

SIO 227A: Winter 2015
Introduction to Seismology

Times and locations

Lectures M, W, F 1:00–1:50 IGPP Munk Conference Room

Instructor

Peter Shearer pshearer@ucsd.edu 858-534-2260

Text

Introduction to Seismology (2nd edition). The book is available electronically through the UCSD library.

Class Website:

Assignments and other information will be posted at:
<http://igpphome.ucsd.edu/~shearer/ED2/>

Summary

This course is intended as a comprehensive introduction to seismology. Our goal is to provide a general overview of the basics of seismology. The emphasis will be practical (how things are actually done), rather than on detailed theory or derivations. There are no formal prerequisites to this class but some familiarity with vector calculus and computer programming is assumed. Many of the problem sets involve writing computer programs. Alternative assignments (often more math intensive) will be provided for those of you without access to computers. Geophysics students, however, are strongly encouraged to do the computer assignments whenever possible. You may help each other with the assignments but the final work you turn in must be your own. There will be no final exam; grades are based on weekly homework assignments.

Outline

1. Introduction
2. Stress and Strain
3. The Seismic Wave Equation
4. Ray Theory: Travel Times
5. Inversion of Travel Time Data
6. Ray Theory: Amplitude and Phase
7. Reflection Seismology
8. Surface Waves and Normal Modes
9. Earthquakes and Source Theory
10. Earthquake Prediction
11. Instruments, Noise, and Anisotropy