

GEOL 1303– Physical Geology Syllabus – Kelsch – Fall 2021

Sul Ross State University; Department of Biology, Geology, & Physical Sciences (BGPS)

Instructor: Ms. Jesse Kelsch, MS

Office: WSB 316

Class time: 10:00 – 10:50 (001) and 12:00 – 12:50 (002)

Email: jkelsch@sulross.edu ** When you email me, please include at least “GEOL 1303” in the subject line**

Phone: 432-837-8657

Office Hours: Mon 11-12, 2-3

Tue 1-3

Wed 11-12, 2-3

other times by appointment

Course Purpose:

The objective of this course is to provide the student with an understanding of HOW the planet Earth’s interior and surface processes work, within the context of science, which is a methodical and consistent method of gathering facts to understand processes in the natural world. The student will gain a theoretical foundation of geology including not just the knowledge accumulated by geoscientists, but also the methods and logic behind how Earth scientists know this knowledge to be true, as well as some first-hand experience locating and analyzing geoscientific data. Topics to be covered include earthquakes, volcanoes, plate tectonics, the interior of Earth, its magnetic field, rocks and minerals, the ocean basins, groundwater, rivers, glaciers, Earth’s hydrosphere and atmosphere, and its climate’s energy budget and long-term carbon cycle.

Text and Materials:

REQUIRED, FREE, DOWNLOADABLE AND ONLINE TEXTBOOKS:

- (1) Physical Geology: Earth Revealed by Carlson, Plummer and Hammersley. This whole text is available as an Open Educational Resource (OER) pdf file at: <https://silo.pub/physical-geology-earth-revealed-9th-edition.html> When you download this pdf file, take the time to insert a table of contents by creating bookmarks. This is a long-used and well circulated textbook for Physical Geology classes that is also available to buy used (as a hardcopy) from various online sellers. Any edition 6th or later will suffice for this class. Two hardcopies are on reserve in the Alpine campus library. Reading assignments from this text are listed in the relevant section in the course’s Blackboard page and also in the class schedule on the syllabus.
- (2) Physical Geography and Natural Disasters by R. Adam Dastrup. This OER text can be read online at <https://slcc.pressbooks.pub/physicalgeography/>. It can be downloaded, but pertinent and required-viewing short videos are embedded in the online version. Essential readings from this text are linked within the relevant section in the course’s Blackboard page and listed in the class schedule on the syllabus. You will notice that this free online resource is a work in progress; nonetheless, the assigned pages are complete and relevant.

Student Learning Outcomes: Each student will demonstrate the following abilities:

(Number/letter in parentheses refer to TEA teacher-certification competency ID’s that this learning outcome addresses)

1. Evaluate and explain the relationships between plate tectonics and the presence of mountains, igneous bodies and earthquake zones.
2. Interpret the origin of common rocks and minerals
3. Determine the relative ages of rocks, geologic structures, and tectonic and climatic events using relative geologic dating principles
4. Calculate speeds and directions of tectonic plate motion using available geologic data (7B)
5. Identify and evaluate structural features in Earth's crust such as faults and folds, and interpret their history.
6. Understand Earth Systems (hydrosphere, geosphere, atmosphere, biosphere) and how they relate to each other within Earth's Critical Zone
7. Predict changes in stream-water flow, stream-channel shape, and clastic-sediment erosion and deposition as governed by the equation $Q=VxA$ (7B)
8. Understand concepts and issues related to interactions of a growing human population with Earth systems (3B)
9. Discuss the value of the scientific method in Earth Science
10. Understand principles of scientific ethics (2I)
11. Model a variety of geologic processes by creating concept sketches of them (4H)

Methods of Evaluation and Grading:

The course material will be presented primarily through in-class lectures and exercises, with supplemental material posted in the Blackboard course page. Students will be assessed through the following methods:

Concept Sketches: Students are required to submit a concept sketch every week in class, depicting a geologic process presented that week in class. The topics for each sketch are given during the lecture, and lecture time is given to the instruction for each of these sketches. Concept sketches require very little artistic skill (*don't panic!*) but the process of creating them enhances learning. A concept sketch includes a line drawing AND complete sentences embedded in the drawing that describe the processes being illustrated. Each submission must be the student's own hand-drawn work on paper in a separate notebook dedicated to these sketches (and not class notes.) A grid-paper composition book is a good example of a separate notebook suitable for drawing in and submitting. Students will submit their notebooks each week on Wednesdays to have returned to them on Fridays in class. The total of all your graded concept sketches comprises 42% of your final grade.

In-class exercises: There will be six in-class assignments on six class days throughout the semester that will allow students to use real geoscientific data to solve an Earth-science problem. These exercises will be completed in small groups within the class time but each student will turn in their own work. Each of these exercises is worth 5% of your course grade, to total 21% of your final course grade. Because they are in-class group activities, they may not be made up. *[Your instructor is conducting research about the efficacy of these exercises and will give you the opportunity to complete survey questions about them during or after the assignment, in class. Whether you opt to answer these survey questions will have no bearing on your grade for the assignment or for the course. More information about this survey-based research will be discussed in class, and a consent form will be presented for your signature, with your choice to participate or to not participate in the surveys.]*

Exams: There will be three module exams, the third of which will be taken during finals week. Material for exams will come from the lecture, exercises, concept sketches, and online supplemental materials. **No make-up exams will be given unless prior arrangements have been made.** The total value of the exams equals 18% of your final class grade, or 6% for each exam.

Online quizzes: After every week an open-note quiz will be posted on Blackboard covering that week's material, as a means of consolidating the information and as practice for the exams. The sum of these weekly quizzes is worth 18% of your final course grade.

Grading calculation: The required projects, quizzes and exams total 1000 points for your course grade:

6 in-class exercises	35 pts ea	210 pts total	21%
14 Weekly concept sketches	30 pts ea	420 pts total	42%
15 weekly online quizzes	12 pts ea	180 pts total	18%
3 module exams	60 pts ea	180 pts total	18%
<u>attentiveness & participation</u>	<u>10 pts</u>	<u>10</u>	<u>1%</u>
total		1000 pts total	100%

Grading: Grades on assignments, quizzes, and discussion board entries will be tallied within the Grade Center on our Blackboard course page. Your final course letter grade will be based on a percentage of the total points as follows:

90.00-100%	A
80.00-89.50%	B
70.00-79.50%	C
60.00-69.50%	D*
Less than 60.00%	F

**Geology majors must earn a C or better in their geology classes in order to pass*

Semester Schedule: Module topics, dates available, and recommended reading:

This calendar is subject to change slightly, with notice, at the instructor's discretion.

Module beginning	Week #	week of	lecture topic	Reading either in 'Physical Geology: Earth Reveled' ("GEOLOGY") or in 'Physical Geography and Natural Disasters' (GEOGRAPHY)	quiz or exam	In-class exercise and class date
1: Earth Processes	1	Aug 23	Science & Geoscience; Earth Systems, the Critical Zone	GEOLOGY p.11 to p.26; including "In Greater Depth 1.4"; GEOGRAPHY 8.2, minus the 3rd video (the sun); section 1: incoming solar radiation	Intro quiz	
	2	Aug 30	Earth's Interior	GEOLOGY chapter 2, all (p. 29-49; GEOGRAPHY 8.2, 2nd video only		

Module beginning	Week #	week of	lecture topic	Reading either in 'Physical Geology: Earth Reveled' ("GEOLOGY") or in 'Physical Geography and Natural Disasters' (GEOGRAPHY)	quiz or exam	In-class exercise <i>and class date</i>
	3	Sep 6	Plate Tectonics	GEOLOGY chapter 4 p. 75-107		
	4	Sep 13	Plate Tectonics & Geologic Structures	GEOLOGY pp. 135-141; 147-154		1: Geologic Structures & Plate Tectonics <i>Wed Sep 15</i>
	5	Sep 20	Earthquakes	GEOLOGY pp157-179		2: Earthquakes <i>Wed Sep 22</i>
2: Earth Materials	6	Sep 27	Minerals; Rock Cycle; volcanoes	GEOLOGY pp217-239 (geol majors only); incl sidebar 9.2 & 9.4; p.243-252; p257-270	exam I	<i>Wed Sep 29:</i> keep open for in-class exercise
	7	Oct 4	Igneous rocks; Metamorphic rocks	GEOLOGY ch 11; ch 15, incl 'In Greater Depth 15.2' Index Minerals		3: Volcanoes <i>Fri Oct 8</i>
	8	Oct 11	Weathering and sediment; soils	GEOLOGY pp 301-312; 351-353;		
	9	Oct 18	Sedimentary rocks; Geologic time	GEOLOGY pp353-356; 366-378; pp 189-212; incl 'Earth Systems 8.1 and 8.2;	Exam II	
3: Earth's Water	10	Oct 25	Hydrologic cycle; atmosphere, water vapor	GEOGRAPHY 8.2 all except 3rd video (<i>The Sun</i>); 8.3 all; 8.6, 3rd & 4th videos only		4: Climate change <i>Wed Oct 27</i>

Module beginning	Week #	week of	lecture topic	Reading either in 'Physical Geology: Earth Reveled' ("GEOLOGY") or in 'Physical Geography and Natural Disasters' (GEOGRAPHY)	quiz or exam	In-class exercise and class date
	11	Nov 1	Greenhouse gases, Earth's carbon cycle; climate change	GEOGRAPHY 10.2, 10.4, 10.6, 10.7; GEOLOGY p. 314		
	12	Nov 8	Rivers	GEOLOGY pp407-427; incl sidebar 16.2		5: Streams and watersheds Wed Nov 10
	13	Nov 15	Ground water	GEOLOGY pp443-451; 456-463		6: Ground water Wed Nov 17
	14	Nov 22	Glaciers; ice ages and interglacials; paleoclimate (<i>no class Wed and Fri; Thanksgiving</i>)	GEOLOGY p489-509; sidebar 9.1 p.221; sidebar 19.3 p500-501; p509-511; sidebar 19.5 p.512		
	15	Nov 29	Glaciers and paleoclimate continued			
		finals week			Exam III	

Relevant Sul Ross State University Policies:

SRSU Library Services

The Sul Ross Library offers FREE resources and services to the entire SRSU community. Access and borrow books, articles, and more by visiting the library's website, library.sulross.edu. Off-campus access requires your LoboID and password. Check out materials using your photo ID. Librarians are a tremendous resource for your coursework and can be reached in person, by email (srsulibrary@sulross.edu), or by phone (432-837-8123).

Software availability for Sul Ross Students:

Enrolled students have license to use Microsoft Office programs on their own computers, for free download through the SRSU website. From sulross.edu go to MySRSU → Resources → Office 365 and follow the instructions using your Sul Ross ID.

Technical Support.

SRSU 24/7 Blackboard Technical Support: Toll Free: 888.837.6055.

Email: blackboardsupport@sulross.edu

Student Accommodations

Sul Ross State University (SRSU) is committed to equal access in compliance with Americans with Disabilities Act of 1973. It is SRSU policy to provide reasonable accommodations to students with documented disabilities. It is the student's responsibility to initiate a request each semester for each class. Students seeking accessibility/accommodations services must contact Rebecca Greathouse Wren, LPC-S, SRSU's Accessibility Services Coordinator at 432-837-8203 (please leave a message and they'll get back to you as soon as they can during working hours), or email rebecca.wren@sulross.edu. Their office is located on the first floor of Ferguson Hall (Suite 112), and their mailing address is P.O. Box C-122, Sul Ross State University, Alpine, Texas, 79832.

Classroom Climate of Respect

Importantly, this class will foster free expression, critical investigation, and the open discussion of ideas. This means that all of us must help create and sustain an atmosphere of tolerance, civility, and respect for the viewpoints of others. Similarly, we must all learn how to probe, oppose and disagree without resorting to tactics of intimidation, harassment, or personal attack. No one is entitled to harass, belittle, or discriminate against another on the basis of race, religion, ethnicity, age, gender, national origin, or sexual preference. Still we will not be silenced by the difficulty of fruitfully discussing politically sensitive issues.

Academic Integrity:

Academic dishonesty hurts everyone and reduces the value of college degrees. Doing someone else's work, presenting the ideas and work of others as your own, submitting the same paper for multiple classes, and/or failing to cite your sources when you utilize the ideas of others, are all examples of academic dishonesty. It is your responsibility to read and understand the university's policy on academic dishonesty in the SRSU Student Handbook, as all violations will be taken seriously and handled through the appropriate university process. The Student Handbook can be found at: <https://www.sulross.edu/page/2454/student-handbook> (page 80).

If you have any questions about this, please ask!