

Comparative Vertebrate Anatomy: BIOE 134/L

Summer 2017

Lecture (70935): Wednesday, Thursday 10:00AM-12:30PM Thiman Lab 101

Lab (70936): Wednesday, Thursday 1:00-4:00PM Thiman Lab 217

Instructors: Dr. Rita S. Mehta, Chris Law

Office Hours: *We are available by appointment (M & T at the Long Marine Lab).

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TA: Benjamin Higgins (bahiggin@ucsc.edu)

Office Hours: *Ben will be available during the labs. He will also be available by appointment at the Long Marine Lab.

*To schedule an appointment with any one of us, please try and provide us with at least 24-hrs notice through an email.

Book: Your Inner Fish, by Neil Shubin (This is available at the Bay Tree Book Store)

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.

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.

Grading:

Points

Letter Grades (based on %):

Lecture:

2 Exams (100 pts each)

200

97-100 = A+

80-83 = B-

5 Quizzes (10 pts each)

50

94-96 = A

77-79 = C+

Total possible points

250

90-93 = A-

74-76 = C

87-89 = B+

70-73 = C-

84-86 = B

60-69 = D

< 60 = F (no course credit)

Laboratory:

2 Lab practicals (100pts each)

200

2 Mock practicals

0

Dissection (8 x 10)/Participation (20)

100

Total possible points

300

Attendance/Participation: Required for all lectures and laboratories. Students must be punctual to class. Attendance and participation are components in your evaluation. Only rarely are course exams allowed to be made up, and then only with a written medical excuse from your physician. We cannot make up labs in summer session. You are welcome to perform the lab on your own.

It is imperative that you come prepared to lecture and laboratory. The laboratory reading assignments should be read **BEFORE** coming to lab. We will be lenient on the first lab if needed. All of these

materials will be on Canvas. If you have to miss lab for any reason that is not a medical emergency, we expect that you will make time to conduct your own dissection at home.

Examinations: Students will not be allowed to leave the room during any examination. Please use the restroom ahead of time. No make-up exams will be given with the exception of a legitimate medical excuse (must be doctor's written medical excuse).

Honor Code: There will be zero tolerance on infractions to the honor code. Please refer to <http://deanofstudents.ucsc.edu/pdf/student-handbook.pdf> (Pay special attention to the following sections: 102.011 Cheating, 102.012 Plagiarism, 102.013 **Furnishing false information in the context of an academic assignment**, 102.014 **Creating an improper academic disadvantage to another student or an improper academic advantage to oneself**, 102.015 **Interference with courses of instruction**, and 102.016 **Theft or damage of intellectual property**).

At the end of the course, students with continually improving grades **may** be given **some** additional consideration. An incomplete grade (I) is given only in accordance with university criteria (see <http://registrar.ucsc.edu/navigator/section4/performance/incomplete%20.html>; if criteria are met, a written contract must be signed both by instructor and student, it is not intended as an escape clause for poor performance).

How to learn anatomy:

Comparative Vertebrate Anatomy is not a course that can be easily learned in a few hours a week. The dissections take time and there is nothing that takes the place of spending the necessary time in the lab as allotted every Wednesday and Thursday. Additional open lab hours will be made available for the week before a practical.

To successfully learn the principles examined in this course, we encourage you to complete all readings and come to lectures. In addition, study groups with your fellow students will allow you to further explore the material by teaching each other. The most important thing is that learning biology does not involve osmosis. Instead you must actively review the material from the textbook, lecture, and laboratory. We are also available if you have any questions, concerns, or comments. We encourage you to review your notes and textbook if you have a question. If you are still unsure, feel free to contact us. Please refer to the syllabus for our availability.

What is conceptual about anatomy? Understanding muscle attachment, origin and insertions, how contraction works is all conceptual. Spatial orientation should be somewhat intuitive and will help you understand how movement occurs through contraction of different muscles. **Terminology is absolutely 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, and frog**. 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 perform your own dissections whenever possible and work in teams.

Accessibility:

Students with disabilities are encouraged to speak to the professors about accommodations they may need to produce an accessible learning environment.

Syllabus for Comparative Vertebrate Anatomy Lecture and Lab

Week	Date	Lecture (9:30 AM – 12:30PM)	Lab (1PM – 4PM)	Readings (home work)
1	Weds 8/2	Syllabus, Introduce Your Inner Fish <i>Lecture:</i> Survey of Vertebrate Diversity <i>Activity:</i> Building Phylogenies	Lamprey Dissection Example Quiz	Geological Time Periods; Chapters 1-2 of Inner Fish; Read up on the lab for 8/3
	Thurs 8/3	<i>Discussion:</i> Chapters 1 & 2, Inner Fish <i>Lecture:</i> Survey of Vertebrate Diversity Quiz 1: Building Phylogenies & Survey of Vertebrate Diversity	Fish Morphology & Musculature Mock Practical	Chapters 3-5 of Inner Fish <i>Activity:</i> Build a fish skull on own for homework
2	Weds 8/9	<i>Lecture:</i> Skull Diversity and Feeding <i>Activity:</i> Parts of the Mammalian Skull Quiz 2: (Material from Week 1 Lecture)	Frog Musculature	Chapters 3-5 of Inner Fish
	Thurs 8/10	<i>Lecture:</i> Skull Diversity and Feeding <i>Discussion:</i> Chapters 3-5 of Your Inner Fish <i>Lecture:</i> Bone & Scaling Quiz 3: (Chs 3-5 of Your Inner Fish)	First Lab Practical <i>Lamprey</i> <i>Frog</i> <i>Necturus</i> <i>Build a fish</i>	Study for lecture midterm
3	Weds 8/16	Midterm I (Lectures + Your Inner Fish Chs 1-5)→ we could have them show up at 10 am.	Skull Diversity + Tooth Diversity	Chapters 6-8 of Inner Fish
	Thurs 8/17	<i>Lecture:</i> Axial Skeleton Quiz 4: (Chs 6-8 of Your Inner Fish) <i>Discussion:</i> Chs 6-8 Your Inner Fish	Axial Diversity	Chapters 9-11 of Inner Fish Owl Pellet Activity on own for homework
4	Weds 8/23	<i>Lecture:</i> Water to Land Transition Quiz 5: (Chs 9-11 of Your Inner Fish) <i>Discussion:</i> Chs 9-11 Your Inner Fish	Rat Mock Practical	Study for Lecture Final
	Thursday 8/24	Activity in class (Rat)	Activity (Rat)	Study for Lecture Final
5	Weds 8/30	Lecture Final Exam- Begin at 10 am Owl Pellet Homework Due	Open Lab (Rat)	
	8/31	Office hours (Beginning at 10:00 am)	Final Lab Practical	