THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Cell, Molecular, and Tissue Engineering

BIOMEDE 4510

Credit Hours:
3.00 - 3.00

Course Levels:
Undergraduate (1000-5000 level)

Course Components:
Lecture

Course Description:
Application of engineering methods to study, measure, repair, or replace biological functions and the molecular cellular or tissue-level length scales.

Prerequisites and Co-requisites:
Prereq: 2000 and Math 2174, or permission of instructor. Concur: 2200 or Biochem 4511.

Course Goals / Objectives:
- Apply knowledge of mathematics, science, and engineering to propose novel molecular, cell, and tissue engineering applications
- Evaluate a proposed molecular, cell, or tissue engineering application with respect to constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Illustrate the role of specific governing process in applications of cell, molecular, and tissue engineering
- Test predictions of a mathematical model by analyzing data

Course Topics:

- Overview of course, course expectations, review units and dimensions
- Mass balance
- Modeling of molecular processes: enzyme kinetics, receptor-ligand interactions, signal transduction pathways,
- Fundamentals and modeling of cellular processes: migration, proliferation, death, differentiation, and cell ECM interactions
- Regulation of tissue growth and differentiation
- Tissue engineering applications
- Regulatory and economical consideration of CMT applications

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Designation:

Elective