

VSU Biology 4530/6530

Comparative Biomechanics

Fall 2019

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BIOL 4530/6530
Comparative Biomechanics
Dr. Ted Uyeno

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

TOPIC	TEXT CHAPTERS
Size Shape and Scale	1,2,3
Introduction to Fluid mechanics	4,5
Viscosity	6
Forces of flow	7
No-slip condition (solid/fluid interfaces)	8
Circulatory systems and other plumbing	9,10
Reynolds numbers	11
Swimming and flying	12, 13, 14
Midterm exam	
Properties of biological materials	15,16
Rigid materials	17
Viscoelastic materials	18
Simple structures	19,20
Soft structures	21
Biological structural systems	22
Motility and mobility	23
Biological motors and transmissions	24
Land locomotion	25
Integration across levels of organization	TBA
Evolution,	

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

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

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

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