Mechanical Engineering Dept. Department

Syllabus
ME 480: Plastics Materials &Processing (3-0-3)

Course Catalog Description:

Thermoplastic and thermosetting polymers, their properties and engineering applications. Plastic manufacturing processes, equipment and mold design. Plastic materials and process selection.

Course Pre-requisites:

- ME 216: Materials Science and Engg.
- ME 217: Materials Lab

Course Objectives:

1. 1. To broaden the knowledge of students about polymers, their applications, and their processes.
2. 2. To teach students the chemical and physical structures of polymers.
3. 3. To teach students different polymer processing methods and equipment.
4. 4. To teach students how to select plastics for different applications.

Course Learning Outcomes:

CLO1. Broaden their knowledge about polymers, their applications, and their processes.

CLO2. Recognize the chemical and physical structures of polymers.

CLO3. Understand polymers' physical and mechanical properties

CLO4. Learn different polymer processing methods and equipment.

Learning Resources:

- R.J. Crawford: Plastics Engineering. Butterworth Heinemann, 2020.
- Callister and Rerthwisch, Materials Science and Engineering, 9th Ed., 2015

Lecture Assessment Plan:

Assessment Task	Week Due	Weight
Project	week 13	25.0%
Exam 2	week 15	30.0%

Assessment Task	Week Due	Weight
Homework	week 2, 5, 8, 11, 14	5.0%
Quiz	week 2, 5, 8, 11, 14	15.0%
Exam 1	week 8	25.0%

Lecture Weekly Schedule:

Week#	Topics
1	Introduction to Polymers
2	Chemical and Physical Structures of Polymers
3	Chemical and Physical Structures of Polymers (Continue)
	Mechanical, Chemical, and Physical Properties of Polymers.
4	Mechanical, Chemical, and Physical Properties of Polymers. (Continue)
5	Mechanical, Chemical, and Physical Properties of Polymers. (Continue)
6	Mechanical, Chemical, and Physical Properties of Polymers. (Continue)
7	Polymer Composites
8	Polymer Composites (Continue)
	Polymer Processing Methods and Equipment.
9	Polymer Processing Methods and Equipment. (Continue)
10	Polymer Processing Methods and Equipment. (Continue)
11	Polymer Processing Methods and Equipment. (Continue)
12	Polymer Processing Methods and Equipment. (Continue)
	Fluid Flow and Heat Transfer in Melt Processes.
13	Fluid Flow and Heat Transfer in Melt Processes. (Continue)
	Interaction between Processes and Properties.
14	Interaction between Processes and Properties. (Continue)
	Design and Selection of Plastics for Applications.
15	Design and Selection of Plastics for Applications. (Continue)
	Special Topics in Polymer Processing.