

## GE01 INTRODUCTIN TO GEOPHYSICS

### 1. Course information

GE 01	<b>Introduction to Geophysics</b> (# credits, Fall 2012)
Meeting times	M, W, F (10-11 am)
Meeting location	Room #, Geophysics building
Prerequisites	None (but Calculus and Physics will help)

### 2. Instructor information

Instructor	<b>YoungHee Kim</b>
Office	Room #, Geophysics building
Email	<a href="mailto:ykim@ldeo.columbia.edu">ykim@ldeo.columbia.edu</a>
Phone	(###) ###-####
Office hours	“Open door” M-F 4-6 pm or by appointment

### 3. Teaching Assistant information

TA	??
Office	Room #, Geophysics building
Email	??
Office hours	T, Th 2-4 pm or by appointment

### 4. Ombuds

Ombudsperson	TBD
Email	??

### 5. Course Description

An introduction to the geophysics of the solid earth; structure and composition of the earth; interactions between crust, mantle, and core; surface and internal dynamics; mantle convection; imaging of the interior via seismic imaging tools

### 6. Course Materials

#### (a) Textbooks

##### Required:

*Fundamentals of Geophysics*, William Lowrie, Cambridge University Press, 1997

##### Supplemental:

(i) *The Solid Earth: An Introduction to Global Geophysics*, C.M.R. Fowler, Cambridge University Press, 2nd edition, 2004

(ii) *Introduction to Seismology*, P. M. Shearer, Cambridge, UK: Cambridge U. Press, 2 ed., 2009

(b) Journal articles assigned as reading will be available as PDFs through the course website.

### 7. Course and Grading Policies

(a) Attendance: All students are expected to attend and participate in all classes.

- (b) Participation and Preparation: Students are expected to come to class with assigned reading. Each student is expected to lead one brief discussion and review of an assigned journal article.
- (c) Assignments: All assignments are due at the start of class on the due date. The lowest homework assignment will be dropped when computing the course grade.
- (d) Grading policy:

Homework	50 %
Oral Presentation	10 %
Midterm	20 %
Final	20 %

## 8. Course Topics

Day	Topic
Week 1-2	Introduction to seismic observations, overview of the field
Week 3	Plate Tectonics and earthquake mechanisms, stresses in plates
Week 4-5	Fundamental concepts in classical seismology: Review of basic elastic wave propagation, the wave equation, P and S type body waves, ray theory, Snell's law, reflection and refraction, surface waves, Earthquake location and magnitude
Week 5-6	Earth structure: Body wave studies, travel times, synthetic seismograms and fine structures, synthesis and inversion of gross geophysical data, surface wave and free oscillation studies
Week 7	Gravity Gravity anomalies, isostasy, rheology
Week 8	Oceanic lithosphere: Ridges, transforms, trenches and oceanic islands
Week 9	Continental lithosphere
Week 10	Student presentation