THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Electroceramics

MATSCEN 5571

Credit Hours:
3.00

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

Course Components:
Lecture

Course Description:
Functional ceramics covering electrical, magnetic and optical properties of oxides. Emphasis is on the processing-microstructure-property correlation.

Prerequisites and Co-requisites:
Prereq: 3271, or permission of instructor.

Course Goals / Objectives:
- Learn basics of electrical, optical and magnetic properties of ceramic materials
- Learn how processing affect crystal structure, microstructure and properties of functional ceramics
- Learn how point defects influence properties of functional ceramics
- Learn non-lithographic processing routes to create ceramic nano-structures and their potential applications

Course Topics:
- Review of band theory and electrical conductivity
- Resistors, varistors and thermistors
- Dielectrics, ferro- and piezo-electrics
- Magnetic ceramics, ferro- and ferri-magnetics
- Optical properties, optical waveguides and fiber-optics
- Electro-optics, magneto-optics
- Nano-structured oxides and their applications

Designation:
Elective