

## 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 and 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 two programs leading to either a Bachelor of Science degree in Industrial Engineering and Management or in Manufacturing Engineering. Both programs are accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://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 7 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, additive manufacturing engineering, quality & reliability, SPACHES, 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. According to the Bureau of Labor Statistics, the national average salary was \$87,040 in 2019 ([www.bls.gov/ooh/architecture-and-engineering/industrial-engineers.htm](http://www.bls.gov/ooh/architecture-and-engineering/industrial-engineers.htm)).

### 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. Students who transfer with an AA or AS degree will have lower division general ed credits satisfied.

### 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.

### Scholarship and Financial Aid

The Department of Industrial and Manufacturing Engineering awards several scholarships annually. Scholarships are available for incoming freshman, transfer students and currently enrolled students. Other forms of financial aid are available through the Office of Financial Aid and Scholarships.

## Industrial Engineering and Management Minor

Students majoring in any engineering discipline may elect a minor in Industrial Engineering and Management. These optional studies offer engineering students the opportunity to add important career-enhancing skills to their technological competencies. The elected courses in an IE&M minor add skills for integrating technology and resources within the complex of people, technology, machinery and information that make up the successful modern business enterprise. Students completing this minor will achieve better understanding of organizational and management processes and will be better prepared to work in the multi-functional teams crucial to success in industry. Total requirement is 18 credits (6 credits are required courses and 12 credits of approved electives).

## Industrial Engineering and Management Plan of Study

Please note this is a sample plan of study and not an official curriculum. Actual student schedules for each semester will vary depending on start year, education 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 an individual plan of study.

<b>Freshman</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
CHEM 121 General Chemistry I & 121L Gen Chem I Lab	4	IME 111 Intro to Industrial and Manufacturing Engineering	3
ENGL 110 College Composition I	4	MATH 166 Calculus II	4
ENGL 120 College Composition II	3	ME 212 Fundamentals of Visual Communication for Engineers	3
MATH 165 Calculus I	4	ME 221 Engineering Mechanics I	3
Computer Science Elective*	3	CHEM 122 General Chemistry II	3
	<b>18</b>		<b>16</b>
<b>Sophomore</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
COMM 110 Fundamentals of Public Speaking	3	IME 311 Work/Station Design and Measurement	3
IME 330 Manufacturing Processes	3	ME 223 Mechanics of Materials	3
MATH 129 Basic Linear Algebra	3	MATH 266 Introduction to Differential Equations	3
MATH 259 Multivariate Calculus	3	PHYS 252 University Physics II & 252L Univ Phys II Lab	5
ME 222 Engineering Mechanics II	3	Gen Ed Social & Behavioral Sciences/Gen Ed Cultural Diversity	3
Gen Ed Humanities & Fine Arts/Gen Ed Global Perspectives	3		
	<b>18</b>		<b>17</b>
<b>Junior</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
IME 456 Program and Project Management	3	IME 461 Quality Assurance and Control	3-4
IME 460 Evaluation of Engineering Data	3	IME 470 Operations Research I	3
ENGL 321 Writing in the Technical Professions	3	IME 472 Simulation of Business and Industrial Systems	3
CE 309 Fluid Mechanics	3	ME 350 Thermodynamics and Heat Transfer	3
IME 440 Engineering Economy	3	Gen Ed Social & Behavioral Sciences/Gen Ed Cultural Diversity	3
		Gen Ed Wellness	2
	<b>15</b>		<b>17</b>
<b>Senior</b>			
<b>Fall</b>	<b>Credits</b>	<b>Spring</b>	<b>Credits</b>
ENGR 402 Engineering Ethics and Social Responsibility	1	IME 450 Systems Engineering and Management	3
IME 480 Production and Inventory Control	3	IME 489 Industrial and Manufacturing Engineering Capstone	3
IME 482 Automated Manufacturing Systems	3	Engr Sci Elective*	3
IME 485 Industrial and Manufacturing Facility Design	3	Technical Elective*	3
Gen Ed Humanities & Fine Arts/Global Perspectives	3	Technical Elective*	3
Technical Elective*	3		
	<b>16</b>		<b>15</b>
<b>Total Credits: 132</b>			

\* Select from approved list of electives

View NDSU equivalencies of transfer courses at: [www.ndsu.edu/transfer/equivalencies](http://www.ndsu.edu/transfer/equivalencies)

### For Further Information

**MAILING ADDRESS:** Industrial and Manufacturing Engineering | NDSU Dept 2485 | PO Box 6050 | Fargo, ND 58108-6050  
**DEPT LOCATION:** Civil & Industrial Engineering 202  
**DEPT PHONE:** (701) 231-9818  
**DEPT WEBSITE:** [www.ndsu.edu/ime/](http://www.ndsu.edu/ime/)

This publication will be made available in alternative formats upon request. Contact the Office of Admission (701) 231-8643 or 800-488-NDSU or ND Telecommunications Relay Service 800-366-6888 (TTY) or 800-366-6889 (voice).

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