

# GEOLOGY 331 - STRUCTURAL GEOLOGY & TECTONICS

## Spring, 2008 - Tim Paulsen

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### *Tentative Schedule*

<u>Lecture Topic</u>	<u>Suggested Reading</u>
1) Primary and nontectonic structures	V&M-Chapters 1 & 2
2) Contact Relations	
3) Stress	V&M-Chapter 3
4) Deformation and strain	V&M-Chapter 4
5) Rock Rheology	V&M-Chapter 5
<b>**EXAM I</b>	
6) Fracturing	V&M-Chapter 6
7) Joints and veins	V&M-Chapter 7
8) Faults and brittle fault rocks	V&M-Chapter 8
9) Ductile deformation mechanisms	V&M-Chapter 9
10) Folds and folding	V&M-Chapter 10
11) Foliations and lineations	V&M-Chapter 11
12) Shear zones and transposition	V&M-Chapter 12
<b>**EXAM II</b>	
13) Deformation, metamorphism, and time	V&M-Chapter 13
14) Whole earth structure	V&M-Chapter 14
15) Plate tectonics and plate boundaries	V&M-Chapter 14
16) Causes of earth movements	V&M-Chapter 14
17) Contractional tectonics	V&M-Chapters 17&18
18) Extensional tectonics	V&M-Chapter 16
19) Strike-slip tectonics	V&M-Chapter 19
20) Structural provinces of the USA	To be announced
<b>** FINAL EXAM (Cumulative; during last lab period)</b>	

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<u>Instructor:</u>	Tim Paulsen Office: 306 Harrington Office Hours: W, F; 12:40-1:40 PM or by appointment
<u>Lectures:</u>	M, W; 9:10-10:10; Room 217, Harrington Attendance required.
<u>Laboratory:</u>	F; 8:00-11:20; Room 313, Harrington Weekly homework exercises will be assigned during lab. Attendance required.
<u>Exams:</u>	Three hourly lecture exams Two laboratory practical exams
<u>Field Trip:</u>	There will be one <u>required</u> field trip to Marquette (MI) leaving Friday, April 25 at 5:00 pm and returning Sunday, April 27. We will discuss this in more detail as the date of the trip approaches.
<u>Other Assignments:</u>	Field notebooks will be collected and graded. A written report on the field trip geology will be required. This will be discussed in more detail in class.
<u>Grading:</u>	<u>Lecture = 65% of total grade</u> <ul style="list-style-type: none"><li>•2 hourly lecture exams, homework, field trip assignment, &amp; participation=50%</li><li>•final lecture exam (cumulative)=50%</li></ul>

Laboratory = 35% of total grade

- lab exams =40%
- quizzes =10%
- weekly lab assignments & participation =50%

Required Texts:

Van der Pluijm, B., and Marshak, S., 2004, *Earth Structure: An Introduction to Structural Geology and Tectonics* (2<sup>nd</sup> edition), W.W. Norton, & Co., 656 p.

Marshak, S., and Mitra, G., 1988, *Basic Methods of Structural Geology*, Prentice-Hall, Englewood Cliffs, NJ, 446p.

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### Spring, 2008 - LAB SYLLABUS

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*Tentative Schedule*

<u>LAB</u>	<u>Topic</u>	<u>Reading</u>
Feb. 8	Attitude and Location	M&M Chapter 1
Feb. 15	Contour Maps	M&M Chapter 2
Feb. 22	Geometric Methods	M&M Chapter 3&4
Feb. 29	Geometric Methods II	M&M Chapter 3&4
March 7	Strain (bring tracing paper)	M&M Chapter 15
March 14	<b>LAB PRACTICAL I</b> (through Strain)	
March 21	To Be Determined	
March 28	Spring Break	
April 4	Stereonet/Rose Diagrams (bring tracing paper)	M&M Chapters 5&12
April 11	Poles and Rotations (bring tracing paper)	M&M Chapter 6
April 18	Equal-area projections (bring tracing paper)	M&M Chapter 8
April 25	To Be Determined	
May 2	Field Trip Lab	
May 9	<b>LAB PRACTICAL II</b>	
May 16	<b>LECTURE FINAL EXAM</b>	

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The lab is in Room 313 Harrington Hall. The purpose of lab time is to work on the assignments for the day. Therefore, I will not give a long lecture at the beginning of lab; my purpose will be to answer questions during the lab time. Because of this arrangement, it is imperative that students complete the reading assignments *before* coming to labs. To encourage this practice, there will be a five to ten minute quiz at the beginning of most labs that will cover the concepts and terminology presented in the assigned reading. Lab assignments are due the following Monday in lecture. Lab attendance is required, which means that if you are absent or leave lab early you will not receive credit for that lab. However, you will still be responsible for the material covered in lab.

You should always bring the following to lab: Paper, Pencil, Eraser, Scale, Protractor, Calculator, Lab book, Thinking cap, Onion skin/Tracing paper (when doing stereonet and strain work)