



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Structure and Properties of Amorphous Materials

MATSCEN 5541

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Provide basic knowledge about the structure and properties of oxide, metallic, semiconducting and polymeric glasses emphasizing viscosity, glass transition, structural relaxation and microstructure.

Prerequisites and Co-requisites:

Prereq: 2241, 2251, 3151, and 3261; or permission of instructor.

Course Goals / Objectives:

- Learn basics of atomic level structure and defects of amorphous materials including oxide, metallic, semiconducting, and polymeric glasses
 - Learn about important theories of the temperature dependence of the viscosity of melts and of super-cooled liquids
 - Learn about the factors that promote glass formation in systems
 - Learn about microstructure that is present in many (but not all) glass forming systems
 - Learn about the factors that influence the properties of amorphous materials
-

Course Topics:

- Introduction to amorphous materials
 - Glass formation from liquid state
 - Formation of amorphous solids from vapor and solid states
 - Viscosity and visco-elastic properties of glass forming melts
 - Glass transition
 - Structural relaxation
 - Phase Separation
 - Atomic level structure of noncrystalline solids
 - Atomic motions in glassy state
 - Thermal properties of amorphous solids
 - Optical properties of amorphous solids
-

Designation:

Elective