

# **GEOLOGY 4308/ 5304 – Tectonics – Fall 2014 – Kelsch**

**Instructor: Jesse Kelsch**

**Office: WSB 316**

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**Class time: MW 12:30-1:45, WSB 316**

**Office hours: TRF 9:30-10:30; TR 1:30-2:30; and 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 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**

Plate Tectonics by Wolfgang Frisch, Martin Meschede and Ron Blakey

A few scientific papers to be assigned during the semester.

## **GRADING**

- There will be four exams, including a comprehensive final exam. Each exam is worth 10% of your grade. In-semester exams will cover material since the last exam. The final will cover material from the whole semester. Exams consist of short answer, quantitative, and essay questions. Makeup exams are only permitted by arrangement made with the instructor PRIOR to missing the exam. All makeup exams are 100% essay questions.
- There will be ten unannounced, beginning-of-class quizzes on the reading material that was assigned for that class period. Therefore, you must complete the outside reading assignment. Quizzes cannot be made up. They will not be scheduled during field trips for other geology classes. If you have a university event other than geology field trips that will require you to miss class, it is already scheduled, so let the instructor know now.
- Two homework assignments will be given during the semester, each worth 5 percent of your final grade. Teamwork is encouraged on homework assignments.
- Students enrolled in 4308 will give one talk and write an associated abstract, plus turn in appropriately selected figures and a bibliography. Students enrolled in 5304 will give two talks this semester, and one will require an associated paper to turn in. See the grade chart for clarity on requirements. The grad-only presentations (and abstract and figures) will occur during the middle of the term. The undergrad presentations (and abstract and figures) and the second grad presentations (and paper) will happen at the end of the term. All students are directed to review and understand the university's policy on plagiarism.

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

	<b>undergrads</b>	<b>grads</b>
exam 1	10	10
exam 2	10	10
exam 3	10	10
exam 4	10	10
HW 1	6	5
HW 2	6	5
Quizzes	20	10
Midterm talk	-	8
Midterm abstract/figs/refs	-	8
End-term talk	14	8
End-term abstract/figs/refs	14	-
End-term paper	-	16
	<b>100</b>	<b>100</b>

### **CLASS 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.

Mon	25-Aug	Ch 1: Review from Physical Geology
Wed	27-Aug	Ch 2: Plate geometry & motion
Wed	3-Sep	Ch 3: Continental rifts
Mon	8-Sep	Ch 3, Ch 4: Passive margins
Wed	10-Sep	Ch 5: MORs
Mon	15-Sep	Ch 8: Transform faults
Wed	17-Sep	EXAM 1
Mon	22-Sep	Ch 7: Subduction Zones
Wed	24-Sep	Ch 7: Subduction Zones
Mon	29-Sep	Ch 7: Subduction Zones
Wed	1-Oct	Forearc subduction erosion
Mon	6-Oct	GRAD STUDENT PRESENTATIONS
Wed	8-Oct	Ch 9: Terranes
Mon	13-Oct	EXAM 2
Wed	15-Oct	Ch 11: Mountain Building & Rock Uplift
Mon	20-Oct	Ch 11: Mountain Building & Rock Uplift
Wed	22-Oct	Delamination
Mon	27-Oct	Delamination
Wed	29-Oct	Ch 6: Mantle Plumes
Mon	3-Nov	Ch 6: Mantle Plumes
Wed	5-Nov	EXAM 3

Mon	10-Nov	Ch 10: Archaean Tectonics
Wed	12-Nov	STUDENT PRESENTATIONS
Mon	17-Nov	STUDENT PRESENTATIONS
Wed	19-Nov	STUDENT PRESENTATIONS
Mon	24-Nov	STUDENT PRESENTATIONS
Mon	1-Dec	STUDENT PRESENTATIONS
Wed	3-Dec	Presentations/ final review/ synthesis

### **DISTANCE EDUCATION**

Students enrolled in distance education courses have equal access to the university's academic support services, library resources, and instructional technology support. For more information about accessing these resources, visit the SRSU website. Students should submit online assignments through Blackboard or SRSU email, which require secure login information to verify students' identities and to protect students' information. The procedures for filing a student complaint are included in the student handbook. 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.

### **ADA**

**Sul Ross State University is committed to equal access in compliance with the Americans With Disabilities Act of 1973. It is the student's responsibility to initiate a request for accessibility services. Students seeking accessibility services must contact Mary Schwartz, M.Ed, LPC, in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is Box C-122, Sul Ross State University, Alpine Texas 79832. Telephone 432-837-8203. [mschwartz@sulross.edu](mailto:mschwartz@sulross.edu)**

### **Primary Learning Objectives:**

Throughout this course, students will develop the ability to:

1. Distinguish types of plate tectonic margins
2. Calculate motion vectors at plate margins
3. Describe the structural features and geophysical data at different types of plate margins
4. Describe current research findings covering the topic of mantle plumes
5. Compare modern tectonic process paradigms to those of early Earth

### **Methods of Assessment/Evaluation:**

Primary learning objective assessment will be made on the basis of homework assignments, quizzes and lecture exams, and presentations. The assignments and exercises will develop student identification description and evaluation of geologic data and physical features. Quizzes will encourage student preparedness. Lecture exams will consist of short answer, essay and multiple choice questions to assess critical reasoning and problem solving skills. All graded coursework will generate discussion of questions missed by a majority of the class, including question and answer logic and content.