



ONE DEGREE, COUNTLESS CAREERS

INDUSTRIAL AND
MANUFACTURING
ENGINEERING



Welcome to the department of Industrial and Manufacturing Engineering, otherwise known as “IME” at North Dakota State University. NDSU’s College of Engineering is well-known for its high-quality undergraduate programs, innovative teaching, imaginative research and student focus.

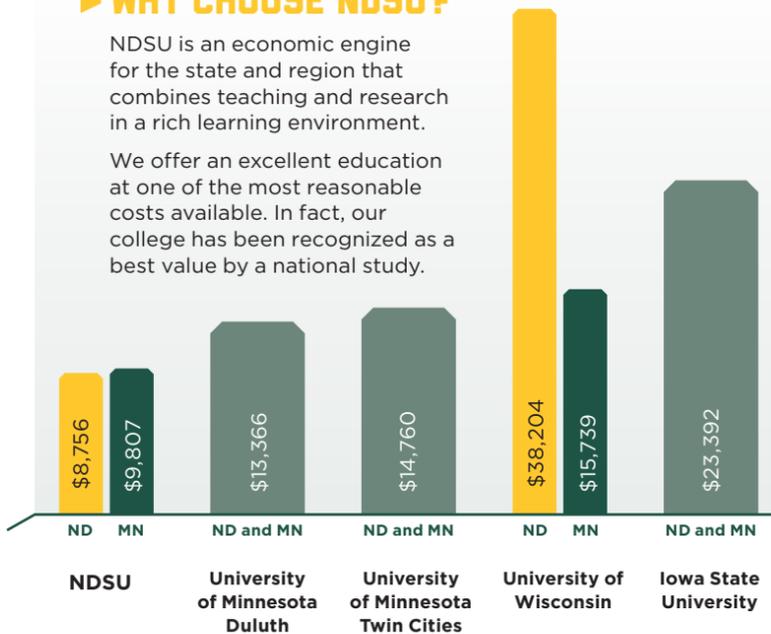
The IME department offers a Bachelor of Science in two programs of study: industrial engineering and management, and manufacturing engineering. NDSU is one of only 19 universities in the U.S. offering a manufacturing engineering program.

Nearly all economic sectors are starving for highly educated, skilled problem solvers with great communication abilities. IME graduates are well-positioned to meet these needs. This gives our graduates nearly an **endless number of opportunities** for career choices and geographic locations, as well as fast-paced career growth.

► WHY CHOOSE NDSU?

NDSU is an economic engine for the state and region that combines teaching and research in a rich learning environment.

We offer an excellent education at one of the most reasonable costs available. In fact, our college has been recognized as a best value by a national study.



We provide several scholarships for undergraduate students at the department level. NDSU also is proud to offer guaranteed awards for incoming students who meet certain academic criteria.

WHY CHOOSE IME?

JOB PLACEMENT

IME Department:

93%

College of Engineering:

86%

MEDIAN STARTING SALARY

Industrial Engineering and Management graduates:

\$64,240

Manufacturing Engineering graduates:

\$55,000

College of Engineering graduates:

\$60,000

THE U.S. BUREAU OF LABOR STATISTICS PROJECTS GROWTH OF

10%

IN INDUSTRIAL ENGINEERING BETWEEN 2016 AND 2026, FASTER THAN THE AVERAGE FOR ALL OCCUPATIONS.

► STUDENT FOCUSED

- Smaller class sizes and faculty accessibility
- Undergraduate research opportunities
- Cooperative education opportunities



► STRONG STUDENT ORGANIZATIONS

We have more than 30 engineering-related student groups including the Society of Women Engineers, Bison Robotics and student chapters of the Institute of Industrial and Systems Engineers and the Society of Manufacturing Engineers.

► CONNECTED TO INDUSTRY

The majority of our students participate in internships and co-ops. When you leave NDSU, you will have excellent hands-on experience for career success and a network of friends and professional colleagues.

► RESEARCH AND DISCOVERY

Undergraduate research is encouraged in our department. It promotes critical thinking and problem-solving skills, provides networking experiences and creates career development opportunities.

Our faculty and staff have extensive experience in industrial and manufacturing specialties. They are committed to leading the way in the following areas:

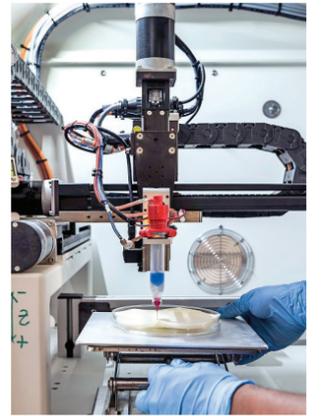
- Operations research
- Facility planning and management
- Ergonomics and human factors
- Additive/advance manufacturing
- Electronics packaging
- Quality and reliability
- Data analytics
- Health care

The IME department has seven labs to support research and students’ educational needs.

Additive Manufacturing Lab

An extrusion-based, bio-compatible, layered-fabrication system has been designed and developed in our laboratory to deposit both engineering materials as well as delicate biomaterials.

The laboratory also has a range of selective-laser sintering systems as well as laser-stereo lithography system, capable of producing parts with a wide range of thermo-mechanical properties.



Automation Lab

The IME automation system simulates a real production line in a miniature scale.



Human Factors Lab

Allows for teaching and research in ergonomics and man-machine interfaces. The lab provides a hands-on emphasis on optimizing person-machine and person-system interactions.



Manufacturing Lab

The machine shop gives students the chance to use one of our Computer Numeric Control machines.



Quality and Reliability Lab

The HawQ test chamber allows for testing and design validation of electronic products.



Sensing and Predictive Analytics for Computational Health Systems (SPACHeS) Lab

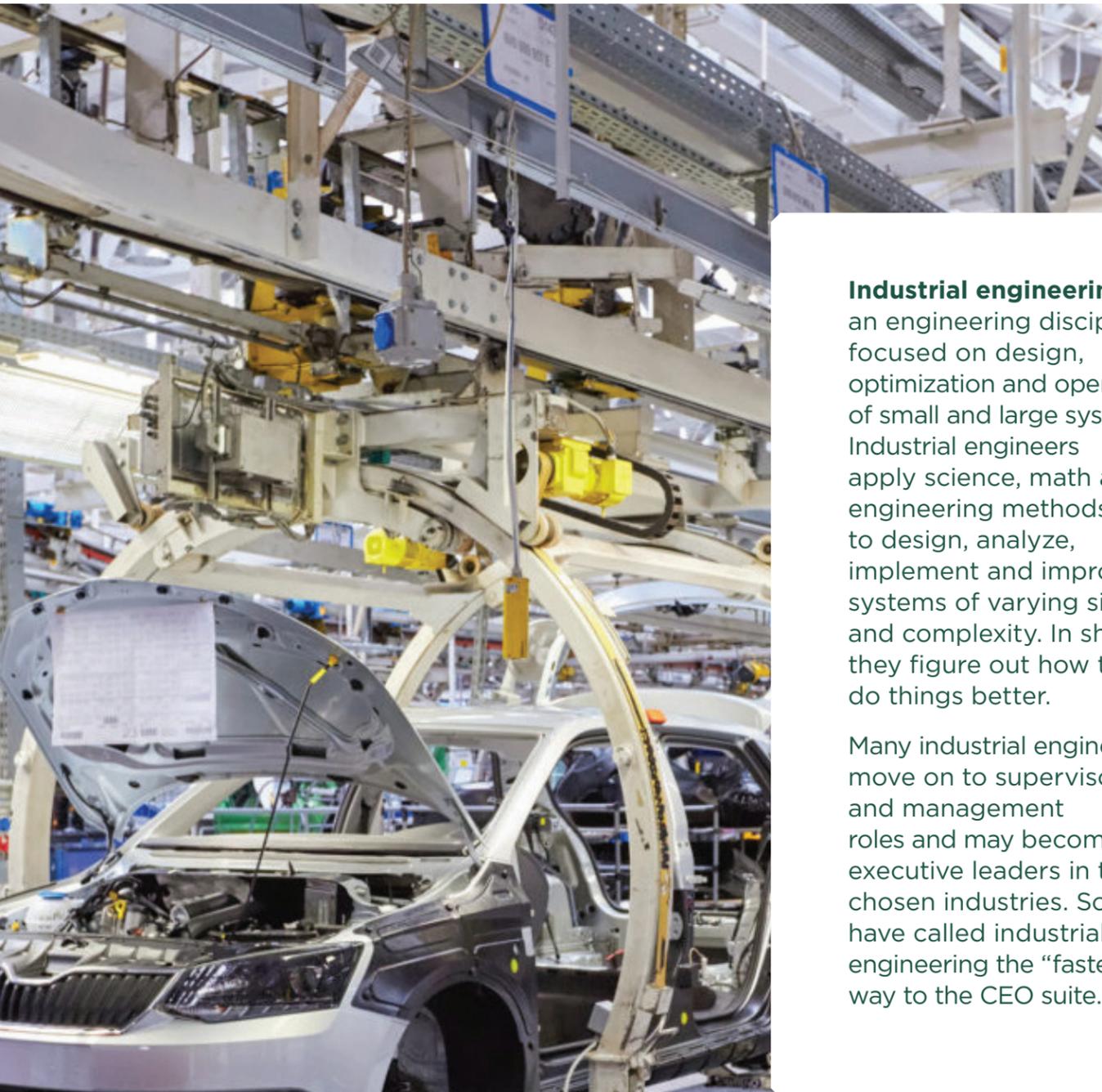
Focused on smart connected systems and prognostic analytics for health care applications.



Simulation Lab

This computer lab utilizes ARENA to simulate manufacturing and business service to optimize operations and outcomes.





Industrial engineering is an engineering discipline focused on design, optimization and operation of small and large systems. Industrial engineers apply science, math and engineering methods to design, analyze, implement and improve systems of varying size and complexity. In short, they figure out how to do things better.

Many industrial engineers move on to supervisory and management roles and may become executive leaders in their chosen industries. Some have called industrial engineering the “fastest way to the CEO suite.”

WHAT IS INDUSTRIAL ENGINEERING?

▶ WHAT INDUSTRIAL ENGINEERS DO

- Optimize complex processes
- Develop and implement integrated systems of people and resources
- Integrate mathematics, physical and social sciences into engineering design
- Review production schedules, engineering specifications and process flows in a manufacturing plant
- Figure out how to manufacture parts or products, or delivery services, with maximum efficiency
- Develop management control systems to make financial planning and cost analysis more efficient
- Design quality-assurance systems
- Meet with clients, vendors, management and staff about the status of projects

▶ CAREER OPPORTUNITIES

Our programs will help you develop a strong base in general education and engineering fundamentals that provide the foundation for a vast range of career choices and a lifetime of growth.

Our graduates are hired in every industry type including:

- Health care
- Entertainment
- Transportation (air, sea, land and space)
- Manufacturing
- IT and cyber-security
- Financial and investment industry



A recent study by PayScale found industrial engineering was the second best college major to get a high-paying job.



Starting job titles for industrial engineers

- Systems engineer
- Production engineer
- Cost engineer
- Automation engineer
- Supply chain engineer
- Process engineer
- Field engineer
- Safety engineer
- Operations researcher
- Project manager
- Manufacturing engineer
- Human factor engineer
- Ergonomist



Manufacturing engineers are the individuals responsible for development, design, implementation and monitoring of manufacturing processes, equipment, tools and machinery used in the making of a wide variety of products.

Their primary goal is to create the stages of a manufacturing system that creates a product in the most time-efficient and cost-effective way possible, while maintaining staff safety and product quality.

WHAT IS MANUFACTURING ENGINEERING?



▶ WHAT MANUFACTURING ENGINEERS DO

- Design new processes, tools or equipment
- Analyze necessary manufacturing processes to determine the most effective equipment and processes
- Install new equipment
- Optimize machine and equipment use through ongoing analysis and identification of inefficiencies within the system
- Determine causes of failures using statistical methods and recommend changes in designs, tolerances or processing methods
- Work with manufacturing staff to train on new equipment or optimization processes
- Supervise technicians, technologists, analysts, administrative staff or other engineers
- Help with troubleshooting problems within the manufacturing process



▶ CAREER OPPORTUNITIES

Our graduates are hired in every industry type including:

- Energy
- Industrial automation
- Medical devices
- Ag equipment
- Recreational equipment

WHAT IS THE DIFFERENCE BETWEEN MECHANICAL AND MANUFACTURING ENGINEERING?

Mechanical engineers focus on the design and analysis of mechanical systems. Manufacturing engineers focus on applying engineering principles to the development and implementation of converting raw material into finished products.



HERE'S WHAT OUR GRADUATES SAY:

"My experience at NDSU truly prepared me for success in my career. The IME department is filled with people who want students to excel and looking back, I know I made the right choice for my higher education."

-Hanna Quade, B.S. 2017, manufacturing engineering

"My time at NDSU and in the IME department made me what I am today. I've worked in health care my entire career, and the opportunities it has provided have occurred because of the IEM program."

- John Hansmann, B.S.I.E.Mgt. 1983, M.S.I.E.Mgt. 1991

"Earning a Master's of Science degree in industrial engineering has provided a platform of expertise I build on every day. The instruction at NDSU exceeded my expectations, and I'm grateful for the opportunity to study under accomplished field experts."

- Connie Rokke, M.S.I.E.Mgt. 2013

"During my time as an IEM student, I was continuously encouraged to think differently about engineering challenges, use innovation to find more robust solutions and develop a broad set of skills necessary to be successful in a variety of industries."

- Kevin Black, B.S.I.E.Mgt. 2010

NDSU

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