

Geology for Engineers

**Geological Sciences
Univ. of Texas at El Paso
UGLC 346**

**Spring 2023 • GEOL 3321
Syllabus
Mon./Wed. 1:30-2:20 PM**

CRN: 16011

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Course Goals and Objectives:

This course will expose engineering students to the wonderful world of the geological sciences and will demonstrate the impact of geology on your everyday life plus the importance of geology for engineering applications. Also, you will also be exposed to how geological processes created the landscape that is El Paso. A student should leave this course with a basic understanding of the concepts and vocabulary of the geosciences. Scientists need a common language though which to communicate ideas; thus, vocabulary is a very important component of this course. You will also be exposed to how scientists approach a scientific problem: observe, question, and analyze. The lectures, quizzes, assignments, tests, and final project will all work toward these goals.

We live in one of the most geologically interesting places on earth, and I will try and include examples from El Paso about most things we do. Finally, geology is a fun subject. This should be a class where you learn a lot and have a good time.

Goals for Knowledge – at the end of this course you should:

- be able to converse with a geologist/geophysicist
- be able to read geologic/geophysical reports
- know basic rock and soil types and the properties of these rocks/soils that an engineer may be concerned with
- understand surface geologic processes and how they affect engineering studies
- understand internal geologic processes (e.g., faults, earthquakes, volcanoes) and how they affect engineering studies
- know how geophysics is used in engineering site investigation

Goals for Skills – at the end of this class you should:

- know how to read topographic and geologic maps
- locate yourself on a map
- be able to construct topographic and geologic cross sections
- be able to predict properties of a rock by how it appears in hand sample/outcrop
- conduct simple geophysical surveys
- communicate geology to colleagues and the general public (throughout the course through written assignments)

How will we determine if you have reached these goals?

- in-class quizzes (11 given throughout the semester-see course outline)
- four in-class exams
- Wednesday lecture activities (11 total)
- laboratory activities (see laboratory syllabus for specific details)
- final project

Textbooks, Online Material, and Course Structure

No text is required for the lecture part of this course. Course materials (e.g., copies of lecture power points, links to videos, study guides, handouts) will be available *at the Blackboard lecture site* and lab assignments will be available *at the Blackboard laboratory site*. However, this also means you need to take good notes based on the lectures and read the material posted on Blackboard to get the most out of this course.

PowerPoint, handouts, and videos will be posted on Blackboard each week as we progress through the course.

Quizzes

Most Tuesday mornings (8 AM) a short **quiz** over lecture material must be submitted to Blackboard by Wednesday at 5 PM (see course outline for details). No late quizzes accepted unless arrangements are made prior to the Weds. 12 PM deadline.

Assignments

Most Wednesday mornings a **problem-solving assignment** will be available on Blackboard at 9 AM. I will go over the assignment on Wednesdays in class to assist you with these assignments. The assignments are due by 5 PM on Fridays for full credit.

Exams

Exams will be taken online through Blackboard, with them being posted at 3 PM on the following days: **February 13, March 8, April 5 and May 3**. The exams will be open note and open book, and you be given 1 hour to complete. The exam will be available for 72 hours, but once you start it, you must complete it.

Labs:

If you miss handing in **more than two lab assignments** and do not contact me or your teaching assistant **within one week** of the day the lab was posted, you may be withdrawn from the course, with a grade of either *W* or *F*. It is up to the teaching assistants to decide if they will grade labs that are turned in more than 1 week late. Teaching assistants may also deduct points for late labs.

LABORATORIES WILL START THE SECOND WEEK OF CLASS! YOU MUST BE ENROLLED IN A LABORATORY SECTION AS WELL AS LECTURE.

Project:

There will be a final project in the course that will be worth 25% of your lab grade (about 10% of your course grade). The project will involve analyzing data, constructing figures, and making power point and poster presentations - all things you will be expected to do as engineers. The project will demonstrate how geology is used by engineers to solve a practical problem.

Grading:

Grades will be calculated based on exams, quizzes, assignments, and laboratories. The grades are not curved. They are based on your ability to learn the vocabulary and concepts of physical geology.

In-class exams [total of 4]	35%
Quizzes [best 10 out of 11]	15%
Assignments [total of 11]	15%
Laboratories, including project	35%
Total	100%

90-100% = A 80-89% = B 70-79% = C 60-69% = D below 60%= F

Other important dates: last day to drop class with “W” is April 1, 2022.

If you score less than 90% on exams, you can improve your test scores by turning in your old exams with corrections to missed questions (due one week after the test). You can earn ½ credit for all questions missed that will be counted toward your exam grade.

Diversity and Accessibility:

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students’ learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, religion, and culture. Your suggestions are encouraged and

appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

It is also my intent to ensure accessibility to all students. If you encounter barriers, please let me know immediately so that we can see if a material adjustment is needed. If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.

Expectations for Class Conduct:

For everyone to feel safe and welcomed in the class, we will be developing a set of classroom norms during our first meeting. We will post these norms on Blackboard and refer to them during the semester.

Extra Credit

There will be 0-2 field trips, attending them will count for extra credit on exams and help your class participation grade. The field trips will be announced during the semester. I will also assign extra credit to attend lectures and presentations from the Department of Geological Sciences. Other extra credit assignments may be assigned randomly during the semester.

iClicker Cloud:

We will be using the iClicker Cloud Classroom Response System (CRS) technology in class, which allows instructors to ask questions, gather student responses, display those responses in real-time. See:

https://www.utep.edu/technologysupport/ServiceCatalog/INST_ClassResponseSystem.html

Handy aids for study:

Several Spanish-English geology dictionaries are posted at the class Blackboard site in a folder. I will also provide relevant web sites for other material in the background material for each week (generally in the power points that cover the lecture materials). The teaching assistants also have found some videos in Spanish (as well as English) that cover lab and lecture topics.

Academic Honesty:

The Geological Sciences Department has gone to great lengths in order to make learning the material easier than engaging in scholastic dishonesty, which is defined in the UTEP Student Handbook and also at <http://www.utep.edu/dos>. Proven violations of these detailed regulations may result in any of the consequences outlined in the Student Handbook.

Plagiarism:

Using another person's ideas, words, drawings, etc. without giving proper credit (through a citation) is considered plagiarism. This includes anything from a book, magazine, technical report or journal, or website. It ALSO includes anything copied from another student's paper or from a paper you wrote for another class where you received credit for it. Plagiarism is considered *Academic Dishonesty* and you may be reported to the Dean of Students if I suspect you of plagiarism. I regularly randomly compare students' papers for similar wording and conduct internet searches on suspicious text. If you plagiarize as a professional, it can cost you your job!

Schedule

Week	Date	Topic	Quiz	Assignment
1	Jan. 18	Intro to Course and Class Norms	Q0 - Syllabus	
2	Jan. 23,25	Plate Tectonics	Q1- Plate tectonics	A1- Cities on plate boundaries, Rio Grande rift
3	Jan. 30, Feb. 1	Earth Materials	Q2- Minerals	A2- Everyday uses of minerals, mineral economics
4	Feb. 6, 8	Igneous Environments	Q3- Igneous rocks, Volcanic hazards	A3- Volcanic hazards
5	Feb. 13, 15 Feb. 13	Sedimentary Rocks Midterm Exam I	-	-
6	Feb. 20, 22	Deformation and Metamorphism	Q4- Sedimentary and metamorphic rocks	A4-Engineering properties of sedimentary and metamorphic rocks
7	Feb. 27, Mar. 1	Rock Properties	Q5- Rock properties	A5- Rock mechanics
8	Mar. 5, 7 Mar. 7	Structural geology – part 1 Exam II		
9	Mar. 12-16	Spring Break		
10	Mar. 20, 22	Structural geology – part 2	Q6- Structural geology	A6- Geotechnical site investigation
11	Mar. 27, 29	Nonseismic geophysics	Q7- Nonseismic geophysics	A7- Nonseismic geophysics for geotechnical investigations
12	Apr. 3, 5	Seismic Geophysics	Q8- Seismic Geophysics	A8- Seismic geophysics for geotechnical investigations

13	Apr. 10,12 Apr. 10	Earthquakes Exam III		
14	Apr. 17,19	Streams and Flooding	Q9- Rivers	A9- Flooding
15	Apr. 24, 26	Groundwater	Q10- Groundwater	A10- Groundwater
16	May 1, 3	Slope stability	Q11- Slope stability	A11-Slope stability
17	May 8- 11	Exam IV		