ST: INVERTEBRATE PALEONTOLOGY

GEOLOGY 5404
Spring 2025
Geology Program; Natural Sciences Dept; ALPS College
Sul Ross State University
Lecture - TuThr 11:00 am – 12:15 am
Lab - Thr 2:00 pm – 4:30 pm

Dr. E. Measures

WSB 315
837-8117
measures@sulross.edu

Geology program phone 837-8112
Geology program office WSB 314

Office hours:
MTWF 9:00 am to 10:30 am
MTW 3:00 pm to 4:00 pm
or by appointment; call or email to arrange;
weekly schedule posted next to office door

Course Description and Course Objectives

The course deals with the morphology, classification, identification, evolutionary trends and geological distribution of invertebrate fossils. Laboratory work consists of systematic study 4of index fossils as well as representative fossils of various phyla.

This course will:

1) discuss the natural history of major marine invertebrate groups including modern and ancient forms;
2) provide hands-on experience with morphology and classification of marine invertebrate groups including modern and ancient forms;
3) discuss the uses of fossils in litho-, bio-, and chronostratigraphy;
4) discuss the evolution of life on Earth;
5) discuss extinction events in the history of the Earth.

Prerequisites/Co-requisites

Historical Geology GEOL 1304/1104

Methods of Instruction

The course consists of 3 lecture hours and 2.5 lab hours per week. Open lab hours will be available.
Printed material for the course will be provided in lecture and lab.

Course Text

Invertebrate Palaeontology and Evolution, 4th ed.
1998. E.N.K. Clarkson. Blackwell Science Ltd.
no lab manual
reference books for lab will be provided

Optional Texts

Index Fossils of North America. 1944 ed. (1987 reprint) H. Shimer and R. Shrock. MIT Press
The Ecology of Fossils. 1981. W.S. McKerrow. MIT Press
Bringing Fossils to Life, 3rd ed. 2013. D. Prothero. Columbia University Press.

Other Recommended Readings

Journal articles, or web sites, applicable to topics being covered will be provided.

Materials

notebook/paper pencils/pens

Attendance Policy and Student Conduct – Expectations and Requirements

- Be on time to lecture and lab, attend all lectures and labs, and stay throughout the entire designated period.
- Be engaged, awake, and on task.
- Do not work on another class during this class.
- Multitasking during lecture is not a good idea.
- For every hour spent in lecture, at least 2 to 3 hours should be spent outside class studying.
- Where possible, schedule routine medical/dental appointments around lecture/lab times.
- Keep instructor informed either **before** anticipated absence or **soon after** unplanned absence.
- If you are going to miss a lecture or lab, or have missed a lecture or lab, written notification (email) and documentation must be provided as soon as possible. **Be sure to get the notes from another student in the class.**
- Legitimate reasons for tardiness, leaving and returning during class, or leaving class early are, but are not limited to, illness, appointment with specialist, family emergency, caregiver duties, and emergency responder calls.
- Inform instructor **prior** to class if conditions exist that may cause you to leave periodically during class or leave before the end of class.
- Arrangements for missed assignments and exams must be made, and the make-up done, within one week of the scheduled due date. Points will be deducted for late work on assignments other than exams. If an exam is not taken within a week of being administered, then an all-essay make-up exam will be given on Dead Day.
- Late assignments will not be accepted once graded papers are returned.
- You are expected to check your SR email at least 3 times a day; morning, noon, and evening,
- You are expected to observe the University's Code of Student Conduct (see the Student Handbook)

Electronics Policy

- Smart phones, cell phones, i-pods, laptops, earbuds (etc.) are to be turned OFF during lectures.
- Texting, checking email, playing games, surfing the internet, working on another class during lectures is **not acceptable and is prohibited.**
- If taking notes on an electronic device is your preferred method, please **discuss this with the instructor.**
- If electronics are to be used for recording audio or for taking images of material written on the board, please **discuss this with the instructor.** If recording is allowed, then class recordings are NOT to be posted on any social media/web site.
- If you need access to your electronics during lectures (e.g., caregiver, emergency responder), for purposes other than note taking, audio recording, or obtaining images of material written on the board, **discuss this with the instructor.**
- Points will be deducted from exams for violation of the electronic policy during lectures.
- If electronics are accessed during an exam, then the exam will **receive a grade of zero.**
- If an electronic device makes an audible noise during an exam, then the exam will **receive a grade of zero.**
- **Use of any AI on any assignment will result in a grade of zero on the assignment.**
- Electronics may be used during lab and for purposes of lab.

Grading/Course Requirements

Requirements:

Exams (3) 51%
Other 4%
hwork/ quizzes/papers
Term projects (2). . . . 10%
Lab (13)..... 35%
(30% from practicals; 70% from labs)

Standard grading scheme:

A ..... ≥90%
B 80-89%
grad students should not make lower than a B
C 70-79%
D 60-69%
F ..... ≤59%

Exams – exams cover the previous 4 to 4.5 weeks of material; some material carries through so exams are comprehensive to a small extent; exam 3 will have some questions from exams 1 and 2 material; all exams are 100 points; question formats will be variable. If you miss an exam then arrangements need to be made to take it within the week. If the exam window is missed, then an all-essay make-up exam will be done on Dead Day.

Other – homework questions/exercises (10 to 20 pts each) related to the chapter readings, or material on the internet; quizzes will consist of questions over the chapter readings or questions over the previous class lectures, homeworks and notes may be used on quizzes; a short paper could be assigned during the semester to acquaint students with the process of library research, familiarization with the geologic literature, and writing a geologic paper; term projects will consist of a technical description of a fossil, or research into an aspect of invertebrate paleontology and a class presentation of the projects

Lab – hands-on work with modern forms and fossils from the major groups of invertebrates; topics to include morphology, taxonomy/classification, paleoecology, biostratigraphy and evolution

Field trip(s) – may be optional or extra credit; attend day-long, or half-day, trip(s) to fossiliferous outcrops close to Alpine, Tx; applies identification/ interpretation of fossils, and basic principles of Paleontology.

Schedule tentative and topics covered as time/discussion permits

TUESDAY		THURSDAY			
		Jan 16	Introduction, Geologic Time Scale Definitions		No Lab
Jan 21	Preservation, Bias in fossil record	Jan 23	Fossil-Lagerstatten, Taxonomy, Major Fossil Groups		Lab: Preservation
Jan 28	Major Fossil Groups, Basics of Invert Paleo	Jan 30	Earliest Life, Cambrian Explosion, Sponges & relations		Lab: Sponges and relations
Feb 4	Paleoecology	Feb 6	Paleoecology, Corals		Lab: Corals
Feb 11	Paleoecology	Feb 13	Functional Morphology, Bryozoans, Graptolites		Lab: Bryozoans Lab: Graptolites
Feb 18	Functional Morphology, Brachipods	Feb 20	**EXAM 1**		Lab: Brachiopods I
Feb 25	Species & Speciation	Feb 27	Mutation, Isolation & Adaptation, Brachipods		Lab: Brachiopods II
Mar 4	Mutation, Isolation & Adaptation	Mar 6	Microevolution		**Lab Practical 1**
Mar 11	Microevolution	Mar 13	Macroevolution, Molluscs		Lab: Molluscs I
Mar 17 through Mar 20 - No Classes - Spring Break					
Mar 24	Macroevolution	Mar 27	Biostratigraphy, Molluscs		Lab: Molluscs II
Apr 1	Biostratigraphy, Molluscs	Apr 3	**EXAM 2**		Lab: Molluscs III
Apr 8	Biogeography	Apr 10	Climate, Sea Level Changes, Echinoderms		Lab: Echinoderms
Apr 15	Climate & Sea Level Changes	Apr 17	Influence of Tectonics, Arthropods, Microfossils		Lab: Arthropods Lab: Microfossils
Apr 22	Extinctions & Causes of Extinctions	Apr 24	Extinctions & Causes of Extinctions		**Lab Practical 2**
Apr 29	Extinctions & Causes of Extinctions	May 1	**Dead Day** **No Classes** **Exam make-ups**		
Monday May 5 Exam 3 10:15 am to 12:15 pm					

Disabilities Accommodation – ADA Statement

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 for accessibility services. Students seeking accessibility/accommodation services must contact Mrs. Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Director by email (mschwartze@sulross.edu), or contact Ronnie Harris, LPC, Counselor by email (ronnie.harris@sulross.edu), both can be reached at 432-837-8203. The office is located on the first floor of Ferguson Hall, room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832.

You will be provided with an accommodation letter which must be given to the instructor as early as possible in the semester.

Library

The Bryan Wildenthal Memorial Library and Archives of the Big Bend offers FREE resources and services to the entire SRSU community. The library's website, library.sulross.edu/, has information on how to borrow or electronically access books, articles, and more. Off-campus access requires logging in with your LoboID and password. Librarians are a tremendous resource for coursework and can be reached by email (srsulibrary@sulross.edu) or phone (432-837-8123).

Expected Student Learning Outcomes

At the end of the semester, the successful student will be able to:

* identify invertebrate fossils to correct Class or Order (*SLO 1)*
* identify diagnostic morphology of an invertebrate fossil (*SLO 1)*
* interpret paleoenvironment indicated by an assemblage of fossils (*SLO 1)*
* interpret approximate geologic age of an assemblage of fossils (*SLO 1, SLO 4)*
* show use of fossils to determine stratigraphic relationships between rock units (*SLO 1, SLO 4)*
* explain how fossils help to explain extinction and evolution (*SLO 1)*

Geology Graduate Student Learning Outcomes (Master of Science SLO's)

1. The student will be able to apply a diverse body of Geologic information in the area of advanced sedimentary geology.
2. The student will be able to apply a diverse body of Geologic information in the area of advanced igneous/metamorphic processes, structural geology and tectonics.
3. The student will be able to apply a diverse body of Geologic information to field and lab research and techniques.
4. The student will be able to communicate diverse bodies of Geologic information through the standard scientific format of an oral presentation based on a written paper.

Geology MS Marketable Skills

* The student will be able to conduct field work.
* The student will be able to use field equipment.
* The student will be able to use lab equipment.
* The student will be able to use library resources.
* The student will be able to communicate in written and oral format.

Academic Integrity

Students are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. A scholar is expected to be punctual, prepared, and focused; meaningful and pertinent participation is appreciated. Students must submit work that is their own.

Behavior that violates academic integrity (aka. academic dishonesty) includes but are not limited to:

- ☹ turning in work as original that was used in whole or part for another course and/or professor;
- ☹ turning in another person's work as one's own;
- ☹ copying from professional works or internet sites without citation;
- ☹ collaborating on a course assignment, examination, or quiz when collaboration is forbidden;
- ☹ use of AI on any assignment for this class.

Violations of academic integrity can result in failing an assignment, failing the class, and/or more serious university consequences. These behaviors also erode the value of college degrees and higher education overall.

Student Responsibilities Statement

All full-time and part-time students are responsible for familiarizing themselves with the **Student Handbook** and the **Undergraduate & Graduate Catalog** and for abiding by the **University rules and regulations**. Additionally, students are responsible for checking their Sul Ross email as an official form of communication from the university. Every student is expected to obey all federal, state, and local laws and is expected to familiarize him/herself with the requirements of such laws.

Classroom Climate of Respect

This class will foster free expression, critical investigation, and the open discussion of ideas. Everyone in the class must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, all people in the class must learn how to oppose and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender, national origin, or sexual preference.