THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Biomedical Optics

BIOMEDE 5120

Credit Hours:
3.00 - 3.00

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

Course Components:
Lecture

Course Description:
Introduction of light-tissue interaction, optical imaging, and spectroscopy.

Prerequisites and Co-requisites:
Prereq: 4110 or equiv, and Sr standing; or Grad standing; or permission of instructor.

Course Goals / Objectives:
- Identify various clinical applications of biomedical optical techniques and criticize the technical advantages and limitations of common biomedical optical devices
- Apply engineering principles and scientific knowledge to optimize the design or the utilization of biomedical optical devices
- Derive the radiative transfer equation, apply diffusion approximations, and simulate light transport in biological tissue using numerical methods such as Monte Carlo simulation
- Utilize optical engineering techniques and tools to collect, analyze, and interpret data from living systems

Course Topics:
- Introduction of clinical and physical aspects of biomedical optics
- Fundamentals of light
- Biomedical optical components
- Simulation of light transport in biological tissue
- Optical property detection and spectroscopy
- Biomedical optical imaging

Designation:
Elective