ERTH/OCN 444: Plate Tectonics
Syllabus/Course Contents

3 credits
Fall 2019
Time: Tues/Thurs 10:30-11:45
Place: POST 702
Office Hours: Tues/Thurs 12:00-13:00

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, and to solve current research problems.

Content:
This course is taught differently each time. This year (Fall 2019) 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 plate tectonic evolution of the North Atlantic 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 Earth Sciences has established several undergraduate student learning objectives. Many of these objectives are relevant targets for the curriculum of ERTH 444.

2) Students can apply technical knowledge to solve real-world problems in the Earth Sciences.
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.

Disability Access: If you have a disability and related access needs the Department will make every effort to assist and support you. For confidential services students are encouraged to contact the Office for Students with Disabilities (known as “Kokua”) located on the ground floor (Room 013) of the Queen Lili’uokalani Center for Student Services:
KOKUA Program; 2600 Campus Road; Honolulu, Hawaii 96822 Voice: 956-7511; Email: kokua@hawaii.edu ; URL: http://www.hawaii.edu/kokua

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