MANUFACTURING ENGINEERING TECHNOLOGY MAJOR

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

The baccalaureate program in manufacturing engineering technology is accredited by the Technology Accreditation Commission of ABET, https://www.abet.org (https://www.abet.org/).

MFG Program Educational Objectives

Within five years into their careers, the graduates from the Manufacturing Engineering Technology Program at Bradley University will have successful careers based on:

- Demonstrated ability to move into a leadership role in various phases of a manufacturing system while communicating objectives and intentions to a diverse team of cross functional members.
- Demonstrated ability to expand into different areas of manufacturing using transferable skills learned through hands-on experience.
- Demonstrated ability to serve both the profession and the society balanced with the work environment.
- Demonstrated ability to gain additional knowledge and skills by obtaining certifications and additional education.

MFG Student Outcomes

In order to meet these program educational objectives, students graduating from Bradley's Manufacturing Engineering Technology program will attain the following outcomes.

1. An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly defined engineering problems appropriate to the discipline
2. An ability to design systems, components, or processes meeting specified needs for broadly defined engineering problems appropriate to the discipline
3. An ability to apply written, oral, and graphical communication in broadly defined technical and non-technical environments; and an ability to identify and use appropriate technical literature
4. An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes
5. An ability to function effectively as a member or leader on a technical team.

The goal of the department is to provide the intellectual and physical learning environment in which students achieve these outcomes. The intellectual component of this environment is supplied by the IMET faculty members, in their roles as mentors, advisors, and engineering professionals, as well as by the curriculum they establish for the programs. The physical component consists of quality facilities equipped with state-of-art instrumentation, equipment, computers, and professional software.

Career Opportunities

Graduates of the Manufacturing Engineering Technology program are well-prepared for a diverse range of careers in industries where physical products are produced, including automotive, aerospace, heavy machinery, medical devices, consumer products, and food production. They play vital roles in transforming product designs into tangible, economically viable, and reliable products. Common job titles for our graduates include design engineer, industrial engineer, quality engineer, project manager, process improvement engineer, systems engineer, and production engineer.

One of the unique aspects of our program is the ability to customize elective courses in management and marketing, allowing students to tailor their education to their career aspirations. Many students take advantage of this flexibility to earn minors in management or marketing, significantly enhancing their competitiveness in the job market. This combination of technical expertise and business acumen prepares our graduates for leadership and management roles, such as project managers, supply chain managers, and operations directors. Additionally, the extensive hands-on engineering courses ensure that students gain practical experience, making them highly effective in implementing and optimizing production processes.

Our department maintains close ties with industry through an outstanding Industrial & Manufacturing Engineering & Technology Department Advisory Council, which includes distinguished members from industry, government, and education. This collaboration ensures that our curriculum remains relevant and aligned with industry needs, providing our graduates with a competitive edge.

The Discipline

Today's industry faces complex challenges, including government regulation, consumerism, inflation, foreign competition, high labor costs, and escalating business expenses. Addressing these challenges requires individuals who can blend theoretical knowledge with practical skills to effectively implement cutting-edge technologies. Our Manufacturing Engineering Technology program is designed to meet these industry needs by integrating studies in mechanical design, modern manufacturing processes, materials science and technology, automation, management practices, and social sciences.

Graduates from our program are well-equipped for roles in various phases of management, production, product development, test and evaluation, sales, and service. The curriculum includes technical concentrations that develop competence in mathematics, physics, chemistry, and other technical sciences such as mechanics, strength of materials, and electronics. Laboratory activities support the fundamental concepts studied and provide hands-on experience with actual hardware, its theory of operation, and its uses in the current state of the art.

Moreover, the program offers technical elective courses in management and marketing, enabling students to customize their education according to their career goals. This flexibility allows many students to earn minors in management or marketing, further enhancing their job prospects. The combination of rigorous technical training and business education ensures that our graduates are not only proficient in engineering principles but also adept at navigating the business aspects of the manufacturing industry.

Students work closely with their academic advisor on the student's BSMFG program of study to tailor their program to their academic

background, interest, and career goals. BSMFG programs have an expected total of 122-124 credit hours.

Code	Title	Hours
Bradley Core Curriculum Requirements		
BCC Communications Oral Communications (BCC – CM)		3.0
COM 103	The Oral Communication Process	
BCC Communications Writing (BCC – W1)		3.0
ENG 101	English Composition	
BCC Communications (BCC – W2). Select one of the following:		3.0
ENG 300	Advanced Writing--Exposition	
ENG 301	Advanced Writing - Argumentative Writing	
ENG 305	Advanced Writing--Technical Writing	
ENG 306	Advanced Writing--Business Communication	
BCC Fine Arts (BCC – FA)		3.0
BCC Global Perspectives (BCC – GP)		3.0
BCC Humanities (BCC – HU)		3.0
Mathematics and Basic Sciences		
Algebra/Precalculus (select from the following):		4.0
MTH 109	College Algebra	
MTH 112	Precalculus	
Or has mathematics placement exam score of at least 61		
Calculus I (select from the following- BCC-QR1):		4.0
IMT 212	Technical Calculus I (BCC – QR1)	
MTH 115	Brief Calculus With Applications I	
MTH 121	Calculus I	
Physics (select from the following- BCC-QR1):		4.0
PHY 107	General Physics I (BCC – NS1)	
PHY 110	University Physics I	
Chemistry (select from the following- BCC-NS2):		3.0
CHM 100	Fundamentals of General Chemistry (BCC – NS2)	
CHM 110	General Chemistry I	
Chemistry lab (select from the following):		3.0
CHM 101	Fundamentals of General Chemistry Lab	
CHM 111	General Chemistry I Lab	
IME 302	Introduction to Quality Engineering (BCC-QR2)	3.0
Major Required Courses		
IME 101	Introduction to Industrial & Manufacturing Engr	1.0
IME 103	Computer Aided Graphics	2.0
IME 110	Introduction to Computers & Computational Analysis	3.0
IME 301	Engineering Economy I	3.0
IME 333	Materials Science Laboratory	2.0
IME 341	Introduction to Manufacturing Processes	3.0
IME 386	Industrial and Managerial Engineering	3.0
IME 395	Solid Modeling & Rapid Prototyping	3.0
IME 431	Materials Engineering	2.0
IME 441	Manufacturing Processes I	3.0
IME 443	Manufacturing Processes II	3.0
IME 445	Computer Aided Manufacturing	3.0
IME 466	Facilities Planning	3.0
IME 481	Lean Production Systems	3.0
IME 495	Design for Manufacturability	3.0
IMT 346	Electricity & Automation	3.0
IMT 362	Metrology and Instrumentation	3.0
IMT 366	Manufacturing Facilities Design	3.0
IMT 446	Computer Aided Manufacturing and Automation	3.0
IMT 498	Senior Industrial Project (BCC – WI, EL)	4.0
Statistics (select from the following):		3.0
IMT 222	Statics	
C E 270	Mechanics of Materials	
Strength of Materials (select from the following):		3.0
IMT 324	Strength of Materials	
C E 270	Mechanics of Materials	
Major Required Business Courses		
ATG 157	Accounting Principles - Financial	3.0
Economics (select from the following- BCC-SB):		3.0
ECO 100	Introduction to Economics	
ECO 221	Principles of Microeconomics	
MTG 315	Principles of Marketing	3.0
M L 350	Managing for Results in Organizations	3.0
IMET Technical Elective Courses (see list below)		**6.0**
Business Management Elective Courses (see list below)		**6.0**
Total Hours		**125**

Approved Technical Electives

Students can tailor their program to their learning goals through technical electives by selecting courses from the list provided below, or they may opt for any 300+ IMET course approved by their advisor.

Code	Title	Hours
IMET Technical Elective Courses		
IME 385	Introduction to Logistics and Supply Chain	
IME 401	Engineering Economy II	
IME 412	Design and Analysis of Experiments (Add this course to earn Quality Engineer Minor)	
IME 461	Simulation of Manufacturing and Service Systems	
IME 485	Occupational Ergonomics (BCC-WI)	
IME 487	Occupational Safety and Health	
Business Management Elective Courses		
FIN 322	Business Finance	3.0
MIS 272	Business Analytics Tools and Techniques	3.0
MIS 276		
M L 353	Operations Management in Organizations	3.0
M L 356	Human Capital in Organizations	3.0
M L 357	Leading Organizations	3.0
M L 358	Managerial Decision Making	3.0
MTG 304	Professional Selling	3.0
MTG 388	Global Supply Chain Management	3.0