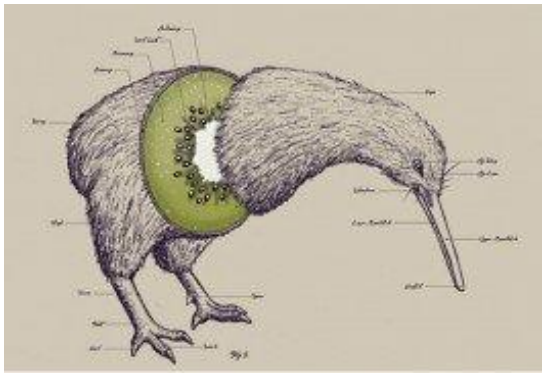
Comparative Anatomy of Vertebrates



BIOL-321, 610 **Fall 2020**
Monday, Wednesday: 11:30AM – 12:50PM
@ home (M, W)
Lab: Mondays, scheduled time, @ virtual lab

Instructor:
Prof. Brooke Flammang, PhD (flammang@njit.edu)
TAs:
Audrey Biondi (aab53@njit.edu)
Carmel Rafalowsky (cr338@njit.edu)

COURSE DESCRIPTION: This course introduces students to the groups of vertebrates and explores the anatomical evolution of vertebrates within the context of the functional interrelationships of morphology and the changing environments to which vertebrates have adapted. An ideal entry point into the ways living creatures interact with their immediate physical world, we examine how the forms and activities of animals reflect the materials available to nature and consider rules for structural design under environmental forces.

Course prerequisites: BIOL 200 and BIOL 205/206.

Course outline:

Dates	Lecture	Lab	Readings
2 Sep	Introduction to the Course		
8,9 Sep	Finding Your Inner Fish	origin of Chordates	Ch. 1
14,16 Sep	Getting a Grip	forelimb homologies	Ch. 2
21,23 Sep	Handy Genes	limb muscles	Ch. 3
28, 30 Sep	**EXAM 1**	cranial 1	
5,7 Oct	Teeth Everywhere	cranial 2	Ch. 4
12,14 Oct	Getting Ahead	axial skeleton	Ch. 5
19,21 Oct	The Best-Laid (Body) Plans	head and trunk muscles	Ch. 6
26,28 Oct	Adventures in Bodybuilding	basic biomechanics 1	Ch. 7
2,4 Nov	**EXAM 2**	basic biomechanics 2	
9,11 Nov	Making Scents (Resp)	respiratory	Ch. 8
16,18 Nov	(Brain, Vision, Hearing)	nervous system	Ch. 9
23 Nov	(Heart)	circulatory	Ch. 10
30 Nov, 2 Dec	The Meaning of it All, Summary Pt 1	science in action 1	Ch. 11
7,9 Dec	Summary Parts 2 and 3	science in action 2	
TBD	**FINAL EXAM**		

Required Texts:

- Shubin, Neil (2008) Your Inner Fish: A journey into the 3.5 billion-year history of the human body. Pantheon Books. ISBN: 978-0375424472

Required Materials: Colored pens/pencils and blank paper for notetaking and drawing.

Grading: 25% weekly lab quizzes
25% Exam 1
25% Exam 2
25% Final Exam

Grading Scale	
A	90-100
B+	83-89
B	73-82
C+	65-72
C	60-64
D	50-59
F	0-49

- Lectures and labs will be posted Sunday evening for the following week.
- Lab quizzes will be multiple choice, timed, and available through the course links on Canvas. They must be taken during the current week the lab is posted. Please ensure you have a strong internet connection to take them. There are no make-ups.
- Lecture exams will be short answer, open-note. You will be required to upload a PDF of your exam in the folder during the posted time frame announced when the exam is released.
- There is no extra-credit.

Learning expectations and assessment:
In this course, students will learn to:

1. Demonstrate the role of physics in the life of biological organisms
2. Identify parameters important to the function of physiological systems
3. Define anatomical structures in fish, reptiles, and mammals
4. Identify homologous structures in different organisms
5. Diagram the forces acting on skeletal structures to generate motion of an organism
6. Explain the factors that influence stability of a physiological structure
7. Explain the ontogenetic and evolutionary changes to the nervous, respiratory, circulatory, digestive, and urogenital systems as organisms adapted to new ecological niches and physiological needs over time

Class Policies:

Cell phones: The use of cell phones during all exam times is prohibited.

Makeup Exam Policy: There will be no makeup exams, except in rare situations where the student has a legitimate reason for missing an exam, including illness, death in the family, accident, requirement to appear in court, etc. The student must notify the Biological Sciences office and the Instructor that he/she will miss an exam. In all cases, the student must present proof for missing the exam TO THE DEAN OF STUDENTS OFFICE, e.g., a doctor's note, police report, court notice, etc., clearly stating the date and times.

Academic Integrity: Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working towards. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf. Please note that it is my professional obligation and responsibility to report any academic misconduct directly to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.