GG/OCN 444: Plate Tectonics  
Syllabus/Course Contents

3 credits  
Fall 2015  
Time, Place and Office Hours: TBA at organizational meeting

Instructors:  
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Objectives:  
Plate tectonics is the unifying theory, or guiding paradigm, of how the large-scale geologic structures on Earth are created. The geometrical analytical techniques of plate tectonic theory have made possible the quantitative predictions and verifications which distinguish plate tectonics from the earlier continental drift and seafloor spreading hypotheses which plate tectonics encompasses and replaces, resulting in the scientific revolution in the Earth Sciences in the late 1960’s. The purpose of this course is to teach students how to use the basic analytical techniques that make plate tectonic theory so powerful, including instantaneous and finite plate rotations and triple junction analysis.

Content:  
This course is taught differently each time. This year (Fall 2015) we anticipate that ~half the course will cover the geometrical analytical techniques of plate tectonics, using handouts from a revision of Plate Tectonics: How it Works by Cox and Hart, and ~half the course will focus on the tectonic evolution of the North Atlantic plate boundary system near Iceland, using reprints and preprints.

Probable Grading:  
Midterm Exam 50%  
Project 50%

General Course Syllabus

Basics of Revolution – Plates and Plate Boundaries  
Plates in Velocity Space and Triple Junctions  
Rotations on a Sphere  
Plate Tectonics on the Globe  
Earthquakes and Plates  
Finite Rotations  
Magnetism and Isochrons
Driving Mechanisms

Absolute Motion

Learning Objectives
The Department of Geology and Geophysics has established several undergraduate student learning objectives. Many of these objectives are relevant targets for the curriculum of GG444.

2) Students can apply technical knowledge to solve real-world problems in geology.
3) Students use the scientific method to define, critically analyze, and solve a problem in earth science.
4) Students can reconstruct geological knowledge in oral presentations.
5) Students can evaluate, interpret, and summarize the basic principles of geology and geophysics to explain complex phenomena in geology and geophysics.