

Earth Sciences 152 Spring 2014

Instructor: David Finn, Room C442 EMS, dfinn@ucsc.edu;

Instructor Office Hours: Wednesday 12am-3pm in room C442 EMS building (or by appointment)

TA: Heidi L. Stauffer, Room: Room D229 EMS building
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TA Office Hours: 12:30-2:30 Monday Room D229 EMS building

Class Room and times: D258 EMS, 9:30-10:40 MWF

Section: 12:30-2:30 Monday room D258 (**DOES NOT MEET EVERY WEEK!**)

Text: Global Tectonics (3rd edition) by Kearey, Klepeis, and Vine
(Available in the Bay Tree Bookstore)

Midterm Exam: ~April 28

Final Exam: ???

Research paper: Required. Any topic having to do with tectonics

Class presentations: June 2 and 4

Final term papers due: June 6 (last day of classes)

Course objective: This course will be geared toward introducing students to different tectonic processes, with plenty of examples from around the globe. We will use a balance of geology and geophysics in developing a better understanding of the diverse processes affecting the solid earth.

Grading:

Quizzes	=	15%
Midterm Exam	=	20%
Final Exam	=	35%
Research Paper	=	25%
Final Presentation	=	5%

Month	Day	Lecture	Suggested Reading
March	31	Class intro, earth's chemical and rheologic layering	TBA
April	2	Supercontinents, geosynclines, Wilson cycle (potential TA strike?)	
	4	Supercontinents, geosynclines, Wilson cycle	
	7	Spreading ridges, transform faults, fracture zones and Euler poles	
	9	Paleomagnetism and GPS Geodesy: Constraints on crustal motions	
	11	Quiz 1 and class discussion	
	14	Forces on plates: Slab pull, ridge push, & basal tractions (and plumes?)	
	16	Subducting plate geometries, arc volcanism and metamorphism	
	18	Subduction erosion, accretion, and the Coulomb wedge theory	
	21	Slab rollback and back-arc extension	
	23	Steep vs shallow slab subduction and back-arc shortening	
	25	Quiz 2 and class discussion	
	28	Midterm	
	30	Oblique subduction and related upper plate deformation	
May	2	Upper and lower plate flexure and associated earthquakes and tsunami's	
	5	Continental collisions, suture zones and ophiolites	
	7	Oroclinal bending and kilometer scale drag folding	
	9	Quiz 3 and class discussion	
	12	Strike-slip faulting over different length scales and strain states	
	14	Ductile deformation: From the crystal lattice to the Tibetan plateau	
	16	Tectonic escape and strike-slip shear zones	
	19	Dynamic topography: Foundering lower lithospheres and slab windows	
	21	Continental extension and metamorphic core complexes	
	23	Quiz 4 and class discussion	
	26	<i>Memorial Day Holiday</i>	
	28	Mantle plumes and large igneous provinces (LIP's)	
	30	Yellowstone Hotspot tectonics and volcanism	
June	2	Student Presentations	
	4	Student Presentations	
	6	Final Review and Party	