

# Manufacturing Engineering

## Department Information

- **Department Web Site:**  
[www.ndsu.edu/ime/](http://www.ndsu.edu/ime/) (<http://www.ndsu.edu/ime/>)
- **Credential Offered:**  
B.S.Mfg.E.; Minor
- **Sample Program Guide:**  
[catalog.ndsu.edu/programs-study/undergraduate/manufacturing-engineering/#planofstudytext](http://catalog.ndsu.edu/programs-study/undergraduate/manufacturing-engineering/#planofstudytext) (<http://catalog.ndsu.edu/programs-study/undergraduate/manufacturing-engineering/#planofstudytext>)

## Major Requirements

### Major: Manufacturing Engineering

**Degree Type:** B.S.Mfg.E.

**Minimum Degree Credits to Graduate:** 129

### University Degree Requirements

1. Satisfactory completion of all requirements of the curriculum in which one is enrolled.
2. Earn a minimum total of 120 credits in approved coursework. Some academic programs exceed this minimum.
3. Satisfactory completion of the general education requirements as specified by the university.
4. A minimum institutional GPA of 2.00 based on work taken at NDSU.
5. At least 30 credits must be NDSU resident credits. Resident credits include credits registered and paid for at NDSU.
6. At least 36 credits presented for graduation must be in courses numbered 300 or higher.
7. Students presenting transfer credit must meet the NDSU residence credits and the minimum upper level credit. Of the 30 credits earned in residence, a minimum of 15 semester credits must be in courses numbered 300 or above, and 15 semester credits must be in the student's curricula for their declared major.

For complete information, please refer to the Degree and Graduation Requirements (<http://catalog.ndsu.edu/past-bulletin-archive/2023-24/academic-policies/undergraduate-policies/degree-and-graduation/>) section of this Bulletin.

### University General Education Requirements

Code	Title	Credits
<b>Communication (C)</b>		<b>12</b>
ENGL 110	College Composition I	
ENGL 120	College Composition II	
COMM 110	Fundamentals of Public Speaking	
Upper Division Writing <sup>†</sup>		
<b>Quantitative Reasoning (R) <sup>†</sup></b>		<b>3</b>
<b>Science and Technology (S) <sup>†</sup></b>		<b>10</b>
<b>Humanities and Fine Arts (A) <sup>†</sup></b>		<b>6</b>
<b>Social and Behavioral Sciences (B) <sup>†</sup></b>		<b>6</b>
<b>Wellness (W) <sup>†</sup></b>		<b>2</b>
<b>Cultural Diversity (D) <sup>**†</sup></b>		
<b>Global Perspectives (G) <sup>**†</sup></b>		
<b>Total Credits</b>		<b>39</b>

\*

May be satisfied by completing courses in another General Education category.

†

General education courses may be used to satisfy requirements for both general education and the major, minor, and program emphases, where applicable. Students should carefully review major requirements to determine if specific courses can also satisfy these general education categories.

- A list of university approved general education courses and administrative policies are available here (<http://catalog.ndsu.edu/past-bulletin-archive/2023-24/academic-policies/undergraduate-policies/general-education/#genedcoursestext>).

## Major Requirements

Code	Title	Credits
<b>Manufacturing Engineering Core Requirements</b>		
IME 111	Introduction to Industrial and Manufacturing Engineering	3
IME 311	Work/Station Design and Measurement	3
IME 330	Manufacturing Processes	3
IME 380	CAD/CAM for Manufacturing	3
IME 430	Process Engineering	3
IME 431	Production Engineering	3
IME 440	Engineering Economy	3
IME 456	Program and Project Management	3
IME 460	Evaluation of Engineering Data	3
IME 461	Quality Assurance and Control	3
IME 480	Production and Inventory Control	3
IME 482	Automated Manufacturing Systems	3
IME 489	Industrial and Manufacturing Engineering Capstone	3
MATH 128	Introduction to Linear Algebra	1
MATH 165	Calculus I (May satisfy general education category R)	4
MATH 166	Calculus II	4
MATH 259	Multivariate Calculus	3
MATH 266	Introduction to Differential Equations	3
ME 212	Fundamentals of Visual Communication for Engineers	3
ME 221	Engineering Mechanics I	3
ME 222	Engineering Mechanics II	3
ME 223	Mechanics of Materials	3
ME 331	Materials Science and Engineering	4
CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory (May satisfy general education category S)	4
CHEM 122	General Chemistry II (May satisfy general education category S)	3
ENGL 321	Writing in the Technical Professions (May satisfy general education category C)	3
ENGR 327	Ethics, Engineering, and Technology	3
PHYS 252 & 252L	University Physics II and University Physics II Laboratory (May satisfy general education category S)	5
<b>Manufacturing Electives</b>		
Computer Science Electives: Select 3 credits from the following:		3
CSCI 122	Visual BASIC	
CSCI 159	Computer Science Problem Solving	
CSCI 160	Computer Science I	
ECE 173	Introduction to Computing	
Engineering and Science Electives: Select a minimum of 9 credits from the following:		
CE 309	Fluid Mechanics	3
ME 350	Thermodynamics and Heat Transfer	3
Select one of the following:		3-4
EE 206	Circuit Analysis I	
ECE 275	Digital Design	
ECE 301	Electrical Engineering I	
<b>Technical Electives: Select 9 credits from the following:</b>		<b>9</b>
IME 335	Welding Technology	
IME 411	Human Factors Engineering	
IME 427	Packaging for Electronics	

IME 432	Composite Materials Manufacturing
IME 433	Additive Manufacturing
IME 435	Plastics and Polymer Processing in Manufacturing
IME 437	Methods for Precision Manufacturing
IME 450	Systems Engineering and Management
IME 451	Logistics Engineering and Management
IME 453	Hospital Management Engineering
IME 462	Total Quality In Industrial Management
IME 463	Reliability Engineering
IME 464	Reliability Analysis
IME 465	Introduction to Machine Learning
IME 470	Operations Research I
IME 472	Simulation of Business and Industrial Systems
IME 485	Industrial and Manufacturing Facility Design
Only one of the following five courses may be counted as technical electives.	
BUSN 340	International Business
BUSN 431	Business Law I-Contracts, Property and Torts
MGMT 320	Foundations of Management
MRKT 320	Foundations of Marketing
MIS 320	Management Information Systems

**Total Credits****109-110**

## Degree Requirements and Notes

- Grades less than 'C' will not be accepted for required courses in CHEM, MATH, and PHYS.
- Students may request approval for other 300-400 level engineering or related courses to be approved as technical electives. To request approval, a student should submit a memo to the IME Department indicating the course of interest and why the course should be approved as a technical elective. This memo will be reviewed by the IME Department Chair for approval.
- 300-400 level BUSN courses require at least junior standing and a minimum 2.50 cumulative GPA.

## Minor Requirements

### Minor: Manufacturing Engineering

**Required Credits: 18**

Code	Title	Credits
<b>Required Courses</b>		
IME 330	Manufacturing Processes	3
IME 380	CAD/CAM for Manufacturing	3
IME 430	Process Engineering	3
IME 431	Production Engineering	3
<b>Electives: Select 6 credits from the following:</b>		<b>6</b>
IME 335	Welding Technology	
IME 427	Packaging for Electronics	
IME 432	Composite Materials Manufacturing	
IME 433	Additive Manufacturing	
IME 435	Plastics and Polymer Processing in Manufacturing	
IME 437	Methods for Precision Manufacturing	
IME 461	Quality Assurance and Control	
IME 465	Introduction to Machine Learning	
IME 482	Automated Manufacturing Systems	
<b>Total Credits</b>		<b>18</b>

### **Minor Requirements and Notes**

- A minimum of 9 credits must be taken at NDSU.
- Only students majoring in an engineering discipline or with department permission agricultural or physical science majors may elect a minor in Manufacturing Engineering.