THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Microscopy in Biomechanics

BIOMEDE 6170

Credit Hours:
3.00

Course Levels:
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Physical principles and modes of light microscopy and atomic force microscopy and their applications for probing biomechanical properties.

Prerequisites and Co-requisites:
Pre-Req: Grad Standing in Engineering

Course Goals / Objectives:
- Describe the physical principles involved in light and atomic force microscopy image formation. -Derive Gauss's lensmaker equation and use it to ascertain chromatic aberration. -Determine spring constant of a AFM cantilever from its geometry
- Label components and carry out alignment procedures for microscopes. -Perform Koehler alignment on inverted and upright light microscopes. -Mount and align an AFM cantilever in a Multimode AFM
- Propose methods for nano and micro-scale biomechanical testing. -Describe experimental approaches to measure persistence length of single molecules and fibers -Analyze AFM-nanoindentation curves via Hertz or Oliver-Pharr models

Course Topics:
- Transmitted and Reflected Light Microscopy
- Light microscopy in Biomechanics
- Atomic Force Microscopy
- AFM in Biomechanics

Designation:
Elective