The Department of Materials Science and Engineering offers the minor in Manufacturing Engineering, suitable for Engineering Science students or for non-Engineering Science students who seek to obtain a more thorough understanding of the engineering sciences. The rapidly changing nature of technology in the manufacturing industries creates a need for graduates with a background in such areas as modern materials processing, design, thermodynamics, statistics, and analysis. The courses in the minor in Manufacturing Engineering provide the student with a broad introduction to the engineering science principles and applications associated with manufacturing engineering and provide important skills for careers in manufacturing, process and systems engineering, and quality engineering.

Engineering science, computer engineering, electrical engineering, mechanical engineering, and applied mathematics and statistics students can assemble a sequence of courses with 18 to 24 credits to satisfy the minor. Courses used to satisfy requirements of another minor in engineering science may not be used to satisfy requirements of another minor in engineering science. The student's program must be approved by the undergraduate program director.

**Requirements for the Minor in Manufacturing Engineering (MFE)**

Completion of the minor requires 18 to 24 credits.

**Requirements for students majoring in Engineering Science (ESG)**

1. ESM 334 Materials Engineering and ESM 335 Strength of Materials or MEC 310 Introduction to Machine Design and MEC 410 Design of Machine Elements
2. Five courses chosen from:
   - AMS 310 Survey of Probability and Statistics
   - ESG 201 Engineering Responses to Society
   - ESM 336 Electronic Materials
   - ESM 353 Biomaterials: Manufacture, Properties, and Applications
   - ESM 369 Polymers
   - ESM 488 Cooperative Industrial Practice
   - ESM 499 Research in Materials Science
   - EST 392 Engineering and Managerial Economics
   - MEC 305 Heat and Mass Transfer

**Requirements for all other students**

1. ESM 334 Materials Engineering and ESM 335 Strength of Materials or MEC 310 Introduction to Machine Design and MEC 410 Design of Machine Elements
2. AMS 310 Survey of Probability and Statistics
3. One course chosen from the following:
   - ESE 123 Introduction to Electrical and Computer Engineering
   - ESG 100 Introduction to Engineering Science
   - MEC 101 and 102 Engineering Computing and Problem Solving I, II
4. ESG 201 Engineering Responses to Society
5. ESM 335 Strength of Materials
6. Two courses from:
   - ESM 353 Biomaterials: Manufacture, Properties, and Applications
   - ESM 488 Cooperative Industrial Practice
   - ESM 499 Research in Materials Science
   - EST 392 Engineering and Managerial Economics
   - MEC 305 Heat and Mass Transfer