Course Description
Earth materials, structure, landforms, mineral resources, and the processes that form them. Includes plate tectonics and how humans are affected by Earth processes.

Course Delivery Style: Synchronous Remote Sessions
To maintain academic quality while accommodating social distancing needs this semester, this course will use a split delivery model that combines face-to-face teaching with remote instruction. The goal is to provide face-to-face instruction to students who want to return to campus, while also allowing students who may need to learn remotely to participate via virtual class sessions.

Your class will be divided and you will be placed into a smaller group of students to maintain physical distancing requirements in our assigned classroom space.

Your assigned group will receive a schedule of in-person class meetings. This schedule is not flexible. For instance, if you are supposed to attend class on a Monday, you cannot elect to go on Wednesday with another class group instead. When you are not in the physical class, you will attend live remote sessions at the same time as our scheduled course. You will also be expected to complete coursework via Blackboard.


Professor: Dr. J.I. “Joe” Satterfield
Office: VIN 122
Phones: 325-486-6766 (Dr. Joe’s office), 325-942-2242 (Physics and Geosciences Department office)
E-mail: joseph.satterfield@angelo.edu

Required Textbook
- If used textbook: purchase SmartWork5 for Earth Portrait of a Planet, SmartWork information

Grading
- 2 exams (45%, 22.5% each)
- 1 comprehensive final exam (30%)
- 5 homework assignments using SmartWork5 (25%; 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.
On-campus Face-to-face Office hours (meet at my office, VIN 122)

- Monday: 8:00 – 9:00 am, 2:00 – 3:00 pm
- Tuesday: 2:00 – 4:00 pm
- Wednesday: 1:00 – 3:00 pm
- Friday: 8:00 – 9:00 am
- Or contact me to set up a convenient time to meet

Virtual Office Hours Via Blackboard Collaborate (go to our Physical Geology lecture room on Collaborate)

- Monday: 3:00 – 4:00
- Wednesday, Thursday: 8:00 – 9:00 am

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 meet in my office, VIN 122, step outside, and discuss almost anything. Favorite topics: geology, hiking, backpacking, study skills, racquetball, Lord of the Rings, future careers, lame jokes, and more.

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 trips you must travel in your own car alone, or with roommates. You must bring facemask and observe social distancing. No special equipment is required but space is limited! You may go on only one optional trip. You can only use your field trip project grade to replace a single lab assignment grade. The schedule:

1. **San Angelo State Park, Tuesday, October 13**. We will meet at 3:00 pm at the South Entrance of San Angelo State Park (directions in lab manual). On this trip we will explore Permian and Pleistocene rocks seen by few other people but close to San Angelo! Leaders: Joe Satterfield and others to be named later

2. **San Angelo State Park, Wednesday, October 14**. We will meet at 3:00 pm at the South Entrance of San Angelo State Park (directions in lab manual). On this trip we will explore Permian and Pleistocene rocks seen by few other people but close to San Angelo! Leaders: Joe Satterfield and others to be named later

3. **Favorite San Angelo Area Outcrops, Saturday, November 14**. 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 and others to be named later.

Geoscience Careers

See Geoscience BS requirements in the [Angelo State Catalog](#). 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!


GEO, the student organization for all interested in geology, meets Wednesdays at 6:00 pm. GEO is a Student Chapter of the [American Association of Petroleum Geologists](#).
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture/Discussion Topics</th>
<th>Read before class on Friday</th>
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</table>
| I: 8/17, 8/19, 8/21 | Flipgrid Introductions  
Journey to the Center of the Earth (Ch 1 and 2)  
*Project: Discovering Plate Boundaries Part 1* (Ch 4)  
8/21: Review Games (Ch 1, 2) | Chapter 1: p. 23, 34-37  
Chapter 2: p. 51-63 |
| II: 8/24, 8/26, 8/28 | Patterns in Nature: Minerals (Ch 5)  
*Project: Discovering Plate Boundaries Part 2* (Ch 4)  
8/28: Project- Minerals and your Driver’s License under UV light  
8/28: HOMEWORK 1 DUE | Chapter 5: p. 120-142 |
| III: 8/31, 9/2, 9/4 | Magma and Igneous Rocks (Ch. 6)  
*Project: Discovering Plate Boundaries, Part 3* (Ch 4)  
9/4: Review Games (Ch 4, 5, 6) | Chapter 4: p. 91-113  
Chapter 6: p. 161-163, 169-180 |
| IV: 9/9, 9/11 | Pages of Earth’s Past: Sedimentary Rocks (Ch 7)  
*Project: Calculating pluton surface area* (Ch 6)  
9/11: HOMEWORK 2 DUE | Chapter 7: p. 210-224 |
| V: 9/14, 9/16, 9/18 | Metamorphic Rocks (Ch 8)  
*Project: Introduction to San Angelo, Edwards Plateau geology* Part 1  
9/18: Review Games before Exam 1 | Chapter 8:  
p. 242-249 (Causes of metamorphism)  
p. 249-255 (Metamorphic Rock textures, names)  
p. 259-260, 262-263 (Contact, regional, and shock metamorphism)  
p.264-265 (big summary diagrams) |
Geologic Maps (Ch 7, Ch 12)  
9/25: *Project: San Angelo, Edwards Plateau geology* Part 2 | Chapter 7:  
p. 224, 226 (Formations)  
Chapter 12:  
p. 459-461 (Formations, Strat columns)  
p. 462-464 (Geologic maps)  
p. 464-466, 476-479 (Geologic time scale) |
| VII: 9/28, 9/30, 10/2 | The Wrath of Vulcan: Volcanic Eruptions (Ch 9)  
*Project: Constructing 3-D volcano models*  
10/2: Review Games (Ch 9) | p. 280-290 (Products of eruptions)  
p. 290-297 (Types of volcanoes)  
p. 300-301 (Infamous eruptions)  
p. 308-311 (Volcanic hazards) |
| VIII: 10/5, 10/7, 10/9 | A Violent Pulse: Earthquakes (Ch 10)  
*Project: Locating Earthquake epicenters*  
10/9: Review Games (Ch 10), HOMEWORK 3 DUE | p. 325-326 (Faults in the Crust)  
p. 333-338 (Seismic waves, measurement)  
p. 342-348 (Where, why quakes occur)  
p. 348-359 (Earthquake damage)  
p. 608-618, 622-623 (Landslides, Ch 16) |
| IX: 10/12, 10/14, 10/16 | Strike and Dip, Folds, and Faults (Ch 11)  
*Project: Constructing block diagrams of structures*  
10/16: Review Games (Ch 11) | p. 396 (Stretching, shortening, shearing)  
p. 400 -401 (Box 11.1: Strike and dip)  
p. 405-408 (Fold types) |
| X: 10/19, 10/21, 10/23 | Mountain Building (Ch 11, p. 379)  
*Project: Fault games with wood blocks*  
*Project: Viewing mountains in 3-D*  
10/23: Review Games (Ch 11), HOMEWORK 4 DUE | p. 397-404 (Joints, Fault types)  
p. 411- 417 (Causes of Mountain Building) |
| XI: 10/26, 10/28, 10/30 | Oil, natural gas resources in Texas (Ch 14)  
*Bronte Oil Field Project*  
10/30: Review games to practice for Exam 2 | p. 529-532 (characteristics of source beds, reservoirs, seals; trap types) |
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</table>
| XII: 11/2, 11/4, 11/6 | 11/2, 11/4: EXAM 2  
11/6: Wind and deserts: Chihuahuan Desert, West Texas, Great Basin, Nevada (Ch 21) | p. 806-811 (desert varnish, wind erosion)  
p. 812-814 (Alluvial fans, playas, salt lakes)  
p. 818-819 (desert pavement)  
p. 819-823 (sand dunes) |
| XIII: 11/9, 11/11, 11/13 | Streams and Floods (Ch 17)  
Project: Constructing Rum Brook profile  
11/13: Meandering Rivers and Braided Streams (Ch 17), | p. 646-647 (longitudinal profiles)  
p. 649-653 (braided and meandering streams)  
p. 657-658 (incised meanders)  
p. 662-663 (Geology at a Glance figure) |
| XIV: 11/16, 11/18, 11/20 | Groundwater (Ch.19): San Solomon Springs, Davis Mtns  
Final Review Project: Subsurface Map #2  
11/17: HOMEWORK 5 DUE  
11/19: EXTRA CREDIT PROJECT DUE  
11/20: FINAL EXAM: Monday section: 10:30  
Wednesday section: 11:30 | p. 722-725 (porosity, permeability, aquitards, aquifers)  
p. 726-729: (Water table, saturated zone, unsaturated zone)  
p. 733-734 (Springs) |

Course Expectations
1) You will attend every class meeting, unless you are sick. Do NOT come if sick! If you cannot attend, the class meeting or lab introduction will be recorded and posted on Blackboard.

2) You will take the next big step: let’s talk outside of class about almost anything. 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) You will not distract yourself or others with electronic devices. You will put your phone away during class and lab. Penalties: a) Friendly warning for forgetting the first two times, b) After the first two warnings, you will be asked to leave the class.

4) Homework submitted after the due date will receive a 10-point deduction!

5) Work turned in after graded work is returned to others will not be graded. (professional ethics issues)

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
- 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 contains PowerPoint slides, web links to scenic areas mentioned in class, practice problems, answers to lab assignments, and your official grades.

Core Curriculum Objectives and related ASU Student Learning Outcomes

<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>

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.

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.

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.

Accomodations 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
The employee charged with the responsibility of reviewing and authorizing accommodation requests is:

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

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.

Title IX at Angelo State University
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 www.angelo.edu/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 www.angelo.edu/title-ix.

Required Use of Masks/Facial Coverings by Students
As a member of the Texas Tech University System, Angelo State University has adopted the mandatory Facial Covering Policy to ensure a safe and healthy classroom experience. Current research on the COVID-19 virus suggests there is a significant reduction in the potential for transmission of the virus from person to person by wearing a mask/facial covering that covers the nose and mouth areas. Therefore, in compliance with the university policy students in this class are required to wear a mask/facial covering before, during, and after class. Faculty members may also ask you to display your daily screening badge as a prerequisite to enter the classroom. You are also asked to maintain safe distancing practices to the best of your ability. For the safety of everyone, any student not appropriately wearing a mask/facial covering will be asked to leave the classroom.
immediately. The student will be responsible to make up any missed class content or work. Continued non-compliance with the Texas 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 potentially short notice.

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 Procedures12 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 Handbook13
- Angelo State University Catalog14

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1 https://digital.wwnorton.com/earth6
2 https://www.angelo.edu/catalogs/
4 https://www.aapg.org/students
5 https://blackboard.angelo.edu
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/services/disability-services/
9 https://www.angelo.edu/content/files/14206-op-1019-student-absence-for-observance-of
10 https://www.angelo.edu/services/title-ix/
12 https://www.angelo.edu/content/files/14197-op-1011-grading-procedures
13 https://www.angelo.edu/student-handbook/
14 https://www.angelo.edu/catalogs/