

MANUFACTURING ENGINEERING, CERTIFICATE

REQUIREMENTS

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The core courses were chosen to include three manufacturing process-focused courses as well as two manufacturing systems-focused courses. A manufacturing engineer must be multidisciplinary because of the complex and broad nature of manufacturing as an application of many engineering principles. The objective of the core course requirements is to provide students with basic understanding of manufacturing systems and basic understanding of manufacturing processes.

The certificate requires a total of 18 credits.

Code	Title	Credits
Three courses must be from the following Core Courses with a grade of BC or better:		
M S & E 332	Macroprocessing of Materials	9
M E 310	Manufacturing: Polymer Processing and Engineering	
M E 311	Manufacturing: Metals and Automation ¹	
I SY E 315	Production Planning and Control	
I SY E 415	Introduction to Manufacturing Systems, Design and Analysis ¹	

An additional three courses must be from any of the following Elective Courses with a grade of BC or better, with at least one course from each of the two categories:

<i>1. Mechanical and Materials Engineering Electives</i>		
M E 311	Manufacturing: Metals and Automation ¹	9
M E 417	Transport Phenomena in Polymer Processing	
M E 418	Engineering Design with Polymers	
M E 419	Fundamentals of Injection Molding	
M E 420	Introduction to Polymer Composites Processing	
M E 429	Metal Cutting	
M E 437	Advanced Materials Selection	
M E/E C E 439	Introduction to Robotics	
M E 446	Introduction to Feedback Control	
M E 447	Computer Control of Machines and Processes	
M E 449	Redesign and Prototype Fabrication	
M E 514	Polymer Additive Manufacturing	
M E 535	Computer-Aided Geometric Design	

M E 601	Special Topics in Mechanical Engineering (Printed and Flexible Electronics: Manufacturing, Devices, and Applications)	
M S & E 332	Macroprocessing of Materials ¹	
M S & E 333	Microprocessing of Materials	
M S & E 401	Special Topics in Materials Science and Engineering (Topic: Metal Additive Manufacturing or Topic: Alloy Design)	
M S & E 461	Advanced Metal Casting	
M S & E/M E 462	Welding Metallurgy	
2. Industrial Systems Engineering Electives		
I SY E 412	Fundamentals of Industrial Data Analytics	
I SY E 415	Introduction to Manufacturing Systems, Design and Analysis ¹	
I SY E/M E 510	Facilities Planning	
I SY E/M E 512	Inspection, Quality Control and Reliability	
I SY E/B M E 564	Occupational Ergonomics and Biomechanics	
I SY E 575 or M E/ STAT 424	Introduction to Quality Engineering Statistical Experimental Design	
I SY E 604	Special Topics in Manufacturing and Supply Chain Management	
I SY E 605	Computer Integrated Manufacturing	
I SY E 615	Production Systems Control	
I SY E/M E 641	Design and Analysis of Manufacturing Systems	
I SY E/M E 643	Performance Analysis of Manufacturing Systems	
Total Credits		18

¹ If M E 311 Manufacturing: Metals and Automation, M S & E 332 Macroprocessing of Materials and/or I SY E 415 Introduction to Manufacturing Systems, Design and Analysis are taken as part of the Core Course Requirement, then they cannot also count as an elective.

No exceptions or substitutions to the core courses are allowed.

Elective courses not listed must be specifically approved by the curriculum committee of the department teaching the course. The request must include the course number, course name, name and contact information for the professor currently teaching or planning to teach the course; syllabus; and which category it should be listed under. Courses that are approved by the curriculum committee of the department teaching the course must be sent to the certificate program director. Only formal courses will be considered.

Only courses taken for a letter grade count toward this certificate. Only courses in which a grade of BC or better is received count toward this certificate. Courses taken at other institutions may be counted toward this certificate if they have been identified as equivalent through the existing process. At least 50% of the courses (i.e., three courses) for this certificate must be earned in residence on the UW–Madison campus.

Students must maintain a cumulative GPA of 3.0 or better for the courses taken for this certificate. If a course is repeated, the average of the grades received in the course will be used in calculating the cumulative GPA.

CERTIFICATE COMPLETION REQUIREMENT

This undergraduate certificate must be completed concurrently with the student's undergraduate degree. Students cannot delay degree completion to complete the certificate.