THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Polymer Processing Fundamentals

ISE 5540

Credit Hours:
3.00 - 3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate

Course Components:
Lecture
Lab

Course Description:
Applies fundamentals of transport phenomena and polymer constitutive equations to the analysis of manufacturing of plastic components.

Prerequisites and Co-requisites:
Prereq: MechEng 2020, 2040, or equiv. Prereq or concur: MatScEn 2251, MechEng 4510, or equiv.

Course Goals / Objectives:
- Derive physics-based mathematical models for relevant plastics manufacturing operations
- Use the models to predict practical results and their limitations
- Use CAE software to analyze and optimize plastics processes
- Design the critical parameters of basic polymer processes, analyze their magnitude, and predict their influence on process functions
- Become familiar with most common polymer processes

Course Topics:

- Polymer fundamentals
- Transport phenomena
- Simple model flows
- Rheology of polymer melts
- Simple non–Newtonian flows
- Injection molding
- CAE software for injection molding
- Extrusion
- Chemo-rheology
- Reactive liquid molding
- SMC Compression Molding
- Other composite manufacturing processes

Designation:

Elective