BIM 233 – Soft Tissue Mechanics
Winter 2019

Contact Information:

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Objectives:
This course will present the structure and function of various soft tissues of the musculoskeletal system, including articular cartilage, tendon, ligament, meniscus, and intervertebral disc. Students will learn the engineering principals governing the mechanical behavior of these tissues, in particular linear viscoelasticity, quasilinear viscoelasticity, and biphasic theory, along with experimental methods used for mechanical testing of these tissues.

Grading:
- 30%: Three problem sets
- 10%: Literature review presentation
- 30%: Exam I
- 30%: Exam II

Calendar:

Date	Topic	
1/08/19	Introduction to class, overview of material	
1/10/19	Tendon	
1/15/19	Linear viscoelasticity	
1/17/19	**NO CLASS** – Suggested replacement: ORL Seminar 1/16/19 at 12:00 PM	
1/22/19	Ligament, Linear viscoelasticity	
1/24/19	Linear viscoelasticity	
1/29/19	Articular cartilage	**Problem set #1 due**
1/31/19	Intervertebral disc	
2/05/19	Current and emerging treatments in sports medicine (Cassandra Lee)	
2/07/19	Meniscus/fibrocartilage, review	**Problem set #2 due**
2/12/19	**Exam I**	
2/14/19	Biphasic Theory	
2/19/19	Biphasic Theory	
2/21/19	Articular cartilage tribology (Sean McNary)	
2/26/19	Quasilinear viscoelasticity/Microstructural models	
2/28/19	Muscle and Bone	**Problem set #3 due**
3/05/19	Experimental methods	
3/07/19	Student literature review presentations	
3/12/19	Student literature review presentations	
3/14/19	**Exam II**	

Literature Review Presentation:
Find a recently published article (2012-present) that utilizes one of the methods discussed in this class (viscoelastic modeling, biphasic theory, etc.) to investigate one of the tissues discussed in this class (tendon, ligament, intervertebral disc, etc.). Present this article to the class as you would at a scientific conference (10-12 minute Powerpoint presentation, with 3-5 minutes for questions). Be sure to describe the viscoelastic model used, and why this model was chosen to fit their data. Provide an assessment of their modeling and the quality of their study.