GEOLOGY 1304, Historical Geology
Spring 2015

Instructor: Dave Rohr, WSB 315; <drohr@sulross.edu>. Office hours 9:30-11:30 M-F, Tu, Th 9:30-10:30 or by appointment.

Course description: Geology 1304 covers the history of Earth including the history of life and how it is interpreted from the rocks and fossils.

Course Outline: If you satisfactorily complete this course you will be familiar with:

Week 1, Review of plate tectonics
Week 2. general classification of sedimentary rocks
Week 3.history of geological science
Week 4.the geologic time scale
Week 5. fossils Exam 1
Week 6. Evolution, extinctions
Week 7. origin of life.
Spring Break: March 10-14.
Week 8. earliest history of the earth
Week 9. Paleozoic, lithofacies, paleoenvironments, fossils.
Week 10. Paleozoic
Week 11. Mesozoic. Exam 2.
lWeek 12.Lithofacies, paleoenvironments, fossils, dinosaurs
Week 13.Cenozoic, lithofacies, paleoenvironments
Week 14. Cenozoic, paleoenvironments, fossils the Ice Ages
Final lecture exam:

Methods of Instruction: The course consists of three hours of lecture by Rohr and the corresponding optional lab GEOL 1104, which is two hours of hands-on lab work with a graduate teaching assistant. The lecture will deal with the location and shape on ancient land masses, ocean basins, mountain ranges and their relation to the theory of plate tectonics. Labs cover fossils and stratigraphic principles.

Class attendance policy: Attendance is expected in lectures. If you are going to miss a lecture exam for a legitimate reason, let the instructor know AHEAD of time.

Grading and examinations: You may review your progress at any time at the Blackboard website.
The semester grade is 90% from lecture exams and 10% from homework. Lab is a separate class and grade.

Homework assignments: 5 exercises x 2% each = 10%
First lecture exam: Wednesday, Feb 18, 30%.
Second lecture exam: Wednesday, April 1, 30 % (only covers material since the first exam)
Final lecture exam: Monday, May 11, 6:00 pm, 30%, comprehensive.

Incomplete (I) grades are given where passing work has been done and only a minor part of the requirements are incomplete. Grades are based on a standard curve (100-90=A; 89.9-80=B; 79.9-70=C; 69.9-60=D).

Texts:

Earth System History 4th ed. by S. Stanley. **ISBN:** 9781429255264
Lab Manual: None, handouts will be provided.

Disability: "Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartze, M. Ed., L.P.C., in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8203. E-mail: mschwartze@sulross.edu . ."

Reference Materials: Review copies of old exams are on the Sul Ross Blackboard Site. Homework assignments and other supplementary material are also at this site.

CONDUCT: Students are expected to observe the University's Code of Student Conduct (see Student Handbook, http://www.sulross.edu/pages/3633.asp).
Please turn OFF all cellular phones, IPODs, MP3s, etc.

Methods of assessment/evaluation – Learning outcome assessment will be made on the basis of three exams, homework, and weekly laboratory exercises. The exams will assess the application of critical reasoning and problem solving skills through short answer questions and multiple choice questions (with some diagrams). Homework assignments will assess student problem solving skills in applying, describing, and explaining principles and processes of Earth history.

Core Objectives addressed:

1) Communication Skills – Students will effectively communicate the results of scientific investigations; using oral, written, and visual communication, either in group discussions, on written exams, and in labs.

2) Critical Thinking Skills – Upon completion of this course, students will apply critical reasoning and problem solving skills to: 1. Identify, describe, and apply the basic stratigraphic principles for evaluating relative time relationships. 2. Explain the changes in life and the continents through time and relate the associated features 3. Explain the relationship between depositional environments and related facies. 4. Apply the basic classification schemes for discrimination of sedimentary rocks.

3) Empirical and Quantitative Skills – Students will use basic math skills to solve problems regarding metric conversions, as well as problems related to plate tectonic spreading rates, measurements of rock and fossils specimens, and producing proportionally correct diagrams of .

4) Teamwork Skills – Students will work effectively with others to support a shared goal during lab sessions on activities, such as map reading and interpretation, facies interpretations, stratigraphic correlation, other problem solving, experimental procedures, and meet clearly defined deadlines in a timely fashion.

GEOLOGY 1304, Historical Geology
Educator Standards TExES Science 8–12

Science Standard X

The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in Earth and space science.

DOMAIN VIII — EARTH'S HISTORY AND THE STRUCTURE AND FUNCTION OF EARTH SYSTEMS

Standards Assessed: Science X

Competency 036: *The teacher understands structure and function of the geosphere.*

The beginning teacher:

A. Analyzes the internal structure and composition of Earth and methods used to investigate Earth's interior (e.g., seismic waves, chemical composition of rocks).

B. Classifies rocks according to how they are formed as described by the rock cycle (e.g., igneous, sedimentary, metamorphic) and identifies the economic significance of rocks and minerals.

C. Uses physical properties (e.g., density, hardness, streak, cleavage) to identify common minerals and understands processes affecting rock and mineral formation (e.g., temperature, pressure, rate of cooling).

D. Identifies different types of landforms and topographic features on the surface of Earth, including the ocean floor (e.g., faults, volcanoes, mid-ocean ridges, deltas).

G. Analyzes the cycling and transformation of matter and energy through the geosphere (e.g., mantle convection).

H. Relates the principles of conservation of mass and energy to processes that occur in the geosphere (e.g., the melting of rock).

Competency 037: *The teacher understands processes of plate tectonics, weathering, erosion and deposition that change Earth's surface.*

The beginning teacher:

A. Understands how the theory of plate tectonics explains the movement and structure of Earth's crustal plates (e.g., sea-floor spreading, major tectonic plates, subduction).

B. Understands evidence for plate movement (e.g., magnetic reversals, distribution of earthquakes, GPS measurements).

C. Describes the historical development of the theory of plate tectonics (e.g.,Wegener's continental drift hypothesis).

D. Analyzes the effects of plate movement, including faulting, folding, mineral formation, earthquakes and volcanic activity.

Competency 038: *The teacher understands the formation and history of Earth.*

The beginning teacher:

A. Knows the historical development of scientific theories relating to the origin and development of Earth (e.g., Hutton's uniformitarianism).

B. Understands how Earth's geosphere, hydrosphere and atmosphere have changed over time and analyzes the significance of these changes (e.g., formation of oxygen in the atmosphere).

C. Understands the organization of the geologic time scale and methods of relative (e.g., superposition, fossils) and absolute (e.g., radiometric, dendrochronology) dating.

D. Identifies important events in the history of Earth (e.g., formation of major mountain chains, breakup of continents, appearance of life, appearance of multicellular organisms) and locates these events on the geologic time scale.

E. Understands relationships between physical changes during Earth's history and biological evolution (e.g., plate movement and biogeography; meteoric impacts, global temperature changes, extinctions, adaptive radiations, formation of ozone layer) and predict future effects (e.g., changing ocean temperatures).

F. Analyzes processes involved in the formation