

GLY6425 - Tectonics, Fall 2020

Time: T-Th Periods 4-5 (10:40-12:35)

Place: Online, Wm 218

Instructor: R. M. Russo

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Office Hours: By appointment

Course Description: Earth is a dynamic planet – constantly changing on many time and length scales. On long time scales, Earth dynamics are closely related to mantle structure and circulation, and we will develop the basic geophysical constraints deriving from seismology and terrestrial magnetism and gravity. The observational basis for understanding Earth dynamics include data deriving from earthquakes; magnetic and gravity anomalies; hypsometry, topography, and bathymetry; and near surface geology. We will review how plate tectonic theory grew from Wegener's ideas on continental drift, and we will examine in detail the tectonics of plate interactions of all types. We will also develop basic theory of motion on a sphere, and outline available methods for quantifying instantaneous and geological plate motions, plate motion histories, and plate dynamics. Homeworks will be exercises relevant to tectonics using GMT.

Grading: 70% homework, 30% term paper/project.

Textbook: Global Tectonics, 3rd Edition, by *Kearey, Klepeis, & Vine*, Wiley-Blackwell Press

Course Sequence
Chapter 2: Earth Interior
Chapter 2: Earth Interior & Earthquakes
Chapter 3: Continental Drift
Chapter 3: Paleomagnetism
Chapter 4: Seafloor Spreading
Chapter 4: Transform Faults
Chapter 5: Plate Tectonics
Chapter 5: Plate Tectonics

Chapter 6: Mid Ocean Ridges
Chapter 6: Mid Ocean Ridges
Chapter 7: Rifts & Rifted Margins
Chapter 7: Rifts & Rifted Margins
Chapter 8: Continental Transforms & Strike-Slip Faults
Chapter 8: Continental Transforms & Strike-Slip Faults
Chapter 9: Subduction Zones
Chapter 9: Subduction Zones
Chapter 10: Orogenic Belts
Chapter 10: Orogenic Belts
Chapter 11: Precambrian Tectonics & Supercontinents
Chapter 12: Plate Tectonics Mechanisms
November 26 THANKSGIVING – NO CLASS
December 09 <i>Last Class</i>