## THE OHIO STATE UNIVERSITY COLLEGE OF ENGINEERING

# **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