

Elective Focus Area in Mechanical Engineering

Manufacturing and Materials Processing

Modified on 10/23/2017

Manufacturing and materials processing represents one of the largest industrial sectors in the U.S., especially in the Midwest. Examples include vehicle and equipment manufacturing (GM, Ford, Chrysler, John Deere, Caterpillar, HON, Maytag, etc.) and metal, polymer, ceramic and glass processing (Alcoa, SSAB, PMX, etc.). The Elective Focus Area (EFA) in Manufacturing and Materials Processing (MMP) builds on the regular courses required for a B.S. in Mechanical Engineering (ME) and provides students with an advanced education in production systems (design and operation of manufacturing systems; equipment selection; plant layout; process and production planning; concurrent engineering; intelligent systems) and process engineering (manufacturing and material process selection, modeling, design and control; tooling design; quality control; material behavior; robotics).

Semester	Course	Session	SH	Pre-/Co-Requisites
4 (Spring)	STAT:2010 Statistical Methods & Computing, or MATH:3800 Elementary Numerical Analysis, or ME:4111 Numerical Calculations	F, S F, S F	3 3 3	MATH:1005 MATH:1560 or MATH:1860 MATH:2560
5 (Fall)	Elective		3	
6 (Spring)	ME:4116 Manufacturing Processes, Simulations and Automation or ME:5146 Modeling of Materials Processing	F S ¹	3 3	ENGR:2760 /ME:3045
7 (Fall)	Elective		3	
7 (Fall)	Elective		3	
8 (Spring)	Elective		3	
8 (Spring)	Elective		3	

Manufacturing and Materials Processing Electives (minimum of 2 required)	Session	SH	Pre-/Co-Requisites
IE:3600 Quality Control	F	3	STAT:2020
IE:3700 Operations Research	F	3	MATH:2550, /STAT:2020
ME:4116 Manufacturing Processes, Simulations and Automation, or ME:5146 Modeling of Materials Processing	F S ¹	3 3	ENGR:2760 /ME:3045
ME:4131 Manufacturing Systems	S	3	IE:3700
General Electives	Session	SH	Pre-/Co-Requisites
Flexible Elective – Choose at most one course from: (i) engineering courses that are required in another (non-ME) program, (ii) engineering courses at an upper level (e.g. ME courses numbered 4100 and above), (iii) mathematics, physics or chemistry courses at a more advanced level than those required in the ME curriculum, (iv) independent investigation in a mechanical engineering subject area, or (v) courses that appear on a list of approved courses found at https://mie.engineering.uiowa.edu/me-elective-focus-areas-efa	Any	3	
IE:3350 Process Engineering	F	4	IE:3700
IE:3500 Information Systems Design	S	3	ENGR:1300
IE:3610 Stochastic Modeling	F	3	STAT:2020, /IE:3700
IE:3750 Digital Systems Simulation	S	3	STAT:2020, IE:3610
IE:4650 Mechatronics Engineering for Smart Device Design	S	3	ENGR:2120, ENGR:2760
ME:4024 Mechanical Engineering Design and Parametric Modeling	S	3	ENGR:2760, /ENGR:2750, /ME:3045
ME:4110 Computer Aided Engineering	S	3	ENGR:2750, ME:3052
ME:4186 Enhanced Design Experience	S	3	ME:4086
ME:5143 Computational Fluid and Thermal Engineering	F	3	ME:3045
ME:5167 Composite Materials	S ¹	3	ENGR:2750

¹offered in spring semester of even years only.

Substitutions are discouraged and will only be approved under exceptional circumstances requiring the approval of the advisor, EFA coordinator and DEO (need to submit the substitution form).

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