STRUCTURAL GEOLOGY
GEOLOGY 310
SPRING 2013

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Office Hours: Mondays 10 a.m. to 11 a.m., or by appointment
Please adhere to my posted office hours or make an appointment *in advance.*
310 TEXTBOOK: Structural Geology, 2nd edition by Twiss and Moores
WEB RESOURCES: Check out the Moodle space for this course

SYLLABUS

The Structural Geology course is designed to introduce you to the scientific study of rock deformation. The primary objective of this course is for you to learn the basic techniques and skills needed to 1) *describe* and 2) *interpret* shapes and orientations of rock bodies and structures. This objective requires you to practice thinking in three dimensions; this may not be an intuitive task at first, but with practice, you will improve.

This is a challenging and rigorous "core" course for geoscience majors. It will require time, diligence and a significant amount of effort in order to master the material. As a rule of thumb, one unit of undergraduate course credit for an average student at an accredited university (that's CSUN!) will require 2 hours of outside study. **This course is worth 4 credits; an average student (C grade) can expect to work at least 8 hours *outside of class* for this course per week**. If you want to earn a B or an A in the course, then you should expect to work more hours than the minimum expectation. I expect that you will spend at least this amount of time outside of lecture reading the textbook *before* coming to class, doing the lab exercises, doing the lecture homework, using the resources on Moodle and reviewing/studying key concepts. I expect exemplary and punctual attendance, participation, and mental engagement in the lectures. I encourage you to take advantage of office hours and the classroom forum for discussion; I am here to help you with your learning process. **That being said, I want to emphasize that the responsibility for learning the material is ultimately yours.** Learning new material means that you have internalized and retained new concepts well enough to apply to new situations to solve geologic problems—this comes with time and effort.

As the lecture and lab materials are mutually supportive, and you are required to integrate these materials on the exams, it is therefore imperative that you attend both lecture and laboratory courses (for the entire duration of their scheduled times!) regularly.

POLICIES

It is the student's responsibility to know and follow the rules and policies that I have outlined in this syllabus. You agree to abide by these policies by accepting this syllabus and any subsequent updated syllabi. At times through the semester, it may become necessary for me to update the syllabus to match the topics and pace that we cover the material. Therefore, future syllabi may

replace this version that you have received on the first day of class. You will find the updated syllabi on the Moodle page for this course.

No late work will be accepted or graded for feedback. I am extremely strict about this policy. An assignment is considered 'late' whether it is turned in one minute or one hour after a deadline. Pay close attention to due date instructions given orally in class, embedded within lectures, or noted in assignments.

I will often send important course information via email or Moodle. Check your account or Moodle for important 'GEOL 310' messages. University policy states that you are responsible for course information sent via email. Your responsibility includes understanding how to forward mail to an off-campus account (if you choose to do so), understanding how to download and save files sent via email and Moodle forum, and following instructions for assignments and deadlines sent via email and/or Moodle.

You can email me about course material or questions that you may have, but be aware that I get dozens of emails per day and will not be able to respond to your email immediately. I will usually be able to respond to your email inquiry within 1 business day and during typical business hours; keep this in mind when emailing me prior to a due date or an exam date. Keep in mind that email is a formal mode of correspondence, and it is not to be used in a casual manner as you would for text messaging or instant messaging. I expect that you will use standard salutations, professional titles, and formal language when corresponding via email.

SAFETY AND RESPONSIBILITY IN THE FIELD

We will have a weekend field trip associated with this course. You are **strongly encouraged** to attend the weekend field trip. However, for the purpose of having an accurate headcount for campgrounds and purchasing adequate supplies, you must sign up and complete paperwork for the trip in advance, and if you do this, you will be required to attend. A grade penalty will be imposed for those students who sign up and are no-shows on the morning of the departure.

Working in the field, while rewarding and exciting, can also be dangerous if you are unprepared or careless. Dangers in the field include: sunburn; heat exhaustion; hypothermia; giardia; insect stings/bites; allergic reactions; ticks; snake bites; cactus needles; poison oak and poison ivy; cuts, abrasions, sprains, broken bones, or concussion from falling or being hit by falling rocks; flash flooding; and being hit by lightning. To decrease your chance of injury, we advise you to:

- Work with a field partner
- Wear suitable field attire
- Carry rain gear, first aid, medications, etc. in your daypack
- Drink plenty of water, and carry at least 2 liters with you in hot weather
- Work at a pace suited to your fitness level
- Bring all necessary medications and take appropriate and responsible precautions given your health conditions
- Exercise caution on steep slopes, especially when others are working downhill from you
- Use protective eyewear when hammering on the outcrop

- Exercise caution when hammering on the outcrop near others
- Move to lower ground during a thunderstorm; stay out of narrow dry washes

We may be working in remote areas that are out of cell phone service range. Medical help could take several hours to reach you in the event of an emergency. It is also important to emphasize that normal standards of student conduct apply in the field, though it is somewhat of a more casual setting. I expect that you will behave with professionalism towards the instructors and your fellow students. **Should you fail to employ appropriate precautions regarding your health and safety, or if your behavior in the field is deemed inappropriate and interferes with the activities of the field trip, you will be sent home immediately at your own expense**. **What is considered unsafe or inappropriate behavior is entirely at my discretion, and may be subject to disciplinary action by the student conduct code upon return to CSUN**. If you are dismissed from the field for these reasons, you are responsible for making travel arrangements and paying out of pocket for any associated expenses with your departure. If you are afraid of any of the above dangers, to the extent that you do not want to take this course, then you are advised to drop the course, change your major, or look for a different university.

Your grade in this course will be assessed by attendance, participation during lecture, quizzes, homework problems, two mid-term exams, and the final exam. Each quiz is worth 30 points, homework problem sets are worth 20 points, each mid-term exam is worth 100 points, and the final is worth 200 points. In the event that you have a borderline grade, I will use your attendance, class participation, and overall effort dedicated to the course as a basis for assigning you a grade. I do not 'grade on a curve'. The grading scale is as follows:

A = 93-100
A- = 90-92
B+ = 87-89
B = 83-86
B- = 80-82
C+ = 77-79
C = 73-76
C- = 70-72
D+ = 67-69
D = 63-66
D- = 60-62
F = < 60

If you choose to drop the course, it is your responsibility to formally drop the class; I will not administratively drop you from the course. Under normal circumstances, you cannot drop the course after the third week. Only with proof of a serious and compelling reason (see Schedule of Classes) will a student be allowed to drop after the third week.

I do not give 'Incompletes' for grades. No exceptions.

You are required to take the exams as they are scheduled. I do not give make-up exams. Therefore, if you miss an exam, a grade of '0' will be recorded. Be sure to check the exam schedule *immediately* so that you avoid missing any exams; buying a plane ticket home prior to the exam time, or failing to show up to the designated exam time are not valid excuses, and will result in you receiving a grade of '0'. If you miss an exam due to an *extraordinary* circumstance (such as a serious illness or a medical or family emergency), you must have official documentation available for me to verify those circumstances, and you must supply that documentation within 24 hours of the exam date. In the event of such an emergency, the suitability of the documentation and administration of make-up exams is entirely at my discretion. You are required to contact me well in advance of such an event, or within 24 hours of an unforeseen event. You will not be eligible to take a make-up exam if you do not follow these directions.

MISSED CLASSES

I expect that you will attend every class unless you are seriously ill. Though attendance is not formally graded, I keep track of attendance as a means of assessing your commitment to the course. Should your grade fall on a borderline between two letter grades, I will use attendance as a deciding factor.

CLASSROOM ETIQUETTE

Cell phones are an unwanted and rude distraction during the lecture. Either turn them off during class, or do not bring them to class. You may bring a laptop for the computer exercises, but you are to be working on course-related material while you are in my class. Playing games, surfing the internet and instant messaging are unprofessional distractions from your primary responsibility: paying attention and learning the material.

Make every attempt to get to class on time. I will begin lectures promptly at the start of class; if you are late, it is your responsibility to get notes from another student. If you must be late to class due to an unforeseen event, enter the room as quietly as possible so as to not disturb your fellow students. You are already familiar with the parking and traffic situations in the Los Angeles area; these are not valid excuses for tardiness.

Keep your desk space clean for the next class—do not leave newspapers, trash, etc. after lecture.

ACADEMIC DISHONESTY

Official California State University policy states: "The maintenance of academic integrity and quality education is the responsibility of each student within this university and the California State University system. Cheating or plagiarism in connection with an academic program at a campus is listed in Section 41301, Title 5, California Code of Regulations, as an offense for which a student may be expelled, suspended, or given a less severe disciplinary sanction. Academic dishonesty is an especially serious offense and diminishes the quality of scholarship and defrauds those who depend upon the integrity of the campus programs. Such dishonesty includes but is not limited to: cheating, fabrication, facilitating academic dishonesty, and plagiarism."

I do not tolerate any form of academic dishonesty. I expect that you will uphold the integrity of the academic environment here at CSUN; however, if I find evidence of academic dishonesty, we will report such evidence to the Office of the Vice President for Student Affairs and recommend disciplinary action. If you are caught cheating in my class, you will be given a failing grade for the assignment, and possibly a failing grade for course depending on the severity of the incident (what constitutes a serious offence is at my discretion). This includes, but is not limited to, plagiarism, facilitating cheating by another student, using electronic files from peer or former student maps, cross-sections, or projects, lying about an excuse for missing an assignment deadline, copying answers during an exam, facilitating cheating by another student, altering a test grading sheet after the exam, or lying about an excuse for missing the exam. Plagiarism also includes the use of paragraphs or even long phrases and diagrams or parts of diagrams from peer or former student reports/labs/maps in your own assignment without proper acknowledgement of the source. Proper acknowledgement of sources clears the student from academic dishonesty charges, but does not fulfill the work obligations of the student and the acknowledged item will count "0" points on the report.

REQUIRED CLASS MATERIALS

Pencils, pens, colored pencils or pens
Eraser
Drafting compass (the kind you make circles with!)
Protractor
Graph paper (10 squares per inch)
Field notebook (purchase from Mari in front office—spiral or paperback notebooks not appropriate)
Brunton compass (see Dave Liggett to check one out from the department)
Field belt
Clipboard or map board

SCHEDULE

Part 1: Brittle Deformation

JAN 23	Introduction and Methods used in Structural Geology	Ch. 1, Apx. 1
JAN 28	Brittle Deformation: Fractures and Joints	Ch. 2
JAN 30	Brittle Deformation: Introduction to Faults	Ch. 3
FEB 4	Brittle Deformation: Normal Faults	Ch. 4
FEB 6	Brittle Deformation: Reverse Faults	Ch. 5
FEB 11	Brittle Deformation: Strike-slip Faults	Ch. 6
FEB 13	Brittle Deformation: Stress	Ch. 7
FEB 18	Brittle Deformation: Stress	Ch. 7
FEB 20	Brittle Deformation: Mechanics Theory and Experiment	Ch. 8

FEB 25	Brittle Deformation: Mechanics of Natural Fractures and Faults	Ch. 9
FEB 27	**EXAM #1: BRITTLE DEFORMATION**	

Part II: Ductile Deformation

MAR 4	Ductile Deformation: Fold Description	Ch. 10
MAR 6	Ductile Deformation: Kinematic Analysis of Folds	Ch. 13
MAR 11	Ductile Deformation: Foliations and Lineations	Ch. 11
MAR 13	Ductile Deformation: Analysis of Foliations and Lineations	Ch. 14
MAR 18	Ductile Deformation: Geometry of Homogeneous Strain	Ch. 12
MAR 20	Ductile Deformation: Strain in Deformed Rocks	Ch. 15

Part III: Rheology

MAR 25	Macroscopic Aspects of Rock Deformation	Ch. 16
MAR 27	Macroscopic Aspects of Ductile Deformation	Ch. 16
APR 1	Rheology	Ch. 16
APR 3	Microscopic Aspects of Ductile Deformation	Ch. 17
APR 8	**SPRING BREAK NO CLASS**	
APR 10	**SPRING BREAK NO CLASS**	
APR 15	Microscopic Aspects of Ductile Deformation	Ch. 17
APR 17	Microscopic Aspects of Ductile Deformation	Ch. 17
APR 22	**EXAM #2 DUCTILE DEFORMATION & RHEOLOGY**	

Part IV: Tectonics

APR 24	Divergent, Transform, Convergent Margins	Ch. 19

Weekend Field Trip: April 27-28

APR 29	Divergent, Transform, Convergent Margins	Ch. 19
MAY 1	Tectonics of Orogenic Belts	Ch. 20
MAY 6	Tectonics of Orogenic Belts	Ch. 20
MAY 8	Extra day for catch-up	
MAY 15	**COMPREHENSIVE FINAL EXAM, 10:15 a.m.-12:15 p.m.**	