GEO 250 – Structural Geology

Spring 2011

Lecture meeting times:
Monday, Wednesday, Friday 13.30-14.20
Lab:
Tuesday 13.30-16.20

Instructor: Elizabeth Goeke
Office: Nobel 124A
Phone: 507-933-7335
E-mail: egoeke@gac.edu
Office Hours: M & W 9 – 10
W 15 – 16
or by appointment

Lecture Text:
Structural Geology of Rocks and Regions, Davis and Reynolds, ISBN: 0471526215

Alternate Texts & References:
Basic Methods of Structural Geology, Stephen Marshak and Gautam Mitra, ISBN: 0130651788
Structural Analysis and Synthesis, Rowland, Duebendorfer and Schiefelbein, ISBN: 1405116528
Structural Geology, Twiss and Moores, ISBN: 0716749513
Microtectonics, Passchier and Trouw, ISBN: 3540640037
Structural Geology: Principle Concepts and Problems, Robert Hatcher, ISBN: 0023557133

Required Lab materials:
Sharp pencils, both hard (at least 2H) and soft leads (HB = #2) (mechanical pencils work best)
Hand-lens
Field book
Fine-tipped pen (India ink pens are best (00 = 0.30 mm or 3x0 = 0.25 mm tip)) – e.g. Alvin Penstix No. 3013-EEF
Eraser (one of those "clicking" refillable eraser pencils works very well)
Protractor and ruler(s) (metric & English) (C-Thru W-8 serves as both)
Colored pencils (at least 18 colors – sharing is fine)
Calculator with trig functions

Why Structural Geology?

Structural geology is the study of deformed rocks: how things deform, why they deform, and what can we deduce from their deformational record that applies to a more regional

scale. The lectures for the course will deal with theoretical aspects of structural geology, which will be augmented by real-world examples during lab. Structural geology requires us to develop our three-dimensional thinking, which may prove to be the most difficult portion of the course.

What will we do in this course?

Lecture –

Lecture will consist of a mix of activities, discussion, and old-fashioned lecture. I will provide access to my PowerPoint slides prior to lecture, but they will consist mainly of diagrams & images. It will be your responsibility to note key concepts, add definitions where appropriate, and annotate the figures given.

Weekly quizzes will occur every Friday and cover the material discussed the previous two lectures. Key concepts & diagrams will be emphasized on quizzes. Quizzes will be at the beginning of lecture and are closed-book, closed-note.

Once a week on Friday, we will discuss a paper related to that week's topic. I'll give you questions to consider and send me answers to before the start of lecture on Friday.

Lab –

Lab will focus on taking the theoretical concepts discussed in lecture and demonstrating their practical application. In general, only a small portion of each lab will be taken up by lecture and the rest will spent individually working on the week's assignment. Labs will comprise a large portion of your final grade (70%) and will be due to two parts: whatever is completed in the course of Tuesday's lab will be due at the 16.30 on that day, will be graded & handed back by the start of class on Wednesday; corrections & the remainder of the assignment will be due at the start of lab the following Tuesday.

Exams –

Lecture exam and final – Exams will focus on material discussed during lecture with the weekly quizzes as a jumping off point. Exams will be take-home, open-note, open-book. In order to do well on my exams, you will need to be very organized and have a strong understanding of the material being covered. Your book & notes should be used on exams as a reference for specific numbers, formulae, and diagrams.

Lab final – The lab final will be an applied field final in which I will ask questions and you will collect data, analyze the data, and draw conclusions about the geological history.

Weekly news entries —

News articles about various geological issues are relatively common. Each week, you will be expected to find 2+ articles about one specific occurrence (*e.g.* an earthquake in Tonga, a volcanic eruption in Chile, a landslide in China) and write a summary of the event

appropriate for a college-newspaper to publish. The 2nd paragraph will be an analysis of whether or not the geology was presented in a scientifically sound fashion by the two news sources. An example is posted on Moodle. Summaries will be only accepted *via* Moodle and must be submitted by each Saturday at midnight, central time.

How to do well in Structural Geology

1. Read the chapter, making notes as you go—do this before lecture
2. Attend lecture and take notes on topics that were not covered by the textbook or you didn't fully understand
3. Ask questions during lecture!
4. Re-examine your notes, recopying them if needed—make sure you understand the topics covered
5. Organize your lecture and lab notes in a 3-ring binder with labeled tabs, so that on the exams you know exactly where the requested material is
6. Keep all your labs, quizzes, homework assignments, etc. in your binder!

A few more points

- In science, you should expect to spend 2-3 hours of time outside of class working for each hour in class—that means that per week, you should be spending 8-12 hours working / studying for this class including reading, finishing labs outside of class time, etc.
- You have a right to access 24/7 the mineralogy classroom, which means the excuse "I couldn't get in while the building was open" just won't fly. Please keep the room neat
- Keep a copy of anything you hand in—I reserve the right to request a 2nd copy in case of disaster (i.e. my office catching on fire)
- The best way to contact me is via email.
- If my door is open, feel free to come in and talk—about class, life at college, the crazy choices the judges made last night on Top Chef
- Make sure that either you use your Gustavus email account or have it forwarded to the account you would like to use—announcements & occasional assignments may be sent out via email
- We have a Moodle site and all lecture notes, homework assignments, lab assignments, etc. will be posted on it

Course Policies

The whole point of this course is for you to learn how our Earth reacts to both uniform and differential forces applied to it. While you're at it, you might as well perform up to your capabilities. Two of the most important things you can do to improve your learning are to (1) attend class and (2) communicate with me regularly. Although you might not consider yourself "hard-rock oriented," *everyone* can succeed in this course.

Attendance/Punctuality —I consider attending class to be the single most important thing you can do to enhance your learning and improve your grade. When you attend class, please come prepared to participate. It doesn't do you much good if you're in class, but are unconscious or lacking the materials you need to participate (pen, paper, etc.). From the time you enter the classroom, your cell phones (and any other electronic device that makes annoying noises) should be silenced. If you elect to leave your phone on (in vibrate mode, of course), please do not answer it, read or send text messages, or even look at it during class.

Punctuality is also important, not only for you, but for your classmates. Many announcements are made at the beginning of class and if you're not there, you won't hear them. Please make every effort to arrive in class at least a minute or two before it starts, so that you're ready to listen and participate when class begins. If you miss an in-class assignment because you're late to class, you won't be able to make it up, nor will you receive extra time to finish it. If you must come late to class, please enter in a way that avoids disturbing your classmates.

Late work will be assessed a penalty of 10% per 24-hour day. After 5 days (50% loss in credit), you may turn it in any time during the remainder of the semester for no more than half credit. If you will be unable to take an exam during the scheduled time, you must contact me in person, by phone, or by e-mail as soon as you know that you'll have a problem, and you must make contact before 10:00 a.m. on the day of the exam. I will make reasonable accommodations for students with illnesses or other extenuating circumstances. However, if you do not provide advance notice of a conflict, you may lose the opportunity to make up an exam.

Geology is a collaborative science. During research, we frequently discuss our findings with collaborators, experts in the field, and others who may have a positive addition to our work. For this class, I expect that any work you hand in will represent you own writing and thinking. This does not mean, I don't expect you to discuss assignments with your classmates or me, just that in the end, the work must represent conclusions that you drew. If you do discuss the assignment with others, I expect you to include an "Acknowledgements" section at the end of the work handed in and include those who inspired you. If you use information from a specific paper or book, take an image from the internet, or find any information at all from an outside source (*i.e.* not you), you must include a reference at the end of the assignment.

The web is a wonderful thing filled with lots of information that it is easy to find—but no one is standing out there judging all the information and determining if it is true or not. Any 10-year old sitting in her room can easily modify Wikipedia, so take what you find on the internet with a grain of salt. Whole-scale copying of sentences or paragraphs from the internet (or other sources) is not

acceptable and your grade will suffer. Take what you find in books, articles, on the internet and translate it into your own words. Assignments that get the answers wrong, but were your own work will receive higher marks than those that blindly copy from various sources.

Disability — I will make every effort to accommodate any disabilities that students may have. Some aspects of this class involve moderate levels of physical exertion, but I will make as many changes as I am able, if necessary. Please talk to me as early as possible if you have any concerns about your ability to succeed in this class! Following is the college's policy, to which I adhere completely.

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (1990) are intended to ensure 'reasonable accommodation' and non-discrimination for students with disabilities in higher education. A student who has physical, psychiatric/emotional, medical, learning or attentional disability that may have an effect on the student's ability to complete assigned coursework should contact the Disabilities Services Coordinator in the Advising Center, who will review the concerns and decide with the student what accommodations are necessary. Disability Services Coordinator Laurie Bickett (x6286) can provide further information.

Help for students whose first language is not English — I want every student to succeed in this course (and ideally, to enjoy geology on the way). Please talk to me as early as you can if you have trouble understanding the lectures or laboratory discussions. We will work together to find a way to help you succeed. The Writing Center has on staff a part-time tutor with professional training in ESL/ELL instruction. Students can schedule work with this tutor by contacting the Writing Center. Students may bring their instructors documentation concerning their ELL status. For further information, contact the Academic Advising Office.

Help for any student who is struggling — Your ability to succeed in this course is not predetermined. If you do not think you're learning as much as you should be, or if your class performance doesn't reflect the work you're putting into the course, please come to see me in my office. We will work together to identify ways that you can learn more effectively. The earlier you take action, the greater the potential reward!

Academic Honesty — I take academic honesty very seriously. Plagiarism (cheating) of any sort will not be tolerated. Plagiarism is the use of someone else's ideas or words as your own. This definition includes copying another student's exam or assignment as well as using material from a book or internet site without acknowledging the source. If you cheat on an exam, plagiarize the work of another person, or present work that is not entirely yours as if it was, the *minimum* penalty will be a zero for that assignment and referral to the Provost's office. If you observe cheating and fail to act, you are also guilty of dishonest conduct and will be held accountable. Serious instances of academic dishonesty will result in failure of the course.

As a student at Gustavus you implicitly agree to abide by the honor policy. The Academic Honesty Policy and the Honor Code can be found at:
http://gustavus.edu/academics/general_catalog/current/index.cfm?pr=acainfo

Grading

Your grade should be a reflection of your learning and growth in the course, and you should receive credit for the things that are important in mastering the material. I believe that it is very important to make sure you understand the criteria for grading, so I have tried to make the grading process as clear as possible. If you achieve at the levels indicated, you will have earned the grade indicated. This holds true whether all students earn an A or all earn a C. That said, if a large proportion of the class is struggling with material, I will adjust the course accordingly, to give you ample opportunity to learn.

Lecture Portion (30%)		**Lab Portion (70%)**	
Midterm Exam	10%	11-12 labs	50%
Final Exam	10%	lab exam	20%
In-class quizzes	5%		
News journal	5%		

Letter Grades

A = 93-100 A- = 90-92.9 [indicates mastery of the material with developed insight]

B + = 87-89.9 B = 83-86.9 B- = 80-82.9 [indicates mastery with limited insight]

C+ = 77-79.9 C = 73-76.9 C- = 70-72.9 [basic knowledge with limited mastery]

D+ = 66-69.9 D = 60-65.9 F = <60.0 [minimal to unacceptable performance]