

Geol. 4421: Vertebrate Paleontology I: Fishes and Amphibians—Spring, 2026

Instructor: Dr. Tom Shiller

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Office Hours: Tuesday and Thursday, 9-11:00 am; Wednesday, 1-3:00 pm; or by appointment

Course Description: This course will focus on advanced topics related to vertebrate life in Earth's history. Topics to be discussed include evolution of fishes and amphibians, systematics, taphonomy, and paleoecology. Lecture topics will be supplemented with both laboratory and field exercises. Students will study skeletal material from extinct and extant vertebrates, learn to prepare fossil bone, observe taphonomic processes, and prospect for vertebrate fossil bones in the field.

General Objectives: Each student will develop:

1. Knowledge of vertebrate life in the past
2. Knowledge about how vertebrates have evolved over time
3. An understanding of modern statistical techniques in classifying vertebrate taxa
4. Knowledge of the processes responsible for the limited vertebrate fossil record
5. A knowledge of how vertebrates lived in the past and the ecosystems they inhabited

Student Learning Objectives: Each student will demonstrate the ability to:

1. Identify and describe different vertebrates based on skeletal remains
2. Properly prepare vertebrate fossil bones in the laboratory and in the field
3. Use cladistics software to estimate the phylogeny of extinct vertebrates
4. Interpret the environments in which different vertebrates lived based on characteristics of the rocks in which they were found
5. Responsibly find and collect vertebrate fossil bones in the field

Learning Outcome: Students will have an understanding of vertebrate life history and how extinct vertebrates are studied in the field of paleontology.

Grades: There will be four exams during the semester covering topics discussed in lecture. There will be two comprehensive lab exams during the semester covering topics discussed in lab. Lab participation will be scored based on attendance and lab notes. There will be a final lab report due following the taphonomy lab exercise. Students will also be assigned lists of key terms to define, related to material being discussed in lecture. Finally, there will be an activity involving cladistical analysis assigned later in the semester utilizing data in Excel. There will be two comprehensive lab exams during the semester covering topics discussed in lab. Lab participation will be scored based on attendance and lab notes.

4 Exams—15% each (60% total grade)

Cladistics Activity—10%

Key Terms—10%

Lab—20%

Attendance and Make-up Policy:

The only acceptable excuses for missing class are those due to illness, approved Sul Ross sanctioned events, and observation of religious holidays. All excused absences **must** be documented on paper. Please inform the professor at least 1 week prior to missing class (e-mail, note on office door, etc....). With an appropriate excuse, you must make up missed quizzes/exams **within 10 days** of the last day of the absence, or you have failed to meet your course responsibilities and will receive a zero. Attendance will be recorded at the beginning of class each day. Attendance is expected, but does not count towards the final grade. Students with 2 or less unexcused absences may drop an exam grade. **Arriving 10 minutes or later to class will be considered an unexcused absence.**

University policy dictates that your instructor can drop you with an F from the course after 6 absences from TR/MW classes or after 9 absences from MWF classes.

Student athletes: You are given a full week to return the completed documentation: your progress (attendance and grade) to your coach, so when you present that card to me, I will take it and return it to you the following class period. Alternatively, you can bring it to my listed office hours and I will look up your progress then. I will not complete them at the beginning or end of class. No exceptions.

Classroom Conduct:

The Student handbook states under Student Misconduct, number 21," Such prohibition includes disorderly classroom conduct that obstructs, interferes with, inhibits and/or disrupts teaching and/or classroom activities." Behavior which is included in this category: 1) persistent talking to ones' neighbors during lecture, 2) coming to class late or leaving early, 3) the use of cellular phones. **CELL PHONES MUST BE TURNED OFF IN CLASS.** This includes texting, emailing and social networking. (*If you are a member of an EMS/VFD group or have a child in day care and they must be able to reach you, let me know and we will discuss.*) Offenders of this policy will be asked once to stop. If it occurs a second time, the offender will be instructed to leave the classroom, there will be a meeting with the Dean of Student Life, and 5 points will be taken from their grade If there are further incidents, UDPS will be called and offenders will be physically ejected from the classroom and will likely be expelled from the University.

CHEATING AND PLAGIARISM WILL NOT BE TOLERATED:

Any student caught cheating on an exam or quiz will receive an automatic **zero** on that assignment. If a student is caught cheating second time, additional disciplinary actions will be taken. Any student plagiarizing information on an assignment will receive an automatic zero for that assignment. **Use of A.I.:** any work submitted by students for this course generated by generative A.I. will be consider plagiarism/cheating.

ADA Statement

SRSU Accessibility Services. Sul Ross State University (SRSU) is committed to equal access in compliance with the Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Mrs. Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Director or Ronnie Harris, LPC, Counselor, at 432-837-8203 or

email mschwartze@sulross.edu or ronnie.harris@sulross.edu. RGC students can also contact Alejandra Valdez, at 830-758-5006 or email alejandra.valdez@sulross.edu. Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine, Texas, 79832.

Class Schedule: Note: dates and topics may be subject to change during the semester.

Week of...	Topics	Lab
1/12	Intro. to Vert. Paleo.	
1/19	Review of Evolutionary Biology and Anatomy	Types of Joints
1/26	Systematics and Morphometrics	Teeth and Dermal Bones
2/2	Vertebrate Origin, Exam 1	Cranial Bones
2/9	Early Paleozoic Fishes	Cranial Bones Cont.
2/16	Early Paleozoic Fishes	Vertebrae, Shoulder Girdle and Ribs
2/23	Evolution of Fishes after the Devonian	Arm and Manus
3/2	Evolution of Fishes after the Devonian, Exam 2	Lab Practical Exam
3/9	SPRING BREAK	SPRING BREAK
3/16	Early Tetrapods and Amphibians Dinosaurs, Pterosaurs, Crocs., and Other Reptiles	Pelvic Girdle
3/23	Early Tetrapods and Amphibians	Leg and Pes
3/30	Triassic Tetrapods	Morphometrics
4/6	Triassic Tetrapods, Exam 3	Cladistics
4/13	Evolutionary Patterns	Cladistics 2
4/20	Vertebrate Biostratigraphy	Lab Final
4/27	FINAL EXAM	