. The Industrial Engineering and Management program covers skill sets and tools that can be used in manufacturing as well as all other industries. Industrial engineers have strong technical skill sets to make improvements in all types of industries including manufacturing settings as well as to evaluate and improve productivity and quality of every aspect of business. Industrial and Manufacturing engineers apply scientific principles to the system design and production of goods and services. They are key team members in design and production of a wide range of products, including automobiles, airplanes, tractors, electronics, toys, building products, foodstuff, and sports and recreational equipment. Both industrial and manufacturing engineers design products and processes to make sure products meet the required reliability, functionality, and quality standards set forth by a company or industry, all while ensuring safety and availability at the best possible price.

In addition, both majors offer the student opportunities for specialization in their junior and senior years. IE&M students can apply their elective courses to extra study in production and operations management, supply-chain and logistics management, reliability and quality engineering, and healthcare engineering and management engineering. MfgE students can elect additional specialization in additive manufacturing, automation, and electronics manufacturing.

Both IE&M and MfgE students learn in an environment of professional realism. Many of the major courses fulfill their learning objectives through projects that are undertaken in collaboration with local companies. Students interact with practicing professionals to learn the real-world applications of the theories they master in the classrooms. In addition, there are five teaching laboratories where students gain hands-on experience and understanding of machining and engineering systems along with three research laboratories providing students with any number of opportunities to learn and develop research skills. Students in both IME majors are urged to take advantage of Cooperative Education and internship positions wherever possible. The knowledge gained through these experiences enhances career preparation and provides for expanded placement opportunity upon graduation.

Learning in the IME Department is a partnership of student and faculty. The student’s responsibility is to learn—to master the concepts, theories and practices that lead to career success. The faculty responsibility is four-fold: to provide an atmosphere that is conducive to learning; to assure availability of the tools necessary for effective and efficient learning; to offer guidance on educational and professional matters; and to evaluate student achievement. The usual faculty role is one of mentor, encouraging students to grow in stature as soon-to-be engineers and as practicing professionals.

IME graduates are well prepared for careers in design, development, and implementation of processes and systems that are often conceived in other engineering disciplines. Career positions in IE&M and MfgE form the vital linkages between abstract concepts and the reality of products and facilities of real use to customers. IME graduates are in demand for employment in a wide range of industries from the production of all types of goods, to transportation and distribution, information management, healthcare, and consulting just to name a few. The possibilities are endless.

In all cases, career positions for IME graduates involve design of processes and procedures in advanced technology environments. These professions routinely apply sophisticated modern tools in information handling, distributed communications, computer-driven controls, and a wide variety of technologically advanced equipment and apparatus. In addition, IME career professionals are skilled in the integration of people and technology within the business context of world-class enterprises. They have meaningful careers in organizations of all types and sizes, located in all parts of the world.