

Advanced Manufacturing and Materials Evaluation Certificate

For information, contact: Department of Mechanical and Manufacturing Engineering, 56 Garland Hall, 513-529-0710.

This certificate program equips participants to remain at the forefront of advances in manufacturing technologies and material science. The program develops and enhances skills in analyzing, adopting and effectively utilizing advanced manufacturing methods and the interplay between manufacturing processes and material properties. Courses can be selected to suit areas of interest and/or job requirements. Coursework includes additive manufacturing, mechanical property characterization, wear analysis, nano-materials, statistical process control, etc. Selection of equipment and creation of a testing program to capture specific service conditions is undertaken. Manufacturing and material property interaction in metals and polymers is examined. Practicum courses can be taken for hands-on experiences in topics such as materials testing, process instrumentation, and automation.

Program Requirements

A total of twelve (12) credit hours from the two concentration areas must be completed for the certificate.

Advanced Materials Concentration

Code	Title	Credit Hours
MME 488A	Material Characterization Techniques	1.0
MME 488B	ASTM Codes	0.5
MME 488C	Sample Preparation Methods, Data Collection and Analysis	1.0
MME 488D	Practicum Material Testing and Sample Preparation	1.5
MME 488E	Dynamic Testing of Materials (DMA)	1.0
MME 488F	Dynamic Scanning Calorimetry (DSC)	0.5
MME 488G	Microscopy (AFM, SEM, TEM) Applied to Material Property and Failure Evaluation	1.0
MME 488I	Practicum Advanced Material Testing	1.5
MME 488J	Biomaterials	1.0
MME 488K	Composite Materials	1.0
MME 488N	Fundamentals of Tribology	1.0
MME 488O	Equipment and Testing Protocols for Wear of Materials	1.0
Total Credit Hours		12

Advanced Manufacturing Processes Concentration: Emerging Tools and Technologies

Code	Title	Credit Hours
MME 489A	Overview of Traditional Manufacturing Processes	2.0

MME 489B	Practicum Traditional Manufacturing Process	2.0
MME 489C	Design, Modeling and Simulation for Additive Manufacturing	1.0
MME 489D	Process Overview and Advances in 3D Printing of Polymers and Metals	1.0
MME 489E	Practicum: Additive Manufacturing	2.0
MME 489F	Overview of Advanced Manufacturing Processes	1.0
MME 489N	Fundamentals of Micro-manufacturing	0.5
MME 489O	Fundamentals of Nano-manufacturing	0.5
MME 489P	Quality, Metrology	1.0
MME 489Q	Practicum: Advanced Manufacturing Processes	1.0
Total Credit Hours		12