The plan for today…

1. Introductions
2. Overview of topics that we could cover in this class
3. Comments and interests
   - what are your top three topics?
   - least favorite topic (or two)?
4. Class organization
Earth structure

Plate tectonics: Evidence for a dynamic earth

- **Plate boundaries**
- **Triple junctions**
- **Motion on a sphere - rotation poles**
- **Absolute plate motions**
Topics
Geomagnetism-tectonics connection

Paleomagnetic evidence for ocean floor spreading
Polar wander
Past plate motions

Topics
Seismology and the structure of the Earth

Stress and strain
The seismic wave equation
Seismic waves
Earthquake seismology
[Seismic reflection and refraction]
Topics
Gravity
The shape of the planets
The geoid
Isostacy
Flexure of the lithosphere, viscosity of the mantle

Topics
Dating the solar system, the Earth and its evolution
Radioactive decay and its applications
Isotopic systems
Age of the Earth and solar system
Core and moon formation
Topics
Heat

Heat flow and geotherms
Heat loss from the Earth
Mantle melting and the adiabat

The Earth’s deep interior

Adams-Williamson equation
Heterogeneity
Global Earth models
The composition of the Earth
Convection in the mantle
The core
**Topics**

**Comparative planetology: Planetary interiors**

**Planetary formation**

**Differentiation**

**Thermal history of the terrestrial planets**

![Diagram showing the internal structure of Earth, Venus, Mars, Mercury, and Moon.]

**Topics**

**Comparative planetology: Planetary surfaces**

**Planetary rocks**

**Impact craters**

**Volcanism and tectonic activity**

**Lineament systems**

![Image of Apollinaris Patera on Mars.]

EPS 122: Lecture 1 - Introduction and class interests
**Topics**

Beneath the oceans

- Oceanic lithosphere
- Mid-ocean ridges
- Subduction zones
- Oceanic islands

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**Topics**

The continental lithosphere

- Crustal variations
- The growth of the continents
- Continental deformation
- Sedimentary basins

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EPS 122: Lecture 1 - Introduction and class interests
Class Organization

Expectations
1. Lectures
2. Reading
3. Homework
4. Three midterms
5. Term project

Grading
35% - Homework
10% - Each midterm
35% - Term project

Textbook “The Solid Earth” (2nd ed) Fowler

Class website http://eps.berkeley.edu/~rallen/eps122

Prerequisites Mathematics 53, 54 or Physics 105 or equivalent will be helpful to students taking the class

Term project Five step process

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