

GEOLOGY 4375: Field Geology I
The University of Texas at El Paso
Department of Geological Sciences
Winter2021-2022

Instructors:

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NOTE: This syllabus is subject to change The current update was made November 16, 2021. Schedules and materials may be altered. However, notice will be provided at least 1 week in advance if possible.

Course Objectives

This course is the first part of your “capstone” class in Geology. It is where you bring together everything you have learned in your time as a major and apply it to solving problems in the field. Observation, Data Collection, Problem solving and Report writing will all be key activities in your professional career and after completing this and GEOL 4376, you should be ready to work as a professional environmental scientist or geoscientist.

Our primary activities will be geologic field mapping, analysis of data and writing of professional reports. Geologic field mapping is the primary method used to collect data. However most important are your observations about the area and how you can use this data to solve geologic problems. We will conduct investigations useful to both environmental professionals and geological professionals. Your results will be used to explain how the rock record is used to evaluate geologic history and how it has shaped the landscape.

The skills that will be practiced are those that were developed in “Geoscience Processes”, Mineralogy, Petrology, Structural Geology, and Sedimentology and Stratigraphy. Included among the bodies of knowledge you will need (and should have already learned in your previous classes) are:

- 1 Use of a topographic map for navigation and recording of geologic data.
- 2 Construction and use of topographic maps, topographic profiles, stratigraphic columns, and geologic maps.
- 3 Use of a Brunton compass for navigation and for measuring geologic structures.
- 4 Use of (digital) maps and aerial imagery in the field.
- 5 Keeping an organized and complete field book.
- 6 Basic concepts and analytical tools used in structural geology.
- 7 Visualization and interpretation of geologic data and relationships in three-dimensions.

- 8 Analysis of cross-cutting relationships.
- 9 Description of rocks and recognition of formational/structural geologic contacts.
- 10 Identification and description of common rocks, minerals, soils, and other geologic materials.
- 11 Identification and interpretation of tectonic, volcanic, geomorphic and other landforms/structures.

Ideally (and most importantly), you will learn to operate as a scientist when solving problems: asking questions; making careful observations; thinking critically and quantitatively about those observations; developing multiple working hypotheses; and testing those hypotheses. Part of this will involve working cooperatively and communicating your ideas to others. Most importantly, you must learn to be honest with yourself and **trust your own observations and do your own mapping.**

Assignments:

Expect to be working on this class all day during each project period. We will typically start early in the morning and work until the late afternoon (times TBA). The course will be organized into 3 mapping projects.

The result of each field project will be a digital geologic map (shapefiles that you will prepare with QGIS software), a paper geologic map (produced from the digital files, printed out, and colored), interpretive cross-sections, and a report. **These are expected to be of professional quality.**

Of particular importance are the reports. This is a writing intensive class and is designated as such in the geo curriculum. These will be based on your observations and rock descriptions, your geologic map, and your interpretations of the geology made through constructing geologic cross sections. It will also contain appropriate (and properly cited) background material. These reports are critical because they will teach you how to write a technical paper and will focus your understanding of the geology and history of the mapping areas. The reports will be graded for their scientific merit and the style and clarity of the writing. The maps and cross-sections will be graded on their scientific merit and their aesthetic quality (completeness, neatness, etc.). See the accompanying handout for more details on these deliverables.

Grading

Your grade will be based on your performance on the field projects. There will be three major projects.

The grade for each of the projects will be earned based on a rubric similar to the following breakdown (total of ~140 points or so per project; see accompanying handout for more example details):

- Geologic map (printed out; graded for content, correctness, neatness, etc.): 40 points
- Map details (e.g. explanation, north arrow, scale, legend, etc.): 10 points
- Digital data (e.g. shapefiles, etc.; graded for completeness, effective use of technology, etc.): 25 points

- Cross-section(s): 25 points
- Report: 40 points

In addition to the example rubric, attached is an assessment tool that illustrates the abilities that we think are: (1) exemplary, (2) acceptable, (3) developing and (4) unacceptable. We will consider these criteria in assigning grades.

Schedule

NOTE this schedule is subject to change due to COVID, weather and other factors.

Monday December 27 – Introduction to class and Software and Field Day 1. Expect to spend 3-5 hours learning how to use software and to start your project. Bring a lap top you can use for working on your map after our field day.

Tuesday December 28 – Day 1 Exploring your area virtually and beginning to map. How to use background reading and resources. Begin writing your paper. Plagiarism Review

Wednesday December 29 – Mapping in your area. Introduction to Geomorphic Elements. Writing descriptions of your observations.

Thursday December 30 – Continued work in your area, Sequences of Events, Describing Geomorphic and Geologic History.

Friday January 31 -- Finish mapping and Continue Writing report.

First Report Due Monday January 3rd at 8 PM.

Monday January 3 -- Begin Second Project, Travel to the indio Mountains

Tuesday January 4 -- Continuing mapping, Interpreting folds.

Wednesday January 5 -- Continuing mapping, Interpreting faults.

Thursday January 6 -- Continuing mapping, Reconstructing Structural History.

Friday January 7 – Finish Mapping and have most of the report written

Monday January 10 – Report Due at 8 AM

Project 3, Dates TBA

Monday January 10 -- Begin Second Project, Travel to the indio Mountains

Tuesday January 11 -- Continuing mapping, Interpreting folds.

Wednesday January 12 -- Continuing mapping, Interpreting faults.

Thursday January 13 -- Continuing mapping, Reconstructing Structural History.

Friday January 14 – Finish Mapping and have most of the report written

Monday January 17 – Report Due at 5 PM

Academic Honesty Policy

Academic dishonesty will not be tolerated. The University guidelines for academic dishonesty are very specific and will be strictly followed. Please read the guidelines (see <http://studentaffairs.utep.edu/dos>), and contact the Dean of Students or the instructors if you have any concerns. Note that a large part of this course will require you to work in groups. Although **reasonable collaboration is allowed** (even encouraged), **all work you turn in is expected to be your own!** You **MUST** learn to trust your own observations and **NOT** rely on the interpretations of others, otherwise you are wasting your time. These three weeks are your opportunity to hone your field skills, so don't cheat

yourself by copying the mapping of others. Copying of other's work WILL be noticed and WILL NOT be tolerated.

Other Issues

Civility: This class requires group interactions with your fellow students, both in the field and online. Think about your colleagues and your role in this environment. Collegiality will make this class a wonderful experience, but if you devolve into factions with infighting, bullying, or other nasty social issues, the class can become unpleasant. The instructors will be exercising important leadership skills with you throughout the course, emphasizing good expedition behavior and team dynamics.

Disability: If you have or suspect you have a disability and need an accommodation, you should contact the Disabled Student Services Office (DSSO) at 747-5148 or at dss@utep.edu or go to Room 106 Union East Building. You are responsible for presenting the instructors any DSS accommodation letters and instructions IN ADVANCE OF GOING TO THE FIELD.

Military Service: If you are a military student with the potential of being called to military service and/or training during the course of the semester, you are encouraged to contact the instructor(s) as soon as possible.

UTEP and Course Policies

Technology Requirements

Course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. If you have technical problems, 1) update your browser, 2) make sure it is blackboard compatible (most are), 3) clear your cache, finally 4) try switching to another browser.

You will need to have access to a computer/laptop, and a cellular phone. You will need to download or update the following software: a **word processing software** like Microsoft Office, Adobe Acrobat Reader, a Media Player, QuickTime, Excel, and Powerpoint, and Google Earth. Check that your computer hardware and software are up-to-date and able to access all parts of the course. We will also use some specialized software for this course that is free and open source. Install QGIS 3.10 or newer and make sure it works on your computer. You might also install Strabospot on your phone.

If you do not have a word-processing software, you can download Word and other Microsoft Office programs (including Excel, PowerPoint, Outlook and more) for free via UTEP's Microsoft Office Portal. Click the following link for more information about [Microsoft Office 365](#) and follow the instructions.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting with standard software, please contact the UTEP [Help Desk](#) as they are trained in assisting with technological needs of students. If you need help with Strabospot or QGIS, please contact me for help.

Safety is most important: It is our number one concern.

Please be prepared when we go outdoors! Wear a hat, use sunscreen, wear proper clothing, and drink lots of water. A water bladder (Camelbak or similar system) helps keep you hydrated and is very convenient compared to water bottles. Use sunscreen with an SPF of at least 50. Appropriate sun-protective clothing includes long sleeves and long pants and a hat with a brim. You are expected to have appropriate footwear, i.e. proper hiking shoes, preferably boots with ankle support. Open toe shoes, sandals, and

most athletic shoes are not acceptable. Always be prepared for inclement weather and extremes in temperature, so dress in layers and bring jackets and rain gear!

When in the field, always be cognizant of your limits and potential dangers and **do not get yourself into situations where you can injure yourself or others**. For safety, you will typically be working with at least one other person and every group will carry a radio. In addition, (optional, but recommended) field trip insurance will be available at the Department's expense. **NOTE: Any safety violations (e.g. failure to communicate, abandonment of field partners, careless/dangerous actions, etc.) will be dealt with seriously.**

Safety hazards present during Camp include but are not limited to:

- **Weather:** As you all know, winter weather around El Paso is wildly variable. It can be a beautiful, spring-like day in the morning and be snowing by afternoon. So bring plenty of warm weather as well as cold weather gear. Dressing in layers is crucial in the winter because all morning will cold, but you will need to shed layers as the day goes on. We know it rarely rains in winter in this area, but if you get caught out in the rain with no protection in the winter it is very dangerous because **hypothermia is a real possibility**. So bring rain gear and keep it in your pack every day.
- **Terrain:** Maintain situational awareness of where you are walking and be aware if someone might be downslope from you in the path of rocks you may cause to fall. Be careful around steep and/or unstable slopes where there is a danger of falling. Do not go somewhere if you are not comfortable with the terrain. Never roll or throw rocks downhill or do anything else that can cause a danger to yourself others while in the field. **If you are caught doing something egregiously stupid and dangerous, you will be immediately and automatically excused from the course with an F and sent home.**
- **Vegetation and Critters:** There are many spiky, prickly plants out there. Otherwise, it is unlikely that you will have many wildlife encounters. Snakes exist in the desert, but in winter you are unlikely to see them except in the afternoon when they might be soaking up the sunshine. Some poisonous arthropods, including scorpions are out there, too. So, always be careful of where you put your hands and feet! If you encounter a snake, stay calm, move away from it carefully, and alert others in the area. If you are bitten by something that might be poisonous, call for help immediately. Bees are present in numbers in some places, so be careful if you are allergic to stings (inform the instructors if this is the case and always carry any needed medication). Other animals you might see include javelina and coyotes. Be very careful if you encounter either of these – avoid interacting with them and move away from the area where you see them and communicate with the rest of the group to make them aware of the animals.

Talk to the instructors if you have any concerns about field equipment or working in the field, especially in terms of safety. In particular the instructors need to know about any physical disability or condition that may affect your ability to work outside. At our first

official meeting (training session) we will hand out a series of forms and questionnaires related to insurance and medical issues.

Course Drop Policy – According to UTEP Curriculum and Classroom Policies, “When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of “W” before the course drop deadline and with a grade of “F” after the course drop deadline.” **If you are not active in the first five weeks of the class and in my judgement you are unable to complete the course with a passing grade, I will drop you from the course. However, otherwise I will not drop you from the course.** However, if you feel that you are unable to complete the course successfully, please let me know and then contact the [Registrar's Office](#) to initiate the drop process. If you do not, you are at risk of receiving an “F” for the course. I will do my best to make sure that you have a good understanding of your progress and grade in the class..

Copyright Statement for Course Materials

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

Equipment

Among the items you will need for your field assignments (IF we have one) are: **a hand-lens (loupe), a field notebook, a clipboard (if you want to carry a paper map), 0.1 inch grid graph paper (for cross-sections), sharp mechanical pencils, fine-tipped ink pens, an engineer's scale (10-60 scales), a protractor, colored pencils, and a calculator.** Rock hammers may be useful, but are optional. Coordinate amongst yourselves if you wish to share some of these resources. Also consider coordinating for bringing any reference books. They will be useful, but it is not necessary for everyone to bring a copy when one or two will suffice for everyone to share. The instructors will bring a limited amount of materials and references as well.

Resources for Students

If you have with any facet of this class, you can always come to me, or you can try some of the many resources that UTEP provides .

Technology Resources

- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.
- Zotero is a free equivalent you can download.