

Comparative Vertebrate Anatomy: BIOE 134/L
Summer 2019

Lecture (70889): Tuesday, Thursday 9:00AM-12:00PM Coastal Biology 115
Lab (70890): Tuesday, Thursday 1:00-4:00PM Coastal Biology 115

Instructors: Dr. Rita S. Mehta
Office Hours: *12-1pm T & Th, or during labs, or by appointment
Phone: 831-459-1490 (office)
Emails: rmehta2@ucsc.edu

TA: Ana Valenzuela Toro (anmavale@ucsc.edu)
Office Hours: *Ana will be available during the labs, after labs for about an hour, or by appointment. Ana's office is in the Costa Lab, CBB 169.

*To schedule appointments outside office hours or outside of lab, please email us with your availability.

Book: Your Inner Fish, by Neil Shubin (Available on Canvas)

Lecture Material: Much of lecture material comes from select chapters from Comparative Anatomy, Function, Evolution. K. Kardong 7th Edition and original research from the PI's lab or the primary literature for papers. All readings will be provided. You are more than welcome to come and look at my lecture notes after class/ during lab. I do not allow students to take photos of power points or anything else during lecture. Photos of dissections are allowed and you are required to sign a waiver which outlines your understanding of how photos are to be used- only for studying purposes and never for social media.

Course Objectives and Goals:

1. Understand basic concepts of evolutionary biology and classification of vertebrates.
2. Become familiar with form and diversity of the following systems: Skull, axial skeletal, and muscular system
3. Be proficient in anatomical dissection
4. Understand basic principles of functional morphology; in particular, how form contributes to different feeding and locomotor behaviors.

<u>Grading:</u>	<u>Points</u>	<u>Letter Grades (based on %):</u>	
Lecture:			
3 Exams: 2 Midterms & 1 Final	(100 pts each)	97-100 = A+	80-83 = B-
6 Quizzes (10 pts each) inner fish	60	94-96 = A	77-79 = C+
Participation (in class/OH)	10	90-93 = A-	74-76 = C
		87-89 = B+	70-73 = C-
		84-86 = B	60-69 = D
<u>Assignments (in/outside lecture)</u>			
Fish Skull Activity	10		
(10 pts in class/lab, 10 pts take-home activity)			< 60 = F (no course credit)
Designer Skull	20		
Design your own skull <i>with</i> motion			
Sketch Science paper	30		
Meet with me to discuss Sketching Communication			
Total possible points	430		

not conceptual. Terminology is memorization. Terminology is how we will communicate so please learn your terminology.

Use of Animals

In this class we will be **dissecting** a number of different animals including a **lamprey, fish, frog, and rat**. We expect that all animals will be dissected properly and respect be given to the animals. We use real animals for dissection because it provides greater learning than models or computer programs. To learn anatomy effectively, you must get your hands dirty (figuratively, we have gloves to keep your hands clean). If you have concerns with the dissections, please come to see me so we can discuss your concerns. Dissection is required and learning this subject matter will be much easier if you work in teams of 2 while making yourself accountable for learning all of the material.

Accessibility:

Students with disabilities are encouraged to speak to Professor, Rita, and TA, Ana, about accommodations they may need to produce an accessible learning environment.

Syllabus for Comparative Vertebrate Anatomy Lecture and Lab

(The syllabus is a guide and may change according to unexpected events. Please be flexible)

Week	Date	Lecture (9:00 AM – 12:00 PM)	Lab (1PM – 4PM)	Readings (home work)
	Tuesday 7/30	<i>Lecture:</i> Chordate Origins <i>Reading:</i> Agnathan Background for Lab	1. Lab Etiquette 2. Lamprey Dissection & Quiz 3. Clean up and get checked off	Chapters 1-2 of <u>Your Inner Fish</u> for quiz on 8/01 Read up on the lab for 8/01
	Thurs 8/01	Quiz 1: <u>Inner fish</u> Chapters 1-2 + Discussion <i>Lecture:</i> Survey of Vertebrates Diversity Build a Fish Skull MIDTERM 1 is next week!	1. Assign selection to fish skull 2. Fish Morphology & Musculature 3. Go over clean-up 4. Clean up and get checked off	Chapters 3 & 4 of <u>Your Inner Fish</u> Study for lecture Exam: Exam is on 1 st week of <u>Lecture + 1-4 of Inner Fish</u>
2	Tues 8/06	Midterm I: Material from week 1 + Inner Fish 1-4 ----- Quiz 2: <u>Inner fish</u> 3 & 4 + Discussion <i>Lecture:</i> Skull Diversity and Feeding <u>Vote on flipping lab and lecture</u>	1. Frog Dissection 2. Review Lamprey, Fish, Frog 3. Mock practical 4. Clean up and get checked off	Chapters 5,6 of <u>Your Inner Fish</u>
	Thurs 8/08	Quiz 3: <u>Inner fish</u> 5 & 6 + Discussion <i>Lecture:</i> Finish Skull Diversity & Feeding	First Lab Practical Lamprey Fish,	Chapters 7-8 <u>Your Inner Fish</u>

		<p>Take-Home Assignment: Design a skull (1 week)</p> <p>Go over parts of the mammal skull / Go over teeth</p>	<p>Frog dissection</p> <p>Help Clean up and get checked off</p>	
3	Tues 8/13	<p>Quiz 4: <u>Inner fish</u> 7-8 & Discussion Go Over Midterm Exams Skull Diversity Lab Part 1</p>	Skull Diversity Lab Part II	<p>Chapters 9-10 <u>Your Inner Fish</u> Start reading Standen 2011</p>
	Thurs 8/15	<p>Quiz 5: <u>Inner fish</u> 9-10 & Discussion</p> <p><i>Assignment of Design a Vertebrate Skull is due! 20 points – present to class</i></p> <p><i>Lecture:</i> Axial Skeleton/ Appendicular skeleton</p>	<p>Axial Diversity Lab Continued from Lecture</p>	<p>Start reading Ch 11</p> <p>Finish reading Standen 2011</p>
4	Tues 8/20	<p>Midterm II (Lectures- Skull Diversity + Axial Diversity+ Your Inner Fish Chs 5-10)→</p> <p>-----</p> <p><i>Lecture:</i> Water to Land Transition Quiz 6- Standen et al. 2014 & Discussion</p>	<p>1. Rat Dissection & Quiz</p> <p>2. Clean up and get checked off</p>	Chapter 11 & Epilogue
	Thursday 8/22	<p>Sketch out the article- science communication- 1 sentence important point summary and sketch (it is not about the sketch, it is about the communication): how many drawings, digital means, how long....; peers listen and learn about the discovery</p> <p>Vote on starting final exam at 10 am</p>	<p>1. Rat Dissection & Quiz</p> <p>2. Clean up and get checked off</p>	
5	Tues 8/27	<u>Final Exam</u>	<p>1. Review of Rat</p> <p>2. Clean up and get checked off</p>	
	8/29	Talk to Rita and Ana final grades; Office hours (Beginning at 10:00 am until 11:30 am)	Final Practical Go over answers; Ana and I clean up	
		Congratulations- You have completed a challenging course this summer!!!		