

INDUSTRIAL ENGINEERING and MANAGEMENT

World leadership—whether for nations, states or individual companies—depends upon providing the highest quality in goods and services at costs that are affordable to the widest possible audience. Retaining world-class status requires relentless continuous improvement in all aspects of the business or governmental enterprise. Industrial engineers use a systems approach and focus on the processes for achieving quality, continuous improvement and cost effectiveness for all types of enterprises—manufacturers, healthcare service industries, non-profits and governments.

The Profession

Industrial engineers are involved in the creation of wealth and prosperity. This is achieved through designing and implementing better, more productive systems in both a manufacturing and a service environment. Industrial engineering is an interdisciplinary program by nature. Industrial engineers design, install, fabricate and integrate systems that include people, materials, information, equipment and energy necessary to accomplish the desired function. Industrial engineers are hired in every industry type such as manufacturing, healthcare, hotel, banking and finance, food processing, chemical and oil industry, distribution and logistics, and more.

Industrial engineers often are responsible for productivity improvements, supply chain optimization, project management, feasibility studies for new technologies and applications, lean and just-in-time implementation, health care management and logistics, and systems integration and engineering. Whether it's shortening a rollercoaster wait line, streamlining an operating room, managing a worldwide supply chain, manufacturing and designing superior automobiles, or solving logistics problems, industrial engineers are at the forefront.

The Program

The Department of Industrial and Manufacturing Engineering (IME) at North Dakota State University offers programs in industrial engineering and management and in manufacturing engineering. Both programs are accredited by the Engineering Accreditation Commission of ABET, www.abet.org.

As a graduate of industrial 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 and resources to create positive change. Quite simply, you will design and implement the best way to get work done.

The Faculty And Facilities

The faculty and staff in the IME 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 give encouragement when you need it. When you leave NDSU, you will have built excellent capabilities for career success, the confident ability for life-long personal growth, and a network of friends and professional colleagues.

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

Career Opportunities

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

Graduates of the IME programs have become a source of talent working in industries such as health care, manufacturing, consulting, food, transportation and distribution, and information systems. Recent IME graduates command starting salaries in the top rank of engineering disciplines. The 2014 Annual Employment Report provided by the NDSU Career Center shows an average salary of \$57,000 for industrial engineering and management graduates.

Transfer Admission

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

Scholarship and Financial Aid

The Department of Industrial and Manufacturing Engineering awards several scholarships annually. The majority of these scholarships are awarded to upper-division students, and a few are directed toward incoming freshmen and transfer students. At NDSU, 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 cumulative grade point average of 2.3.

Sample Curriculum

Credits	General Education
	First Year Experience
1	UNIV 189 - Skills for Academic Success
	Communication
3	COMM 110 - Fundamentals of Public Speaking
3, 3	ENGL 110, 120 - College Composition I, II
3	ENGL 321 - Writing in the Technical Professions
	Quantitative Reasoning
4	MATH 165 - Calculus I
	Science & Technology
3, 1	CHEM 121, 121L - General Chemistry I and Lab
3	CHEM 122 - General Chemistry II
4	PHYS 252 - University Physics II
6	Humanities & Fine Arts
6	Social & Behavioral Sciences
2	Wellness
-	- Cultural Diversity
-	- Global Perspective
42	TOTAL
Credits	Major Requirements
1	ENGR 402 - Engineering Ethics and Social Responsibilities
3	IME 111 - Introduction to Industrial and Manufacturing Engineering
3	IME 311 - Work/Station Design and Measurement
3	IME 330 - Manufacturing Processes
3	IME 440 - Engineering Economy
3	IME 450 - Systems Engineering and Management
3	IME 456 - Program and Project Management
3	IME 460 - Evaluation of Engineering Data
3	IME 461 - Quality Assurance and Control
3	IME 470 - Operations Research I
3	IME 472 - Simulation of Business and Industrial Systems
3	IME 480 - Production and Inventory Control
3	IME 482 - Automated Manufacturing Systems
3	IME 485 - Industrial and Manufacturing Facility Design
3	IME 489 - Industrial and Manufacturing Engineering Capstone
2	MATH 129 - Basic Linear Algebra
4	MATH 166 - Calculus II
3	MATH 259 - Multivariate Calculus
3	MATH 266 - Introduction Differential Equations
3	ME 212 - Fundamentals of Visual Communication for Engineers
3	ME 221 - Engineering Mechanics I
3	ME 222 - Engineering Mechanics II
3	Computer Science Elective
12	Engineering Science Electives
9	Technical Electives
88	TOTAL
131-132	CURRICULUM TOTAL

This sample curriculum is not intended to serve as a curriculum guide for current students, but rather an example of course offerings for prospective students. For the curriculum requirements in effect at the time of entrance into a program, consult with an academic advisor or with the Office of Registration and Records.

<https://bulletin.ndsu.edu/undergraduate/programs/>

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