



THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Introduction to Musculoskeletal Biomechanics

MECHENG 5700

Credit Hours:

3.00

Course Levels:

Undergraduate (1000-5000 level)

Graduate (5000-8000 level)

Course Components:

Lecture

Course Description:

Introduction to field of musculoskeletal biomechanics at a level appropriate for advanced undergraduates and early graduate students. Fundamental anatomy and physiology. Mechanics of muscle, tendon, ligament, meniscus, bone. Equations of motion for movement. Introduction to experimental methods.

Prerequisites and Co-requisites:

Prereq: 3670, 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 musculoskeletal 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.
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Course Topics:

- Locomotion
 - Muscle physiology and force production
 - Neuromuscular control
 - Motion capture and inverse dynamics
 - Bone mechanics
 - Ligaments and joints
 - Cartilage formation and degeneration
 - Trauma biomechanics
 - Clinical applications
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Designation:

Elective