

BS in Product Design and Manufacturing Engineering

The product design and manufacturing engineering program prepares students to engineer products as well as their production, in an integrated manner. The goal of design and manufacturing activities is the cost-effective conversion of raw materials and intermediate products into higher value products through the use of various design, processing, assembly, automation and mass-production techniques. Students in this program learn to appreciate and use the relationships between design, materials selection, processing, productivity, quality and cost to enhance profitability. The strength of this program is its curriculum in three areas — materials and processes, product engineering and assembly, and manufacturing quality and productivity — with an emphasis on aviation in course materials, projects and a capstone design project. Graduates of this program can apply their broad and comprehensive skills in a wide spectrum of industries.

Program Educational Objectives

Within a few years after graduation, product design and manufacturing engineering graduates are expected to:

- Apply product design and manufacturing engineering expertise in designing, modeling, analyzing, automating, implementing, managing and/or improving products, processes and systems to address challenges in manufacturing and emerging industries.
- Engage in professional growth through advanced education, certifications, professional engagement and adaptation to emerging technologies and industry practices.
- Demonstrate leadership, ethical responsibility and collaboration that create value for organizations and society.

Program Requirements

The BS in product design and manufacturing engineering (BSPDME) program requires the completion of 128 credit hours for graduation, minus hours commensurate with advanced placement credit. Students may select 9 credit hours of technical electives to emphasize the study of advanced engineering concepts and topics in other engineering disciplines that impact design and processing. Selection of appropriate courses allows students to tailor their studies to fit their individual interests and needs. Students' programs of study are determined in consultation with their faculty advisors. All the prerequisite courses must have a grade that generates 2.000 or more credit points per credit hour.

In addition to meeting the requirements of the WSU General Education Program (<http://catalog.wichita.edu/undergraduate/academic-information/general-education-program/>) and the requirements of the College of Engineering, students must meet the specific requirements for the product design and manufacturing engineering program given below.

Course	Title	Hours
General Education (34-35 credit hours)		
Select courses to meet General Education requirements ¹		24
General Education courses that will also meet Program Requirements		
PHIL 385	Engineering Ethics ²	3
PHYS 313	Physics for Scientists I ²	4
PHYS 315	University Physics Lab I ²	1
MATH 242	Calculus I ²	5
Mathematics/Natural Sciences		
MATH 243	Calculus II ²	5

MATH 451	Computational Mathematics Using MATLAB	3
MATH 555	Differential Equations I	3
PHYS 314	Physics for Scientists II ²	4
PHYS 316	University Physics Lab II ²	1
CHEM 211	General Chemistry I ²	5
IME 254	Engineering Probability and Statistics I	3

Product Design		
AE 223	Statics	3
ECE 282	Circuits I	4
IME 222	Engineering Graphics	2
IME 222L	Graphics Lab	1
IME 255	Engineering Economy	3
IME 425	Kinematic and Dynamic Design	3
IME 625	Product Performance Evaluation using CAE	3
ME 250 & ME 251	Materials Engineering and Materials Engineering Laboratory	4
AE 333	Mechanics of Materials	3
IME 554	Statistical Quality Control	3

Manufacturing		
IME 258	Manufacturing Methods and Materials I	3
IME 258L	Manufacturing Methods and Materials I Lab	1
IME 553	Production Systems	3
IME 561	Applied Control Systems	3
IME 558	Manufacturing Methods and Materials II	4
IME 676	Aircraft Manufacturing and Assembly	3
IME 761	Robot Programming and Applications	3
IME 788	Rapid Prototyping and 3D Printing	3
IME 590	Industrial Engineering Design I	3
IME 690	Industrial Engineering Design II	3

Technical Electives ³		
Select 9 credit hours of technical electives based on the following		9
At least 6 credit hours must be from the ISME department		
Choose from the following: AE 300-799; CS 300-799; ECE 300-799; IME 300-799; ME 300-799; and/or		
No more than 3 credit hours from the following: ACCT 300-799; FIN 300-799; MGMT 300-799; and/or		
Additional TEs (if any) in STEM (closely related to the degree) and preapproved by ISME faculty advisor		

Total Credit Hours **128**

¹ See the requirements of the WSU General Education program (<http://catalog.wichita.edu/undergraduate/academic-information/general-education-program/>). Starting in fall 2021, first-year college students must take a First-Year Seminar (FYS) within their first two semesters at WSU. Required major courses may also count towards General Education requirements. Students will need to select additional technical electives to reach 128 credit hours required for graduation with assistance from an advisor.

² May count as a general education course.

³ Students should consult with their faculty advisor for a list of approved technical electives.

Applied Learning

Students in the Bachelor of Science in product design and manufacturing engineering program are required to complete an applied learning or research experience to graduate from the program. The requirement can be met by completing the capstone design experience consisting of IME 590.