Dynamic Earth GG101 - Fall 2016

To get an A, read the textbook before doing the homework and take notes while you're reading the textbook. You're given the chance to use your notes for exams, so gradually build up your compilation of notes instead of building it the night before. If you do that, an A is easy and you'll be able to enjoy the full experience of this WONDERFUL class.
5/12/16 Rate My Professor.com

Required – iClicker 2; Purchase your eText on-line at WileyPLUS https://www.wileyplus.com/WileyCDA/ use “Manoa” for school. All homework’s use the on-line WPLS Learning Space (WPLS) system.

Tutorial – here is a playlist of WPLS tutorials: https://www.youtube.com/playlist?list=PLxlUEu1LlFZIRrEgkoY1QgOytUFZEAr

Required - You must have access to a computer to complete homework’s.

Why take a geology class?  Do you want an A? You cannot learn without studying.
  1. To understand your home planet;  1. Do every homework (30 mins per week);
  2. To become a better steward of your  2. Come to every class;
    community;  3. Do all the reading (2-3 hrs per week);
  3. To be an informed voter;  4. Participate and ask questions in class;
  4. To improve your critical thinking skills.  5. Prepare for exams by taking notes as you read (1 hr per week);
  6. To not grade on a curve – everyone can get an A.

Your grade will be calculated as the average of 3 exams (50%), several homework assignments (45%), and several in-class assignments + attendance + class participation (5%). All homework assignments are given on WileyPLUS. Check the “Course Stream” page to see announcements, due dates, and extra credit.

To do well in this class there are several things you need to do:

1. Attend class. This allows you to complete all in-class exercises. These are not announced in advance and if you miss class when there is an exercise you get a 0% grade.
2. Do all the assigned homework. Each homework has a due date and once the date has passed the homework will be closed. Missing a single homework drags your grade down dramatically.
3. Use assigned extra-credit. The “Critical Thinking” boxes in each chapter can be used as extra-credit exercises to raise your low homework scores (or if you miss assigned homework). I will assign these off and on during the semester.
4. Study the practice tests. These are a great way to prepare for the exams.
5. Read the book. At least half of the questions on the exam are tied directly to the reading.
6. Make notes. Exams are taken as a timed test, closed book, open discussion (work together), and you are allowed to bring one page of notes (front and back) per chapter.

Week  Reading  Weekly Topic

Section 1 – Plate Tectonics, Minerals and Rocks

Aug 22  1, 3  Introduction, course logistics: What is Geology?
Aug 29  3  How does plate tectonics control the organization of Earth’s crust?
Sept 5  4, 5  What is the origin of rocks and minerals?
Sept 12  8, 9  How are Earth materials naturally recycled over time?

Sept 16, EXAM #1 – Chapters 1, 3, 4, 5, 8, 9

Section 2 – Environmental Geology and Climate Change

Sept 19  21, 6  What geologic processes and products characterize the oceans?
Sept 26  20  What is coastal erosion, how do we manage beaches? What is ocean acidification?
Oct 3  19  What is the relationship between atmospheric circulation and surface environments?
Oct 10  18  Where is groundwater found and how do we use it?
Oct 17  17  Where do we get freshwater? What are the environmental problems affecting Hawaii?
Oct 24  15  How do glaciers work and what are ice ages?
Oct 31  14  How is climate change impacting Hawaii and how do we know humans are the cause?

Nov. 4, EXAM #2 –This exam covers all chapters thus far.

Section 3 – Deep Time, Sudden Shaking

Nov 7  12  How do scientists determine the age of geologic events??
Nov 14  13  How does Earth history provide evidence of evolution?
Nov 21  11  What is the cause of earthquakes?
Nov 28  10  What are the origin and fate of mountains?

Dec 5  Catch-up and Review

Dec. 7, EXAM #3 – This exam covers the entire semester.
The Department of Geology and Geophysics has established the following undergraduate student learning objectives.

1. Students can explain the relevance of geology and geophysics to human needs, including those appropriate to Hawaii, and be able to discuss issues related to geology and its impact on society and planet Earth.

2. Students can apply technical knowledge of relevant computer applications, laboratory methods, and field methods to solve real-world problems in geology and geophysics.

3. Students use the scientific method to define, critically analyze, and solve a problem in earth science.

4. Students can reconstruct, clearly and ethically, geological knowledge in both oral presentations and written reports.

5. Students can evaluate, interpret, and summarize the basic principles of geology and geophysics, including the fundamental tenets of the sub-disciplines, and their context in relationship to other core sciences, to explain complex phenomena in geology and geophysics.

**Geology and You**

This course will provide you with a new view of the world. For the rest of your life you will carry a special perspective that only an understanding of geology can provide. A geology course can make you a better member of your community because you will understand your home planet, you will know how to avoid natural hazards, you will know how to sustain natural resources, you will understand that global warming is real, you will become an informed voter, and you will improve your critical thinking skills.

**Earth is the product of billions of years during which geologic processes have carved the land, mixed the seas and air, and shifted the continents—and continue to do so.**

All life on Earth is the product of natural selection. Preserving biodiversity and natural habitats is critical to the continuation of Earth’s natural resources. Natural resources are geologically renewed but humans use resources faster than they can be naturally renewed. Today humans use 1.5 Earths; that is, the resources we use in 1 year, will take 1.5 years to replace. In the U.S. we use 5 Earths. This is not sustainable.

To ensure that heavily used resources are still here for future generations means that we must ultimately find alternative resources, augment the rate of natural renewal, or reduce our rate of consumption (or all the above). This is can lead to sustainability.

Regardless of your lifework, the science of geology can provide you with a level of awareness that will serve you in your career, your personal life, and your role as a community member of planet Earth. Here are 5 “Enduring Understandings” of geology that serve as semester-long learning goals.

**1. The study of Earth encompasses a vast range of time and space.** Geologists study nature from the length of the Solar System (trillions of kilometers) to the bonding of atoms (0.00000001 centimeters). We stretch our minds to understand the megascopic to the microscopic. Massive planets are constructed of the smallest minerals. Eons of time consist of long periods of slow and gradual change punctuated by short intervals of sudden violent convulsions in nature (i.e., earthquakes, floods, landslides). This immense span of time and space is one of the fundamental characteristics of the geological sciences.

**2. Plate tectonics controls the geology of Earth’s surface.** The theory of plate tectonics has far reaching implications for the organization of the planet and its history. As plates move they perpetually change the way our planet looks. Mountain ranges rise when plates collide only to be worn by erosion down to the sea. Ocean basins open and close as continents rift and collide again. Nearly every aspect of geology is related to how plates interact and change through time.

**3. Geologic systems are the product of interactions between solid Earth, oceans, atmosphere, and living organisms.** Earth is organized into overlapping geologic systems that influence and react to each other. Geologic systems consist of interdependent materials (such as rocks, sediments, organic compounds, and water) that interact with natural physical and chemical processes. In a broad sense, these interactions occur because solar energy, geothermal energy, and gravitational energy are at work mixing the air, ocean, and solid Earth.

**4. Change is ever present and accumulates over vast time. Humans are powerful agents of change.** You live upon an ancient and restless landscape that is changing under your feet. All forms of life have evolved partially in response to geologic change over time. Today’s Earth is the product of both gradual and instantaneous change accumulating over 4.6 billion years. Hence, our planet looked very different in the past and it will look different in the future.

**5. Rocks and sediments are pages in the book of Earth history.** Geologists read the story of Earth history in the crust. Earth history teaches us that Earth is very old, that evolution is responsible for life’s incredible diversity, that ever-present change is a characteristic of geologic systems, and that geologic processes operate on an immense stage of time and space.