

**Structural Geology** is a broad field of study that is about faults, folds, and other deformation structures within the lithosphere; it is typically based on features that one can observe in the field (or in thin section). It covers their description, and the interpretation of how they formed. Structural geology also includes an understanding of the principles that underlie their formation, and the variety of techniques that are used to analyze geologic structures (strain analysis, kinematic analysis, dynamic analysis, tectonic analysis). In the context of structural geology, **Tectonics** refers to the link between different plate tectonic situations and the types of structural features that develop. Structures can be analyzed at micro-, meso-, macro- and mega- scales, and used to interpret the tectonic activity and setting for a region.

**CLASS MEETINGS**

Lectures: M, W, F 1:00 pm – 1:50 pm in WSB 21  
Labs: Thursday 2:00 pm – 3:50 pm in WSB-22

**INSTRUCTOR**

Dr. Kate Pound  
Office: WSB 155  
Phone 320-308-2014 (*don't use this, I never remember to check phone messages*)  
Email: [kspound@stcloudstate.edu](mailto:kspound@stcloudstate.edu)  
Office Hours: to be posted *or* by appointment

**D2L and WEBSITE**

A D2L site will be set up for this course. Most class materials will be posted on this site.

**TEXTBOOK**

Structural Geology, Haakon Fossen, Cambridge University Press, 2010, 463p.  
ISBN 978-0-521-51664-8 or 9 780521 516648

**OTHER READINGS**

There are several other articles or papers that I will expect you to read. A paper copy of each of these will be placed in the EAS office, lunchroom, or Faculty-Student Research area, or in D2L.

**GRADING:**

Your grade will be determined as shown below. Shaded grades will be used.  
A range = 90-100; B range is 80-90; C range is 70-80; D range is 60-70; F is below 60.  
The exams may or may not be curved.

Component	Percentage
Exams (10% each)	40%
Lab Exercises	40%
In-Class Worksheets	20%

**D2L**

A D2L site is set up for this course. Some class materials will be posted on the D2L site. I will also post reminders about assignments and some diagrams from lectures and any lecture slides. Make sure you check the D2L Course News page regularly. I will post your grades in D2L Grades as material is graded.

**OTHER COMMUNICATIONS**

Depending on what other social media class members use, I might set up an additional communication system.

## THE EXAMS

There will be a total of 4 exams. Three of these will be 'In-Class' exams. The Final Exam (Exam 4) will be a cross between a 'Lecture Exam' and a 'Lab'.

## CLASSROOM / LAB EQUIPMENT

You will need to bring the following equipment to class. We won't use it every class, but I am counting on you to have /bring:

- Colored pencils – minimum of 12 distinct colors, 24 is better.
- Ruler (12") – with measurements in inches *and* centimeters/ millimeters
- Protractor
- Drawing compass
- Basic calculator
- A good eraser (actually, several good erasers)
- SHARP pencils; at least one needs to be 3H or 4H. Mechanical pencils are best
- Your brain, in 'on' and 'alert' mode

## LUNCHTIME, NAPTIME, AND GENERAL EXPECTATIONS

Class meets when many of you will be hungry. Make sure you have eaten something so you are not too hungry to focus and learn. You can bring beverages or snacks to class, as long as they are not \*NOISY\*, and as long as they don't smell good (or bad). The 1:00 – 2:00 pm time slot is when many of our bodies say 'naptime'; I will not be napping during class, and will try to make sure you don't either. I expect you to be in class every day (on time), and I expect you to take good class notes. If you miss a class, it is **YOUR RESPONSIBILITY** to find out from classmates what we did in class. Promise *never* to ask me 'did I miss anything important?' because you will get a sarcastic response. Plagiarism and cheating will not be tolerated, and will be handled according to the student Code of Conduct (<http://www.stcloudstate.edu/studenthandbook/code/prohibited.asp>). Always proofread submitted work.

## FIELD TRIP:

Currently there is no 'significant' Field Trip set up for this class. I will canvas class members during the first meeting about a possible field trip.

## STUDENT LEARNING GOALS After this class you will:

- Be able to use and apply terminology and techniques used to describe and interpret geological structures
- Be able to explain stress and strain in rocks, and the relations between stress and strain and the geologic structures and tectonic settings they are associated with
- Be able to use stereonet and structural contours to effectively and correctly answer geologic questions
- Be able to correctly identify and interpret structural fabrics
- Be able to correctly explain the role of metamorphism in micro-, meso-, macro-, and mega-structural features
- Be able to describe precisely and succinctly the structures associated with different plate tectonic settings
- Be able to examine a geologic map and use data therein to determine the structural geologic history of the region.

**ATTENDANCE IN CLASS IS MANDATORY. THE INSTRUCTOR CANNOT TEACH YOU MATERIAL IF YOU MISS CLASS. IF YOU MISS A CLASS IT IS YOUR RESPONSIBILITY TO FIGURE OUT WHAT YOU MISSED. YOU CANNOT GET CREDIT FOR WORK IF YOU MISS THE CLASS IT WAS DONE IN.**

## AHS 424 Structural Geology & Tectonics Tentative Schedule Fall 2014

Date	Topic	Reading
Mon Aug 25 <sup>th</sup>	Introduction Review	Fossen, Ch. 1 Strike & Dip Handout
Weds Aug 27 <sup>th</sup>		
Fri Aug 29 <sup>th</sup>		
Lab	Lab 1: Strike and Dip	
Mon Sept 1 <sup>st</sup>	<b>NO CLASSES – LABOR DAY</b>	
Weds Sept 3 <sup>rd</sup>	Deformation, Strain & Stress	Fossen, Ch. 2, 3, 4 (selected parts) Handouts
Fri Sept 5 <sup>th</sup>		
Lab	Lab 2: Deformation, Strain & Stress	
Mon Sept 8 <sup>th</sup>	Faults & Fractures	Fossen, Ch. 7, 8 Handouts
Weds Sept 10 <sup>th</sup>		
Fri Sept 12 <sup>th</sup>		
Lab	Lab 3: Faults and Fractures	
Mon Sept 15 <sup>th</sup>	Stereonet & Structural Data	Fossen Ch. 9 & Appendix B p. 422-427 Handouts
Weds Sept 17 <sup>th</sup>		
Fri Sept 19 <sup>th</sup>		
Lab	Lab 4: Intro to Stereonets	
Mon Sept 22 <sup>nd</sup>	Folds & Folding	Fossen, Ch. 11 Handouts
Weds Sept 24 <sup>th</sup>		
Fri Sept 26 <sup>th</sup>	<b>EXAM 1</b>	
Lab	Lab 5: Folds	
Mon Sept 29 <sup>th</sup>	Foliation, Cleavage & Lineation	Fossen, Ch. 12, 13 Handouts
Weds Oct 1 <sup>st</sup>		
Fri Oct 3 <sup>rd</sup>		
Lab	Lab 6: Valhalla Cove	
Mon Oct 6 <sup>th</sup>	Maps Intro & Stereonet	Fossen, Appendix B p. 422-427 Handouts
Weds Oct 8 <sup>th</sup>		
<b>FALL BREAK October 9<sup>th</sup> &amp; 10<sup>th</sup></b>		
Mon Oct 13 <sup>th</sup>	Advanced Maps & Stereonets	Fossen, Appendix B p. 422-427 Handouts
Weds Oct 15 <sup>th</sup>		
Fri Oct 17 <sup>th</sup>		
Lab	Lab 8: Lyra's Paw	
Mon Oct 20 <sup>th</sup>	Review / Study time – NO class	
Weds Oct 22 <sup>nd</sup>	<b>EXAM 2</b>	
Fri Oct 24 <sup>th</sup>	Topography / Structure Review	Handouts
<b>NO LAB THIS WEEK</b>		

Mon Oct 27 <sup>th</sup>	Structure Contours	Handouts
Weds Oct 29 <sup>th</sup>		
Fri Oct 31 <sup>st</sup>		
Lab	Lab 9: Structure Contours	

Mon Nov 3 <sup>rd</sup>	Structural Cross Sections	Handouts
Weds Nov 5 <sup>th</sup>		
Fri Nov 7 <sup>th</sup>		
Lab	Lab 10: Structural Cross Sections	

Mon Nov 10 <sup>th</sup>	Metamorphism & Ductile Deformation	Fossen Ch. 14, 15 Handouts
Weds Nov 12 <sup>th</sup>		
Fri Nov 14 <sup>th</sup>		
Lab	Lab 11: Ductile Deformation	

Mon Nov 17 <sup>th</sup>	Microstructures	Fossen Ch. 10 (selected parts) Handouts
Weds Nov 19 <sup>th</sup>		
Fri Nov 21 <sup>st</sup>	<b>EXAM 3</b>	
Lab	Lab 12: Microstructures	

Mon Nov 24 <sup>th</sup>	Extension	Fossen, Ch. 17 Handouts
Weds Nov 26 <sup>th</sup>		

**THANKSGIVING BREAK - NO CLASSES Thursday 27<sup>th</sup> & Friday 28<sup>th</sup>**

Mon Dec 1 <sup>st</sup>	Compression	Fossen, Ch. 16 Handouts
Weds Dec 3 <sup>rd</sup>		
Fri Dec 5 <sup>th</sup>		
Lab	Lab 13: Regional Geology in Compressional Regimes	

Mon Dec 8 <sup>th</sup>	Strike-Slip	Fossen, Ch. 18 Handouts
Weds Dec 10 <sup>th</sup>		
Fri Dec 12 <sup>th</sup>		
Lab	Lab 14: Regional Geology in Strike-Slip Terrains	

**FINAL EXAM: Monday December 15<sup>th</sup> 1:00-3:30 pm in WSB-21**