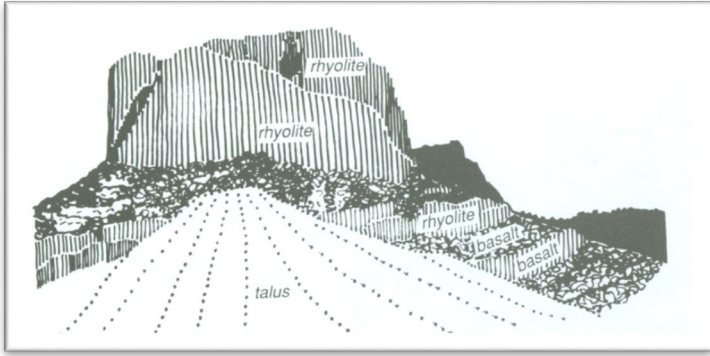


MWF-11 GEOL 1303: PHYSICAL GEOLOGY, FALL 2019



Geology of Casa Grande Peak in Big Bend National Park. We will hike nearby on our November field trip! Figure from Spearing (1991)

Professor: Dr. J.I. “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: 10:00 – 11:00 am, 2:00 – 5:00 pm
- Tuesday: 9:00 – 11:00 am, 2:00 – 3:00 pm
- Wednesday: 10:00 – 11:00 am
- Thursday: 10:00 – 11:00 am, 2:00 – 3:00 pm
- Friday: 8:00 – 10:00 am
- Or contact me to set up a convenient time to meet

Required Textbooks

1. *Earth: Portrait of a Planet, Sixth Edition, with SmartWork5*, by Stephen Marshak
2. SmartWork5 for Earth Portrait of a Planet, Free! [SmartWork information](#)¹

Grading

- 2 exams (25% each)
- 1 comprehensive final exam (35%)
- 3 homework assignments using SmartWork (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.

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! Take the next big step: let's talk in my office, VIN 122, about almost anything. Topics I like to discuss: geology, hiking and backpacking, study skills, racquetball, Lord of the Rings, future careers, lame jokes, and more

Schedule

Week	Lecture/Discussion Topics	Lab Exercises
I: 8/26, 8/28, 8/30	Journey to the Center of the Earth (Ch 1 and 2) Drifting Continents (Ch 3) Patterns in Nature: Minerals (Ch 5)	1: Topographic maps and aerial photos (read p. 1 – 7 before lab)
II: 9/4, 9/6	Patterns in Nature: Minerals (Ch 5) <i>Project: Minerals and your Driver's License under UV light</i>	No labs this week! (Labor Day Holiday Monday)
III: 9/9, 9/11, 9/13	Magma and Igneous Rocks (Ch. 6, p. 152) <i>Project: Calculating pluton surface area</i> <i>Project: Discovering Plate Boundaries, Part 1</i> (Ch 4)	2: Rock-forming minerals (p. 18-29)
IV: 9/16, 9/18, 9/20	<i>Project: Discovering Plate Boundaries, Parts 2, 3</i> (Ch 4) Pages of Earth's Past: Sedimentary Rocks (Ch 7) 9/16: HOMEWORK 1 DUE	3: Igneous Rocks (p. 34 – 37)
V: 9/23, 9/25, 9/27	9/22 – 25: Geological Society of America Annual Meeting, Phoenix 9/27: Metamorphic Rocks (Ch 8)	No labs this week
VI: 9/30, 10/2, 10/4	9/30: EXAM 1 Geologic maps (Ch 12) <i>Project: Introduction to San Angelo, Edwards Plateau geology</i>	4: Sedimentary Rocks (p. 42 – 48)
VII: 10/7, 10/9, 10/11	The Wrath of Vulcan: Volcanic Eruptions (Ch 9,) <i>Project: Constructing 3-D volcano models</i>	5: Metamorphic Rocks (p. 54 – 57)
VIII: 10/14, 10/16, 10/18	A Violent Pulse: Earthquakes (Ch 10, p. 312) 10/18: Out of Class Assignment, Santana Caldera, MX research trip	LAB QUIZ 1: MINERALS AND ROCKS (Labs 2-5)
IX: 10/21, 10/23, 10/25	<i>Project: Locating Earthquake epicenters</i> 10/25: HOMEWORK 2 DUE	6: San Angelo State Park Field Trip (Required): Meet at State Park. Directions: p. 62 – 63
X: 10/28, 10/30, 11/1	Mountain Building (Ch 11, p. 379) <i>Project: Constructing block diagrams of structures</i> <i>Project: Fault games with wood blocks</i>	7: Block diagrams of folded and faulted rocks (p. 68 – 74)
XI: 11/4, 11/6, 11/8	Wind and deserts: Chihuahuan Desert, West Texas, Great Basin, Nevada (Ch 21, p. 768) <i>Project: Viewing mountains in 3-D</i> 11/8: EXAM 2	8: Constructing a geologic cross section (p. 90 – 92), Part I
XII: 11/11, 11/13, 11/15	Oil, natural gas resources in Texas (Ch 14, p. 504) <i>Bronte Oil Field Project</i>	8: Constructing a geologic cross section (p. 90 – 92), Part II
XIII: 11/18, 11/20, 11/22	Streams and Floods (Ch 17, p. 614) <i>Project: Constructing Rum Brook profile</i> 11/22: HOMEWORK 3 DUE	Practice for Lab Quiz 2
XIV: 11/25	Groundwater (Ch.19, p. 694)	No Labs this week! (Thanksgiving Holidays Weds-Fri)
XV: 12/2, 12/4, 12/6	<i>Review Projects</i> 12/6: MAKE-UP EXAMS	LAB QUIZ 2: TOPOGRAPHIC AND GEOLOGIC MAPS (Labs 1, 6-8)
XVI: 12/11	FINAL EXAM: 10:30 – 12:30 am	

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. The schedule:

1. *Archaeology Fair and Elementary School Science Nights*: Saturday, September 21 at Fort Concho (Archaeology Fair) and evenings to be announced (Science Nights). Opportunities for sharing basics of rocks, fossils, and maps with students, their parents, and interested people of all ages.
2. *Kickapoo Cavern*. Saturday, October 26. This field trip will head to the Kickapoo Cavern to explore a wild cave. There are no trails in the cave, so you must be sure-footed. We will be led by a cave guide and shown the wonders of a dead cave of historical significance. Leaders: Heather Lehto, Jessica Garza
3. *Big Bend National Park*: Friday-Sunday, November 15-17. Physical Geology field trip to Big Bend National Park: hike and sketch Cretaceous stratigraphy in Santa Elena Canyon, describe Tertiary volcanic rocks in Tuff Canyon, hike to the top of the Lost Mine Trail in the Chisos Mountains. Leaders: Joe Satterfield,
4. *Favorite San Angelo Area Outcrops*: Saturday, December 7. We will meet early in the morning and return in the mid-afternoon. We will visit little-known outcrops just north of San Angelo, including Rattlesnake Hill, Edith Spring, Spence Reservoir, and the Divide Roadcut. Leaders: Joe Satterfield,

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 meteorite impacts, volcanoes, earthquakes, river flooding, oil and gas resources, groundwater, and plate tectonics. Many examples will be from West Texas and western North America. Problem-solving techniques that you will learn and 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
- Get as much practice or experience as you can
- Carefully defend your thinking when answering questions.
- Learning outcomes will be evaluated by exams and homework assignments

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 Wednesdays at 6:00 pm. The first meeting will be September 4. GEO is a Student Chapter of the [American Association of Petroleum Geologists](#)⁵.

Core Curriculum Objectives and related ASU Student Learning Outcomes

Student Learning Outcome	Assessment Method
1. Gather, analyze, evaluate, and synthesize information relevant to a question or issue.	Lab Quiz
2. Develop, interpret, and express ideas through effective visual communication.	Lab Assignment
3. Manipulate and analyze numerical data and arrive at an informed conclusion	Homework/In-class Assignment
4. Manipulate and analyze observable facts and arrive at an informed conclusion	Average Lab Grade
5. Work effectively with others to support and accomplish a shared goal.	IDEA Forms

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.

Student Disability Services

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.

The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student's responsibility to initiate such a request by contacting: Ms. Dallas A. Swafford, Director of Student Disability Services, 325-942-2047

Title IX

Angelo State University is committed to the safety and security of all students. If you or someone you know experience sexual harassment, sexual assault, domestic or dating violence, stalking, or discrimination, you may contact ASU's Title IX Coordinator: Michelle Nicole Boone, J.D., Director of Title IX Compliance, 325-486-6357, michelle.boone@angelo.edu, Mayer Administration Building 204A

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.

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](#)¹⁰
- [Angelo State University Catalog](#)¹¹

¹ <https://digital.wwnorton.com/earth6>

² <https://blackboard.angelo.edu>

³ <https://www.angelo.edu/catalogs/>

⁴ <https://www.bls.gov/ooh/life-physical-and-social-science/print/geoscientists.htm>

⁵ <https://www.aapg.org/students>

⁶ <https://www.angelo.edu/student-handbook/community-policies/academic-integrity.php>

⁷ https://www.angelo.edu/dept/writing_center/academic_honesty.php

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

¹¹ <https://www.angelo.edu/catalogs/>