Geology 4402: Structural Geology
Spring 2017

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Office Hours: 8:30 - 9:30 AM, M, W, Th; By appointment or any time I'm in my office.

Course Information

Location: LDB 318 Lecture: 10:00 AM -11:00 AM, MWF and Lab: 2:00-4:00; 4:00-6:00 PM -Th
Required Texts: Structural Geology, Haakon Fossen; Cambridge University Press, 2011

Other Text: Earth Structure: An Introduction to Structural Geology and Tectonics, 2nd ed., van der Pluijm and Marshak, 2004; Supplemental reading assignments as assigned.

Course Description

This class serves as an introduction to Structural Geology. The principle objective of this course is to teach you how to interpret deformation features in rocks and to uses these features to understand deformation and tectonic processes that affect the earth's crust.

Specific Objectives of the Course:

- To introduce the concepts of stress and strain as a means of understanding the mechanics of deformation of rocks and minerals.
- To introduce terms and procedures used to describe the geometry of deformation features in rocks.
- To explain the mechanics of formation of the common brittle and ductile deformation features in rocks and minerals using the concepts of stress and strain.
- To explain how to evaluate the mechanics of deformation of rocks and rock units containing a wide variety of brittle and ductile deformation features.
- To introduce you to the procedures required to determine the deformation history of a region.
- To describe a range of tectonic settings that contain various deformation features.
- To explain how deformation features allow us to interpret the history and mechanics of formation of various tectonic settings.
- To teach you to think critically.

Grading Scheme

Your grade will be based on **three lecture exams, a *comprehensive* final exam, laboratory assignments (including a laboratory midterm and final), and field mapping and cross-section projects.** Your final grade in this course will be determined entirely on the basis of the points you accumulate*. Grades are assigned on the basis of standard 90, 80, 70% cutoffs. Questions regarding the scoring of a given exam or lab exercise will be considered only on the day they are returned in class.

Examinations, Assignments, and Point Breakdown

First Lecture Mid-Term (2/13)	100 pts
Lab Mid-Term (3/9)	100 pts
Second Lecture Mid-Term (3/10)	100 pts
Lab Exercises (12 @ 15 pts)	180 pts
Third Lecture Mid-Term (4/11)	100 pts
Lab Final Exam (5/4)	100 pts
Cross Section Project* (5/5)	100 pts
Field Mapping Project* (4/6-4/9)	75 pts
Lecture Final (5/8, 11AM – 1:00 PM)	150 pts
Random Pop Quizzes	30 pts
	Total Points: 1035 pts

***You must make a grade of C or better on the projects to pass the class.**

Some Implications of the Grading System

- The relative number of A's, B's, C's, etc. you receive on your exams is not considered when computing your grade, only your point totals are used.
- You will not be graded on improvement (although more of points are scored near the end of the course).
- A very poor performance on any exam may be difficult to overcome; again, this is because points and not a sum of A's, B's, C's, etc. will be used to compute your grade.
- You must be present on the day exams and lab exercises are returned in order to question your point score. The correct answers to exam questions will be discussed (lecture) or posted (lab) on the day they are returned in class (generally 1 week after the exam).
- You should be able to determine your grade at any point during the course.

Study Questions for each lecture section are available on the class Blackboard web site. You should use these questions as a guide to important material in the lectures and assigned reading. Answers to these questions will not be collected, posted, or graded; however, at least 50 percent of the material o n the mid-term and the final lecture examinations will come directly from these questions.

Field Trips

The best way to learn geology is in the field. Structural geology requires field work. There will be at least one field trip, possibly two. **No excuses, you all go**.

(1) Filed Mapping Exercise (April 6 -9)
(2) TBA

Students with Disabilities

Any student with documented disabilities who may need classroom academic adjustments or auxiliary aids and services may request academic accommodations (for example, a note taker). Students must request assistance with academically related problems stemming from a disability by

contacting the Director of the Counseling Center in the Lee Drain Annex or by calling (936) – 294-1720. It is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and consistent with course requirements

Academic Honesty

I expect you to fulfill your academic obligations through honest and independent effort. If I have sufficient reason to believe you are cheating on any graded work in this course, you will be dropped from the course with a failing grade.

Policy on academic honesty: Academic honesty is fundamental to the activities and principles of our university. Members of our academic community must be confident that every student's work has been responsibly and honorably acquired, developed, and presented. Any effort on the part of a student to gain an advantage not given to all students (including the asking of an instructor to arbitrarily change a grade) is viewed as dishonest, whether or not that effort is successful. Our academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation, to suspension, to expulsion. If you are ever in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult your course instructor.

Class Policies on Attendance

Your attendance, motivation, and participation are integral to your success in this course. Regular attendance is by far the easiest way to achieve a good grade in this course. I implore you to attend each and every class and to actively participate. If you decide to drop the course, it is your responsibility to fill out the necessary paperwork or you will receive a grade based upon your performance in the class regardless of the amount of work you completed.

Missed Exams and Assignments

Make-up exams will be allowed for documented emergencies only (e.g., severe illness). To be eligible to take a make-up exam, you must notify me before the missed exam and present sufficient proof to document your emergency. Make-up exams will consist of short answer, definitions, and essay questions. It is your responsibility to schedule a make-up exam and the exam must be taken within one week of the missed exam. There will be no make-up exam for the final.

Lecture Topics

Please Note: The topics of lecture are in relative chronological order but are subject to change. The dates of the exams are set and the material to be covered will be clarified based on lecture topics completed.

Read Before Class	**Lecture Topics**
Chapter 1	Introduction & Overview
Chapter 2	Primary & Non-tectonic structures
Chapter 3	Force & Stress
Chapter 3	Force & Stress: Mohr Diagrams
Chapter 4	Deformation & Strain
Chapter 5	Rheology
Chapter 6	Theory of Brittle Deformation
Chapter 7	Joints & Veins
Chapter 8	Faults, Faulting, & Analysis
Chapter 18	Tectonics & Faulting
	Thrust Faulting, Fold & Thrust Belts
Chapter 16	Normal Faulting & Extensional Tectonics
Chapter 19	Strike-slip Faulting & Wrench Tectonics
Chapter 9	Theory of Ductile Deformation
Chapter 10	Folds & Folding
Chapter 11	Rock Fabrics: Foliations & Lineations
Chapter 4 & 5	Rheoogy & Experimental Strain again
Chapter 12	Ductile Deformatioin Processes