MANUFACTURING ENGINEERING

Manufacturing engineers make things. Everything manufacturing engineers do is ultimately tied to the production of goods. Almost everything we use, whether at home, at work, or at play, is manufactured. By its official professional definition, manufacturing occurs when the shape, form or properties of a material are altered in a way that adds value. Manufactured goods are everywhere: aircraft structures, machinery, electronics, medical devices, automobile parts, household products, toys, textiles and clothing, cans and bottles—virtually everything we use.

The Profession

Everything needed in modern society is manufactured. Manufacturing engineers design, direct and coordinate the processes and production systems for making virtually every kind of product from beginning to end. As businesses try to make products better and at a lower cost, they turn to manufacturing engineers to find out how.

Manufacturing engineers apply scientific principles to the production of goods. They are key team members in production of a wide range of products: automobiles, airplanes, tractors, electronics, surgical instruments, toys, building products, foodstuffs, sports and recreational equipment, and more. In all cases, manufacturing engineers design the processes and systems to make products with the required functionality, to high quality standards, available when and where customers prefer, at the best possible price and in ways that are environmentally friendly.

The Program

The Department of Industrial and Manufacturing Engineering (IME) at North Dakota State University offers programs leading to Bachelor of Science degrees in Manufacturing Engineering and in Industrial Engineering and Management. Both programs are accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

As a graduate of manufacturing engineering, you will have the opportunity to design systems and processes that improve the quality and productivity of an organization's business activities. You will employ a strong base of fundamental engineering and management skills to effectively integrate people, technology, machines and money to create positive change. Quite simply, you will design and implement the best way to make things.

Faculty and Facilities

The faculty and staff members in the department have extensive experience in industrial and manufacturing specialties. The IME faculty and staff will know your name, understand your potential and problems, and will offer encouragement when you need it. When you leave NDSU, you will have built excellent capabilities for career success, the confident ability for lifelong personal growth, and a network of friends and professional colleagues.

The department has 12 laboratories with a significant amount of equipment that provide valuable services in support of students' educational needs. The departmental laboratories include manufacturing, rapid prototyping, CNC, machining, microfabrication, welding, electronics, precision manufacturing, automation and robotics, and PLC, as well as computer simulation and human factors.

Career Opportunities

The IME programs at NDSU can help you to open the door to various opportunities for starting your professional career in a wide range of industries or to seek advanced degrees at NDSU or another institution. The IME programs will help you to develop a strong basis in general education and engineering fundamentals that provide the foundation for a very wide range of career choices and for a lifetime of growth. IME programs will help you develop industry-standard skills you can use to open the door to many career opportunities that can offer you financial rewards and exceptional professional success.

Manufacturing engineering graduates have become a source of talent working in industries that produce such products as biomedical devices, microelectronics, transportation and construction equipment, aircraft and spacecraft, and processed foods. Recent IME graduates command starting salaries in the top rank of engineering disciplines. According to the Bureau of Labor Statistics, the national average salary was $97,050 in 2016 (www.bls.gov/oes/current/oes_nat.htm).

Transfer Admission

Students who have studied two years of pre-engineering at another institution may be able to transition into the manufacturing engineering program with no loss of credits.

Scholarships and Financial Aid

The Department of Industrial and Manufacturing Engineering awards scholarships annually. The academic scholarships for freshmen are coordinated through the Office of Admission. These scholarships include the Helgason Scholarship, which is available only to College of Engineering students. Other forms of financial aid are available through the Office of Financial Aid and Scholarships.

Selective Admission

The Department of Industrial and Manufacturing Engineering has minimum admission requirements for transfer students. Transfer students must have a minimum grade point average of 2.3.

Manufacturing Engineering Plan of Study

Please note this is a sample plan of study; actual student schedules will vary depending on start year, individual goals, applicable transfer credit, and course availability. Students are encouraged to work with their academic advisor on a regular basis to review degree progress and customize their own plan of study.

Freshman

Fall	Credits	Spring	Credits
CHEM 121 & 121L General Chemistry I and General Chemistry I Laboratory	4	IME 111 Introduction to Industrial and Manufacturing Engineering	3
ENGL 110 College Composition I	4	MATH 166 Calculus II	4
MATH 165 Calculus I	4	ENGL 120 College Composition II	3
Computer Science Elective*	3	ME 212 Fundamentals of Visual Communication for Engineers	3
		ME 221 Engineering Mechanics I	3
		CHEM 122 General Chemistry II	3
	15		**19**

Sophomore

Fall	Credits	Spring	Credits
COMM 110 Fundamentals of Public Speaking	3	IME 311 Work/Station Design and Measurement	3
IME 330 Manufacturing Processes	3	MATH 266 Introduction to Differential Equations	3
MATH 128 Introduction to Linear Algebra	1	PHYS 252 & 252L University Physics II and University Physics II Laboratory	5
MATH 259 Multivariate Calculus	3	ME 331 Materials Science and Engineering	4
ME 222 Engineering Mechanics II	3	Engineering Science Elective*	3
ME 223 Mechanics of Materials	3		
	16		**18**

Junior

Fall	Credits	Spring	Credits
IME 380 CAD/CAM for Manufacturing	3	IME 431 Production Engineering	3
IME 430 Process Engineering	3	IME 440 Engineering Economy	3
IME 456 Program and Project Management	3	IME 461 Quality Assurance and Control	3
IME 460 Evaluation of Engineering Data	3	Engineering Science Elective*	3
ENGL 321 Writing in the Technical Professions	3	Gen Ed Humanities & Fine Arts/Gen Ed Global Perspectives	3
Gen Ed Wellness	2		
	17		**15**

Senior

Fall	Credits	Spring	Credits
ENGR 402 Engineering Ethics and Social Responsibility	1	IME 489 Industrial and Manufacturing Engineering Capstone	3
IME 480 Production and Inventory Control	3	Engineering Science Elective*	3
IME 482 Automated Manufacturing Systems	3	Gen Ed Social & Behavioral Science	3
Gen Ed Social & Behavioral Science/Gen Ed Cultural Diversity	3	Technical Elective*	3
Gen Ed Humanities & Fine Arts	3	Technical Elective*	3
Technical Elective*	3		
	16		**15**

Total Credits: 131

* Select from approved list of electives

View NDSU equivalencies of transfer courses at: www.ndsu.edu/transfer/equivalencies

For Further Information

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