THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Musculoskeletal Biomechanics

MECHENG 6700

Credit Hours:
3.00 - 3.00

Course Levels:
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Fundamental anatomy and physiology. Mechanics of muscle, tendon, ligament, meniscus, and bone. Equations of motion for human movement. Introduction to experimental methods in musculoskeletal biomechanics.

Prerequisites and Co-requisites:
Prereq: Grad standing in MechEng or BiomedE, or permission of instructor.

Course Goals / Objectives:
- Describe the biological, mechanical, and neurological aspects of how muscles produce movement
- Identify the engineering tools that are used to study orthopaedic biomechanics and explain their function
- Create and solve equations of motion for simple models of human movement
- Describe the mechanical behavior of bones, ligaments, tendons, meniscus, and cartilage
- Describe how external mechanical stimuli contribute to fracture initiation and healing, skeletal differentiation, bone modeling and remodeling, joint formation and joint degeneration

Course Topics:
- Basic anatomical and biomechanical terminology
- Muscle physiology and mechanics
- Locomotion
- Neural control
- Motion tracking techniques
- Inverse dynamics
- Bone mechanics and mechanobiology
- Orthopaedic biomechanics
- Impact/trauma biomechanics
- Clinical applications

Designation:
Elective