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# GEO 582.01: Mechanics of the Lithosphere

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## GEO582: Mechanics of the Lithosphere

### Instructor

Rebecca Bendick

Office hours MWF 10-12 or by appointment

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### Prerequisites

This course requires graduate standing and previous course work in classical mechanics, geophysics, and tectonics.

### Summary

This is a graduate level seminar focused on recent scientific developments in continental tectonics. We will read recent and classic papers both on the measurement and theory of continental deformation from tectonic forcing. We will emphasize materials directly relevant to the research goals of each student.

### Expectations

Course grade will be determined by class participation and a final project demonstrating use of the course concepts on a problem relevant to the student's research.

### Schedule

August 29: no class meeting; assignment and expectations posted

September 5: introduction

Bendick, R. and L. Flesch (2013) A review of the mechanics of heterogeneous materials and their implications for relationships between kinematics and dynamics in continents, *Tectonics*, doi:10.1002/tect.20058.

September 12:

Argus, D. Y. Fu, and F. Landerer (2014) Seasonal variation in total water storage in California inferred from GPS observations of vertical land motion, *Geophysical Research Letters*, 41.

September 19:

England and McKenzie (1982) A thin viscous sheet model for continental deformation, *Geophys J. Royal Astr. Soc.*, 70.

September 26: no class

October 3:

Lechmann, S., D. May, B. Kaus, and S. Schmalholz (2011) Comparing thin-sheet models with 3D multilayer models for continental collision, *Geophys. J. Int.*, 187.

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October 10:

Hammond, W., G. Blewitt, and C. Kreemer (2011) Block modeling of crustal deformation of the northern Walker Lane and Basin and Range from GPS velocities, J. Geophys. Res. 166.

October 17:

Sonder, L. and C. Jones (1999) How the west was widened, Ann. Rev. Earth Planet. Sci. 27.

October 24:

Loveless, J. and B. Meade (2011) Partitioning of localized and diffuse deformation in the Tibetan Plateau from joint inversions of geologic and geodetic observations, Earth Planet Sci. Lett., 303.

October 31:

Reading TBD

November 7:

Reading TBD

November 14:

Reading TBD

November 21:

Reading TBD

December 5:

Reading TBD

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