UNIVERSITY OF TEXAS AT EL PASO
Department of Earth, Environmental and Resource Sciences

GEOLOGY 2309/2109: Earth Materials 1
Fall 2025

*You must be enrolled in both the lecture (GEOL 2309) and lab (GEOL 2109)
**If you are a DEERS or ESCI major, you should be taking both GEOL 3312: *Geoscience Processes* and GEOL 2309: *Earth Materials 1* together. These courses are co-requisite to one another and are only offered once per year. GEOL 2309 and 2109 are required (core) courses for all DEERS and ESCI majors.

Instructor:

Dr. Jay Chapman, Geology Room 319, jbchapmanv@utep.edu
Office hours: by appointment

Teaching Assistant:

Jose Franco Moraga, Geology 106a, jdfrancomor@miners.utep.edu
Office hours: by appointment

Class Meetings:

Lecture: Tuesday and Thursday 10:30-11:50am in Geology 302
Lab: Tuesday 12:30-3:20pm in Geology 404 or 320

This is an in-person class and attendance at all lecture and lab sessions is expected of all students. Successful completion of all the labs, including field trips, is expected of all students. Excessive absences and/or missing work will have negative grade consequences. Accommodation for absences can be made on a case-by-case basis, but please contact the instructor well in advance if there are any conflicts.

Course Description:

For geoscientists, Earth Materials encompasses much more than learning the inventory of minerals and rocks that the Earth is made of. It is the critical step in which such rock inventories are tied to geological processes in a systematic manner which establishes the skillset that forms the base for quantitative assessment of rock transformations spanning the fields from environmental science to hydrology, soil science to the geochemistry of ore deposits and oceans, and from the interior of the planet to the composition of other planetary bodies in the solar system. In this course, students will master this critical step in their geoscience education by combining a systematic overview of Earth Materials with in-depth investigation of selected topics. These topics will be explored in lectures and discussions centered around student-participation, as well as in laboratory exercises and field trips for DEERS and ESCI majors. As such, this course integrates the chemistry, physics, biology, and math of the Earth, an approach that is simply awesome.

Prerequisites:

An introductory-level geoscience course (example: GEOL 1301, Introduction to Physical Geology). Other introductory courses, including EPCC courses, can meet this prerequisite. Please contact the instructor if you have any questions.

Course Objectives and Expected Learning Outcomes:

At the end of this course, students will:

1. Understand the fundamental types of Earth Materials, including atmospheric gases, natural waters, soils, minerals, rocks, and ore deposits
2. Be able to apply knowledge about Earth material chemistry and physical properties to link composition to geological processes
3. Understand the principles of mineral and rock stability under a wide range of conditions, including pressure and temperature
4. Readily identify the most common minerals and rocks, know where they belong in the rock cycle, and what environments they most commonly occur in
5. Be able to predict from the knowledge of geological processes some common mineral assemblages (rocks) and vice versa, including some ore minerals
6. Examine the economic and societal importance of key Earth Materials, including raw materials for construction, minerals, ores, water, air, soil, and energy resources
7. Know the basics about how to find relevant information about geoscience topics and know how to read and process geoscience literature
7. Be able to apply the concepts of observation, interpretation, application of theory, and hypothesis testing to geoscience-related questions
8. Have acquired the skillset of using multiple lines of evidence to problem solve
9. Have learned how to work and learn from peers in team settings
10. Continue to develop critical thinking skills

Grading:

Lecture

Exams	40%	(2-3 exams; dates to be determined)
Homework and In-Class Exercises	15%	(~5 throughout semester)
Weekly Blackboard Quizzes	30%	(~15 total, open notebook)
Notebook	15%	(periodically throughout semester)

Lab

Lab and Field Trip Assignments	100%	(8-10 total)

Grading Scale: Above 90 = A, 80-89 = B, 70-79 = C, 60-69 = D, Below 60 = F

Fieldwork:

There will be several excursions to on- and off-campus field localities during the semester. Due to UTEP rules, all students need to fill out insurance and release forms before trips. Please consult the instructors if you have health, scheduling, or other concerns about doing fieldwork. Please be prepared when we go outdoors (e.g. have water, sunscreen, hat, good walking shoes, etc.). Among the items you will need are a field notebook (provided), hand lens (provided).

Class Online Materials:

Check the Blackboard portal for this course often for updates and announcements. The online materials are the key part of the class and Blackboard will be the main venue all class business. 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.

Textbooks:

There is no required textbook, but obtaining (buy/borrow/rent/etc.) or having access to at least one text is recommended.

Abbreviation	Title, Author, Publisher	NOTES
OPEN	"Mineralogy" by Perkins ***(https://opengeology.org/Mineralogy)***	Basic, free online textbook (default option for most)
EM	"Earth Materials" by Klein and Philpotts, Cambridge	Basic, cheap, can be used for Earth Materials 2
KD	"Mineral Science" by Klein and Dutrow, Wiley	Good, a little old, expensive
DYAR	"Mineralogy and Optical Mineralogy" by Dyar, Gunter, and Tasa, MSA	Very good, somewhat expensive, pdf option less costly
NESSE	"Introduction to Mineralogy" by Nesse, Oxford	Great, expensive

Academic Dishonesty Policies:

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures (HOOP). It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. The University guidelines for academic dishonesty are very specific and will be strictly followed. All suspected violations of academic integrity must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) (https://www.utep.edu/student-affairs/osccr/) for possible disciplinary action. Refer to the UTEP HOOP (https://www.utep.edu/hoop/section-2/student-conduct-and-discipline.html), and the guidelines here (see https://www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html) for more information, and contact the Dean of Students or the instructors if you have any concerns.

Note that this course may require you to work in groups at times and individually at other times. Although reasonable collaboration will occur from time-to-time (on assignments, not exams), all work you turn for a grade in is expected to be your own.

Accommodations Policies:

UTEP is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services (CASS) (https://www.utep.edu/student-affairs/cass/ada-policies/accommodations-for-individuals-with-disabilities%20.html) Note that the student is responsible for following up with the instructors about any accommodation letters and instructions.