

Sul Ross State University

GEOL 4308/5304– Tectonics – Fall 2024 –

Dr. Kelsch

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

Office hours: Mon, Tue, Thur 1:30-3:00 pm; Wed 2:00-3:00 pm; or by appointment

OVERVIEW

This course is an integrated study of the geologic 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

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
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.

- There is one field trip for this class to view structural and tectonic elements of the southern Rio Grande Rift within the Border Corridor Transform Zone near Redford, TX. Attendance and participation is worth 5 percent of your final course grade, and up to 10 percent extra credit for completing a field project from this trip. Trip dates are Thursday October 24 through Sunday October 27.

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
26-Aug		Review of geophysical evidence for Earth's internal layering; types of crust
2-Sep	Ch 2	Map-view plate geometry & horizontal plate motions
9-Sep	Ch 3	Continental rifts & passive margins
16-Sep	Ch 5	MOR's & ocean crust
23-Sep		EXAM 1
30-Sep	Ch 7	Subduction zones & active margins ; subduction erosion; accretionary wedges
7-Oct	Ch 8	Transform plate boundaries
14-Oct	Ch 8	The San Andreas fault system and the western North American plate boundary
21-Oct	Ch 11, 9	Collisional orogens; Terranes and the growth of continents; field trip Oct 24-27
28-Oct		EXAM 2

4-Nov	Ch 12, 13	Young orogens; Old orogens
11-Nov	Ch 11	Mountain building; rock uplift; isostasy
18-Nov	Ch 6	Mantle plumes and superplumes
25-Nov		Term presentations
2-Dec		Term presentations

(finals week: EXAM 3)

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.

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. 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. RGC students can also contact Alejandra Valdez, at 830-758-5006 or email alejandra.valdez@sulross.edu. Our office is located on the first floor of Ferguson Hall, room 112, and our mailing address is P.O. Box C122, Sul Ross State University, Alpine. Texas, 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](https://www.timelycare.com/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/. Off-campus access requires logging in with your LoboID 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.