

Instructor - Dr. Ted Uyeno

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Hours -

Office: TBA (or by appointment)

Course: Lecture – MWF noon – 12:50pm, BSC 2022

Lab – F, 8:30-11:20am, BSC 1043



Textbook – Vogel, S. 2013. Comparative Biomechanics: Life’s Physical World (2nd ed.) **Laboratory** – Course information and links or references for lab and supplementary readings will be posted on Blazeview.

Course Description: This course applies engineering and physics principles to understand how aquatic, terrestrial and aerial organisms function. Integrated lectures and labs explore the limitations and opportunities the physical world provides to organisms. Some topics that we will touch on include; how flies fly, how bones break, how tendons and muscles work, why mucus is so sticky and how to design patentable biomimetic solutions.

Pre-Requisite: BIOL1107-1108 or instructor permission, and PHYS 1111K or 2211K.

Attendance: MANDATORY! Please note: 1) I track of attendance. 2) Disruptive students will be asked to leave. 3) **NO** electronics/earphones are allowed in **lecture or laboratory**. Viewing a cellphone during a quiz or exam will be treated as an instance of **CHEATING**. 4) Those wishing to use laptops/iPads as part of the class are required to sit in the first row of the classroom. Viewing anything other than course work during course time is prohibited. Any of these violations may result in the loss of one **LETTER GRADE** from your final grade. Students missing 20% of the lectures will receive a grade of “F” **regardless** of standing.

Tentative Lecture Outline - This is the order in which we will cover topics.

TOPIC(1)Tjcn /TT0 1 Tf 12 -064.56 5inu-8(UOPI2u16 MCd m6 MCe , QDITICHA9T196 1 re W n B /Tcn /TT

TEXT/CHAPTERS

Size Shape and Scale

1,2,3

BIOL 4010/6010
Comparative Biomechanics
Dr. Ted Uyeno

Tentative Lab Schedule - This is the order in which we will cover topics.

DAY	TOPIC	TECHNIQUE
1	Intro to Bioinstrumentation	Light/microphotography
2	Kinematics	X-ray/HiSpeed imaging
3	Flow visualization	Velocimetry
4	Material properties	Force/displacement
5	Electronic instruments	Electronics workshop
6	Rapid prototyping	CAD/CAM
7	Froud numbers	
8	Egg design	Paper 1 due
9	Mechanisms	
10	Joints	
11	Scientific writing	
12	Presentation preparation	
13	Student presentations	Paper 2 due
14	Student presentations	
15	Thanksgiving	
16	Wrap-up!	

Project 1 (Techniques paper, 75 pts)
Project 2 (Biomechanics paper, 125 pts)