



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
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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.
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Designation:

Elective