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

GEOLOGY 2309/2109: Earth Materials: Mineralogy and Petrology
Fall 2023

*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: Mineralogy* together. These courses are co-requisite to one another and are only offered once per year.

Instructors:

Dr. Jay Chapman, Geology Room 319, jbchapmanv@utep.edu
Office hours: 8:00-9:00 am Tuesday and Thursday (or by appointment)

Dr. Phil Goodell, Geology Room 223, goodell@utep.edu
Office hours:

TA:

Ms. Jessie Shields (PhD student), jeshields2@miners.utep.edu
Office hours:

Class Meetings:

Lecture: Tuesday and Thursday 10:30-11:50am in Geology 123
Lab: Tuesday or Thursday 12:30-3:20pm in Geology 222

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 instructors well in advance if there are any conflicts.

Course Description:

For geoscientists, Mineralogy and Petrology are much more than learning the inventory of minerals that rocks are 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 and soil science to the geochemistry of ore deposits and oceans, and to geophysics and planetary exploration. In this course, students will master this critical step in their geoscience education by combining a systematic overview of Mineralogy and Petrology with in-depth investigation of selected topics. These topics will be explored in student-participation based lectures and discussions, as well as in laboratory exercises, and importantly, field trips. As such, this course integrates the chemistry, physics, biology, and math of the Earth, an approach that is simply awesome.

Course Objectives and Expected Learning Outcomes:

At the end of this course, students will:

1. Be able to apply their knowledge about mineral chemistry to the understanding of the links between the paragenesis of rock-forming minerals and associated geological processes.
2. Understand the principles of mineral stability under a wide range of conditions.
3. Readily identify minerals and rocks and know where they belong in the rock cycle.
4. Be able to predict from the knowledge of geological processes mineral assemblages (rocks) and vice versa.
5. Understand the use of the electromagnetic spectrum in mineralogy.
6. Know the basics about how to find relevant information about geoscience topics and have learned how to read and process geoscience literature.
7. Be able to apply the concept of observation – interpretation – application of theory – testing to questions in the field of mineralogy and petrology.
8. Have acquired the skillset of using multiple lines of evidence to problem solving.
9. Have learned how to learn by learning from each other in team settings.
10. Continued to develop their critical thinking skills.

Grading:

Each exam counts 100 points. Everything else, such as quizzes and assignments count 20 points. Extra credit is available. The final grade is determined by adding to a total for each student, and a histogram is made of all student totals. Letter grades are determined from the histogram.

Your final grade in this course will be shared among both GEOL 2309 and GEOL 2109. Grades will be computed based on the above percentage breakdown applied to the total number of points computed at the end of the semester. Each graded item (assignment, exam, quiz, etc.) will have an assigned point value that may vary from item to item.

Some extra credit points from assignments, quizzes, etc. may be made available.

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), a clipboard, 1-cm grid graph paper, a sharp mechanical pencil, a fine-tipped ink pen (e.g., ultra-fine tip sharpie marker), a metric scale ruler, a protractor, colored pencils, and a calculator. In addition, rock hammers and Brunton compasses will be available for your use on the days we need them (no need to purchase).

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. Note that, for simplicity, only the Blackboard portal for the lecture component (GEOL 2309) will be used (any Blackboard portals for the lab component will remain unused).

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
EM	"Earth Materials" by Klein and Philpotts, Cambridge	Basic, cheap, can be used for Petrology
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, very expensive

LAB SCHEDULE (subject to change)

Week	Dates (T, Th)	Labs
1	Aug. 29, 31	Lab 1 (T): **FIELD TRIP: The Campus Andesite**: in-class, on-campus w/ Processes, all students Lab 2 (Th): El Paso rocks & minerals, all students
2	Sept. 5, 7	Lab 3 (T): **FIELD TRIP: Transmountain Road**: all day, off-campus w/ Processes, all students Lab 4 (Th): Mineralogy lab: all students
3	Sept. 12, 14	Lab 5 (T/Th): Mineralogy lab: section students
4	Sept. 19, 21	Lab 6 (T/Th): Mineralogy lab: section students
5	Sept. 26, 28	Lab 7 (T/Th): Mineralogy lab: section students
6	Oct. 3, 5	Lab 8 (T/Th): Mineralogy lab: section students
7	Oct. 10, 12	Lab 9 (T/Th): Mineralogy lab: section students
8	Oct. 17, 18	Lab 10 (T/Th): Mineralogy lab: SECTION OR ALL STUDENTS
9	Oct. 24, 26, 27-29	Lab 11 (T): **FIELD TRIP: Mt. Cristo Rey**: all-day, off-campus w/ Processes, all students Lab 12 (Th): Mineralogy lab, all students Lab 13 (Friday-Sunday): **FIELD TRIP: Tusas Mtns.**: 3-day, off-campus w/ Processes, all students
10	Oct. 31, Nov. 2	Lab 14 (T/Th): Mineralogy lab: section students
11	Nov. 7, 9, 11	Lab 15 (T/Th): Mineralogy lab: SECTION OR ALL STUDENTS Lab 16 (Saturday): **FIELD TRIP: Bishops Cap**: all day, off-campus w/ Processes, all students
12	Nov. 14, 16, 18	Lab 17 (T/Th): Mineralogy lab: SECTION OR ALL STUDENTS Lab 18 (Saturday): **FIELD TRIP: Potrillo Volcanic Field**: all day, off-campus w/ Processes, all students
13	Nov. 21, 23	Thanksgiving Break
14	Nov. 28, 30, Dec. 2	Lab 19 (T): **FIELD TRIP: Mt. Cristo Rey**: all-day, off-campus w/ Processes, all students Lab 20 (Th): Mineralogy lab: ALL STUDENTS Lab 21 (Saturday): **FIELD TRIP: Orogrande**: all day, off-campus w/ Processes, all students
15	Dec. 5, 7	Catch up and Review

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.