

## Earthquake Seismology and Risk Assessment GEO 5330/6330 Spring 2014

Instructor: Dr. Keith Koper, koper@seis.utah.edu, 585-3669 (voice)

Meeting Times: MWF, 10:45-11:35 AM, FASB 330

Office Hours: by appointment, FASB 217

### Topics:

1. Introduction to earthquakes, seismicity, and seismology
2. Stress, strain, and faulting
3. Focal mechanisms and moment tensors
4. Earthquake kinematics and dynamics
5. Seismic magnitudes, energy release, and scaling relationships
6. Earthquake location
7. Special types of earthquakes (tsunamigenic, deep, volcanic, induced, etc.)
8. Earthquake prediction and triggering
9. Seismic hazard
10. Case studies of recent notable earthquakes

### Reading:

There are no formal requirements, however the following are important references that will sometimes be used in class:

Aki, K. and P. Richards (2002), *Quantitative Seismology, Second Edition*, University Science Books, Sausalito, CA.

Kramer, S.L. (1996), *Geotechnical Earthquake Engineering*, Prentice Hall, Upper Saddle River, New Jersey.

Stein S., and M. Wyssession (2003), *An Introduction to Seismology, Earthquakes, and Earth Structure*, Blackwell Publishing, Oxford, UK.

Shearer, P.M. (2009), *Introduction to Seismology 2<sup>nd</sup> Edition*, Cambridge University Press, Cambridge, UK.

### Grading:

Class Participation: 10%; Quizzes: 25% Midterm: 25% Final: 40%