

Curriculum Structure SIO 162 – Winter 2014
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Class involves two overnight weekend field trips date to be arranged. One Saturday or Sunday and one 1/2 day field trip to N. Torrey pines State Beach or Cardiff State Beach.

Mid-term 30% of the mark, Homework/field reports 30% of the marks. Final 40% of the Marks

Week 1 – Class Introduction and Introduction to Brittle Structures (slump beach walk).

Week 2 – Detailed descriptions of brittle structures, Lab brittle structures.

Week 3 – Detailed descriptions of ductile structures, Lab ductile structures.

Week 4 – Strike slip and normal fault structures – (weekend field trip to Anza Borrego this week potentially)

Week 5 – Thrust structures (Con) , **Midterm**(weekend field trip to Anza Borrego this week potentially)

Week 6– Beach walk to the Cove to look at the Rose canyon fault (Tide dependent could be following week), Rock mechanics, Mohr's circle, stress/strain

Week 7– Rock mechanics, Mohr's circle, stress/strain (Con)

Week 8– Dynamic friction, Earthquake dynamics mechanisms and constitutive relationships. (leave Friday lunch time for Death Valley potentially)

Week 9- Dynamic friction (Con). Ductile deformation mechanisms and constitutive relationships. (leave Friday lunch time for Death Valley potentially)

Week 10 - Ductile deformation mechanisms and constitutive relationships (con).
Revision lecture.

Book: “Structural Geology” by Twiss and Moores. Will be especially important for the second half of the class, which is more quantitative.

Supplies:

Field notebook- at least 8.5 X 11 inches. You will be drawing stratigraphical columns, as well as cross sections across faulted areas. Colored pencils can help.

Sleeping bag, tent (if you don't want to sleep on a tarp under the stars), good shoes, hat, refillable water bottle.

Field Geology Compass- must be able to measure “dip”. Doesn't have to be a “Brunton”. Here is a good one:

<http://www.rei.com/product/787189/suunto-mc-2-pro-compass>

Labs:

In class.

- 1) brittle structure identification in rock samples
- 2) ductile structure identification in rock samples
- 3) measuring strike/dip of a plane, as well as trend/plunge of a line. Learn how to plot information on “stereonet” and make calculations using them.
- 4) tour of the rock mechanics lab in Vaughan hall.

Afternoon field trips:

North Torrey pines beach (focus on way-up structures)

Rose canyon fault (La Jolla shores-cove) (focus on brittle faulting structures)

You will turn in your field notes to be checked off for completeness the day of the trip.

Weekend field trips:

Anza Borrego state park (Stratigraphical column and an ancient disaster at Split Mountain Gorge)(Constructing cross sections of the San Andreas Fault at Painted Canyon, and a look at a neo-tectonic structure) (Campfire fun)

Death Valley National Park (Gargantuan detachment faults at Badwater)(Megabreccia at Titus Canyon)(Brittle-ductile transition at Mosaic Canyon) (Campfire fun)

You will be turning in comprehensive field reports from the weekend trips, including photos and a well thought out summary, placing our study sites within the larger tectonic picture.

