MASTER OF SCIENCE IN MANUFACTURING ENGINEERING

Department: Industrial and Manufacturing Engineering and Technology (https://catalog.bradley.edu/graduate/engineering-technology/industrial-manufacturing-engineering/)

The Department of Industrial & Manufacturing Engineering & Technology offers a Master of Science in Manufacturing Engineering (MS MFE) degree, which is highly ranked globally. This program addresses a broad spectrum of needs in both manufacturing, and service industries. The MS MFE program is designed to equip students with the expertise needed to become future leaders, researchers, and facilitators in the field. By utilizing tools such as lean manufacturing and Six Sigma, students will learn to optimize manufacturing processes and systems effectively.

The program offers a comprehensive intellectual framework alongside a robust technical foundation, preparing students to tackle future challenges in manufacturing and related industries. The curriculum emphasizes a thorough understanding of manufacturing materials, processes, and systems. Coupled with a hands-on research project, the program blends theoretical knowledge of material sciences and processes with practical applications in manufacturing products and systems. The department boasts an exceptional materials science laboratory, equipped with diverse materials testing equipment, and a cutting-edge manufacturing processes laboratory.

The graduates from the Master of Science of Manufacturing Engineering Program at Bradley University will have successful careers based on:

- Demonstrated ability to recognize high level manufacturing business problems and implement effective solutions for improving enterprise values.
- Demonstrated ability to handle expanded job responsibilities and effectively lead cross-functional teams in design, development, and improvement of products, processes, and systems.
- Demonstrated ability in advanced study and life-long learning in professional advancements and active participation in professional societies.

The courses listed in the following curriculum must be completed to meet the degree requirements for the Master of Science in Manufacturing Engineering.

MS MFE Degree Requirements

The program offers students two options: thesis and research project options. Each of these options require a total of 30 credit hours. A minimum grade point average of 3.00 is required for degree completion. The specific requirements for each option are as follows:

Thesis Option

This option is recommended for investigating a research problem in depth for at least one semester work and includes:

- 24 credit hours of approval course meeting the following requirements:
  - IME 511 Probability and Statistics for Analytics or IME 512 Design and Analysis of Experiments – 3 hrs
  - Manufacturing Engineering Technical Elective courses listed below – 15 hrs
  - Graduate courses from Engineering, Math, Data Science and Analytics Program, or Computer Sciences approved by major advisor – 6 hrs
- IME 699 Thesis – 6 hrs
- Comprehensive assessment: Thesis presentation and demonstrations.

Students should work with their thesis advisor and graduate program coordinator to create a course plan by the end of the first semester. The plan lists the courses required for completion of the program. Courses not on the approved plan may not be counted towards the MSMfE degree.

Research Option

In this option the research component consists of 3-credit hours, but an additional 3-crdit hours course is required and includes:

- 27 hours of approval course meeting the following requirements:
  - Either IME 511 Probability and Statistics for Analytics or IME 512 Design and Analysis of Experiments – 3 hrs
  - Manufacturing Engineering Technical Elective courses listed below – 15 hrs
  - Graduate courses from Engineering, Math, Data Science and Analytics Program, or Computer Sciences approved by major advisor – 9 hrs
- IME 691 Research – 3 hrs
- Comprehensive assessment: Research presentation and demonstrations.

Students should work with their advisor and graduate program coordinator to create a course plan by the end of the first semester. The plan lists the courses required for completion of the program. Courses not on the approved plan may not be counted towards the MSMfE degree.

Manufacturing Engineering Technical Elective Courses

Code	Title	Hours
IME 501	Engineering Cost Analysis	3.0
IME 512	Design and Analysis of Experiments	3.0
IME 522	Manufacturing Quality Control	3.0
IME 524	Six Sigma Theory and Methodologies	3.0
IME 531	Polymer and Ceramic Materials and Processing	3.0
IME 533	Composite Material and Manufacturing	3.0
IME 541	Advanced Forming Processes	3.0
IME 543	Advanced Material Removal Processes	3.0
IME 553	Advanced Computer Aided Manufacturing	3.0
IME 555	Computer Integrated Manufacturing	3.0
IME 560	Principles of Robotic Programming	3.0
IME 563	Process Engineering	3.0
IME 566	Advanced Facility Planning	3.0
IME 570	Selected Topics in Industrial & Manufacturing Engineering	1.0-3.0
IME 581	Cellular Lean Manufacturing Systems	3.0
IME 586	Logistics & Supply Chain Systems	3.0
IME 590	Geometric Modeling	3.0

IME 592	Tribology	3.0
IME 595	Design for Manufacturability	3.0