GEOL 460 Solid Earth Geophysics

Mid Term I Study Guide

Tectonics

Can you use vector math, in 2-D and 3-D, to calculate plate motion rates? (Lab 1: 1, 3)

Magnetism

Can you calculate the modern angle of inclination given a location on Earth? If you are given an angle of inclination, can you tell at what latitude you are at on Earth? (Lab 2: 1)

Given magnetic measurements in some basalt, can you determine the magnetic latitude where these basalts had formed? (Lab 2: 2)

Can you calculate spreading rates? What is the difference between a half- and a full-spreading rate? What is an Euler Pole?

Earthquake Seismology

Could you tell which motions recorded on which three component seismograph come from which of the four main seismic phases? (Lab 3: Part I)

Can you use S-P travel times to (a) locate an earthquake epicenter and (b) the time of origin for an earthquake? (Lab 3 Part II Step 1)

Can you use a time travel plot from an earthquake to determine its epicentral angle or its time of origin? (Lab 3 Part II Step 2)

Global Seismology

What is the difference between seismic waves and rays? How is a wavefront formed? How does a wavefront reflect? How does a wavefront refract? What are the formulas for Vp and Vs? Think beyond general education: why Vs = 0 in fluids? How are different phases formed? Why do seismic waves appear to curve back up to the surface of the Earth, after initially curving into the Earth? What is the critical angle? Why do the S and P wavefronts propagate along an arc and not a straight line? Could you tell the difference from seismic wave propagation between a PREM and a Homogeneous Earth model? Can you calculate angles of incidence given two layers with difference seismic velocities? Can you do the same for reflected phase transformed rays (e.g. a reflected P-wave from an incident S-wave)? Can you calculate the Vp or Vs given elastic moduli and density data?