

SYLLABUS
Physical Geology GEOL 1401-070
Fall, 2015
TR 11:00 AM- 12:15 PM VIN 139

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Office hours: Monday, Wednesday, Friday 8AM - 10AM, Tuesday, Thursday 9AM – 11AM or by appointment.

Required Texts:

1. *Earth: Portrait of a Planet, Fifth Edition, Stephen Marshak*
2. *Laboratory Manual in Physical Geology, Tenth Edition, edited by R. M. Busch*

Grading:

- 2 exams (15% each)
- 1 comprehensive final exam (20%)
- 2 homework assignments (3% each).
- 2 lab quizzes (10% each),
- 8 graded lab exercises (3% each)
- Extra Credit Project (+ 0 - 5%), Brief, illustrated report about a scientific paper on a geology topic of your own choosing. Details to be provided after Exam 1.
- Make-up a single lab or two homework grades by participating on an optional field trip and turning in a brief report.

Student learning outcomes

You will learn about rocks and minerals that make up Earth and the sometimes subtle and often destructive processes that shape it. You will learn and test fundamental concepts about volcanoes, earthquakes, river flooding, oil and gas resources, groundwater, and plate tectonics.

Problem-solving techniques that you will learn and practice:

1. Use multiple working hypotheses
2. Be skeptical: look for ways to test hypotheses
3. Make sketches: they help in visualizing the world in three dimensions
4. Quantify events and processes when possible
5. Apply the Principle of Uniformitarianism
6. Study and work together
7. Get as much practice or experience as you can
8. Carefully defend your thinking when answering questions.

Field Trips

On field trips you will get a chance to apply concepts discussed in class to describe and interpret outcrops of rocks and sediments. On the optional weekend trips we will travel in a university van. No special equipment is required but space is limited! You may go on more than one optional trip, but you can only use one field trip project to replace a single homework or lab assignment grade.

Tentative schedule:

- 1) Required field trip to San Angelo State Park during lab time: Monday-Thursday afternoon October 19-22. We will meet at San Angelo State Park to review and practice rock and mineral identification skills on Permian and younger rocks. Leader: your lab instructor (James Ward, Heather Lehto, Fawn Last, Bob Purkiss, or Joe Satterfield)
- 2) Big Bend National Park: Friday-Sunday, November 6-8. Physical Geology field trip to western Big Bend National Park: hike and sketch Cretaceous stratigraphy in Santa Elena Canyon, collect shark teeth and dinosaur bone fragments in Terlingua area, describe Tertiary volcanic rocks in Tuff Canyon and Chisos Mountains. Leaders: James Ward, Joe Satterfield, and Fawn Last.
- 3) Favorite San Angelo area outcrops: Saturday, December 5. We will meet early in the morning and return in the mid-afternoon. We will visit Spillway Hill, the Nasworthy Dam, the Concho River in Downtown San Angelo, a working oil well and tank battery, a fossil collecting locality in the Edwards Plateau on Devil's Courthouse Mountain. Leaders: Joe Satterfield, James Ward, Heather Lehto, and Fawn Last

GEO, the student organization for all interested in geology, meets Wednesdays at 6:00 pm. The first meeting will be September 1. GEO is a Student Chapter of the American Association of Petroleum Geologists (www.aapg.org). Sigma Gamma Epsilon, the national honor society of the earth sciences is related to GEO.

Attendance Policy

You are expected to attend every class meeting. Your attendance will be recorded. We will discuss many topics that are not in the textbook. If you must miss a class, contact me if you need help in obtaining assignments or notes. Although showing up for class is not directly part of your grade (see Grading section above), you will find it extremely difficult to pass this class if you do not attend regularly and participate!

Course Webpages

<http://blackboard.angelo.edu> contains Powerpoint slides, web links to scenic areas mentioned in class, practice problems, answers to lab assignments, and your official grades.

Know the ASU Honor Code

Angelo State University expects its students to maintain complete honesty and integrity in their academic pursuits. Students are responsible for understanding the Academic Honor Code, which is contained in both print and web versions of the Student Handbook.

Student Organization

GEO, the student organization of all interested in geology, meets Wednesdays at 7:00 pm. The first meeting will be September 4. GEO is a student chapter of the American Association of Petroleum Geologists (www.aapg.org). Sigma Gamma Epsilon, the national honor society of the earth sciences is related to GEO.

YOU CAN MAJOR OR MINOR IN GEOLOGY at ASU!

See Geoscience BS requirements at

https://www.angelo.edu/dept/physics/geoscience_degree.php An Earth

Science Minor requires 18 hours of geology courses. Physical Geology is a requirement for a major or a minor.

Rewarding careers exist for geologists, geophysicists, hydrogeologists, and secondary science teachers. Talk to

your professors! Read <http://www.bls.gov/ooh/life-physical-and-social-science/print/geoscientists.htm>.

Statement of Persons with disabilities

Persons with disabilities which may warrant academic accommodations must contact the Student Life Office, Room 112 University Center, in order to request such accommodations prior to any accommodations being implemented. You are encouraged to make this request early in the semester so that appropriate arrangements can be made.

Statement of religious holy days

A student who intends to observe a religious holy day should make that intention known in writing to the instructor prior to the absence. A student who is absent from classes for the observance of a religious holy day shall be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.

| Week | Lecture/discussion topics | Lab Exercises |
|-------------|--|--|
| I | Chapters 2,3 and 4 Journey to the centre of the Earth, Drifting continents and Plate Tectonics | 1. Topographic maps and aerial photos (p.227-249) |
| II | <i>Project discovering plate boundaries</i> | 2. Rock-forming minerals (p.73-100) |
| III | <i>Project discovering plate boundaries</i> Chapter 5. Minerals | No labs! Labour Day Holiday Monday |
| IV | Chapter 6. Magma and Igneous Rocks | 3. Igneous Rocks (p129-142) |
| V | Chapter 7. Sedimentary Rocks | 4. Sedimentary Rocks (P153-170) |
| VI | Exam 1 (Sept 29) Chapter 8. Metamorphic Rocks Chapter 12. Geologic maps | 5. Metamorphic Rocks (p 187-198) |
| VII | Chapter 9. Volcanic eruptions | Review for Lab Quiz 1 |
| VIII | Chapter 10. Earthquakes | Lab Quiz 1 Minerals and rocks (Labs 2-5) |
| IX | Chapter 11. Mountain Building <i>Project, constructing block diagrams of structures.</i> | 6. San Angelo State Park Field Trip (Required): Meet at State Park |
| X | Chapter 14. Energy resources <i>Project: Fault games with wood blocks</i> | 7. Block Diagrams of folded and faulted rocks (p.259-272) |
| XI | EXAM 2 (Nov 3) Chapter 21. Deserts | 8. Constructing a geologic cross section Part I (p 264-268) |
| XII | Chapter 17. Floods | 8. Constructing a geologic cross section Part II (P. 264-268) |
| XIII | Chapter 19. Groundwater | Practice for Lab Quiz 2 |
| XIV | Chapter 22. Glaciers and ice ages | No Labs (Thanksgiving Holidays) |
| XV | Review | Lab Quiz 2: Topographic and Geologic Maps (Labs 1, 6-8) |
| XVI | FINAL EXAM December 8 10:30AM -12:30PM | |