



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Cell Engineering

BIOMEDE 5520

Credit Hours:

3.00 - 3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Cell-related phenomena important to tissue engineering and medicine: Cell-surface and cell-cell interactions; chemical/mechanical effects on cell function; cell engineering applications for treatment of human diseases.

Prerequisites and Co-requisites:

Prereq: 4510 or equiv, and Sr standing; or Grad standing; or permission of instructor.

Course Goals / Objectives:

- Describe cell and molecular biology terminology and techniques
 - Analyze cell-surface and cell-cell adhesive interactions, cell function, and the effects of chemical and mechanical environments on cells from a science/engineering perspective
 - Explain the association between cell dysfunction and human disease, and the basic principles of tissue growth, gene therapy and stem cell applications
 - Communicate their views on current research topics related to cell engineering
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Course Topics:

- Overview of basic cell and molecular biology terminology and techniques
 - Cell-surface and cell-cell adhesive interactions; Receptors and ligands; Biomechanics of cell adhesion.
 - Cell function: cell cycle/proliferation, motility, intracellular signaling, death/apoptosis.
 - Effect of the chemical environment on cell function.
 - Effect of the mechanical environment (mechanical forces) on cell function.
 - Genetic manipulation of molecules in cells and mice.
 - Stem cells: Potential applications and unknowns
 - Presentation of paper projects by student teams
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Designation:

Elective