GEOL 1403 Physical Geology (4 credits)
Fall 2018

Section 010 MWF 9:00-9:50am
Lab Section: 06Z M 1:00-2:50pm
Lab Section: 07Z M 3:00-4:50pm
ROOM: VIN 139

Instructor: Dr. Heather L. Lehto
Email: Heather.Lehto@angelo.edu
Office hours: VIN 127, TWR 2-4pm or by appointment

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

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 their formation processes.
4) Identify and describe various volcanic hazards.
5) Identify and describe various earthquake hazards.
6) Describe how mountains are formed including how stress causes deformation and what kinds of deformation result.
7) Place geologic events in order using the geologic principles and correlate layers on a regional scale.
8) Evaluate good and bad aspects of energy resources.
9) Describe where our water comes from in Texas and how humans can affect those sources.
10) Explain variations in the ocean and coastlines.
11) Describe how climate changes and what affect humans have on climate change.

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>
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<tbody>
<tr>
<td>1. Gather, analyze, evaluate, and synthesize information relevant to a question or issue.</td>
<td>Lab Quiz</td>
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<td>2. Develop, interpret, and express ideas through effective visual communication.</td>
<td>Lab Assignment</td>
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<tr>
<td>3. Manipulate and analyze numerical data and arrive at an informed conclusion</td>
<td>Homework/In-class Assignment</td>
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<td>4.</td>
<td>Manipulate and analyze observable facts and arrive at an informed conclusion</td>
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<td>Average Lab Grade</td>
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<tr>
<td>5.</td>
<td>Work effectively with others to support and accomplish a shared goal.</td>
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<td>IDEA Forms</td>
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**ATTENDANCE POLICY:** You are expected to attend all scheduled class meetings. Missed lecture activity points CANNOT be made up. Attendance will be checked at each class meeting via the TopHat system at random. Please inform me well ahead of time if you will need to be absent for any reason including religious holidays. NOTE: You are NOT automatically dropped if you stop attending class. November 2 is the last day to drop a course.

**CELL PHONES AND OTHER ELECTRONIC DEVICES:** You may use a laptop or tablet to take notes during class. Please do not disturb others with their use. The use of any electronic device not authorized by the instructor during a test may result in the forfeiture of your grade for that test. All electronic devices should be turned off and stored out of sight during tests.

**GRADING:**

- 4 exams (5% each)
- 1 comprehensive final exam (12%)
- 15 chapter quizzes (1% each, lowest 2 are dropped)
- 4 Smartwork Homework Assignments (3% each)
- 2 lab practicals (10% each)
- 8 graded lab exercises (2.5% each)
- 6 pre-lab quizzes (0.5% each)

- Extra Credit Project (+ 0 – 5 pts), 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 grade by participating on an optional field trip and turning in a brief project report.

Make-up exams will be given for tests ONLY under extenuating circumstances. Prior email notification is needed for a make-up exam. There will be NO makeup chapter quizzes given, that is what the 3 dropped are for.

**SMARTWORK ASSIGNMENTS**

To complete the Smartwork homework assignments you will need to register with Smartwork using the enrollment code below and the registration code you got when you purchased the book. Use the following instructions to create an account with Smartwork:

To enroll in SmartWork you will need an Enrollment Key (provided by your instructor), a valid email address, and a Registration Code from W. W. Norton. Registration codes are contained within SmartWork folders; these are bundled with new books at your instructor's request. If you do not have a registration code, you may purchase one at wwnorton.com/smartwork.
Register For Smartwork

1. Go to https://digital.wwnorton.com/earth5
2. Click on “Sign in, register a code, or purchase access”
3. Select “No, I need to register, purchase, or sign up for trial access.” Click the green button to continue.
4. Fill out all fields and enter either the registration code that come with your book or select the “I want to view purchase and class test options” option. NOTE: Use your ASU email as the email address for your Smartwork account. Don’t forget to record your account information for future reference!

Access your course in Smartwork: You will then need to add yourself to the correct student set for your course.

1. Log into Smartwork
2. Click on the gear menu in the upper-right corner of your screen.
3. In the dropdown menu, select “Add Yourself to a Student Set.”
4. In the pop-up window, enter in the five-digit Student Set ID number provided below.

Student Set ID: 62851

Access the Smartwork help pages by clicking the gear icon in the upper-right corner of the screen after logging in. This will give you information on how to use the Smartwork system to do your assignments.

For each homework assignment you will complete a list of questions. You can submit answers to the questions up to 4 times, however, each additional submission after the first will cost you a 5% deduction on your grade. So don’t just go guess until you get it right, it will cost you.

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 university vehicles. 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 lab assignment grade.

Tentative schedule:

1) **Required field trip to San Angelo State Park during lab time.** Monday-Thursday afternoon October 16-20. We will meet at San Angelo State Park to review and practice rock and mineral identification skills on Permian and younger rocks. Leaders: Joe Satterfield, Elizabeth Koeman-Shields, Bob Purkiss, and Heather Lehto.

2) **Optional field trip to Sonora Caverns.** Date November 3. This field trip will head to the world famous Sonora Caverns in Sonora, TX to explore this beautiful cave. The cave contains some of the most beautiful and unique cave formations in the world. The tour of the caverns is led by one of the cave guides who will describe both the human and geologic history of the cave. Leader: Heather Lehto.

3) **Optional field trip to Big Bend National Park.** Friday-Sunday, November 9-11. 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. Leader: Joe Satterfield.

CLASS PREPARATION ASU EMAIL: Since class announcements will be routinely distributed via email and Blackboard, you will need to regularly check your ASU email account and our course Blackboard site (daily). All course correspondence will be through your ASU email account and Blackboard. Please see the email policy in Bb for more details. ASU provides Internet and email services to you at any of the computer labs on campus. Call 942-2911 to set this up if necessary.

LECTURE: A typical class meeting will combine lectures, discussions, group activities, multimedia presentations, and other demonstrations and activities to give you an opportunity to learn concepts in as active a manner as possible.

KNOWLEDGE SURVEYS: Knowledge surveys are intended to give you a means of self-assessing your own learning and to serve as a guide for studying. The entire Knowledge Survey for this course is available in pdf format on Blackboard all the time. Knowledge survey items that will be tested on individual exams will be posted on a Blackboard quiz (there are NO POINTS for these) at least a week prior to the Exam. Taking the Knowledge Survey quiz will help you categorize the items you need to study based on your confidence in you knowledge of the item. The results of you Knowledge Survey quiz will be shown after clicking “OK” after taking the quiz. If you should need your results again for any reason simply email Dr. Lehto (heather.lehto@angelo.edu).

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.

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.
GEOLOGIC EXHIBITION ORGANIZATION (GEO):

GEO, the student organization of all interested in geology (not just majors/minors), meets almost every Wednesday @ 6:00PM. 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 @ ASU! See the BS in Geoscience requirements at https://www.angelo.edu/physics/geoscience_degree.php. A Geology Minor requires 18 hours of geology courses. Good and rewarding careers exist for geologists, geophysicists, hydrogeologists, secondary science teachers, and petroleum engineers. Talk to your professor and read http://www.angelo.edu/dept/physics/Geosciences/geoscience_careers.php.

FINAL NOTE:
It is my goal to make this class both interesting and informative for you. With a reasonable amount of effort, it should be possible for everyone to meet the course objectives and earn a passing grade. With additional effort, aptitude, and investment of time, students may earn even higher course grades. If at any time you run into difficulties with the material, or need assistance or clarification, please do not hesitate to ask for help. I am here for you, and I will be glad to entertain any reasonable requests.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Lecture Topic</th>
<th>Chapter Quizzes</th>
<th>Lab Exercise and Pre-lab Reading</th>
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</thead>
<tbody>
<tr>
<td>August 27</td>
<td>Syllabus&lt;br&gt;Planet Earth&lt;br&gt;Continental Drift and Plate Tectonics</td>
<td>Ch 1 &amp; 2&lt;br&gt;Ch 3 &amp; 4</td>
<td>1: Topographic maps and aerial photos&lt;br&gt;(Pre-lab reading: pg. 1-7)</td>
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<tr>
<td>September 3</td>
<td><strong>No classes Monday, September 3</strong>&lt;br&gt;Continental Drift and Plate Tectonics</td>
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<td>No labs this week!!!</td>
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<td>September 10</td>
<td>Minerals&lt;br&gt;Igneous Rocks</td>
<td>Ch 5&lt;br&gt;Ch 6</td>
<td>2: Rock-forming minerals&lt;br&gt;(Pre-lab reading: pg. 18-30)</td>
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<td>September 17</td>
<td>Igneous Rocks&lt;br&gt;Sedimentary Rocks&lt;br&gt;<strong>Exam 1: Chapters 1-5</strong></td>
<td>Ch 7</td>
<td>3: Igneous Rocks&lt;br&gt;(Pre-lab reading: pg. 34-37)</td>
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<td>September 24</td>
<td>Metamorphic Rocks&lt;br&gt;Volcanoes</td>
<td>Ch 8&lt;br&gt;Ch 9</td>
<td>4: Sedimentary Rocks&lt;br&gt;(Pre-lab reading: pg. 42-48)</td>
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<td>October 1</td>
<td>Volcanoes&lt;br&gt;Earthquakes</td>
<td>Ch 10</td>
<td>5: Metamorphic Rocks&lt;br&gt;(Pre-lab reading: pg. 54-57)</td>
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<tr>
<td>October 8</td>
<td>Earthquakes&lt;br&gt;<strong>Exam 2: Chapters 6-9</strong></td>
<td></td>
<td>Review for Lab Quiz 1</td>
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<td>October 15</td>
<td>Mountain Building&lt;br&gt;Geologic Time</td>
<td>Ch 11&lt;br&gt;Ch 12</td>
<td>Lab Quiz 1: Minerals and Rocks (Labs 2-5)</td>
</tr>
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<td>October 22</td>
<td>Geologic Time&lt;br&gt;Energy Resources</td>
<td>Ch 14</td>
<td>6: San Angelo State Park Field Trip - Required&lt;br&gt;(Pre-lab reading and directions: pg 62-63)</td>
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<td>October 29</td>
<td>Energy Resources&lt;br&gt;Streams</td>
<td>Ch 17&lt;br&gt;Ch 18</td>
<td>7: Block diagrams of folded and faulted rocks&lt;br&gt;(Pre-lab reading: pg. 68-73)</td>
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<td>November 5</td>
<td>Oceans&lt;br&gt;<strong>Exam 3: Chapters 10, 11, 12, 14</strong></td>
<td></td>
<td>8: Constructing a geologic cross section&lt;br&gt;(Pre-lab reading: pg. 90-92)</td>
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<tr>
<td>November 12</td>
<td>Groundwater</td>
<td>Ch 19</td>
<td>8: Constructing a geologic cross section (continued)</td>
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<td>November 19</td>
<td>TBD&lt;br&gt;<strong>No classes November 21-23</strong></td>
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<td>No labs this week!</td>
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<td>November 26</td>
<td>Climate Change&lt;br&gt;<strong>Exam 4: Chapters 17, 18, 19, 23</strong></td>
<td>Ch 23</td>
<td>Review for Lab Quiz 2</td>
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<tr>
<td>December 3</td>
<td>TBD&lt;br&gt;Review</td>
<td></td>
<td>Lab Quiz 2: Topographic and geologic maps&lt;br&gt;(Labs 1 and 6-8)</td>
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<td>December 10</td>
<td><strong>Final Exam</strong>&lt;br&gt;Wednesday, December 12, 8-10am</td>
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<td>No labs!!!!</td>
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