PS1110 - THE DYNAMIC EARTH
Syllabus: Fall Semester, 2014

Instructor: Jeff Eaton, phone: 801-626-6225; jeaton@weber.edu.
Office Hours: MWF 9:30-10:30; TTh 8-9; or by appointment. Office: Science Lab Building, Room 207M.


Basis for Grade: There will be two multiple-choice exams during the semester (each worth 100 points) and a comprehensive final exam (worth 200 points). There will also be some pop quizzes worth variable points (total basis for grade = 500 points + quizzes and homework assignments). Exam and final grades are based on a curve. If you have to miss an exam please let me know in advance (a phone or e-mail message is fine).

Purpose of Class: To provide the student with an understanding of the physical materials and processes of the Earth and to emphasize the dynamic nature of our planet.

PLEASE NOTE: for the fullest appreciation of this class it is strongly recommended that you take the lab, Geosci 1115, concurrently with this class (offered Thursday, 1:30-4:20). This will provide hands-on experience and make the lecture material seem less abstract. The lab is required for Geosciences majors.

Part I. Earth Materials
Aug. 25: Introduction - purpose of class, basis for grade, and expectations. What is science and what is geology? Chapter 1.
Aug. 27: The origin of the universe, solar system, the early Earth. VIDEO
Sept. 1: NO CLASSES
Sept. 3: Rock forming minerals and physical properties of minerals. Chapter 3, p. 87-103 (p. 87-98).
Sept. 5: Kinds and nature of Igneous rocks: Chapter 4, p. 107-120 (p. 101-114).
Sept. 8: Origins and differentiation of magma (Bowen’s reaction series): Chapter 4, p. 120-128 (p. 114-122).
Sept. 12: Intrusive Igneous bodies: Chapter 4, p. 128-132 (p. 149-163).
Sept. 19: NO CLASS – I’m on a field trip.
Sept. 24: Metamorphic rocks: Chapter 8, p. 229-241 (p. 221-233).
Oct. 3: Review and catch-up.
Oct. 6: EXAM 1 - in this classroom

Part II. The Tectonic System – the forces that shape the Earth.
Oct. 15: Earthquake destruction and what you should know about living in Utah. No reading.
Oct. 17: NO CLASSES – Fall Break
Oct. 29: Transform boundaries in oceanic crust (not in text).
Nov. 3: Hot spots and mantle plumes: (no reading)
Nov. 4: Last day to withdraw from individual classes with a “W:
Nov. 5: Catch-up and review
Nov. 7: **EXAM II** – in this classroom (geologic time, structure & plate tectonics)

**Part III. The Hydrologic System - Processes at the Earth’s Surface.**
Nov. 10: Mass wasting: Chapter 15.
Nov. 17: Groundwater: Chapter 17, p. 461-477 (p. 457-469).
Nov. 21: Glaciers and Glaciation. Chapter 18.
Nov. 24: Deserts and Winds: Chapter 19.
Nov. 26: Shorelines: Chapter 20.
Nov. 27-28: **NO CLASSES – Thanksgiving vacation.**
Dec. 3: Review first two-thirds of class.
Dec. 5: Review last third of class - **Last day of classes.**

**FINAL EXAM: 8:30 class:** 8:30-10:20 AM, Wednesday, Dec. 10, SL320 (in this classroom). **10:30 class:** 10:30-12:20, Wednesday, Dec. 10, SL320 (in this classroom). Let me know **in advance** if you have a conflict.
Natural Sciences General Education Program
Mission Statement

The mission of the natural sciences general education program is to provide students with an understanding and appreciation of the natural world from a scientific perspective.

Science is a way of knowing. Its purpose is to describe and explain the natural world, to investigate the mechanisms that govern nature, and to identify ways in which all natural phenomena are interrelated. Science produces knowledge that is based on evidence and that knowledge is repeatedly tested against observations of nature. The strength of science is that ideas and explanations that are inconsistent with evidence are refined or discarded and replaced by those that are more consistent.

Science provides personal fulfillment that comes from understanding the natural world. In addition, experience with the process of science develops skills that are increasingly important in the modern world. These include creativity, critical thinking, problem solving, and communication of ideas. A person who is scientifically literate is able to evaluate and propose explanations appropriately. The scientifically literate individual can assess whether or not a claim is scientific, and distinguish scientific explanations from those that are not scientific.

Foundations of the Natural Sciences
Learning Outcomes

After completing the natural sciences general education requirements, students will demonstrate their understanding of general principles of science:

1. Nature of science: Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific.

2. Integration of science: All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated.

3. Science and society: The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the Earth’s environment.

4. Problem solving and data analysis: Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner.

The Physical Sciences
Learning Outcomes

Students will demonstrate their understanding of the following features of the physical world:

1. Organization of systems: The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws.

2. Matter: Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales.

3. Energy: Interactions within the universe can be described in terms of energy exchange and conservation.

4. Forces: Equilibrium and change are determined by forces acting at all organizational levels.