INVERTEBRATE PALEONTOLOGY
GEOLOGY 3411
Spring 2023

Geology Program; Department of Natural Sciences
College of Ag, Life, and Physical Sciences, Sul Ross State University
TuThr 9:30 am – 10:45 am; Thr 2:00 pm – 4:30 pm

Dr. E. Measures
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Office hours:
MTWTF 11:00 am to 12:00 pm
MTW 3:00 pm to 4:00 pm
or by appointment

Course Description and Course Objectives

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

Hands-on lab exercises will emphasize examination of fossils, their morphology, comparison to modern forms, and classification.

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 3 lab hours per week. There will be minimal use of Blackboard.

Required Text

Invertebrate Palaeontology and Evolution, 4th ed.
1998. E.N.K.Clarkson. Blackwell Science Ltd.
no lab manual

Optional Texts

Index Fossils of North America. 1987 reprint of 1944 ed. 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

Links to news articles, or web sites, applicable to topics being covered will be posted on Blackboard.

Materials

notebook/paper pencils/pens

Attendance

Attendance is expected in lectures and required in lab. Come on time and do not leave during class or leave class early. Lecture and lab exams and exercises missed cannot be made up at a later time unless prior arrangements are made. If you are going to miss an exam for a legitimate reason, let the instructor know AHEAD of time.

Use of electronic devices, not specifically related to taking notes or recording lecture, is considered inconsiderate and disruptive and will not be tolerated.

You are expected to check you Sul Ross e-mail and to access Blackboard.

ADA Statement – Disabilities Accommodation

Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the policy of SRSU to provide reasonable accommodation to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. If you would like to request such accessibility/accommodations services, please contact Mary Schwartze Grisham, LPC, SRSU's Accessibility Services Coordinator (ADA coordinator), in Counseling & Accessibility Services, at 432-837-8203 or email mschwartze@sulrosss,edu. Office is located on the first floor of Ferguson Hall, room 112, and the mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832.

Please inform the instructor ASAP of accommodations.

Grading/Course Requirements

Requirements:		Standard grading scheme:
Exams (3)	57%	A ..... ≥90%
Other	13%	B 80-89%
homework/		C 70-79%
daily quizzes		D 60-69%
		(D does not count for majors)
Lab	30%	F ..... ≤59%

Exams – test 1 and 2 covers the previous 4 to 4.5 weeks of material; test 3 will have some questions from test 1 and 2 material; each test is 100 points; material is the basic vocabulary, concepts/theory of Paleontology and morphology of the major invertebrate groups; some material carries through so exams are comprehensive to a small extent; question format will be variable. If you miss a test for a scheduled Sul Ross activity then arrangements need to be made with me to take the test before the event. If you miss a test because of an emergency (documentation required) then arrangements need to be made with me to take the test. All other make-ups will be during Dead Days and the test will consist exclusively of essay questions.

Field trip – 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

Homework – questions/exercises related to the chapter readings or exercises to emphasize the basic principles of paleontology; each homework is worth 10 to 20 points; homeworks will be used to complete the weekly labs; homework could also include internet exercises and/or written analysis/discussion of paleontologic events in the news or other media; project could consist of making, identifying and curating a collection of fossils

Quizzes – short questions over the chapter readings; questions over the previous class day's lecture; homeworks and notes may be used on quizzes

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

Schedule tentative and topics covered as time/discussion permits

TUESDAY		THURSDAY			
		Jan 19	Introduction and Geologic Time Scale Taxonomy		No Lab
Jan 24	Preservation	Jan 26	Major Fossil Groups		Lab: Preservation
Jan 31	Paleoecology	Feb 2	Paleoecology Sponge Taxonomy & Morphology		Lab: Sponges and relations
Feb 7	Functional Morphology	Feb 9	Coral Taxonomy & Morphology & Evol		Lab: Corals
Feb 14	Biostratigraphy	Feb 16	Bryozoa Taxonomy & Morphology		Lab: Bryozoans
Feb 21	Species Brach Taxonomy & Morphology & Evol	Feb 23	**TEST 1**		Lab: Brachiopods I
Feb 28	Mutation, Isolation & Adaptation	Mar 2	Brach Taxonomy & Morphology & Evol		Lab: Brachiopods II
Mar 7	Fossil-Lagerstatten I	Mar 9	Microevolution		**Lab Test 1**
Mar 13 through Mar 17 - No Classes - Spring Break					
Mar 21	Macroevolution	Mar 23	Macroevolution Mollusc Taxonomy & Morph & Evol		Lab: Molluscs I
Mar 28	Biogeography	Mar 30	Biogeography Mollusc Taxonomy & Morph & Evol		Lab: Molluscs II
Apr 4	**TEST 2**	Apr 6	Cambrian Explosion Earliest Life		Lab: Molluscs III
Apr 11	Invertebrate Diversification	Apr 13	Eustacy & Climate Echin Taxonomy & Morph & Evolution		Lab: Echinoderms
Apr 18	Changes in Sea Level & Climate	Apr 20	Influence of Tectonics Trilobite Taxonomy & Morph & Evol		Lab: Trilobites
Apr 25	Extinctions	Apr 27	Causes of Extinctions		
May 2	Causes of Extinctions	May 4	Fossil-Lagerstatten II		**Lab Test 2**
May 9		May 11	**Dead Day No Classes Test make-ups**		
Monday May 15 8 am to 10 am					

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 UNDERGRADUATE STUDENT LEARNING OUTCOMES (BACHELOR OF SCIENCE SLO's):

1. The student will be able to apply a diverse body of Geologic information in the area of Earth history.
2. The student will be able to apply a diverse body of Geologic information in the area of mineralogy and petrology.
3. The student will be able to apply a diverse body of Geologic information in the area of structural geology and tectonics.
4. The student will be able to apply a diverse body of Geologic information in the area of stratigraphy.
5. The student will be able to apply a diverse body of Geologic information in the area of field techniques.

Geology BS marketable skills (Required by THECB):

* 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. Examples of academic dishonesty include 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.