PHYSICAL GEOLOGY, Fall 2017
GEOL 1403-02
MWF, 9-9:50a
VIN-158

Professor: James W. Ward, Ph.D., P.G.
Office: VIN 124
Phone: 325.486.6767
Dept. office: 325.942.2242
E-mail: james.ward@angelo.edu

OFFICE HOURS: Monday-Friday 11:00-Noon, T and R 10:00-11:00.
Or contact me to set up an alternate time to meet

REQUIRED MATERIALS:
- LAB MANUAL: *GEOL 1403, Physical Geology Laboratory Manual, Heather L. Lehto*
- ASU email account that you check regularly
- Blackboard course site: http://blackboard.angelo.edu

STUDENT LEARNING OBJECTIVES
1) Describe and draw the layers of the Earth, including the chemically and physically different layers.
2) Describe the theory of plate tectonics including identifying plate boundaries, describing plate motions at boundaries, and identifying landforms/features associated with each boundary.
3) Identify rocks and minerals and describe the formation process of the three rock types.
4) Determine the possible natural hazards to an area (i.e., volcanoes, earthquakes, floods, erosion).
5) Place geologic events in order using relative and numerical dating techniques.
6) Evaluate good and bad aspects of energy resources.
7) Describe where our water comes from in Texas and how humans can affect those sources.
8) Describe coastal processes that affect the ocean currents and beaches.

Learning outcomes will be evaluated on exams, lab projects and an IDEA course evaluation

CORE CURRICULUM STUDENT LEARNING OUTCOMES: The following list of core curriculum student learning outcomes will be met and measured during this course.

<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Assessment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Gather, analyze, evaluate, and synthesize information relevant to a question or issue.</td>
<td>Lab Quiz</td>
</tr>
<tr>
<td>2. Develop, interpret, and express ideas through effective visual communication.</td>
<td>Lab Assignment</td>
</tr>
<tr>
<td>3. Manipulate and analyze numerical data and arrive at an informed conclusion</td>
<td>Homework/In-class Assignment</td>
</tr>
<tr>
<td>4. Manipulate and analyze observable facts and arrive at an informed conclusion</td>
<td>Average Lab Grade</td>
</tr>
<tr>
<td>5. Work effectively with others to support and accomplish a shared goal.</td>
<td>IDEA Forms</td>
</tr>
</tbody>
</table>
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.
- Optional Field Trip. Make up a single lab or homework grade by participating on an optional field trip and turning in a brief project report. More details on next page.

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.

1) Required field trip to San Angelo State Park during lab time: Monday-Thursday afternoon October 16 -19 (Dr. Satterfield's (Joe's) M-3 and R-3 labs: October 9 or 12). 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)


3) Favorite San Angelo area outcrops: Saturday, December 9. 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, and a fossil collecting locality in the Edwards Plateau on Devil's Courthouse Mountain. Leaders: Joe Satterfield and James Ward.

4) Archaeology Fair or Elementary School Science Nights: Archaeology Fair at Fort Concho in San Angelo, Saturday, September 23, and Science Nights at Elementary Schools, one or two weekday evenings, dates to be announced. Help Geoscience majors and faculty lead a hands-on geology activity for all ages. Leader: Fawn Last.

ATTENDANCE POLICY:
You are expected to attend every class meeting. 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!

CELL PHONES and OTHER ELECTRONIC DEVICES:
You WILL NOT need an electronic device of any kind (smartphone, cell phone, tablet, laptop, etc.) to participate in class. Please do not use any electronic device during class time unless you have obtained prior authorization from Dr. Ward.
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.

STUDENTS 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.

RELIGIOUS HOLY DAY:
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.

YOU CAN MAJOR OR MINOR IN GEOLOGY @ ASU!

SCHEDULE: All information is subject to change.

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture/Discussion Topics</th>
<th>Lab Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>I:</td>
<td>Minerals (Ch 5, p. 116)</td>
<td>1: Topographic maps and aerial photos (read p. 1 – 7 before lab) Dr. Joe’s labs: Lab 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>II:</td>
<td>Journey to the Center of the Earth (Ch 1 and 2, p. 34) Magma and Igneous Rocks (Ch. 6, p. 152) Project: Calculating pluton surface area</td>
<td>No labs this week! (Labor Day Holiday Monday)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV:</td>
<td>9/18: HOMEWORK 1 DUE Project: Discovering Plate Boundaries, Parts 2, 3 Metamorphic Rocks (Ch 8, p. 233)</td>
<td>3: Igneous Rocks (p. 34 – 37) Dr. Joe’s labs: Lab 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Dates</td>
<td>Assignment/Activities</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
<td>-----------------------</td>
</tr>
</tbody>
</table>
| VI:  | 10/2, 10/4, 10/6 | The Wrath of Vulcan: Volcanic Eruptions (Ch 9, p. 272)  
*Project: Constructing 3-D volcano models* |
| VII: | 10/9, 10/11, 10/13 | A Violent Pulse: Earthquakes (Ch 10, p. 312)  
*Project: Locating Earthquake epicenters*  
LAB QUIZ 1: MINERALS AND ROCKS (Labs 2-5)  
Dr. Joe’s labs: Lab 6 |
| VIII: | 10/16, 10/18, 10/20 | Mountain Building (Ch 11, p. 379)  
*Project: Constructing block diagrams of structures*  
6: San Angelo State Park Field Trip (Required): Meet at State Park. Directions: p. 62 – 63  
Dr. Joe’s labs: Lab 1 |
| IX:  | 10/23, 10/25, 10/27 | 10/23 – 10/25, Geological Society of America Meeting, Seattle  
10/27: Project: Fault games with wood blocks  
10/27: HOMEWORK 2 DUE |
| X:   | 10/30, 11/1, 11/3 | Project: Viewing mountains in 3-D  
Oil, natural gas resources in Texas (Ch 14, p. 504)  
7: Block diagrams of folded and faulted rocks (p. 68 – 74) |
| XI:  | 11/6, 11/8, 11/10 | Bronte Oil Field Project  
Wind and deserts: Chihuahuan Desert, West Texas, Great Basin, Nevada (Ch 21, p. 768)  
11/10: EXAM 2 |
| XII: | 11/13, 11/15, 11/17 | Streams and Floods (Ch 17, p. 614)  
*Project: Constructing Rum Brook profile* |
| XIII:| 11/20 | Groundwater (Ch.19, p. 694)  
No Labs this week! (Thanksgiving Holidays Weds-Fri) |
| XIV: | 11/27, 11/29, 12/1 | Glaciers and Ice Ages (Ch. 22., pg. 795)  
*Project: Drawing a Drumlin*  
Practice for Lab Quiz 2 |
| XV:  | 12/4, 12/6, 12/8 | Review Projects  
12/8: MAKE-UP EXAMS  
LAB QUIZ 2: TOPOGRAPHIC AND GEOLOGIC MAPS (Labs 1, 6-8) |
| XVI: | 12/13 | FINAL EXAM: 8:00 – 10:00 am |