Columbian mammoths roamed the Concho and Colorado River valleys in the Pleistocene Ice Ages (Ch 19). ASU fossil collections include mammoth bones, teeth, and a tusk. Mammoth bones have been excavated in San Angelo State Park. Sketch by Tim King, Santa Clara University (from San Jose State news release). Explore a mammoth mass-death site on the ASU field trip to the Waco Mammoth National Monument March 28!

**Professor: Dr. Joe Satterfield**
Office: VIN 122
Office phone: 325-486-6766
Physics and Geosciences Department Office: 325-942-2242
E-mail: joseph.satterfield@angelo.edu

**Office hours**
- Monday: 8:00 – 10:00 am, 1:00 – 3:00 pm
- Tuesday: 9:00 – 11:00 am
- Wednesday: 8:00 – 10:00 am, 2:00 – 3:00 pm
- Thursday: 10:00 – 11:00 am
- Or contact me to set up a convenient time to meet

**Required Textbooks**
2. *ASU Historical Geology Lab Manual*, by Heather L. Lehto (purchase from ASU Bookstore)

**Grading**
- 2 exams (25% each)
- 1 comprehensive final exam (35%)
- 3 homework assignments (5% each)
- Extra Credit Project (+ 0 – 10%). Brief, illustrated report about a scientific paper on a geology topic of your own choosing. Details provided after Exam 1.

**Course Expectations**
1) You are expected to attend every lab meeting. Your attendance will be recorded. We will discuss many topics of Texas and North American geology that are not in the textbook.

2) Take the next big step: let’s talk in outside of lab about almost anything. My office, VIN 122, is a good place to find me or to see where I am. Topics I like to discuss: geology, hiking and backpacking trails, productive ways of learning geology, racquetball, Lord of the Rings, future careers, lame jokes, and more.

3) Do not distract yourself or others in the lab with electronic devices. You will put away your phone and will not text during class.
<table>
<thead>
<tr>
<th>Dates</th>
<th>Topics</th>
<th>Lab Schedule</th>
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</thead>
<tbody>
<tr>
<td>I: 1/14, 1/16</td>
<td>1/14: Earth as a System (Ch 1) &lt;br&gt;The geologic time scale &lt;br&gt;1/16: Fundamental Geologic Principles (~6) &lt;br&gt;Project: Working out Sequences of Events</td>
<td>Introduction &lt;br&gt;Lab Safety</td>
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<td>II: 1/21, 1/23</td>
<td>Describing sedimentary rocks (Ch 2) &lt;br&gt;The diversity of life and fossils (Ch 3)</td>
<td>LABS DO NOT MEET &lt;br&gt;(MLK HOLIDAY ON MONDAY)</td>
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<td>III: 1/28, 1/30</td>
<td>Sedimentary Environments (Ch 5) &lt;br&gt;Transgressions and regressions</td>
<td>1: Rock-forming minerals (Lab Manual Ch 1)</td>
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<td>IV: 2/4, 2/6</td>
<td>2/4: HOMEWORK ASSIGNMENT 1 DUE &lt;br&gt;Correlation and Dating of the Rock Record (Ch 6) &lt;br&gt;Project: Correlating strata</td>
<td>2: Sedimentary rocks: Describing and interpreting sedimentary environments (Lab Manual Ch 2)</td>
</tr>
<tr>
<td>V: 2/11, 2/13</td>
<td>2/11: EXAM 1 &lt;br&gt;Project: Calculating rock ages &lt;br&gt;Project: M&amp;M Radioactive decay</td>
<td>3: Stratigraphic column of rocks in Concho River Valley &lt;br&gt;(Lab Manual Ch 3)</td>
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<td>VI: 2/18, 2/20</td>
<td>Evolution and the Fossil Record (Ch 7) &lt;br&gt;Project: Bird beak contest</td>
<td>4: Igneous and metamorphic rocks (Lab Manual Ch 4)</td>
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<td>VII: 2/25, 2/27</td>
<td>Hadean, Archean Eons of Precambrian (Ch 11) &lt;br&gt;Proterozoic Eon of Precambrian (Ch 12) &lt;br&gt;Project: Interpreting Llano uplift geologic maps</td>
<td>5: FIELD TRIP 1 - Permian trackways, San Angelo State Park &lt;br&gt;(Lab Manual Ch 5) &lt;br&gt;LAB 5 DUE AT END OF TRIP</td>
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<tr>
<td>VIII: 3/3, 3/5</td>
<td>Late Paleozoic mountain-building, reefs in West Texas (Ch 15)</td>
<td>LAB QUIZ 1: DESCRIBING ROCKS (Labs 1, 2, 4, and 5)</td>
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<td>3/9 – 3/13</td>
<td>SPRING BREAK – GET OUTSIDE!</td>
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<td>X: 3/24, 3/26</td>
<td>The Early Mesozoic Era (Ch 16) &lt;br&gt;Project: Viewing rocks under polarizing scopes</td>
<td>7: Fossils, Keys to Past Life &lt;br&gt;(Lab Manual Ch 7)</td>
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<td>XI: 3/31, 4/2</td>
<td>3/31: EXAM 2 &lt;br&gt;Giant aquatic reptiles: placodonts, ichthyosaurs, plesiosaurs, mosasaurs (Ch 16)</td>
<td>8: More Common Texas Fossils &lt;br&gt;(Lab Manual Ch 8)</td>
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<td>XII: 4/7, 4/9</td>
<td>How to recognize, evaluate results of science Dinosaurs (Ch 17)</td>
<td>9: FIELD TRIP 2: Fossil Localities near Christoval &lt;br&gt;(Lab Manual Ch 9) &lt;br&gt;LAB 9 DUE AT END OF TRIP</td>
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<td>XIII: 4/14, 4/16</td>
<td>The Cretaceous World (Ch 17)</td>
<td>10: Paleo-Geoenvironments</td>
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<td>Lab Schedule</td>
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| XIV 4/21, 4/23 | Dinosaur extinction hypotheses and tests  
The rise of the Rocky Mountains | (Lab Manual Ch 10)                                                             |
|             | 4/21: HOMEWORK ASSIGNMENT 3 DUE  
Cenozoic volcanoes in West Texas  
The Pleistocene Epoch: the first humans, Ice Ages, and woolly mammoths (Ch. 18, 19) | Review all fossils in lab  
Practice Quiz on fossils |
| XV: 4/28, 4/30 | Dead Week Review of Historical geology  
problem-solving techniques  
Review project: 3-D Images of active Faults in Basin and Range and California  
Review Project: constructing thickness map  
Review Project: Grand Canyon Seq. of Events  
5/2: All make-up exams | LAB QUIZ 2: FOSSILS  
(Labs 6, 7, 8, 9, and 10) |
| XVI: 5/5     | 5/5: 10:30 am – 12:30 pm: FINAL EXAM                                  | Lab does not meet!                                                             |

**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 homework or lab assignment grade. Tentative schedule:

1. **Girl Scout STEM Conference:** Saturday, March 21: for Middle School and High School young women, various rooms and labs on ASU campus. Some volunteer opportunities on Friday, March 20. Leaders:
2. **Waco Mammoth National Monument:** March 28, [Waco Mammoth Information](#) Leader: Elizabeth Koeman-Shields
3. **Art and Science Day at the San Angelo Museum of Fine Art:** Saturday, April 11, Leader: Heather Lehto
4. **Elementary School Science Nights:** evenings to be announced. Opportunities for sharing basics of rocks, fossils, and maps with students, their parents, and interested people of all ages.
5. **Rocker B Ranch field trip:** Saturday, May 2: Learn W. Edwards Plateau geology and collect fossils at the historic Rocker B Ranch outside Mertzon and Barnhart. Leaders: Cody Webb, Joe Satterfield

**Student Learning Outcomes**

1. To practice problem-solving techniques used to interpret the history of Earth. Many of these are applicable to other fields and to everyday life. Problem-solving techniques that you will practice:
   - Use multiple working hypotheses
   - Be skeptical: look for ways to test hypotheses
   - Make sketches: they help in visualizing the world in three dimensions
   - Quantify events and processes when possible
   - Apply the Principle of Uniformitarianism
   - Study and work together
2. Get as much practice or experience as you can To find out about major events in Earth history over the last 5 billion years, including the appearance of diverse living things, changes in climate, and the rise of mountains
3. To recognize, and make interpretations from, common rock types, fossils and landforms present in West Texas and western North America

Learning outcomes 1 – 3 will be evaluated by grades on exams, lab projects, lab quizzes, and homework.
Core-course learning objectives

1. Critical Thinking Core Objective, SLO1: Students will be able to state a question, gather information, analyze data, identify assumptions, develop hypotheses, and evaluate results to arrive at an answer to a question.

2. Communication Core Objective, SLO2: Students will be able to represent, organize, format, and display data and information visually.

Course Webpages
The Angelo State Blackboard site\(^2\) contains PowerPoint slides, web links to scenic areas mentioned in class, practice problems, answers to lab assignments, and your official grades.

Geoscience Careers
See Geoscience BS requirements in the Angelo State Catalog\(^3\). A Geoscience 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!

The US Department of Labor Occupational Handbook\(^4\) contains information on geology careers, salaries, education needed, and future job outlook in geology.

GEO, the student organization for all interested in geology, meets twice a month, Wednesdays at 6:00 pm. The first meeting is January 23. GEO is a Student Chapter of American Association of Petroleum Geologists\(^5\).

Academic Integrity
Students are expected to maintain complete honesty and integrity in all work. Any student found guilty of any form of dishonesty in academic work is subject of disciplinary action and possible expulsion from ASU. The College of Science and Engineering adheres to the Statement of Academic Integrity\(^6\).

Plagiarism
Plagiarism is a serious topic covered in ASU’s Academic Integrity policy in the Student Handbook. Plagiarism is the action or practice of taking someone else’s work, idea, etc., and passing it off as one’s own. Plagiarism is literary theft.

In your discussions and/or your papers, it is unacceptable to copy word-for-word without quotation marks and the source of the quotation. It is expected that you will summarize or paraphrase ideas giving appropriate credit to the source both in the body of your paper and the reference list.

Papers are subject to be evaluated for originality via Turnitin. Resources to help you understand this policy better are available at the ASU Writing Center\(^7\).

Copyright Policy
Students officially enrolled in this course should make only one printed copy of the given articles and/or chapters. You are expressly prohibited from distributing or reproducing any portion of course readings in printed or electronic form without written permission from the copyright holders or publishers.

Accommodations for Students with Disabilities
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation.
Student Disability Services is located in the Office of Student Affairs, and is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability. It is the student’s responsibility to initiate such a request by contacting an employee of the Office of Student Affairs, in the Houston Harte University Center, Room 112, or contacting the department via email at ADA@angelo.edu. For more information about the application process and requirements, visit the Student Disability Services website. The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

Dallas Swafford, Director of Student Disability Services
Office of Student Affairs, Houston Harte University Center, Room 112
325-942-2047
dallas.swafford@angelo.edu

Title IX
The University prohibits discrimination based on sex, which includes pregnancy, sexual orientation, gender identity, and other types of Sexual Misconduct. Sexual Misconduct is a broad term encompassing all forms of gender-based harassment or discrimination including: sexual assault, sex-based discrimination, sexual exploitation, sexual harassment, public indecency, interpersonal violence (domestic violence and/or dating violence), and stalking. As a faculty member, I am a Responsible Employee meaning that I am obligated by law and ASU policy to report any allegations I am notified of to the Office of Title IX Compliance.

Students are encouraged to report any incidents of sexual misconduct directly to ASU’s Office of Title IX Compliance and the Director of Title IX Compliance/Title IX Coordinator at:
Michelle Boone, J.D.
Director of Title IX Compliance/Title IX Coordinator
Mayer Administration Building, Room 210
325-942-2022, michelle.boone@angelo.edu

You may also file a report online 24/7 at Title IX Incident Form.

If you are wishing to speak to someone about an incident in confidence you may contact the University Health Clinic and Counseling Center at 325-942-2173 or the ASU Crisis Helpline at 325-486-6345.

For more information about Title IX in general you may visit ASU Title IX webpages.

Student Absence for Observance 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. See ASU Operating Policy 10.19 Student Absence for Observance of Religious Holy Day for more information

Incomplete Grade Policy
It is policy that incomplete grades be reserved for student illness or personal misfortune. Please contact faculty if you have serious illness or a personal misfortune that would keep you from completing course work. Documentation may be required. See ASU Operating Policy 10.11 Grading Procedures for more information.

General Policies Related to This Course
All students are required to follow the policies and procedures presented in these documents:

- Angelo State University Student Handbook
- Angelo State University Catalog