

Sul Ross State University

GEOL 4308/5304– Tectonics – Fall 2026 –

Dr. Kelsch

Instructor: Jesse Kelsch, Ph.D.; Office: WSB 316; jkelsch@sulross.edu; 837-8657

Class time: MWF 10-10:50, WSB 210

Office hours: Mon, Tue, Wed 1pm-2:45pm; or by appointment

COURSE DESCRIPTION

This course is an integrated study of the geologic and geophysical features that reveal the mechanisms of plate tectonics. It includes detailed study of collisional orogens, subduction zones, oceanic spreading centers, and continental rifts; plate reconstructions via paleomagnetism and transform faults; and what we know about ancient orogens and the building of continental crust. This class is a multidisciplinary survey of lithospheric-plate geometries and interactions through time, and the resultant effects on geologic structures, topography, relief, and landforms.

REQUIRED TEXT AND READING

1. Plate Tectonics by Wolfgang Frisch, Martin Meschede and Ron Blakey
2. Four scientific papers to be assigned and provided during the semester.
3. Scientific papers obtained by the student to complete an integrated term paper

GRADING and methods of assessment/ evaluation

Grades will be calculated via the following table of total percentage value for each assignment:

3 section exams	30
paper reviews	30
class discussion	10
term paper	15
term presentation	10
November field trip	5+10
total	100+10

➤ There will be three section exams. These exams will be open-note and open-book and will be taken during class time on their given date. Exams consist of short-answer, quantitative, sketching, and essay questions. Makeup exams are only permitted by arrangement made with the instructor PRIOR to missing the exam.

➤ Four peer-reviewed journal papers covering topics related to plate tectonics will be assigned during the semester for students to read before a designated class period and discussed in that class period. A paper review consisting of five questions must be completed for each of these papers before the designated class period. The total value of these paper-review sheets is 30% of the

class grade, and the in-class discussions 15%.

- Students will select a topic in plate tectonics on which to conduct literature research to prepare a summary paper and a 12-minute presentation, each of which must include appropriately selected figures from your references and a bibliography. Figures will come from the references used to research the topic, but will be recaptioned and cited. Undergraduate students' papers require a minimum of three references and must be two full single-spaced pages (or four full double spaced.) Graduate students' papers require a minimum of five integrated references and must be at least three full single-spaced pages (or 6 double-spaced,) not counting figures. All students are advised to consider a topic and begin finding papers through the Sul Ross library early, as Interlibrary Loan may be required to obtain pdf copies of the published papers you'll use. SRSU ILL is very efficient and will retrieve all of the papers you'll request. Every paper you acquire might not have value for your term paper, though, and so early preparation is important. There will be milestone due dates for portions of your paper.

SEMESTER SCHEDULE

This schedule is PLANNED, and is subject to minor modification as necessary during the semester. Reading assignment is the material from the textbook as listed as the discussion topic for that class period. There will also be papers from the literature assigned ahead of time. These will be assigned in class; they are not listed below but are also required reading.

Week of:	Text Reading	Topic
24-Aug		Review of geophysical evidence for Earth's internal layering; types of crust
31-Aug	Ch 2	Map-view plate geometry & horizontal plate motions; no in-person class Wednesday
7-Sep	Ch 3	Continental rifts & passive margins
14-Sep	Ch 5	Passive margins, MORs & ocean crust
21-Sep		Rio Grande rift; EXAM 1 Wednesday 9/23
28-Sep	Ch 7	Subduction zones & active margins
5-Oct	Ch 7	Subduction erosion; accretionary wedges
12-Oct	Ch 8	Transform and oblique plate boundaries; GSA week: no in-person classes
19-Oct	Ch 8	The San Andreas fault system and the western North American plate boundary
26-Oct	Ch 11	Collisional orogens; EXAM 2 Wednesday 10/28
2-Nov	Ch 11	Rock uplift; isostasy
9-Nov	Ch 13	Terranes and the growth of continents; Earth's supercontinents
16-Nov	Ch 6	Mantle plumes and superplumes
23-Nov	--	Term presentations
30-Nov	--	Mountain building and integration of concepts

(EXAM 3: during finals week)

Course Learning Objectives :

Throughout this course, students will develop the ability to:

1. Evaluate the structural features and geophysical data that reveal different types of plate margins
2. Distinguish types of plate tectonic margins based on surface, geodetic, and geophysical data
3. Calculate motion vectors at plate margins
4. Evaluate published plate-tectonics research

Student Learning Outcomes :

The student will be able to apply a diverse body of Geologic information in the areas of advanced igneous/metamorphic processes, structure and tectonics.

The student will be able to communicate diverse body of Geologic information through the standard scientific format of an oral presentation based on a written paper.

Marketable Skills:

Student will be able to communicate in written and oral format.

Student will be able to start and finish a project and manage their time throughout.

Required statement regarding generative AI

In this course, students shall give credit to AI tools whenever used, even if only to generate ideas rather than usable text or illustrations. This includes internet-browser AI search functions. If using AI tools on assignments, add an appendix showing (a) the entire exchange, highlighting the most relevant sections; (b) a description of precisely which AI tools were used (e.g. ChatGPT private subscription version, Google Gemini browser addition, or DALL-E free version), (c) an explanation of how the AI tools were used (e.g. to generate ideas, to find papers, etc.); (d) an account of why AI tools were used (e.g. to save time, to surmount writer's block, to stimulate thinking, to handle mounting stress, to clarify prose, to translate text, to experiment for fun, etc.). Students shall not use AI tools during in-class examinations, or assignments unless explicitly permitted and instructed. Overall, AI tools should be used wisely and reflectively with an aim to deepen understanding of subject matter.

ADA Statement

SRSU Accessibility Services. Sul Ross State University (SRSU) 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. To help protect confidentiality, students seeking accessibility/accommodation(s) services must submit the [Accommodation Request Form](#) located on our [website](#). Students are welcome to call the Office of Accessibility Services at 432-837-8203 or stop by Ferguson Hall Room 112 if they have any additional questions regarding the process. Our mailing address is PO Box C-122; Alpine, TX; 79832.

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.

Students should correspond using Sul Ross email accounts and submit online assignments through Blackboard, which requires a secure login. Students enrolled in distance education courses at Sul Ross are expected to adhere to all policies pertaining to academic honesty and appropriate student conduct, as described in the student handbook. Students in web-based courses must maintain appropriate equipment and software, according to the needs and requirements of the course, as outlined on the SRSU website. Directions for filing a student complaint are located in the student handbook.

Counseling

Sul Ross has partnered with TimelyCare where all SR students will have access to nine free counseling sessions. You can learn more about this 24/7/365 support by visiting [Timelycare/SRSU](#). The SR Counseling and Accessibility Services office will continue to offer in-person counseling in Ferguson Hall room 112 (Alpine campus), and telehealth Zoom sessions for remote students and RGC students.

Libraries

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/](#). Utilize free services such as InterLibrary Loan (ILL), ScanIt, and Direct Mail to get materials delivered to you at home or via email. 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).

No matter where you are based, public libraries and many academic and special libraries welcome the general public into their spaces for study. SRSU TexShare Cardholders can access additional services and resources at various libraries across Texas. Learn more about the TexShare program by visiting [library.sulross.edu/find-and-borrow/texshare/](#) or ask a librarian by emailing srsulibrary@sulross.edu.

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.