



Structure and Defects in Materials

MATSCEN 6747

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Elements of crystallography, structure and defects in solids.

Prerequisites and Co-requisites:

Prereq: Grad standing in Chem, Engr, or Physics; or permission of instructor.

Course Goals / Objectives:

- Introduce students to the basics of crystallography and structural imperfections in crystalline and non-crystalline materials
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Course Topics:

- Introduction to lattice geometry, unit cells, planes and directions, Miller indices, zones and the zone rule, and symmetry elements.
 - Crystal systems, space lattices (Bravais lattices), the stereographic projection and point groups.
 - Stereographic projection and point groups (continued), crystal systems.
 - Crystal systems (continued), Laue groups, space groups, crystal structures.
 - Tensors, and their relation to crystal structures - Neumann's Principle.
 - Stress, strain, and elasticity. Glide and dislocations.
 - Dislocations in crystals, point defects.
 - Interfaces in materials.
 - Interfaces in materials - topological theory of interfacial defects.
 - Mid-term and final examinations.
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Designation:

Elective

Required