

# Manufacturing Engineering

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## Department Information

- **Department Location:**  
106 Engineering Building
- **Department Phone:**  
701-231-9818
- **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:** 131

### 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 36 credits presented for graduation must be in courses numbered 300 or higher.
6. Transfer Students: Must earn a minimum of 60 credits from a baccalaureate-degree granting or professional institution.
  - a. Of these 60, at least 36 must be NDSU resident credits as defined in #7.
  - b. Within the 36 resident credits, a minimum of 15 must be in courses numbered 300 or higher and 15 credits in the major field of study.
7. At least 36 credits must be NDSU resident credits. Resident credits include credits registered and paid for at NDSU.

For complete information, please refer to the Degree and Graduation Requirements (<http://catalog.ndsu.edu/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/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<br>& 121L   | General Chemistry I<br>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<br>& 252L   | University Physics II<br>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   |         |

**Technical Electives: Select 9 credits from the following: 9**

|   |  |
|---|--|
| 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 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.