



Mechanobiology

BIOMEDE 5420

Credit Hours:

3.00 - 3.00

Course Levels:

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Introduction to the incorporation of living components and compatible biomaterials to study, repair, or replace biological functions.

Prerequisites and Co-requisites:

Prereq: 4410, and Sr standing; or Grad standing; or permission of instructor.

Course Goals / Objectives:

- Summarize the major stages of a mechanically-induced biological process and provide examples of these stages for a given tissue
 - Describe the major theories of mechanotransduction and provide experimental data consistent and inconsistent with each theory
 - Develop a mathematical model of a mechanically regulated biological process, use published data to test the hypothesis, and design experiments to provide further data to evaluate the validity of the model
 - Present and discuss the results of literature searches and modeling efforts in a written and oral format
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Course Topics:

- History of mechanobiology and basic concepts
 - Mechanocoupling and Mechanotransduction
 - Mechanobiology of blood vessels
 - Mechanobiology of Cartilage
 - Mechanobiology of Bone
 - Mechanobiology of Skeletal Muscle
 - Mechanobiology of Cardiac Muscle
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Designation:

Elective