Structure-Property Relationships of Polymers

MATSCEN 5641

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
An understanding of the structure/property relationships that drive the continued expansion of polymers into a wide array of applications.

Prerequisites and Co-requisites:
Prereq: 2010, CPHR 2.0 or higher, and rank 3 or 4 in Engineering; or Grad standing; or permission of instructor.

Course Goals / Objectives:
- Survey the broad field of polymer science and engineering associated with the behavior of plastics
- Introduce the student to important concepts that distinguish plastics from inorganic materials (e.g., ceramics, metals) and govern their behavior as solids
- Learn about crystallization and crystallization phenomena important in determining polymer 'architecture'
Course Topics:
- Introduction to bonding in polymers
- Polymer architecture and microstructure – crystallization/thermal analysis
- Recycling and the “Big 6”
- Mechanical properties and additives
- Unit operations and properties
- Case studies and fracture; diffusion
- Polymer synthesis and chain structure
- Polymer solutions
- Polymer blends
- Polymer surfaces and interfaces
- Modern polymer topics

Designation:
Elective