GEOL 3402 – Structural Geology Syllabus – Kelsch – Spring 2015

Sul Ross State University, Department of Biology, Geology and Physical Science
Instructor: Ms. Jesse Kelsch, MS **Office**: WSB 316 **Phone**: 837-8657 **Email**: jkelsch@sulross.edu
Office Hours: Mon 1-3; Tue 10:30-noon; Thur 2-3:30; and by appointment
Class day and time: 10-10:50 MWF
TAs: Mitchell May (Alpine), Keonho Kim (Midland)

Course Description:
The objective of this course is to provide the student with an understanding of the features of deformed rocks, extending to the classification, identification, occurrence, causes and geographic distribution of deformation. This is a core class in the Geology curriculum. **Prerequisites: Physical Geology; Trigonometry** (trig may be taken as a corequisite)

Text and Materials:
Text: Structural Geology by Haakon Fossen
Lab manual: Structural Analysis & Synthesis by Rowland, Duebendorfer and Schiefelbein, 3rd edition (RD&S)
Necessary Equipment:
--a good protractor
--a good drafting ruler with metric and inches- clear plastic marked in 0.1 inches & cm.
--good quality drafting compass
--pencils, at least 10 colored pencils, sharpener, & erasers
--one fine point drafting/technical pen (recommend 0 point)
--pad of good quality 8"X10" tracing paper
--one thumbtack (not pushpin). Be a hero and bring several to the stereonet lab for your classmates
--calculator with trigonometric functions
Recommended Equipment (especially if you're going to field camp, anyway):
--hand lens & rock hammer
--clip board
--combination protractor/scale (clear, see-through)
--grain-size card

Grading: Final course grade for 3402 will be based on a percentage of the total points as follows:

Map project 1	10%
Map project 2	12%
Fault Presentation	8%
Fault Paper	10%
Exam 1	11%
Exam 2	11%
Final Exam	13%
Lab total	25%
3402 total	100%

Final grades: 100-90 = A; 89-80 = B; 79=70 = C; below 69 = F

Exams – There are four exams: Three section exams and a comprehensive final exam. Exams are based almost entirely on lecture material, so come to class, take good notes, and review your notes. Your lowest-score exam will be dropped. Exams can be made up with PRIOR approval. All makeup exams will be essay and quantitative.

Required Field Trips:
There will be two field trips to the eastern part of Big Bend National Park. It is required that students attend both. Students will complete hands-on exercises demonstrating the ability to identify, describe, measure and evaluate geologic structures in the field in order to infer the timing, degree, style and origin of deformation. We will be camping at the Stillwell Store campground. You must provide your own field and camping equipment, water bottles and food. More information will be provided later in the semester.
Dates: Mar 4-5 and Apr 22-24

Presentation and term paper - Each student will choose a mapped fault somewhere on Earth and research that fault (8 references from peer-reviewed geoscience journals) enough to give a 12 minute presentation, and write a paper. We will discuss this assignment later in the semester. The talks will be given in the final weeks of classes, starting on Wednesday, April 27.

Tips to help you succeed in this course: 1) Attend every lecture and lab—do not miss class. 2) Come to class prepared. Expect to read approximately 10-15 pages per class period outside of/ before/ in preparation for class. 3) Read through your own lecture notes some time shortly after the class period (within 2 days,) to be sure you understand the material that was covered. 4) If you have any problems with course material, understanding assignments, preparing for exams… ASK YOUR INSTRUCTOR! Take advantage of my office hours and/or your TA's.

Student Learning Objectives:
Throughout this course, students will develop the ability to:

1. Identify and classify geologic structures
2. Measure and describe the orientation of the structures
3. Apply various projection techniques to graphically and geometrically illustrate geologic structures
4. Demonstrate qualitative and quantitative analytical methods in the laboratory and in the field
5. Evaluate and interpret the origin, extent, timing and causes of deformation

Methods of Assessment/Evaluation:
Student learning-objective assessment will be made on the basis of lab and field exercises, the research paper, and lecture exams. The assignments and exercises will develop student identification, description and evaluation of geologic data and physical features. Lecture exams will consist of short answer, essay and multiple choice questions to assess critical reasoning and problem solving skills. Lab exercises will engage students in application and evaluation of various analytical and projection methods for solving structural geologic problems. The research paper will provide an opportunity to creatively apply the content learned in class. All graded coursework will generate discussion of questions missed by a majority of the class, including question and answer logic and content.

***Distance Education Statement*:** 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. 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.

Sul Ross State University Attendance and Classroom Policies:

Attendance is expected. In order for you to succeed in this class, it is crucial that you be here. You cannot learn from me or your fellow students if you are not here. Therefore, I expect you to attend all classes, not just on exam or quiz days. Sul Ross policy states that an instructor may drop a student with an "F" for 9 absences. (If you miss 9classes you will probably fail anyhow.) Perfect attendance will get you 10 extra credit points. Sleeping in class will earn you an 'absent.' Texting in class (see next section) will also earn you an 'absent.'

Class disruption: The Student handbook states under Student Misconduct, number 21," Such prohibition includes disorderly classroom conduct that obstructs, interferes with, inhibits and/or disrupts teaching and/or classroom activities." Behavior which is included in this category: 1) persistent talking to ones' neighbors during lecture, 2) coming to class late or leaving early, 3) the use of cellular phones or MP3 devices in the classroom. CELL PHONES MUST BE TURNED OFF IN CLASS. This includes texting. *(If you are a member of an EMS/VFD group or have a child in day care and they must be able to reach you, let me know and we will work something out.)* Offenders of this policy will be asked once to stop, and 5 points will be taken from their grade. If it occurs a second time, the offender will be instructed to leave the classroom and will be marked absent for that day.* This action will be followed by a meeting with the Dean of Student Life. If there are further incidents, UDPS will be called and offenders will be physically ejected from the classroom. This will quite likely be followed by expulsion from the University.

- ***Important point to distill from this:** Texting during class is disruptive. Please just don't. The first time, you'll lose 5 points. If you are seen doing so a second time during class, you'll be made to leave *and marked absent for that day*.

Plagiarism/Cheating Policy: The student is referred to the student handbook on Academic Honesty. If you are caught cheating or plagiarizing you will either be brought before the dean of the College with expulsion proceedings initiated, or given an F in the course. All work turned in must be your own.

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. If you have a disability, find out what your resources are: Students seeking accessibility services must contact Mary Shwarze in Counseling and Accessibility Services, Ferguson Hall, Room 112. The mailing address is PO Box C-171, Sul Ross State University, Alpine, Texas 79832. Telephone: 432-837-8203.

Weekly timetable

Week	Topics	Reading material
1	Introduction; What is structure; Tectonics summary	1.1, 1.2, 1.12, start ch 2
2	Transformations, displacement, rigid and nonrigid deformation	Ch 2 all but matrix sections
3	Strain analysis	Ch 2 and 3
4	Even more strain! EXAM 1	Ch 3
5	Stress, Mohr circles,	Ch 4 & 5
6	Stress	Ch 5 & 6
7	Joints and faults	CH 7
8	Yes, more Faults EXAM 2	Ch 9
9	Spring break	-----
10	Folds	Ch 11
11	Cleavage, foliation, lineation, boudinage	Ch 12,13,14
12	Ductile shear zones; deformation mechanisms	CH 15
13	Fault-fold interactions; EXAM 3	Ch 16
14	Extensional environments;	Ch 17
15	Finish extension; Start Talks	----
16	Talks	----