THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Principles of the Characterization of Materials

MATSCEN 6715

Credit Hours:
2.00 - 2.00

Course Levels:
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Fundamentals of beam-solid interactions and their application to the characterizing the structure and composition of materials. The emphasis of this course will be on techniques utilizing X-ray and electron probes.

Prerequisites and Co-requisites:
Prereq: Grad standing in MatScEn or WeldEng, or permission of instructor.

Course Goals / Objectives:
- Techniques utilizing X-ray and electron probes

Course Topics:
- Introduction to X-Ray Diffraction - Generation of X-Rays - Basic Diffraction Theory - Powder Diffractometry
- Introduction to Transmission Electron Microscopy - Electron interaction with matter - Electron diffraction - Imaging modes and defect analysis
- Introduction to Scanning Electron Microscopy - Electron generation - Detectors and Imaging modes - Crystallographic analysis with Orientation Microscopy
- Spectroscopy Using Electron Probes
- Spectroscopy Using Photon Probes
- Spectroscopy Using Ion Probes

Designation:
Elective
Required