

Structural Geology - Spring 2017 Syllabus

GLY 313-201 - CRN: 3475

Lecture: Tuesday / Thursday - 9:30-10:45am - Science 165

Lab: Friday - 1-2:50pm - Science 165

Dr. Mitchell Scharman

Email: scharman@marshall.edu

Office: Science 163

Phone: (304) 696-5435

Office Hours: M 12-1:30pm; T & R 11am-12:30pm, or by appointment

Please do not stop by in the hour before any scheduled class

Required Text: *Structural Geology* by Fossen (2nd ed.)

- E-learning modules are located at www.cambridge.org/fossen2e

Required Supplies: mechanical pencils with eraser (no pens), tablet of tracing paper; C-thru protractor rulers, colored pencils, and an extra eraser stick may also be useful on lab assignments.

- Note: C-Thru brand protractor-rulers and tracing paper can be purchased at Latta's (15th St and 4th Ave); recommend purchasing 2-3.
- Bruntons will be checked out as needed. Rock hammers and clipboards will also be checked out as needed; however, these are great investments as young geologists.

Catalog Course Description: Analysis, classification and origin of depositional and deformational structures common to all classes of rocks; their structural history, relationships, and stresses which caused them. *4 credit hours; pre-requisites: GLY110 or 200; GLY212.*

About the Course: This course explores the nature and types of structures present in rocks that make up the Earth's crust and the deformational processes that make them. Fundamental concepts and principles of deformation are examined in a variety of plate tectonic and mountain building settings. The laboratory introduces methods used in structural interpretation and analysis. One weekend field trip, and several local field outings are planned to look at the structural geology in the Appalachian Mountains.

This course is intended to introduce geology majors to the sub-discipline of structural geology emphasizing descriptive structural geology, structural interpretation, and kinematic and dynamic analysis. Topics include: stress/strain in rocks, brittle and ductile structure development, introduction to common structural geology methods, and the varying deformational regimes.

Objectives:	Assessment
Understanding of various types of structure, processes of formation	• Comprehension Quizzes • Lab Assignments • Exam 1, 2
Interpretation of structural observations and data.	• In-class assignments • Comprehension Quizzes • Exam 1, 2
Understand processes of deformation in extensional, contractional, traverse settings.	• Lab Assignments • Comprehension Quizzes • Exam 2
Application of Basic Interpretation/ Analysis Methods	• In-class assignments • Lab Assignments

Structural Geology - Spring 2017 Syllabus

GLY 313-201 - CRN: 3475

Course Materials and Organization: Assigned readings are mostly drawn from the required text book. You will need to keep track of assignments for lectures and labs. The required text also has excellent e-learning modules to accompany each chapter. Any additional materials will be distributed in lecture, lab, or be made available on Blackboard.

Office Hours/Communication

The only time requested you not stop by is the hour before any of my scheduled classes. See the general weekly schedule posted on my office door to get a better idea when I am not available. Appointments can also be made - please email and suggest a time; if you only verbally tell me you are going to stop by at a given time, it may not be placed on my calendar. Please check your Marshall University Outlook email regularly, I occasionally send e-mails about important class information or updates. I generally check my email daily between 8am and 5pm during the week, and will respond as I am able.

Class and Lab Periods

Tuesday and Thursday class periods are mostly devoted to lectures on scheduled topics, and active learning activities. Friday class periods are devoted to lab assignments, but some lecture time may also be used for lab preparation. Lecture recordings will be posted on Blackboard after each topic. I urge you to take notes rather than relying exclusively on the provided recordings. Cell phones are not to be used during class time. I also encourage you to not use a computer to take notes, but just with pencil and paper.

Grading

In-class Assignments.....	15%
Mid-term Exam.....	15%
Final Exam.....	20%
Lab Assignments	30%
Comprehension Quizzes	20%
Total	100%

Grading Scale:

A: 100-90%; B: 89-80%
C: 79-70%; D: 69-60%
F: 59% or less

No curve is applied; please do not inquire. Assignments are graded within 1-2 weeks time.

Comprehension Quizzes/Exams

A brief comprehension quiz on the week's topic/reading assignment will be given at the start of class on Tuesdays. The few questions on each quiz will focus on just the basics of the topic, so be sure to read and review the assigned materials prior to the each Tuesday class.

In addition to the comprehension quizzes, there will be two exams in the course. These will mostly be based on the conceptual ideas discussed during the semester in lecture. See course schedule for times.

Lab Assignments

Lab assignments are intended to introduce basic methods in application to structural geology. Unless otherwise stated in the instructions, lab assignments are assigned Fridays and are due the following Friday by the start of the lab period. Submit completed assignments in the bin on my office door start of lab (1pm). Please staple your lab assignment so that it is neat and orderly.

Structural Geology - Spring 2017 Syllabus

GLY 313-201 - CRN: 3475

Late Work and Associated Policies

Credit will be lost for late lab assignments, at the rate of 0.5 point/day (i.e. 5% of total assignment grade). *Assignments are considered late if they are not turned in by the start of lecture; if they are submitted anytime after that, a grade deduction will occur.* Weekdays are the only days that apply towards the late penalty. For example: if a lab assignment due on Friday is not submitted until the following Monday, a total penalty of 1 point will be deducted, resulting in a maximum possible grade of 9 out of 10 points; 0.5 point for Friday, and 0.5 point for Monday.

No make-ups for comprehension quizzes or in-class learning activities will be given for late arrivals or absences from class. Likewise, for exams: if you arrive late on exam day, you will not be allowed to start the exam if exams have already been turned in. Time extensions for lab assignments, and alternate make-up assignments for in-class activities, quizzes, and exams will only be allowed for a university-excused absence. You must take initiative to speak with me ASAP if you miss any with a valid university excused absence, and alternate deadline will be set for what was missed. If this deadline is not met, a grade of zero will be applied and no extra extension will be given.

University Excused Absence Policy

No attendance is taken in this course, but you will need a University Excused Absence to make-up missed in-class activities, comprehension quizzes, lab assignments, or exams. Absences that are classified as University Excused Absences are the following: serious medical reasons, legal reasons, military obligations, or university activities excused by the academic deans. Serious medical reasons are defined as student illness or critical illness/death in the immediate family; "immediate family" is defined as a spouse/life partner, child, parent, legal guardian, sibling, grandparent or grand-child. Routine doctor appointments are not excused; such appointments should be scheduled around your classes.

If you miss *less than 3 consecutive hours* of the course, you must speak with me about any make-up work. Note, in this case, it is up to the professor to determine if your absence is considered an official university excused absence. Professor must receive proper notification/documentation of an university excused absence. Please speak to me sooner rather than later about such absences.

If you miss *3 consecutive hours or more* of class, you must speak with the Dean of Student Affairs Office. In such a case, notice of an excused absence must be received by the instructor from the Dean of Student Affairs office prior to completing the make up work.

There will be no make-up quizzes/assignments without a university excused absence. All excused assignments and make-up quizzes must be completed prior to taking the final exam.

Field Trips

Be prepared for the weather and terrain. In particular, wear appropriate clothing, sturdy hiking boots, a daypack, and water. Always bring your notebook, ruler, mechanical pencil, clipboard, Brunton, etc. The associated field trip assignment will be counted as a lab grade. For logistical reasons there will be no make-up opportunities for field trips.

Note About Personal Conduct

Everyone in the course is expected to act in a professional and courteous manner. Any disruptive or offensive behavior - especially that directed at anyone else in the class - will not be tolerated. Any violation will be met with a requirement to drop the course and forfeit any associated

Structural Geology - Spring 2017 Syllabus

GLY 313-201 - CRN: 3475

grades. All cell phones must be turned off, put away, and remain away, for the duration of each class period. It is extremely unprofessional, as well as a waste of the Professor's and fellow student's time, if you are looking at a cell phone while a conversation/lecture/lab is in progress. Having a cell phone out during a quiz is considered cheating. Finally, the Professor will only respond to emails that are written with at least a basic level of professionalism and courtesy.

By your continued enrollment in this course, you agree with the policies in this syllabus and to the following University Policies: Academic Dishonesty; Excused Absence Policy for Undergraduates; Computing Services Acceptable Use; Inclement Weather; Dead Week; Students with Disabilities; Academic Forgiveness; Academic Probation and Suspension; Academic Rights and Responsibilities of Students; Affirmative Action; Sexual Harassment

The full text of each policy is available at:

<http://muwww-new.marshall.edu/academic-affairs/policies>

Structural Geology - Spring 2017 Syllabus
GLY 313-201 - CRN: 3475

Tentative Lecture/Lab Schedule

Date	Lecture/Lab Topic	Reading Assignment*
Jan. 10/12	Lecture: Course Syllabus; Structural Geology Introduction; Strain Introduction	Chapter 1 (all)
Jan. 13	Lab 1: Structure Contours	Handout 1
Jan. 17/19	Lecture: Strain	Chapter 2.1-2.5, 2.7-2.12, 2.14-2.17, 2.25-2.30; Discussion Paper
Jan. 20	Lab 2: 3-point Problems & Basic Sections	Handout 2
Jan. 24/26	Lecture: Stress	Chapters 4 (all), 5.1-5.3, 5.6, 5.7
Jan. 27	Lab: Stereonets	Handout 3; Appendix B
Jan. 31/Feb. 2	Lecture: Brittle Deformation	Chapter 7.1-7.4, 7.6-7.8
Feb. 3	Lab: Stereonets Part 2	Handout 4
Feb. 7/9	Lecture: Joint, Veins, Faults	Chapters 8.1-8.3, 8.5, 8.8, 9.1-9.3
Feb. 10	Lab: Geologic Cross-sections Part 1	Handout 5
Feb. 14/16	T Review; R <i>Exam 1</i>	
Feb. 17	Lab: TBD (Possible Afternoon Field Trip)	
Feb. 21/23	Lecture: Fault Growth/Folds	Chapters 9.4, 9.5, 12.1-12.4
Feb. 24	Lab: Structural Analysis Part 1	Handout 6
Feb. 28/Mar. 2	Lecture: Contractional Regimes	Chapters 10.1, 10.2, 17 (all)
Mar. 3	Lab: Continue Structural Analysis Part 1	Handout 6
Mar. 7/9	Lecture: Extension Regimes	Chapter 18.1-18.4, 18.6-18.8, 18.10-18.12
Mar. 10	Lab: Cross-sections Part 2	Handout 7
Mar. 14/16	Lecture: Strike-slip Regimes	Chapter 19 (all)
Mar. 17	Lab: Fault Slip Analysis	Handout 8 and Paper
Mar. 21/23/24	<i>Spring Break</i> - No Class	
Mar. 28	Lecture/Lab: Joint Orientation Statistical Analysis	Handout 9

Structural Geology - Spring 2017 Syllabus
GLY 313-201 - CRN: 3475

Date	Lecture/Lab Topic	Reading Assignment*
Mar. 29/31	No Class - SE GSA	
Apr. 4/6	Lecture: Foliation	Chapter 13 (all)
Apr. 7	Lab: Structural Analysis Part 2	Handout 10
Apr. 11/13	Lecture: Lineation/Boundinage	Chapter 14 (all), 15.1, 15.3, 15.5
Apr. 14	Lab: Continue Structural Analysis Part 2	Handout 11
Apr. 18/20	Lecture: Shear Zones	Chapter 16.1-16.3, 16.5
Apr. 21/22	Friday/Saturday Field Trip - Seneca Rocks/Dolly Sods	
Apr. 25/27 (Dead Week)	Lecture: Larger Picture	Chapter 22 (all)
Apr. 28	Lab: Field Trip Data Stereonet Analysis	Handout 12
Tuesday May 2 - Final Exam - 8-10am - Science 165		

*Be sure to note that there are also e-modules associated with each assigned chapter and appendix.

Notes and other important dates:

Schedule may change throughout semester due to unforeseen circumstances.

Jan. 9-13: Late registration/schedule adjustment (add-drop)

Jan. 13: Last day to add a course

Jan. 17: "W" withdrawal period begins

Feb. 27: Freshmen/Sophomore mid-term grades

Mar. 17: Last day to drop a course

Apr. 29: Last day to completely withdraw from Spring semester

May 9: Final grades due by noon