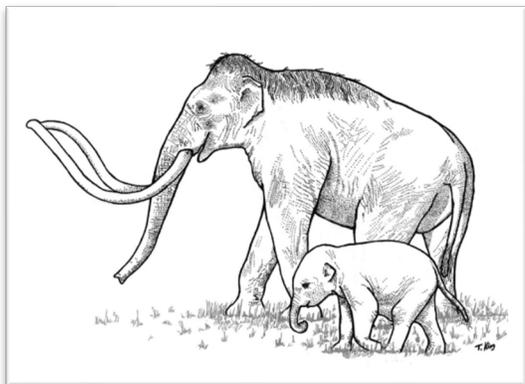


TR-9:30 GEOL 1304: HISTORICAL GEOLOGY LECTURE, SPRING 2022



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).

Course Description

Application of geological principles to interpret four billion years of Earth history recorded in rocks. Includes evolutionary changes and the use of fossils in time and space.

Course Delivery Style: On-campus class

TR-9:30 Historical Geology lecture will be taught face-to-face in the GEO Lab, VIN 139. We will spend much time in class on projects applying terms and concepts to solve problems. Short videos featuring Dr. Joe and posted on Blackboard coupled with extensive reading in textbook will introduce terms and concepts.

Professor: Dr. Joe Satterfield

Office: Vincent 122

Office phone: 325-486-6766

Physics and Geosciences Department Office: 325-942-2242

E-mail: joseph.satterfield@angelo.edu

On-campus Face-to-face Office hours (meet in my office, VIN 122)

- Tuesday: 1:00 – 2:00 pm
- Wednesday: 10:00 am – 1:00 pm, 2:00 – 5:00 pm
- Or contact me to set up a convenient time to meet

Required Textbook

1. *Earth System History, Fourth Edition*, by Steven M. Stanley

Grading

- 2 exams (46%, 23% each)
- 1 comprehensive final exam (30%)
- 4 homework assignments (24%; 6% 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.

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 required lab trips and optional trips you must travel by yourself in your own vehicle. No special equipment is required. 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. *Rocker B Ranch field trip: Saturday, May 7: Learn W. Edwards Plateau geology and collect fossils at the historic Rocker B Ranch outside Mertzon and Barnhart.*
2. *Lake Brownwood fossil-collecting field trip: Saturday, TBA*

Course Expectations

- 1) You will participate in every class, view and take notes on every course video, and read the required pages in each chapter.
- 2) You will not distract yourself or others in the lab with electronic devices. You will put away your phone and will not text during class.
- 3) 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.

Course Webpages

The [Angelo State Blackboard site](#)¹ contains PowerPoint slides, course videos, web links to scenic areas mentioned in class, practice problems, answers to lab assignments, and your official grades.

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](#)². Policy for this course: first offense- zero for exam or assignment, second offense- F in course

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](#)³

Schedule

Dates	Topics	Required reading
I: 1/18, 1/20	Earth as a System The geologic time scale Fundamental Geologic Principles (~6) Unconformity types <i>1/20: Project- Working out Sequences of Events</i>	Chapter 1: p. 1-3 Chapter 1: p. 10-13 Chapter 1: p. 3-5, 9-10 Chapter 1: p. 22-23
II: 1/25, 1/27	Describing sedimentary rocks Fossil Preservation Methods Domains: Major groups of life forms <i>2/5: Project: Fossil preservation methods</i> 1/27: HOMEWORK 1 DUE	Chapter 2: p. 38-45 Chapter 2: p. 52-54 Chapter 3: p. 50-51
III: 2/1, 2/3	Non-marine sedimentary environments Shallow, deep marine sedimentary environments <i>Project- Flute casts on houses</i>	Chapter 5: p. 112-116 Chapter 5: p. 118-126
IV: 2/8, 2/10	Records of Sea Level Change Time correlation: biostratigraphy, magnetic stratigraphy Formations, Members, Groups, Beds Lithologic correlation <i>2/18: Project: Correlating strata</i> 2/10: HOMEWORK 2 DUE	Chapter 6: p. 139 Chapter 6: p. 134-137, p. 144-145 Chapter 1: p. 8 Chapter 6: p. 136-138
V: 2/15, 2/17	Radioactive decay provides Absolute Ages <i>2/15: Project- Calculating rock ages</i> <i>2/15: Project- M&M Radioactive decay</i> 2/17: EXAM 1: Chapters 1, 2, 3, 5, and 6 (Week IV topics)	Chapter 6: p. 141-145
VI: 2/22, 2/24	Scientific Method in geology Organic Evolution: Charles Darwin's contribution Genes, DNA, and chromosomes Evolutionary radiations and other trends	Chapter 7: p. 158-162 Chapter 7: p. 162-164 Chapter 7: p. 166-172, 175-180
VII: 3/1, 3/3	Makeup of a Continent: Shields, Cratons, more Oldest Fossils, Stromatolites, and Origin of Life Identifying thrust faults, anticlines, and synclines Distinguishing 4 contact types on a geologic map The Proterozoic Grenville Orogeny <i>Project and Homework 3: Interpreting Llano uplift geologic maps</i>	Chapter 11: p. 252-253 Chapter 11: p. 256-272 Chapter 9: p. 195-196, 210-211 Chapter 12: p. 296-298
VIII: 3/8, 3/10	Late Paleozoic vertebrates: giant amphibians, early reptiles (first amniotes), pelecysaurs, therapsids, Ocham's Razor 3/10: HOMEWORK 3 DUE	Ch 15: p. 360, 366-367, 370-371
3/14 – 3/18	SPRING BREAK: GET OUTSIDE!	
IX: 3/22, 3/24	Late Paleozoic mountains and reefs in West Texas <i>3/24: Project: Construct Permian basin thickness map</i> Construct Permian Basin Cross-section	Ch 15: p. 379-382 Ch 15: p. 384-387

Dates	Topics	Required reading
X: 3/29, 3/31	Pangea begins to fragment, Fault block basins Triassic Chinle Fm redbeds, Jurassic Navajo Fm ergs	Ch 16: 411-415 Ch 16: p. 416
XI: 4/5, 4/7	4/5: EXAM 2 (Chapters 6 (isotopic dating), 7, 11, 12, 15) Giant aquatic reptiles: placodonts, ichthyosaurs, plesiosaurs, mosasaurs	Ch 16: p. 396-398
XII: 4/12, 4/14	Therapsid Mass Extinction, End Triassic: causes, effects Saurischian (Sauropods, Therapods) vs Ornithischian Dinosaurs (Stegosaurus, Hadrosaurs) Rise of Dinosaurs: Why So Successful? Pterosaurs vs Birds <i>4/14: Project: Viewing rocks under polarizing scopes</i>	Ch 16: p. 408-409 Ch 16: p. 399-400 Ch 16: p. 401 – 405 Ch 16: p. 410-411, Ch 17: 430-431
XIII: 4/19, 4/21	Dinosaur extinction hypotheses and tests The rise of the Rocky Mountains	Ch 17: 437-443 Ch 17: p. 439 Ch 18: p. 465, 469-471
XIV: 4/26, 4/28	Cenozoic volcanoes in West Texas, Rio Grande Rift The Pleistocene Epoch: Ice Ages Human Evolution in the Neogene (Late Tertiary) Period Giant Armadillos Mammoths, Mastodons, Sabre-toothed Cats 4/28: HOMEWORK 4 DUE	Ch 18: p. 471-472 Ch 19: p. 485-494 Ch 19: p. 509-519 Ch 19: p. 505-506 Ch 20: p. 531-533
XV: 5/3, 5/5	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 5/5: All make-up exams	
XVI: 5/12	5/12: 8:00– 10:00 am: FINAL EXAM	

Late Assignment Policy

- Late assignments will not be accepted after graded assignments or projects returned or key posted (generally one week after assignment is due). These are ethics and project management issues!
- If quarantined, accommodations will be provided for late work. Please let Dr. Joe know in writing.

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

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.

Geoscience Careers

See Geoscience BS requirements in the [Angelo State Catalog](#)⁴. 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](#)⁵ 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](#)⁶.

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](#).⁷ 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

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](#)⁸ 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](#)⁹ for more information.

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 Miller, J.D.

Special Assistant to the President and Title IX Coordinator

Mayer Administration Building, Room 210

325-486-6357

325-942-2022, michelle.boone@angelo.edu

You may also [file a report online](#)¹⁰ **24/7.**

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, visit [Title IX website](#)¹¹.

Tech University System Policy may result in disciplinary action through the Office of Student Conduct.

Modifications to the Syllabus

This syllabus, including grade evaluation and course schedule, is subject to modification. In particular, the COVID-19 pandemic may require significant changes in course delivery and content on short notice.

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](#)¹²
- [Angelo State University Catalog](#)¹³

¹ <https://angelo.blackboard.com/>

² <https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

³ https://www.angelo.edu/dept/writing_center/academic_honesty.php

⁴ https://www.angelo.edu/dept/physics/geoscience_degree.php

⁵ <https://www.bls.gov/ooh/life-physical-and-social-science/print/geoscientists.htm>

⁶ <https://www.aapg.org/about/membership/types/student>

⁷ <https://www.angelo.edu/services/disability-services/>

⁸ <https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of>

⁹ <https://www.angelo.edu/content/files/14197-op-1011-grading-procedures>

¹⁰ <http://www.angelo.edu/incident-form>

¹¹ www.angelo.edu/title-ix

¹² <https://www.angelo.edu/student-handbook/>

¹³ <https://www.angelo.edu/catalogs/>