

GEOL 1110 Physical Geology syllabus

Fall 2021

Section 501, 3 credits

In-person: Tuesday/Thursday 10:30 am - 11:45 am

Classroom: VAHS 101

PROFESSOR: Dr. Benjamin Burnett

E-MAIL: burnettben@unm.edu

OFFICE HOURS: Tuesday/Thursday 11:45-1:00 in VAHS 108 or *by appointment*

Required technologies:

Software: Microsoft Office (Word, Excel and others, accessible through Lobomail via my.unm.edu), Adobe Acrobat Reader (get.adobe.com),

iClicker: provided in classroom (you will use the same one each day).

Class format: This class will meet in-person. In-person classes are subject to change based on COVID-19 concerns and restrictions (more information on the next page).

This course is an introduction to **Geoscience**, where we take a comprehensive view of the materials, processes, and history of the Earth. We will investigate how mountains are formed, how volcanoes erupt, where earthquakes occur, and how water, wind, and ice can shape the landscape. We also consider the importance that earth materials and processes have on humans and the impacts that human activities have on Earth systems, both globally and locally. We will examine environmental change at both local and global scales from a scientific standpoint.

Student Learning Outcomes

1. Recall, describe or explain geologic vocabulary.
2. Identify or explain aspects of the geologic time scale and compare the uses and limitations of relative and absolute dating.
3. Recognize or explain the evidence used to support the theory of plate tectonics. Describe or identify how plate tectonics is related to the structure and features of the Earth.
4. Describe the formation of, and describe, compare, and classify minerals.
5. Identify or describe the three main rock types, how each forms in the context of the rock cycle and what each indicates about its environment of formation.
6. Recognize or explain the fundamentals of surface and groundwater hydrology and discuss the impact of human activities on water quality and quantity.
7. Describe or discuss the processes that are responsible for specific geologic hazards (e.g., earthquakes, volcanic eruptions, mass movement, flooding, etc.).
8. Recognize or describe the geologic processes involved in the formation and concentration of geologic resources.
9. Describe atmospheric circulation and the processes that control Earth's weather and climate.
10. Recognize the role that climate change plays on Earth's biota and extinction rates in the modern Earth system and throughout Earth history.
11. Understand the scientific method and recognize the importance of fact-based reasoning and decision making, both quantitative and qualitative.

UNM Learn CLASS PAGES: Log in at: <https://learn.unm.edu> with your UNM CIRT username and password to access this site. It holds the syllabus, schedule, lecture outlines and graphics, and your grades (posted confidentially). Problem sets and some homework assignments will be given there. Most material is on the “Course Information” page. You can find “Course information” in the menu on the left. Hint: if you don’t see the menu, click the blue bar or tab on the left side of the screen to expand the menu and see your options. There’s also a link to your grades and the discussion board for the class in this menu.

TEXTBOOK: [How the Earth Works](#) by Gary Smith and Aurora Pun.

Reading the assignments on time is essential. Please bring up questions from readings in class.

CLASS CONDUCT: Class will begin on time and end on time. **Take notes with paper and pencil.** It is very difficult to draw sketches and graphs on most computers quickly, as will be necessary. Additionally, your handwritten notes may be used for pop quizzes and exams, but computers may not. Absence from more than 2 classes without medical or other documented legitimate excuse may result in being dropped from the class, but **if you decide not to take the course you should drop it yourself.**

COVID-19 CONSIDERATIONS: Do not come to class if you feel sick, have a fever or unexpected breathing issues. Contact the university and your professors immediately. We must all wear masks or similar face coverings at all times during class.

You have the ability to prevent the spread of COVID-19 and to preserve the health of fellow students, your instructor, staff and the community by following UNM health protocols. The UNM Provost Administrative Directive on Mandatory Student Face Covering and Symptom Reporting of July 9, 2020 requires that all students on UNM-Main and UNM branch campuses wear face masks in the face-to-face classroom and on campus unless they have a specific mask accommodation (confidentially documented with the Accessibility Resource Center). UNM Provost Administrative Directive is consistent with Governor Lujan Grisham’s [Public Health Emergency Order](#) as amended, and the [Public Health Order of the New Mexico Health Secretary](#). It also requires daily participation in symptom screening through covidscreen, which will be sent via UNM e-mail.

UNM Administrative Mandate on Required Vaccinations

All students, staff, and instructors are required by [UNM Administrative Mandate on Required Vaccinations](#) to be fully vaccinated for COVID-19 as soon as possible, but no later than September 30, 2021, and must provide proof of vaccination or of a UNM validated limited exemption or exemption no later than September 30, 2021 to the [UNM vaccination verification site](#). Students seeking medical exemption from the vaccination policy must submit a request to the [UNM verification site](#) for review by the UNM [Accessibility Resource Center](#). Students seeking religious exemption from the vaccination policy must submit a request for reasonable accommodation to the [UNM verification site](#) for review by the [Compliance, Ethics, and Equal Opportunity Office](#). For further information on the requirement and on limited exemptions and exemptions, see the [UNM Administrative Mandate on Required Vaccinations](#).

Acceptable masks and mask wearing in class: A two-layer mask that covers the nose and mouth and that is cleaned regularly is acceptable. A face shield is not sufficient protection. It is vital that you wear your mask correctly, covering your nose and mouth. Removing your mask for an extended period to eat or drink in class violates the Provost Administrative Directive and endangers others.

Mask Wearing Accommodation: Individuals with a documented disability or diagnosis may seek accommodation with the UNM Accessibility Resource Center (ARC) (<https://arc.unm.edu/>). Individuals do not need to reveal private information to an instructor. ARC will require documentation of health requirements, which will be kept confidential. The instructor will be informed only of any need for accommodation.

Consequences of not wearing a mask properly: Unless you have an ARC-approved accommodation, if you don't wear a mask, or if you do not wear a mask properly by covering your nose and mouth, you will be asked to leave class. If you fail to wear a mask properly on more than one occasion, you can expect to be dropped from the class. If you insist on remaining in the classroom while not wearing a mask (without an ARC-determined accommodation), class will be dismissed for the day to protect others and you will be dropped from the class immediately.

This class may move to remote delivery at any time to preserve the health and safety of the students, instructor and community. Please check your UNM email or the Announcements page for this class on learn.unm.edu regularly for updates about our class and please check <https://bringbackthepack.unm.edu> regularly for general UNM updates.

GRADING: Grading will be weighted as follows:

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|---|-----|
| Midterm Exam 1: | 10% |
| Midterm Exam 2: | 15% |
| Final Exam (~20% comprehensive): | 20% |
| Quizzes and in-class exercises (drop lowest): | 35% |
| Short problems (about 4; drop lowest): | 15% |
| News Item: | 5% |

- **No late work accepted** (this applies to short problems and in-class exercises, where the lowest score is dropped for each).
- **No extra credit is given** (i.e. no one will have a chance to earn points that everyone does not have). The way to get "extra credit" is to do your best on the regular work!

MAKE-UPS: Because your lowest quiz and problem scores are dropped, **no make-up quizzes or problems will be given** except in exceptional documented cases. If you cannot take an exam during the scheduled period, you must contact me **before the exam period has ended** to document legitimate reasons and discuss scheduling.

Optional field trip: There will be an optional field trip which can be used as a replacement grade for a quiz in-class activity or problem set.

ACCOMMODATIONS: The University of New Mexico strives to be compliant with the ADA (Americans with Disabilities Act), which prohibits discrimination in the offering of programs and services on the basis of disability. The UNM committee on disabilities notes that disabled students should inform their instructor of special needs as soon as possible to ensure that those needs are met in a timely fashion.

QUIZZES: Quizzes will be given about every 2 weeks. These quizzes will sometimes be on learn and sometimes in the last 5-10 minutes of class. The quizzes will be based on notes given that day and in the previous class; open notebooks are allowed. You will do very well on the quizzes as long as you attend class and **take good notes**. The lowest quiz score is dropped.

Use of "iClickers": Clickers are remotes used in class that allow students to respond to questions anonymously. They provide rapid feedback for both the instructor and students and will be used to give quizzes and assess participation in this course. A clicker will be assigned to you on the first in-class day, you do not need to buy one yourself.

EXAMS: These are designed primarily to test your understanding of concepts, but some memorization of important facts and terminology is necessary. **The textbook reading provides essential reinforcement for lecture material and may form the basis for exam questions.** Exams are taken in class. You will be allowed to use a “cheat sheet” which is one notebook page with hand-written notes on it. You’ll get more information about the “cheat sheet” before the first exam.

SHORT PROBLEMS: About 4 problem sets of different types will be assigned during the term, including simple quantitative problems. You will access and complete these online, and all are due one week after they are assigned.

Plagiarism – which without question includes copying and pasting of all or part of any web material – will not be tolerated on any work.

KEEPING UP WITH THE NEWS: Because Earth science often concerns issues of environmental, social, and political importance, it will be your job to keep track of current events, and to submit one relevant geoscience news item for possible brief discussion in class. **WRITE a concise single paragraph summarizing the issue, scientific findings, and/or events in the article and your reaction to this news in light of your understanding of environmental science, to turn in with the article.** Newspaper clippings, magazine articles, and web materials will suffice, or even video or audio recordings (if truly news). So that news discussions are distributed throughout the term, turn in your item by email or in class following the schedule below. **Don’t forget** – these are easy points!! This will be due in November.

Additional resources:

We are currently living through one of the most challenging times in living memory, and you may be experiencing a lot of stress and anxiety. Fortunately, as a UNM student you have access to wide range of resources designed to help students succeed in their academics and in their personal lives. UNM-Valencia has a **Learning Center** that offers a wide range of tutoring options. Many of the larger classes at UNM-V have assigned tutors that are familiar with the class materials. GEOL 1110 is a small class and doesn’t currently have an assigned tutor, but you can get help from other tutors with a science background. Check out the Learning center website here:

<https://valencia.unm.edu/campus-resources/the-learning-center/learning-center.html>

or make an appointment here: <https://esurvey.unm.edu/opinio/s?s=131505>

UNM also offers counseling and other mental health resources. Sometimes you just need to talk to someone who can help you process the events in your life and improve your mental state. Many of these resources can be accessed online. <https://shac.unm.edu/services/mental-health/index.html>

The UNM Office of Equal Opportunity (OEO) contains a wide range of resources that can help you succeed and keep our campus free from discriminatory acts and sexual violence. If you have witnessed or survived sexual discrimination or assault or a hate crime, the OEO website has reporting options and professionals who can answer your questions. <https://oio.unm.edu/>

The OEO also coordinates with UNM’s Accessibility Resource Center where students can request accommodations for disabilities. <https://arc.unm.edu/>

A more complete listing of UNM resources related to diversity, safety and health and COVID-19 can be found here: <https://oio.unm.edu/resources/index.html>

*****PLEASE BE SURE TO REMAIN IN EMAIL CONTACT FOR UPDATES AND NOTICES THROUGHOUT THE CLASS *****

| Last updated 8/20/2021 | | GEOL 1110 Physical Geology, Fall 2021 | | |
|---------------------------|---|--|--|----------------------------------|
| | | Tentative SCHEDULE | | GEOL 1110L |
| Week | Section | Lecture Topics | Reading in <u>How Does</u> <u>Earth Work</u> | Lab |
| 23-Aug | Earth Materials | What is science? Chemical bonding Mineral properties | Ch. 1, 2 | Quantitative Geoscience |
| 30-Aug | | Rock Cycle Igneous rock formation | Ch. 3, 4 | Mineral properties |
| 6-Sep | | Labor Day Sept. 6 Volcanic Hazards Sediments and Sedimentary Rocks | Ch. 4, 5 | Mineral identification |
| 13-Sep | | Metamorphic Rocks Geologic time | Ch. 6, 7 | Igneous Rocks |
| 20-Sep | Earth History | The history of Earth Review for first exam | Ch. 7, 9 | Sedimentary Rocks |
| 27-Sep | Internal Processes and Plate Tectonics | MIDTERM EXAM 1 on Sept. 28 Earth's interior processes | Ch. 8 | Metamorphic rocks |
| 4-Oct | | Mantle convection Deformation of Earth materials | Ch. 10, 11 | Relative and numerical dating |
| 11-Oct | | Plate tectonics Fall break Oct. 14-15 | Ch. 12 | Plate Tectonics |
| 18-Oct | Earth Surface Processes | Plate tectonics Soils | Ch. 13, 14 | Topographic Maps |
| 25-Oct | | Mass movements Hydrologic cycle and river flow | Ch. 15, 16 | Seismology |
| 1-Nov | | Flooding and hydrographs | Ch. 16 | Geologic maps |
| 8-Nov | | MIDTERM EXAM 2 on Nov. 9 Groundwater | Ch. 17 | Surficial geology |
| 15-Nov | | Glaciers Oceans and shorelines | Ch. 18, 19 | Groundwater |
| 22-Nov | Atmosphere and Environment | Global wind patterns Thanksgiving break Nov. 25-26 | Ch. 20 | No Lab |
| 29-Nov | | Climate Climate change | Ch. 21 | Climate Change |
| 6-Dec | | Energy and mineral resources Environmental geology | | Practical examination |
| 13-Dec | | Review and Final Exam: Dec. 16th 10:30am-12:30pm | | (no lab) |