GEOL1110-502 Spring 2020 - Physical Geology
"Civilization exists by geological consent, subject to change without notice." ***Will Durant***

Instructor: Dr. Kevin Hobbs **Email:** khobbs84@unm.edu **Office:** A-132A **Phone:** 925-8876
Office hours: Tuesday & Thursday 10:30-12:00 and 4:20-5:00; W 9:00-10:40
Class time and location: Tuesday & Thursday 3:00-4:15 P.M. in VAHS101
Textbook: *Earth: Portrait of a Planet* by Stephen Marshak; Norton Publishing
Supplies needed: Notebook or binder with lined paper, pencils; some students prefer different colors of pens/pencils for note-taking and diagrams.

Schedule

Week	Date	Topic	Reading
1	1-21	Introduction; why study geology?	Prelude; Ch. 3
	1-23	Plate tectonic theory	Ch. 4, online resources
2	1-28	Earth composition	Ch. 2
	1-30	Paleomagnetism & Earth's magnetic field	Ch. 3 and 4, online resources
3	2-4	Plate boundaries	Ch. 4
	2-6	Drivers of plate motion – **Mini-exam**	Ch. 4
4	2-11	Minerals	Ch. 5
	2-13	Intro to rocks; igneous rocks	Ch. 6, online resources
5	2-18	Magma; lava; igneous rocks	Ch. 6
	2-20	Sedimentary rocks	Ch. 7; Interlude B
6	2-25	**EXAM #1**	
	2-27	Sedimentary rocks	Ch. 7
7	3-3	Rock cycle & metamorphism	Ch. 8, Interlude C
	3-5	Geologic time	Ch. 12
8	3-10	Dating	Ch. 12, online resources
	3-12	Dating	Ch. 12
9	3-17	**Spring break – no class**	
	3-19	**Spring break – no class**	
10	3-24	Structural geology	Ch. 11
	3-26	Structural geology	Ch. 11, online resources
11	3-31	Orogeny and mountain belts	Ch. 11; Ch. 8 if needed
	4-2	**EXAM #2**	
12	4-7	Seismology, continued	Ch. 10
	4-9	Earthquakes and associated hazards	Ch. 10
13	4-14	Volcanoes	Ch. 9
	4-16	Volcanoes of New Mexico	Online resources
14	4-21	Hydrocarbons and energy resources	Ch. 14
	4-23	Energy resources	Ch. 14
15	4-28	Groundwater	Ch. 19
	4-30	Groundwater	Ch. 19, online resources
16	5-5	Karst	Ch. 19; online resources
	5-7	**FINAL EXAM**	

A note on class schedule: The schedule included above will serve as a general outline for the semester. Dates and topics might change as needs arise. Changes will be posted ASAP.

About your instructor:
I am interested in learning about how complex systems work. Earth is the most complex system on Earth, which is why I have studied, practiced, worked in, and taught geology since 2002. I love geology so much that I got three degrees from three universities in it! Then I married another geologist so that we could talk about geology. I take vacations just to learn about geology. When I'm not learning or teaching geology, I'm miserable and no fun to be around. I love animals (even cats, but I'd rather tell you about my dogs), riding two-wheeled things as fast as I can (which is not very fast), and coffee (the hotter, stronger, and blacker, the better!).

Course Goals (these are what your instructor wants for you to get out of the course):

1. *To introduce the principles and processes of science using Earth science as a guide.*
   Familiarity with the scientific method benefits individuals, communities, and societies.

2. *To present Earth science and the methods by which it is studied and practiced.*
   Understanding of Earth's composition, history, and processes lead to more informed consideration other sciences as well as arts, cultures, and human histories.

3. *To introduce students to the importance of Earth science on individuals and societies at the local, regional, and global scale*
   Each of us plays a role in our environment; we have impacts on it and are impacted by it. As Earth scientists, we seek to understand better these impacts and to be able to make reasoned considerations of the geological issues facing us and our society.

Student Learning Objectives (SLOs – these are mandated by the state Higher Education Department):
1. By evaluating a set of data, the student will define a problem, pose a hypothesis, and describe how the hypothesis can be tested. (Relates to UNM/HED Area 3, Competencies 1, 2, 4)
2. Students will be able to state the age of the Earth and describe how geologists measure absolute rock ages by radioactive decay. (Relates to UNM/HED Area 3, Competencies 1, 3)
3. Students will be able to determine the relative order in which a series of geologic events occurred by applying the concepts of relative dating. (Relates to UNM/HED Area 3, Competencies 1, 3)
4. Students will be able to describe the compositional (crust, mantle, core) and mechanical (lithosphere, asthenosphere, outer core, inner core) layers that exist in the Earth. (Relates to UNM/HED Area 3, Competency 3)
5. Students will be able to name and describe fluvial, karst, glacial, coastal and Aeolian landforms (e.g. meanders, moraines, dunes, etc.) and be able to explain the specific geologic processes involved in their formation. (Relates to UNM/HED Area 3, Competencies 3, 5)
6. Students will be able to describe the three main rock types (igneous, sedimentary, and metamorphic) and how they form in the context of the rock cycle. (Relates to UNM/HED Area 3, Competency 3)
7. Students will be able to explain the evidence for the plate tectonic processes that occur at each of the three types of plate boundaries. (Relates to UNM/HED Area 3, Competencies 2, 3)
8. Students will be able to describe the geologic processes involved in formation and concentration of a significant geologic resource (examples include fossil fuels and metals). (Relates to UNM/HED Area 3, Competencies 3, 5)
9. Students will describe the processes that are responsible for specific geologic hazards (e.g., earthquakes, volcanic eruptions, mass movement, flooding, etc.). Page 3 of 3 (Relates to UNM/HED Area 3, Competencies 3, 5)

Attendance:
Attendance is required at each class meeting. *Attendance is taken before the start of each class. To be late is to be absent.* Students with 3 consecutive absences or 4 absences overall may be dropped from the course. **Students with 2 absences in the first three weeks of class will be dropped from the course.** There are no excused absences. If you are forced to miss a class, you are encouraged to get notes and materials you missed from a classmate and read the assignment for that day.

Grading:

Tests: 3 exams	45%
Assignments: 9 in-class and homework assignments, lowest score dropped	35%
Weekly reading quizzes	20%
TOTAL	100%

Grade scale:	98+ = A+	92-97 = A	90-91 = A-	
	88-89 = B+	82-87 = B	80-81 = B-	
	78-79 = C+	72-77 = C	70-71 = C-	
	68-69 = D+	62-67 = D	60-61 = D-	0-59 = F

Exams:
Exams cover all materials covered since the last exam. Each exam is worth 15% of the total grade for the class. Exams will contain multiple choice, short answer, and interpretive questions.

In-class and homework assignments:
A total of 35% of the final grade will be based on eight in-class and homework assignments. Some of these will require discussion and/or collaboration with your classmates. Due dates for homework assignments will be posted when the assignment is given. You will always have at least 48 hours to complete homework.

Reading quizzes:
There will be an in-class or online reading quiz most weeks. These quizzes will be based upon the assigned readings from the textbook and other sources. Online quizzes must be completed before class. At the end of the semester, your lowest quiz score is omitted. Because reading quizzes are posted a minimum of 48 hours prior to the due date, late quizzes are not accepted.

Late policy:
I accept late work but penalize by deducting points. If your work is one day late, I deduct 20% off your score. Two days late = 30% deducted. Three days late = 40% deducted. More than three days late = 50% deducted. Because reading quizzes are posted a minimum of 48 hours prior to the due date, late quizzes are not accepted.

Extra credit:
As in life, there is no extra credit in this class.

Reading:
This course covers a broad range of topics from many fields of Earth science. It would be impossible to give fair treatment to all topics with lectures alone. Therefore, successful students must read from the textbook and other sources in preparation for class meetings. To encourage you to read

before class meetings, most online quizzes will be taken from the reading materials that will be discussed in class on the due date of the online quiz. I encourage you to take notes while reading, including writing down questions that arise during reading that you would like to discuss in class. Re-reading after the class meeting has been shown to improve comprehension and success.

There are a number of old geology textbooks and lab manuals available for use in the STEM Center (if you don't know where this is, just ask! It's in the same building as the library.) Getting a perspective different from the one in the official textbook can be useful.

Class participation expectations:
This is a challenging course. It is important that you not only know the material but understand it as well. There are things that you can do to increase your chances of successfully completing this course.

-- **Come to class**. This is the single most important predictive factor for success. Those students who regularly come to class succeed at a much higher rate than those who don't (this seems like a no-brainer but it is an important factor)

-- **Study**. Students tend to underestimate the amount of material covered in this course as well as the depth of understanding that is required. This is not high school; you cannot cram in one night. It is necessary to keep up with the material (meaning to review it every day!!). A good rule of thumb is that you should spend 2 hours preparing for each hour you spend in class. Thus, you should expect to spend 8-10 hours a week on lecture and studying in order to make a C.

-- **Read your text**. Much information on tests can be found in your text. The text has been selected to match the information in the lectures and reading the text will only help you understand the material.

-- **Use all the help available**. Come to office hours and come prepared with questions. Bother your instructor with incessant relevant questions (not necessarily during lecture, sometimes it is important to get through the material, but I am happy to answer even slightly relevant questions after class, in office hours, by email, etc.)

-- **Turn in assignments**. Refer to the grade scale above. A student can score an "A+" on all three exams, but they will still fail the course if they miss half of the assignments and reading quizzes. On the other hand, a student can score a "D" on all three exams but still pass the course if they correctly complete all assignments and quizzes on time!

I expect that each of you will come to class prepared and willing to work. This includes reading the chapter before the class meeting, participating in discussions, asking questions where appropriate, being courteous to your fellow students, and being willing to think.

Office hours:
While my "official" office hours are listed at the top of this syllabus, you are welcome to stop by my office at any time. My door is always open, and I am here to help you in any way that I can. If you are having trouble catching me in my office, email or phone me so that we can arrange a meeting. Students who visit office hours tend to perform better in class. There are also photographs of all my dogs in my office, and who doesn't like looking at dog pictures?

Plagiarism and cheating:
Discussion of ideas is essential in science, and I encourage you to talk with one another about the topics and assignments in this class. However, all work that you submit must be your own. If you use information from outside resources, such as the textbook, newspapers, the internet, or journals, you must cite it. Plagiarism will result in a "0" on the assignment. If you are concerned about what does or does not constitute plagiarism, I'm happy to help – just ask me after class, via email, or in office hours.

Electronic devices:
Do not use cell phones during class, even for checking texts. Mute or turn off anything that can provide any distraction before class begins. You will be asked to leave class if using electronic devices at inappropriate times.

The following statements are included at the suggestion of UNM administration:

Accessibility:
"In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 for additional information. If you need an accommodation based on how course requirement interact with the impact of a disability, you should contact me to arrange an appointment as soon as possible. At the appointment we can discuss the course format and requirements, anticipate the need for adjustments and explore potential accommodations. I rely on the Disability Services Office for assistance in developing strategies and verifying accommodation needs. If you have not previously contacted them I encourage you to do so."

Title IX:
In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education (see pg 15 - http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see:https://policy.unm.edu/university-policies/2000/2740.html