

Certificate: Plastics and Composite Materials

Students in this certificate program will be exposed to both design and manufacturing considerations of plastics and composite materials. Particular emphasis will be given to the materials for automotive applications. Processes, properties and design of the materials will be examined, and characteristics of the materials manufactured from different processes will be discussed. (12 credit hours)

ME 484 Manufacturing Polymeric Composite Materials

3 credits

This course will consider the manufacturing processes for production of plastics and composite parts. The emphasis will be on manufacturing principles that are based on rheology, polymer flow and transport phenomena. Design considerations and quality control techniques for manufacturing plastic and composite parts will also be covered.

ME 483 Design Considerations for Polymeric and Composite Materials

3 credits

Physical and mechanical behavior of non-reinforced and reinforced (composite) polymeric materials in relation to their applications in modern technology. Emphasis is given to the design considerations with these materials in contrast to those with metallic materials. Time- dependent properties, such as creep and stress relaxation, are considered. Manufacturing methods are covered.

ME 582 Injection Molding

3 credits

This course discusses the injection molding process in depth, including the new developments, such as gas-assisted injection molding. Additionally, this course discusses the properties of injection molded design considerations for injection molded parts.

ME 584 Mechanical Behavior of Polymers and Ceramics

3 credits

Mechanical behavior of polymers and ceramics are considered in relation to their structures, processing and applications. Emphasis is given on their deformation, fatigue and fracture characteristics. Strengthening mechanisms for both materials are discussed.

ME 587 Automotive Composites

3 credits

The emphasis in this course is on automotive composites, such as SMC, RTM and RIM. In addition to properties of these materials, this course covers the manufacturing processes, design considerations and test methods, as well as quality control techniques, used for automotive composites.

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*Other courses are available for all certificate topic areas with approval of department advisor.