

# BACHELOR OF ENGINEERING IN MANUFACTURING ENGINEERING

The Bachelor of Engineering degree in Manufacturing Engineering provides students with expertise that focuses on the processes needed to produce physical goods and materials. Students will gain a strong foundation in materials, mechanical engineering, and design to support their understanding of the mechanics of processes. They will also gain foundational understanding of industrial engineering concepts to support their ability to optimize production systems for maximum efficiency. Topics will include traditional manufacturing as well as modern digital manufacturing (additive manufacturing / 3D printing) processes and automation. Graduates from this program will be well prepared for careers in a wide range of industries including: traditional manufacturers, primary materials producers, and high-tech manufacturing (including defense, aerospace, and biomedical).

Course	Title	S.H.
<b>Year 1</b>		
<b>Fall</b>		
CHEM 1515	General Chemistry 1	4
ENGL 1550	Writing 1	3
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
MATH 1571	Calculus 1	4
GER Elective (SPA)		3
Semester Hours		17
<b>Spring</b>		
CMST 1545	Communication Foundations	3
ENGL 1551	Writing 2	3
MATH 1572	Calculus 2	4
MECH 1560	Engineering Communication with CAD	2
PHYS 2610	General Physics 1	4
Semester Hours		16
<b>Year 2</b>		
<b>Fall</b>		
CEEN 2601	Statics	3
MATH 2673	Calculus 3	4
MECH 2606	Engineering Materials	3
PHYS 2611	General Physics 2	4
ISEN 3723	Manufacturing Processes	3
MFG 3723L	Manufacturing Processes Laboratory	1
Semester Hours		18
<b>Spring</b>		
ECEN 2614	Basics of Electrical Engineering	3
ISEN 3716	Systems Analysis and Design	3
MATH 3705	Differential Equations	3
MECH 2603	Thermodynamics 1	3
MECH 2641	Dynamics	3
Semester Hours		15
<b>Year 3</b>		
<b>Fall</b>		
MFG 3771	Additive and Digital Manufacturing	3
ISEN 3724	Engineering Economy	3
ISEN 3710	Engineering Statistics	3
MECH 3720	Fluid Dynamics	3

MECH 3762	Design of Machine Elements	3
MECH 3762L	Design of Machine Elements Laboratory	1
Semester Hours		16
<b>Spring</b>		
ISEN 3720	Statistical Quality Control	3
GER Elective (SPA)		2
GER Elective (SS)		3
GER Elective (SS)		3
Semester Hours		11
<b>Year 4</b>		
<b>Fall</b>		
GER Elective (AH)		3
PHIL 2625	Introduction to Professional Ethics	3
MFG 4823	Manufacturing Processes 2	3
MFG 4823L	Manufacturing Processes 2 Laboratory	1
MFG 4871	Stress Plasticity and Deformation with FEA for Manufacturing	3
MFG 4861	Design for Manufacturability	3
Semester Hours		16
<b>Spring</b>		
GER Elective (AH)		3
ISEN 5823	Automation	3
MECH 5836	Fluid Power and Control	3
ENT 3700	Entrepreneurship New Venture Creation	3
MFG 4821	Manufacturing Capstone	3
MFG Technical Elective (select from list)		
Semester Hours		15
Total Semester Hours		124

## Learning Outcomes

The goal of the B.E. in Manufacturing Engineering degree program at YSU is to provide our graduates with strong foundation of theoretical and applied skills equipping them for success to pursue careers in manufacturing or to continue on to advanced study in related field.

The learning objective for the major in Manufacturing Engineering include:

1. Students will demonstrate an understanding of the fundamentals of manufacturing engineering, including significant elements from Mechanical Engineering, Industrial Engineering, and manufacturing process design and analysis.
2. Students will demonstrate independent and critical thinking.
3. Students will demonstrate competency in the use of modern engineering computational tools, including solid modeling and finite element analysis software.
4. Students will be able to acquire and interpret experimental data using appropriate instrumentation, sensing, data acquisition, and computational tools.
5. Students will demonstrate the ability to effectively communicate information orally and in writing.