

ENVG 342, Structural Geology and Rock Mechanics

Instructor: David Borrok (dborrok@nd.edu) Book: Earth Structures by van der Pluijm and Marshak

Time: Tuesday and Thursday 9:30 to 10:45 am; lab Thursday 3:30 to 5:15 pm

Place: Lecture 330 DeBartolo Hall; Lab 154 Fitzpatrick Hall




Homework: approximately 6 equally weighted assignments, 25% of total grade.

Tests: 2 equally weighted, including final, 25% of total grade.

Projects: 2, will partly incorporate lecture and lab time, major project will be 15% of total grade; minor project will be 10% of total grade.

Labs: Approximately 10 equally weighted, 25% of total grade (no separate lab tests).

Field trip: Spring break – required! Data from trip will be large part of lab and project grade.

Date	Assigned Reading	Lecture Topics	Homework	Tests	Projects	Labs
Jan. 11	Ch. 1 & 2	Overview , review, and primary structures. Applications and tools – Real Examples .	Homework 1 assigned			Core ; rock quality determination (RQD)
Jan. 13						
Jan. 18	Ch. 3 + handouts	Rock mechanics . Stress, Mohr's circle, stress in the earth and how to measure stress.			Major Project (hypothetical structural analysis) assigned.	No Lab
Jan. 20 (no class)						
Jan. 25	Ch. 6	Rock mechanics . Brittle Deformation. Coulomb's and Mohr- Coulomb failure criteria.	Homework 1 due (25 th)			Core ; materials testing
Jan. 27						
Feb. 1	Ch. 4 & 5	Rock mechanics . Strain. How to measure strain, and how strain is related to stress (rheology)	Homework 2 assigned			Core ; materials testing
Feb. 3						
Feb. 8	Ch. 7 & 8	Joints, Veins, Faults . What do these features mean, and how do we identify and quantify them.				Fault/joint interpretation
Feb. 10						
Feb. 15	Ch. 8 + handouts	Faults Continued . Earthquakes and natural disasters.	Homework 3 assigned, 2 due.			Geologic Maps; cross-sections I
Feb. 17						
Feb. 22	Ch. 9 (briefly) Ch. 10	Ductile Processes . Microstructures, folds and folding.			Minor Project (journal interpretation) assigned	Stereonet and other data projections
Feb. 24						
Mar. 1	Ch. 10 and 11	Folding continued, and fabrics . Interpreting foliations and lineations.	Homework 4 assigned, 3 due.	Test 1; Mar. 1		Spring Field Trip Prep.
Mar. 3						
Mar. 15	Handouts	Review of field-scale features and concepts				Spring Field Trip Conclusions 
Mar. 17						
Mar. 22	Ch. 13	Structural Analysis of a Region . How structural geologists piece together pressure and temperature history	Homework 5 assigned, 4 due.			Geologic Maps; cross-sections II 
Mar. 24						
Mar. 29	Ch. 14, 16, 17, and 19	Tectonics . Review of concepts			Minor Project Abstracts Due on March 31 	Field Trip to look at building stones
Mar. 31						
April 5	Ch 16, 17, and 19	Tectonics . Extensional, convergence, and strike-slip tectonic features.	Homework 6 assigned, 5 due.		Major Project Due on April 5th	Minor project present. (3)
April 7						
April 12	Ch 20-22	Regional Perspectives. Each class period, 2 people will provide individual presentations on one of the essays in these chapters. Essays will be chosen in advance (no duplication), and the talks will be informal (overheads are fine).	Homework 6 due.			Minor project present. (3)
April 14						
April 19						
April 21						Planetary Mapping
April 26	REVIEW	REVIEW FOR FINAL		Test 2; during finals		No Lab