Herpetology Biology of Amphibians and Reptiles

SyllabusBiol 4540-03 (Lecture); Biol 4541-01 (Lab)Spring 2023Lectures:Tuesday/Thursday, 8:00AM-8:50AM. Room: BIOS 220Instructor:Dr. Raul E. Diaz, Jr.Office/Lab: La Kretz Hall 394/309 [Lab is where I am 99.999% of the time]Email: rdiaz9@calstatela.edu Your emails will be answered within 24hrs. Things do come up, please be patient (i do not check emails at night)Office Hours: Tuesday, 10:00AM-11:00AM and by appointment in person or via Zoom (email me)Personal Website: https://reptile-embryos.com

Lab: Wednesday, 10:55AM-1:25PM. Room: BIOS 220

Instructor: Dr. Raul E. Diaz, Jr.

COURSE INFORMATION

As a first go through at Cal State Los Angeles, Herpetology is under the guise of Special Topics. This course is set up as a Lecture (which meets 2x a week) and Lab (which meets 1x a week). Attendance is mandatory in both, learning the content for Herpetology involves learning a large set of terms associated with anatomy, systematics/phylogenetics and 'scientific names' associated with the classification of reptiles and amphibians. You will also learn about ecology, geology, biogeography, systematics, osteology, soft tissue anatomy, behavior and development. This course is integrative and while many may consider it challenging, most will consider it a very fun course that ties the biological sciences together within a framework of understanding organismal biology.

REQUIRED TEXT(S)

The assignments (3 lecture exams, 2 lab practicals) will be based solely on lecture content from powerpoint presentations and handouts. That being said, the textbooks recommended for the course are STRONGLY recommended. Most students taking this course have a genuine interest in the field of Herpetology and will want to have their own copy (either of the two books below) to supplement lecture content, reiterate lecture content and also to expand to topics we are unable to cover in class due to time constraints. Additionally, you MUST purchase a copy of the Peterson Field guide for lab (either the 3rd or 4th Edition, with the latter recommended – more will be discussed in class about the two editions).

Lecture Books

- 1. L. J. Vitt, and J. P. Caldwell. 2013. *Herpetology. An Introductory Biology of Amphibians and Reptiles*. Fourth Edition. Academic Press.
- 2. Pough, F. Harvey, Andrews, Robin M., Cadle, John E., Crump, Martha L., Savitzky, Alan H., and Wells, Kentwood D. 2003. *Herpetology*. Prentice Hall.

Lab Books

- 3. Stebbins, Robert C. 2003. A Field Guide to Western Reptiles and Amphibians: Field Marks of All Species in Western North America, Including Baja California. Peterson Field Guide. PREFERRED
- 4. McGinnis, Samuel M. and R. C. Stebbins. 2018. Peterson Field Guide to Western Reptiles and Amphibians, 4th Edition. Peterson Field Guides.

COURSE DESCRIPTION

Traditionally, Herpetology is the discipline that focuses on the biology of amphibians (frogs, salamanders, caecilians) and reptiles, NOT including birds (tuatara, lizards, snakes, amphisbaenids, crocodilians, turtles). Thus, most lineages of tetrapods are covered except birds and mammals, giving us a course where we can learn about a comprehensive group of organisms spanning deep evolutionary time, differences in ecology, reproductive modes, body size and most importantly (to me!) anatomy. This course will explore the origin and evolution of tetrapods onto land and later amniotes, with a focus on how amphibians and reptiles are related to each other within these lineages, respectively. Extinct and Extant (living) will be covered in this course, with the former to less of a degree. Evolutionary relationships between groups will be emphasized based on the most recent studies. Our aim is to expose you to the global biodiversity of amphibians and reptiles along with various exciting aspects of their biology. Additionally, the lab portion of the course will focus on the external and internal (skeletal) anatomy of reptiles and amphibians and more specifically you will be exposed to and expected to learn (i.e., tested) how to identify native California species while also knowing their distribution, ecology and classification. We will have two "optional" field trips (if all goes well), one is to explore how specimens are preserved and utilized at the Los Angeles County Natural History Museum's Department of Herpetology and the other may be an optional Saturday trip to the L. A. Zoo (date TBD). Much of the material covered in lecture will be enhanced and expanded in the laboratory component of this course.

GRADES AND GRADING POLICY

The course grade is based upon total points earned. Grades are based on the following letter grade scale: A (100–90), B (89–80), C (79–70), D (69–60), F (<60) and are based on exams. In Lecture, you have 3 Exams at 100 points each. In lab, you have 2 practicals at 50 points each.

You are expected to maintain a Laboratory Notebook for taking notes at EACH LAB. This includes notes from presentations in lab, illustrations you are expected to make that help you identify species along with notes and other notes. These will be collected prior to the end of the semester and returned to you before finals week for a total of 25 points (you MUST keep these active).

Lecture & Lab Practical Exams	425 Points	
• Lecture Exam 1	100 points	
• Lecture Exam 2	100 points	
• Lecture Exam 3	100 points	
 Practical Exam 1 	50 points	
 Practical Exam 2 	50 points	
• Lab Notebook	25 points	

- There are **NO MAKE-UP** practical exams **except** as required by university policy in extreme circumstances. If you miss a scheduled practical exam, your grade for that exam will be a **Zero**.
- Final Exam: As of 16 January 2023, the university has not yet posted the final exam schedule for Spring 2023, this will be posted ASAP

NOTE: Below is a preliminary schedule for Lecture and Lab (separately). Changes to presented material or order may occur and will be posted on Canvas as an Announcement (make sure you get alerts on Canvas as this is how I primarily communicate with my students).

Week	Date	Day	Lecture Topic	Reference
No.			-	chapters (V&C4)
1	24-Jan	Tu	Introduction to Herpetology	Chapter 1
	26-Jan	Th	History of Herpetology	Chapter 1
2	31-Jan	Tu	Phylogenetics and Tree Thinking	Chapters 2, 3
	02-Feb	Th	The Vertebrate Story – Evo-Devo	Chapters 2, 3
3	07-Feb	Tu	Vertebrate Body Anatomy	Chapters 2, 3
	09-Feb	Th	Origin of Tetrapods	Chapters 2, 3
4	14-Feb	Tu	Amphibians	-
	16-Feb	Th	Anuran Biology & Anatomy	Chapters 17
5	21-Feb	Tu	Anuran Diversity I	Chapters 17
	23-Feb	Th	Anuran Diversity II	Chapters 17
6	28-Feb	Tu	Salamander Biology & Anatomy	Chapters 16
	02-Mar	Th	Salamander Diversity I	Chapter 16
7	07-Mar	Tu	Salamander Diversity II	Chapter 16
	09-Mar	Th	Caecilian Biology	Chapter 15
8	14-Mar	Tu	Caecilian Diversity	Chapter 15
			Midterm Exam I posted	-
	16-Mar	Th	Origin of Amniotes, Diversity of Reptiles	
9	21-Mar	Tu	Lepidosauria: Rhynchocephalia	Chapter 20
	23-Mar	Th	Lepidosauria: Squamata: Lizards I	Chapter 21
10	28-Mar	Tu	NO Class - Spring Break (Mar. 27–Apr. 02)	
	30-Mar	Th	NO Class - Spring Break (Mar. 27-Apr. 02)	
11	04-Apr	Tu	Lepidosauria: Squamata: Lizards II	Chapter 21
	06-Apr	Th	Lepidosauria: Squamata: Snakes I	Chapter 22
12	11-Apr	Tu	Lepidosauria: Squamata: Snakes II	Chapter 22
	13-Apr	Th	Lepidosauria: Squamata: Amphisbaenids	Chapter 21
			Midterm Exam II Posted	
13	18-Apr	Tu	Archosauria: Crocodilia	Chapter 19
	20-Apr	Th	Testudines I	Chapter 18
14	25-Apr	Tu	Testudines II	Chapter 18
	27-Apr	Th	Biogeography/Geology and Herp Distributions	Chapter 14
15	02-May	Tu	Reproduction/Reproductive Modes	Chapter 4, 5
	04-May	Th	EvoDevo of Herps	
16	09-May	Tu	Physiological Ecology	Chapters 6-10
	11-May	Th	Review and Catching up	
17	Week of	XX	FINALS WEEK (Final Exam Day and Time TBD)	
	15 May			

LECTURE SCHEDULE

LAB SCHEDULE

Date	Day	Lab Topic
25-Jan	Wed	No meeting the first week
01-Feb	Wed	Field and Lab Research in Herpetology
08-Feb	Wed	Herp Skull Morphology – Classic and Modern Techniques

15-Feb	Wed	CT Scanning and working with CT images
22-Feb	Wed	CT Scanning and working with CT images FRI 24 February – NAT HIST MUSEUM TRIP
01-Mar	Wed	California Herpetological Diversity and Distributions
08-Mar	Wed	Anurans of California
15-Mar	Wed	Anurans of California
22-Mar	Wed	Anurans of California
29-Mar	Wed	Salamanders of California
05-Apr	Wed	Salamanders of California
12-Apr	Wed	Salamanders of California
19-Apr	Wed	NO Lab - Spring Break (Mar. 16–24)
26-Apr	Wed	
03-May	Wed	LAB PRACTICAL I
10-May	Wed	Lizards of California <u>FRI 12 MAY – L.A. ZOO TRIP</u>
08-Apr	Monday	Lizards of California
12-Apr	Friday	Lizards of California
19-Apr	Friday	Snakes of California
20-Apr	Saturday	Snakes of California
21-Apr	Sunday	Snakes of California
22-Apr	Monday	Crocodilians, Rhynchocephalia, Amphisbaenia
26-Apr	Friday	Crocodilians, Rhynchocephalia, Amphisbaenia
27-Apr	Saturday	Turtles of California
03-May	Friday	Turtles of California
04-May	Saturday	
08-May	Wednesday	LAB PRACTICAL II

For Lab, make sure to set up an account at <u>https://sketchfab.com/</u> as we will be using this website in lab heavily to visualize 3D skulls (you will also use this to prepare for class). I will post a link to a specific collection for you to look at for specimens. You will be expected to have a tablet, laptop or cell phone to use this resource during lab. Make sure to also have Adobe Reader installed in your computer. Of importance is the resource from the University of Florida's Museum of Natural History from Blackburn's Lab <u>Click This Link</u>

For CT Datasets, <u>https://morphosource.org/</u> and for visualization of a wide range of vertebrates from CT Data there is <u>https://digimorph.org/</u>

ADDITIONAL RESOURCES

AmphibiaWeb— Resource on amphibian species as a whole, phylogenetic relationships, conservation and amphibian species lists generated by country, state, etc. <u>https://amphibiaweb.org/</u>

Reptile-Database.— Similar to AmphibiaWeb but for reptiles, very good and up to date. <u>http://www.reptile-database.org/</u>

California Herps.— Lucky you, a fantastic field-guide oriented website for all species in California. Of importance is that it also shows variation in coloration/patterns across their distribution range. <u>https://www.californiaherps.com/</u>