

SRSU NATURAL HAZARDS – GEOL 4311/5304, Spring 2025; TR 9:30-10:45am

Professor: Dr. Jesse Kelsch

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Office Hours: Mondays and Wednesdays 1:30 – 4:00pm

Section I. Introduction and Course Learning Objectives

Welcome to Natural Hazards in the Geology program at Sul Ross State University. In this class we will investigate several Earth-system processes that are capable of disrupting living systems, both human and non-human, which are considered hazards, disasters, or catastrophes depending on the scale of the disruption. Topics covered in this three-credit course are mass movements (e.g. landslides and rockfalls), earthquakes, volcanic eruptions, river flooding, coastal flooding and erosion, hurricanes, wildfires, prolonged drought, and ground subsidence. Within each topic's section in the semester, we will first explore it from the perspective of that process' function in the Earth system. We will then consider the phenomenon from various perspectives of human society: What risks does each pose and why, and what role do professional geologists have in mitigating those risks? We will find and analyze real geoscientific data from certain hazardous events, where available. We will also explore the physical causes of compounded hazards, where one exacerbates another (for example: drought exacerbating wildfires, and wildfires exacerbating mudslides.)

Some of the geologic skills and knowledge available from this class:

1. An understanding of hazardous earth processes.
2. Access, application, and analysis of publicly available geoscientific data.
3. Evaluation of practiced hazard-mitigation efforts.

Section II. SACSCOC Student Learning Outcomes

The student completing this course successfully will be able to apply a diverse body of geologic information in the areas of Earth history, structural geology and tectonics. The student will also be able to communicate a diverse body of geologic information through the standard scientific format of an oral presentation based on a written paper.

Section III: THECB Marketable Skills

1. Student will be able to use library resources.
2. Student will be able to communicate in written and oral format.

Section IV. Course Requirements and Grading

Your participation and performance in this course will be assessed from the following gradable items:

- Term project (see 'Term Project' below) (15%)
- Two exams (midterm and final) (25%)
- Five in-class exercises using geologic data (50%)
- Attentiveness and participation in class lectures and exercises (10%)

Grades will be recorded in the Blackboard course page.

Letter grading:

Final course grade will be based on a percentage in the standard grading system:

100-90 (A), <90-80 (B); <80-70 (C), <70-60 (D), <60 (F)

Term project:

All students enrolled in the course will investigate one historic natural disaster and report on it via (1) an in-class presentation using digital media, and (2) a technical paper. Graduate students' presentations will each be one class period in length and will include a data-driven in-class exercise for all students. Undergraduate students' presentations will each be ~15 minutes long and will not incorporate an exercise. In all cases, students should give equal attention to both the geology of the disaster and the societal effects of it, including what measures were taken before and after the event to mitigate its effects.

Attendance and Make-up Policy:

The only acceptable excuses for missing class are those due to illness, approved Sul Ross sanctioned events, and observation of religious holidays. All excused absences must be documented on paper. Please inform the professor at least 1 week prior to missing class (email, note on office door, etc.). With an appropriate excuse, you must make up missed exams within FIVE days of the last day of the absence or you have failed to meet your course responsibilities and will receive a zero. University policy dictates that your instructor can drop you with an F from the course after 6 absences from TR classes or after 9 absences from MWF classes. Sounds serious! But you can do well in this course if you show up, pay attention during the class time, stay current on your assignments, and take advantage of Dr. Kelsch's office hours to discuss class content.

Section V. University Policies, Programs, and Services

Academic Integrity

Students in this class are expected to demonstrate scholarly behavior and academic honesty in the use of intellectual property. Students should submit work that is their own and avoid the temptation to engage in behaviors that violate academic integrity, such as turning in work as original that was used in whole or part for another course and/or professor; turning in another person's work as one's own; copying from professional works or internet sites without citation; collaborating on a course assignment, examination, or quiz when collaboration is forbidden. Students should also avoid using open AI sources *unless permission is expressly given* for an assignment or course. Violations of academic integrity can result in failing assignments, failing a class, and/or more serious university consequences. These behaviors also erode the value of college degrees and higher education overall.

Student Responsibilities Statement

All full-time and part-time students are responsible for familiarizing themselves with the Student Handbook and the Undergraduate & Graduate Catalog and for abiding by the University rules and regulations. Additionally, students are responsible for checking their Sul Ross email as an official form of communication from the university. Every student is expected to obey all federal, state and local laws and is expected to familiarize themselves with the requirements of such laws.

ADA Statement

Sul Ross State University is committed to equal access in compliance with the 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 Mrs. Mary Schwartz Grisham, LPC, SRSU's Accessibility Services Director or Ronnie Harris, LPC, Counselor, at 432-837-8203 or email mschwartz@sulross.edu or ronnie.harris@sulross.edu. The Counseling and Accessibility office is located on the first floor of Ferguson Hall, room 112, and their mailing address is P.O. Box C122, Sul Ross State University, Alpine. Texas, 79832.

Library Information

The Bryan Wildenthal Memorial Library and Archives of the Big Bend in Alpine offer 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 logging in with your Lobold and password. 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).

Section VI. Semester schedule

This schedule is planned and is subject to change. Student presentations may be scheduled earlier than in the last weeks if the student prefers.

Week	Day	Date	Topic
1	Thur	16-Jan	Intro; hazards vs earth system ; disasters vs catastrophe
2	Tue	21-Jan	Mass Wasting/ Slope failure
	Thur	23-Jan	"
3	Tue	28-Jan	"
	Thur	30-Jan	Earthquakes
4	Tue	4-Feb	"
	thur	6-Feb	"
5	tue	11-Feb	Volcanoes
	Thur	13-Feb	"
6	Tue	18-Feb	"
	Thur	20-Feb	Floods: rivers
7	Tue	25-Feb	"
	Thur	27-Feb	"
8	Tue	4-Mar	<i>midterm exam during class</i>
	Thur	6-Mar	Floods: coastal processes
9	Tue	11-Mar	tsunami
	Thur	13-Mar	coastal erosion
10	Tue	spring break	
	Thur	spring break	
11	Tue	25-Mar	Wildfire
	Thur	27-Mar	"
12	Tue	1-Apr	Drought
	Thur	3-Apr	"
13	Tue	8-Apr	Ground subsidence
	Thur	10-Apr	"
14	Tue	15-Apr	Presentations
	Thur	17-Apr	"
15	Tue	22-Apr	"
	Thur	24-Apr	"
16	Tue	29-Apr	"
			<i>final exam during finals week</i>