

Required Texts:

Pollard and Martel, Structural Geology: A Quantitative Introduction, this is a text in preparation. You will be provided with printed chapters free of charge. Please buy a 3-ring binder to keep it all together. The authors will appreciate any feedback we provide.

Part 3: Descriptive Analysis from: G. H. Davis , S. J. Reynolds, and C.F. Kluth, 2012, Structural Geology of Rocks and Regions, third edition (Wiley) is available from Broad Street Books in a custom textbook format.

Assignments:

Reading: Assigned readings are meant to add to the classroom and field experiences. They should be completed before class so that you can ask questions and participate in activities. Both of the texts are rich in details and methods and will thus serve as excellent resources as we tackle problems in structural geology.

Field Reports and Problem sets: Every other week you will be expected to complete a short assignment based on our field trips and the related class sessions. The format of these reports will vary throughout the semester. These reports will be due on Monday one week after the associated lab. In addition to the field reports there will also be short problem sets or assignments based on in class material.

Literature summaries: We will be reading and discussing several papers from the literature in class. You will be required to hand in a written summary for each of these papers at the beginning of the class discussion. Assignments will vary to help develop your scientific writing skills.

Quizzes: There will be two quizzes during the semester. These will be largely problem-based and serve to help evaluate your understanding of the course material.

Grading:

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| • Weekly lab/field reports and problem sets | 50% |
| • Written summaries of 5 papers from the literature | 25% |
| • Final Project | 15% |
| • Quizzes | 10% |

Honor System and Collaboration:

All work, unless otherwise noted appropriately is assumed to be your own. It is your responsibility to correctly acknowledge sources (libguides.wesleyan.edu/citing) I encourage you to work in small groups during labs and on problem sets. **Unless otherwise noted, however, the final product of any assignment (lab write-up, etc.) should be done individually. Please acknowledge collaborators on all assignments.**

Missing classes, late assignments, etc.

All field trips and classes are required. If you need to miss a lab, class, etc. please let me know in advance so that we can make other arrangements. Late assignments will be penalized 10% and must be handed in within one week of the due date.

Disability Resources

Wesleyan University is committed to ensuring that all qualified students with disabilities are afforded an equal opportunity to participate in and benefit from its programs and services. To receive accommodations, a student must have a documented disability as defined by Section 504 of the Rehabilitation Act of 1973 and the ADA Amendments Act of 2008, and provide documentation of the disability. Since accommodations may require early planning and generally are not provided retroactively, please contact Disability Resources as soon as possible.

If you believe that you need accommodations for a disability, please contact Dean Patey in Disability Resources, located in North College, Room 021, or call 860-685-5581 for an appointment to discuss your needs and the process for requesting accommodations.

Additional Reading Materials

(Many on reserve in the Science Library)

Introductory texts:

- G. H. Davis , S. J. Reynolds, and C.F. Kluth, 2012, Structural Geology of Rocks and Regions, third edition (Wiley).
- R. J. Twiss and E. M. Moores, 2007, Structural Geology , second edition (W. H. Freeman and Company).
An introductory structure text that goes into most topics in a more detail than Davis and Reynolds
- B. van der Pluijm and S. Marshak, 1997: Earth Structure; an Introduction to Structural Geology and Tectonics (WCB/McGraw-Hill). *Another good intro text with a greater emphasis on tectonics*
- H. Fossen, 2010: Structural Geology (Cambridge). *A graphics-rich introductory text with an emphasis on industry applications of structural geology.*

Methods:

- S. Marshak and G. Mitra, 1988: Basic Methods of Structural Geology (Prentice Hall). *A great reference for stereonet and trigonometric solutions to common structural problems.*
- R. R. Compton, 1985: Geology in the Field (Wiley). *A thorough reference for many aspects of field geology and field mapping.*
- McClay, K. The Mapping of Geological Structures. (Wiley) *Another field techniques book. More modern, but not as thorough.*

Physical Geology:

- Marshak, S.. Earth: Portrait of a Planet (Norton) *A good introductory geology text, use to review or learn basic rocks, minerals, and other topics*

Advanced:

- Pollard DD and Fletcher RC, Fundamentals of Structural Geology (Cambridge). *A thorough mathematical approach to structural geology.*
- Allmendinger et al., 2012, Structural geology algorithms: vectors and tensors. (Cambridge). *A reference for problem-solving in structural geology using linear algebra and computation.*

The Field

We will be going in the field almost every Monday afternoon so come to class dressed appropriately. Weather conditions will vary from warm and sunny to cold and rainy to possibly snowy! We will also take two Sunday field trips to go a little farther afield where we can see exciting things like fold-thrust belts that we can't see right here in Middletown (see class schedule and reserve the dates).

Supplies for field/lab:

Scientific Calculator

Protractor

Hand lens

Grain size card (free from department)

Brunton and measuring board (on loan from department)

Personal Supplies and Clothing

Sunscreen

Rain jacket

Warm jacket

Bottle of water

Comfortable walking shoes (with closed toes)

Long pants/sleeves, especially if you are allergic to poison ivy

Personal camera (optional)

Day (time)	Date	Topic	Reading	Assignment Due
M (11-12:20)	9/7	Introduction to Deformation	PM 1	
<i>M (1:10-4:00)</i>	9/7	<i>Lab: Reading the rocks</i>		
W (11-12:20)	9/9	Describing lines and planes	DRK A, E, I, PM 2 (1 - 44)	<i>Field Notes</i>
M (11-12:20)	9/14	No class (SCEC)		
<i>M (1:10-4:00)</i>	9/14	<i>Lab: Rock and Mineral Review</i>	<i>M 5, A, 6, 7</i>	
W (11-12:20)	9/16	No class (SCEC)		
<i>M (11-4:00)</i>	9/21	<i>Lab: Map-scale problem solving</i>	<i>DRK B-D</i>	
W (11-12:20)	9/23	Mapping and Magma		Magma read
<i>M (11-4:00)</i>	9/28	<i>Lab: Map-scale problem solving</i>		
W (11-12:20)	9/30	Maps to Cross Sections	DRK F-H	
M (11-12:20)	10/5	Stress	PM 2 (1 - 44), PM 4 (19-25)	<i>Map Problem</i>
<i>M (1:10-4:00)</i>	10/5	<i>Lab: Hartford Basin Overview</i>		
W (11-12:20)	10/7	Cross Sections II		
<i>F-Su</i>	10/9-11	<i>Optional: NEIGC</i>		
M (11-12:20)	10/12	Faults, Fractures, and Fluids	<i>DRK N</i>	Fluid read
<i>M (1:10-4:00)</i>	10/12	<i>Lab: Fault Architecture</i>		
W (11-12:20)	10/14	Breaking Rocks		
Su (8am-8pm)	10/18	Rhode Island Field Trip		<i>RI Map</i>
M (11-12:20)	10/19	Earthquakes and GPS intro		
<i>M (1:10-4:00)</i>	10/19	<i>½ lab – intro to GPS</i>		Quiz 1
W (11-12:20)	10/21	Determining strain from GPS		<i>Hartford Basin</i>
M (11-12:20)	10/26	Fall Break		
M (1:10-4:00)	10/26	Fall Break		
W (11-12:20)	10/28	Earthquake conversations		EQ read
M (11-12:20)	11/2	Napa Valley earthquake		
<i>M (1:10-4:00)</i>	11/2	<i>Lab: Ancient Earthquakes</i>		
W (11-12:20)	11/4	No Class (GSA)		
M (11-12:20)	11/9	GPS-EQ presentations		<i>GPS-EQ lab</i>
<i>M (1:10-4:00)</i>	11/9	<i>Lab: Sandbox modeling</i>		
W (11-12:20)	11/11	Friction		
Su (7am-7pm)	11/15	New York Field Trip		
M (11-12:20)	11/16	Making Mountains		Mountain read
M (1:10-4:00)	11/16	No lab		
W (11-12:20)	11/18	Metamorphic fabrics		
M (11-12:20)	11/23	Viscous Flow		
<i>M (1:10-4:00)</i>	11/23	<i>Lab: Folding Food</i>		<i>Fold belt lab</i>
W (11-12:20)	11/25	Thanksgiving Break		
M (11-12:20)	11/30	Buckling the lithosphere		Planets read
<i>M (1:10-4:00)</i>	11/30	<i>Lab: Folds in the field</i>		
W (11-12:20)	12/2	Synthesis		Quiz 2
<i>M (11-4:00)</i>	12/7	<i>Lab: Independent exercise</i>		<i>Folds lab</i>
W (11-12:20)	12/9	Final Projects		Final projects
Th (5:00)				<i>Independent</i>

DRK – Davis, Reynolds and Kuth, Section 3: Descriptive Analysis. Lettered sections (and pages).
 PM – Pollard and Martel, in preparation, Structural Geology: A quantitative Introduction.
 Numbered chapters (and pages).
 M – Marshak, Earth: Portrait of a Planet, 4 ed. Numbered chapters and pages.