Ceramic Processing

MATSCEN 5551

Credit Hours:
3.00

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

Course Components:
Lecture

Course Description:
Overview of ceramics processing, including essential topics of: powder synthesis/characterization, colloidal/sol-gel processing, shaping/consolidation, sintering, microstructure development and nanoceramics, and thin films/coating.

Prerequisites and Co-requisites:
Prereq: 3141, 3151, and enrollment as MatScEn-BS major; or Grad standing; or permission of instructor.

Course Goals / Objectives:
• Choose and apply appropriate powder characterization and synthesis methods
• Choose and apply appropriate colloidal and sol-gel processing methods
• Choose and apply appropriate powder consolidation and shaping methods
• Choose and apply appropriate sintering methods
• Design appropriate methods for microstructural and nanoceramics development
Course Topics:
- Introduction and overview
- Powder synthesis and characterization
- Colloidal and sol-gel processing
- Mixing and packing of powders
- Forming, shaping and pre-sintering processing
- Solid state and liquid-state sintering
- Microstructural development and nanoceramics
- Other methods (thin films, coatings, glass-ceramics)

Designation:
Elective