GG 611  Accelerated Introduction to Geology  
Fall 2014 Class Schedule: MWF 10:30- 11:20;  POST 702

Coordinator:    Patty Fryer (956-3146; POST 504A; pfryer@hawaii.edu)
additional instructors:  Jeff Taylor (956-3899; POST 524C; gjtaylor@higp.hawaii.edu)
                      Emilio Herrero-Bervera (956-6192; POST 716; herrero@soest.hawaii.edu
                      Stephen Martel (956-7797; POST 805; smartel@hawaii.edu )
                      Mike Mottl (956-7006; MSB 304; mmottl@soest.hawaii.edu)
                      Steven Stanley (956-5512; POST 719D; stevenst@hawaii.edu)

August  22 Mon.  Taylor  Introduction
August  24 Wed.  Taylor  Composition of the Earth
August  26 Fri.  Taylor  Minerals and their properties
August  27 Sat  Taylor & Fryer  Field trip SE Oahu
August  29 Mon.  Taylor  Igneous rocks and their classification
August  31 Wed.  Taylor  No Class
September  2 Fri.  Taylor  Igneous rocks and their classification Cont...
September  5 Mon.  Labor Day  Melting and crystallization; phase diagrams
September  7 Wed.  Taylor  Cont.
September  9 Fri.  Taylor  Petrogenetic processes
September 12 Mon.  Taylor  Cont.
September 14 Wed.  Taylor  Physical properties of magmas and magma migration
September 16 Fri.  Taylor  Cont
September 19 Mon.  Fryer  Plate Tectonics
September 21 Wed.  Fryer  Plate Tectonics Continued
September 23 Fri.  Fryer  Metamorphic rocks
September 26 Mon.  Fryer  Metamorphism: mineralogy, facies
September 28 Wed.  Fryer  Cont.
September 30 Fri.  Fryer  Phase diagrams
October  3 Mon.  Fryer  Metamorphism as a global process
October  5 Wed.  Fryer  Seismology: sources, recording devices,
October  7 Fri.  Fryer  Cont.
October 10 Mon.  Fryer  Wave propagation
October 12 Wed.  Fryer  Earth structure
October 14 Fri.  First 2 instructorsMid-term take-home exam: Due. Oct 21
October 16 Mon  Herrero-Bervera  The Earth's core & composition
October 19 Wed.  Herrero-Bervera  Geomagnetism, paleomagnetism
October 21 Fri.  Herrero-Bervera  cont
October 24 Mon.  Herrero-Bervera  Calibration of the geological time scale
October 26 Wed.  Herrero-Bervera  cont
October 28 Fri.  Herrero-Bervera  cont
October 31 Mon.  Martel  Rheology and structure  (best costume wins a prize)
November  2 Wed.  Martel  cont
November  4 Fri.  Martel  Folds, faults
November  7 Mon.  Martel  Deformation mechanisms
November  9 Wed.  Martel  cont.
November 11 Fri.  Veteran's Day  No Class
November 14 Mon.  Martel  cont  (assignment for Steve is due on Nov 22)
November 16 Wed.  Mottl?  Evolution of atmosphere
November 18 Fri.  Mottl?  Evolution of the oceans
November 21 Mon.  Mottl?  cont
November 23 Wed.  Mottl?  Carbon cycle
November 25 Fri.  No class  Thanksgiving Holiday
November 28 Mon.  Stanley  Physical and chemical weathering
November 30 Wed.  Stanley  Weathering and mass wasting events
December  2 Fri.  Stanley  Soils
December  5 Mon.  Stanley  Sedimentation environments and structures
December  7 Wed.  Stanley  Origin of life
December  9 Wed.  Stanley  Fossils and the geologic record
December TBD Exam due Final take-home assignment Due

Grading will be based on responses to the mid-term and final examinations and on any homework assigned by instructors. Some field trips (on weekend days) will be included in the course, weather and access permitting.

Course Objectives:
1. To introduce the non-Geology BA/BS graduate students to the fundamental aspects of the geologic sciences.
2. To give students from other fields a grasp of the underlying principles that govern geologic processes.
3. To provide students with an accelerated introduction to the fields of excellence within the department.
4. To let students meet and interact with a number of active researchers in diverse fields within the department.

Learning Objectives: The student will be able
1. to describe the general chemical composition of the Earth, the origin of the elements, the processes by which minerals and magmas form and the nature of volcanism within the context of tectonic processes.
2. to explain concepts of solid-state changes in mineral assemblages in rocks as a reflection of changes in physical and chemical environments within the Earth as they relate to various geologic processes.
3. to recognize the mechanisms of propagation of elastic waves through the Earth and interpret their significance for determining large-scale Earth structures and the consequences of earthquakes.
4. to categorize phenomena that affect variations in density of Earth materials and how changes in physical/chemical parameters affect dynamics of the interior of the Earth that affect global processes.
5. to contrast the Earth's core, mantle and crust in terms of magnetic properties of minerals and processes and to state what factors permit a calibration of the geologic time scale using data from measurements of rock magnetism.
6. to interpret the processes that control the deformation of the Earth's lithosphere.
7. to describe the nature of movement of water through and within the Earth's crust.
8. to contrast the processes of weathering of materials exposed on the Earth's surface and categorize types of soils that result.
9. to describe the nature of sediments deposited in a variety of geologic environments.
10. to summarize the salient aspects of geologic time in terms of the evolution of atmosphere, oceans and life on Earth.

NOTE: students enrolled in this course are expected also to enroll in a GG-300-level course (choice of which should be made in consultation with the student's advisor).

Students with disabilities may contact the KOKUA office at http://www.hawaii.edu/kokua/ for assistance. The KOKUA office provides a variety of types of advice and assistance. All possible accommodations for student needs associated with any type of disability will be provided during this course.