THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Finite Element Applications in BME

BIOMEDE 5430

Credit Hours:
3.00 - 3.00

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

Course Components:
Lecture

Course Description:
The finite element method for solution of differential equations for modeling biomedical engineering applications (implemented using COMSOL Multiphysics software).

Prerequisites and Co-requisites:
Prereq: Math 2177 or equiv, and Anatomy 2220 or equiv, and Sr or Grad standing; or permission of instructor.

Course Goals / Objectives:
- Use governing differential equations for problems in biomechanics, biotransport, and biofluids, including multi-physics cases, and formulate and find finite element-based solutions
- Solve and analyze sets of biomedical engineering problems using the finite element method with COMSOL software for static linear applications, time-varying linear applications, non-linear applications
- Complete an independent project, formulating and solving a biomedical engineering problem of interest

Course Topics:
- Introduction Finite Element Methods COMSOL software
- Introduction Governing differential equations recast as integral equations
- Thermal Problems in BME
- Diffusion Problems in BME
- Structural Problems in BME
- Fluid Problems in BME
- Student Project Presentations

Designation:
Elective