

Geology 330: Structural Geology Spring Semester 2012

Class Schedule

Lecture: MWF 3:00 – 3:50 pm

Lab: F 3 – 3:50 pm

Field Trips: Arkansas – April 18-22, 2012
Thompson Dam May 4-5 2012

Instructor

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Office Hours: M 1-2pm; F 1-2 pm

Text: van der Pluijm, B.A. and Marshak, S. Earth Structure, Second Edition. WW Norton & Company, 2004, 656 p.

Grading:

Exams (2, including final)	200 pts
Labs and assignments	150 pts
Research Paper	150 pts
Lab Practical Exam	100 pts
Total	600 pts

NOTE: A passing grade in the lab is required to pass the class.

University/Course Policies and Additional Information

University Policy requires that instructors maintain attendance records. Attendance records for Geology 330 are maintained in class and in lab. Greater than three unexcused absences during these projects will result in a failing grade for the entire course.

University Policy requires that course syllabi include a statement that informs students about the availability of the Services for Students with Disabilities Office. Any student enrolled in Geology 330 who has a disability and is in need of classroom accommodations should contact the instructor and the Services for Students with Disabilities Office in Old Library 2136 at the beginning of the semester.

University Policy requires that each course syllabus identify which of the 5 Liberal Education Learning Goals are addressed in the course. The UWEC Liberal Education Learning Goals this course addresses include: Knowledge of Human Culture and the Natural World, Creative and Critical Thinking, Effective Communication and Individual and Social Responsibility. Students are advised to save copies of their papers and work in this class as evidence of achievement of UWEC academic goals.

University Policy encourages instructors to inform students of their policies regarding academic misconduct. I consider any academic misconduct in this course as a serious offense, and I will pursue the strongest possible academic penalties for such behavior. A definition of academic misconduct and disciplinary procedures and penalties for academic misconduct are described in the UW-Eau Claire Student Services and Standards Handbook in the section titled "Chapter UWS 14—Student Academic Disciplinary Procedures."

Course Behavior/Expectations

I expect your course behavior to reflect respect for all members of the course at all times. You should be prepared to participate in classroom activities and answer questions in class. **NO personal electronic devices are allowed in lecture/lab.** Laptop computers may only be used to take notes during class; please sit at the front of class if you plan on using a laptop for notes. Violation of these policies will be considered academic misconduct.

Labs

Each week we will have lab. Lab topics and schedule can be found below in the schedule. Materials you will consistently need for lab are pencil (2H or harder lead), eraser, colored pencils, ruler, protractor and scientific calculator. **LAB ASSIGNMENTS ARE ALWAYS DUE THE FOLLOWING WEEK AT THE BEGINNING OF THE NEXT LAB!** We will have local field trip(s) during lab hours towards the end of the semester when weather becomes more appropriate. Reports/assignments related to the field trips will be provided prior to the trips.

Exams

There will be 2 lecture exams during the semester. The questions on the lecture exams will be essay-type and include short essay, short answer, diagram drawing, diagram/photo interpretation, calculations, etc. Exams include material covered in lecture and reading assignments. A lab practical exam will be given near the end of the semester in order to assess your ability to apply what you have learned to realistic problems that will be encountered in your geologic careers.

Research Paper

You are required to write a research paper on a topic of your choosing. The topic can be a major geologic structure or structural/tectonic region (e.g., San Andreas Fault or Basin and Range Province) or a structural process (e.g., flexural-slip folding, mechanics of thrust faults). I have provided a list of potential topics but if you have an idea for a research paper that you would like to pursue please consult with me for additional direction and for topic approval.

The research paper will be a *maximum* of 12 pages double spaced, including all figures and a complete reference list. You will format your research paper according to the Journal of Structural Geology guidelines. See a published journal article or <http://www.sciencedirect.com/science/journal/01918141> for formatting examples. Term paper outline (detailed with reference list) due February 15, 2012 will be worth 5% of the final paper grade. You must have your topic approved prior to submission of the outline. Rough draft of your research paper, which will be worth 75% of your research paper final grade, is due March 2, 2012. Note that you must have your research paper rough draft proofed by the UWEC Writing Center prior to the due date. The final corrected draft of your research paper, making up the remaining 20%, is due April 4, 2012. Additional documents will include more information regarding your research paper. Late outlines or drafts **WILL NOT** be accepted.

Field Trips

An extended weekend field trip to the Ouachita Mountains in Arkansas (or somewhere equally as exotic) will take place April 18-22. We will depart at 5:00 pm on Wednesday and return Sunday between 8-10 pm. We will also have a short (1.5 day) field trip to the Thomson Dam, MN which will take place May 4-5. When on field trips, we will be traveling in University vehicles. You must obey all University regulations regarding travel as well as any instructions from the certified drivers of the vehicles.

Course Outline (*TENTATIVE!!*)

Date	Topic	Readings
Week 1		
1/23	Course introduction	Chapter 1
1/25	Primary vs. secondary structures	Chapter 2
1/27	Primary vs. secondary structures	Chapter 2
Lab:	<i>Review: Maps and compass; Introduction to stereonets</i>	
Week 2		
1/30	Review of Plate Tectonics	Chapter 14
2/01	Review of Plate Tectonics	Chapter 14
2/03	Stress	Chapter 3
Lab:	<i>Apparent dip, structure contours and three-point problems</i>	
Week 3		
2/6	Stress	Chapter 3
2/8	Strain	Chapter 4
2/10	Strain	Chapter 4
Lab:	<i>Geologic map interpretation & geologic structure sections</i>	
Week 4		
2/13	Strain	Chapter 4
2/15	Rheology	Chapter 5
2/17	Rheology	Chapter 5
2/15	OUTLINE OF RESEARCH PAPER APPROVED	
Lab:	<i>Advanced stereonet analysis</i>	
Week 5		
2/20	Brittle Deformation	Chapter 6
2/22	Fractures, joints and veins	Chapter 7
2/24	Fractures, joints and veins	Chapter 7
Lab:	<i>Mohr circles and brittle failure</i>	
Week 6		
02/27	Introduction to faults and faulting	Chapter 8
02/29	Faults and faulting	Chapter 8
03/2	Normal faults and faulting	Chapter 8
Lab:	<i>Advanced stereonet analysis</i>	
03/2	ROUGH DRAFT OF RESEARCH PAPER DUE	
Week 7		
03/5	Thrust faults and faulting	Chapter 8
03/7	Strike-slip faults and faulting	Chapter 8
03/9	MIDTERM EXAM	
Lab:	<i>Strain analysis</i>	
Week 8		
03/12	Introduction to ductile deformation	Chapter 9
03/14	Deformation microstructures	Chapter 9
03/16	Deformation mechanisms	Chapter 9
Lab:	<i>Faults and fault rocks</i>	

03/19-03/23	No Classes – Spring Break	
Week 9		
03/26	Introduction to folding	Chapter 10
03/28	Folds and folding	Chapter 10
03/30	Folds and folding	Chapter 10
Lab:	<i>Folds and fold geometry</i>	
Week 10		
04/02	Fold mechanisms	Chapter 10
04/04	Ductile structures: Foliations and lineations	Chapter 11
04/06	Ductile structures: Foliations and lineations	Chapter 11
Lab:	<i>Field trip to Big Falls, WI</i>	
04/4	FINAL DRAFT OF RESEARCH PAPER DUE	
Week 11		
04/9	Ductile structures: Foliations and lineations	Chapter 11
04/11	Ductile structures: Foliations and lineations	Chapter 11
04/13	No class – Arkansas fieldtrip	
Lab:	No lab – Arkansas fieldtrip	
Week 12		
04/16	Shear zones and kinematic indicators	Chapter 12
04/18	Shear zones and kinematic indicators	Chapter 12
04/20	Shear zones and kinematic indicators	Chapter 12
Lab:	<i>Foliation, lineations and kinematic indicators</i>	
Week 13		
04/23	Introduction to fold and thrust belts	Chapter 18
04/25	Fold and thrust belts	Chapter 18
04/27	Fold and thrust belts	Chapter 18
Lab:	<i>Field trip to Jim Falls, WI</i>	
Week 14		
04/30	The Appalachian Orogen	pgs. 582-591
05/2	Extensional tectonics: Rifting	Chapter 16
05/4	Extensional tectonics: Rifting	Chapter 16
04/4-5	FIELD TRIP TO THOMSON DAM, MN	Depart 5 pm
Week 15		
05/7	Extensional tectonics: Metamorphic Core Complexes	Chapter 16
05/9	The subduction factory	Chapter 17
05/11	Deformation in magmatic arcs	Chapter 17
Lab:	<i>Mystery lab</i>	
Finals week	FINAL EXAM	