Biomaterials Laboratory

MATSCEN 5631

Credit Hours:
1.00

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

Course Components:
Lab

Course Description:
A laboratory experience in the processing and characterization of biomaterials used for the replacement of human tissues.

Prerequisites and Co-requisites:
Prereq or concur: 5611 or 5641; or permission of instructor.

Course Goals / Objectives:
- Provide experiences with and an understanding of forming processes used in biomaterials
- Learn about kinetic phenomena that determine materials behavior under both chemical and mechanical stresses within the human body

Course Topics:
- Hydroxyapatite formation and sintering. Materials directed toward the replacement of bony tissues.
- Electrospinning and mechanical properties. Generation of tubes of electrospun nanofiber suitable for use as blood vessel replacements.
- Tissue engineering scaffolds and the environment. The mechanical and microstructural behavior of tissue engineering scaffolds exposed to cellular media.
- Cell-scaffold interactions. The effects of cell culture on polymeric scaffolds.
- Surface characterization of biomaterials. XPS, SIMS, mass spectrometry of representative implant materials.
Designation:
Elective