ESS 101: Introduction to Geology: A Human Perspective (NW/I&S)
Winter 2020

Instructor: Terry Swanson
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Office Hours: M 10:30-11:20 am and W 9:30-10:30 am (or by appointment).

Course Overview:

After taking this course students will never look at the Earth the same. This course relates the physical processes operating on and the materials that comprise our planet to individuals and society as a whole. Students will apply their scientific knowledge to understand the important relationship between geological processes, materials and hazards to human development and the constraints on modern societies.

Course Expectations & Responsibilities:

It is crucial that all students in this class have access to the full range of learning experiences. At the University of Washington, it is the policy and practice to create inclusive and accessible learning environments consistent with federal and state law.

Full participation in this course requires the following types of engagement:

Lecture: the ability to attend tri-weekly lectures of 50 minutes with 300-600 other students in large lecture hall. Lectures will video taped and accessible on Panapto (through Canvas).

Laboratory: the ability to attend one weekly laboratory of 110 minutes with 15-25 other students in laboratory with tables. Complete weekly laboratory exercises.

Movies and Field Trips: Movies and field trips are optional extra credit opportunities in this class. Movies will be shown in the large lecture hall and open to all students. Field trips rigor and hiking will vary depending upon the field trip. Some field trips will require minimal hiking and observe road outcrops. Other field trips could involve extensive hiking on varied terrain.

Disability Accommodation: If you anticipate or experience barriers to your learning or full participation in this course based on a physical, learning, or mental health disability, please immediately contact the instructor to discuss possible accommodation(s). A more complete description of the disability policy of the College of the Environment can be found here. If you have, or think you have, a temporary or permanent disability that impacts your participation in any course, please also contact Disability Resources for Students (DRS) at: 206-543-8924 V / 206-543-8925 TDD / uwdss@uw.edu e-mail / http://www.uw.edu/students/drs.
Student: inform the instructor during the quarter of any accommodation(s) you will or may potentially require.
Instructor and TA: will maintain strict confidentiality of any student's disability and accommodation(s); help all students meet the learning objectives of this course.

Academic Integrity:

At the University level, you must do your own scholarly work. Presenting anyone else's scholarly work (which can include written material, exam answers, graphics or other images, and even ideas) as your own, without proper attribution, is considered academic misconduct.

Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect that you will know and follow the university's policies on cheating and plagiarism. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the College of the Environment Academic Misconduct Policy and the University of Washington Community Standards and Student Conduct website.

Learning Objectives and Goals:
Understand the basic concepts of how science works through the scientific method and application of earth science to human existence and modern societies. Student will learn to be critical thinkers. After taking this course students will never look at the Earth the same. This course relates the physical processes operating on and the materials that comprise our planet to individuals and society as a whole. Students will learn about how the Earth evolved from primordial dust to form the compositionally zoned planet upon which life now exists. Students will learn about the unifying concept of plate tectonics, which will provide a unifying framework to understand the why, when and where of earthquakes, volcanoes, mountain belts, ocean basins and rock types in their surrounding world. Students will apply their scientific knowledge to understand the important relationship between geological processes, materials and hazards to human development and the constraints on modern societies. Students will become amateur geologists and drive their friends and families crazy with their new-found knowledge. Students will also learn about time and its importance to the geologic record. This course will provide students with important information about geologic hazards, which will perhaps one day save lives or personal property. This course will provide students many experiential learning opportunities to visit spectacular geologic sites around Washington State through the ESS 101 optional weekday/weekend field trip program.

Text and Readings:

1. *Physical Geology* by Steven Earle (open source text book) under CC-BY 4.0 international license.

2. Specific readings have been uploaded to my website which will provide information regarding the relationship of geology (material, processes and landforms) to human development and modern civilization. These readings will supplement lecture and laboratory topics and content.

Grades: Your grade will be determined as follows:

Laboratory	**120 points (plus 20 points as exam questions)**
Mid-quarter Exam	**140 points (10 points are from lab questions)**
Final Exam	**140 points (10 points are from lab questions)**
TOTAL	**400 points**

Examinations:
The mid-quarter and final exams will be multiple choice. Bring *SCANTRON* forms and pencils to both examinations. These can be purchased at the "By George" newsstand and at the Hub store. Both examinations cover material from lecture and the text. Each examination will cover one half of the quarter. Laboratory quiz questions will be given on the midterm and final exams.

Laboratory: The laboratory is intended to introduce you to the practical applications of geology through group lab exercises and lab field trips. You are expected to attend all weekly

laboratory sessions. Make-up laboratory protocol will be discussed at the start of the quarter. **Laboratory does not meet the first week of classes.**

Take Home Readings and Exercises: Take home readings and exercises will focus on the relationships and application of the geological science to human evolution and modern societies. There will be questions on the midterm and final exams taken from these readings.

Honor System: Rather than spend time trying to devise special tests, hire proctors, or compare papers, we have instituted an Honor System in this class: **Students pledge to do their own work on assignments and tests.** You may find that we are much more respectful and trusting of you compared to some other classes; please do not violate that trust by asking others to supply you with assignment and/or test answers. **I will go out of my way to help you learn, so please take advantage of my enthusiasm and not my trust!**

Student Assistance: My office hours are given above; however, if you are unable to make either of the above times, then **make an appointment with me** for a time that does not conflict with your schedule. We will also have weekly Tutorials sessions offered on Friday afternoons at 3:30 pm (Room to be announced in lecture).

Field Trips: A program of 9-10 **optional** field trips will be offered on weekend and weekdays, as well as "3 nights out at the movies" where students watch geology themed movies with their professor. Field trips and movie particpation **will provide extra credit towards your final grade.** There will be a sign-up list in the T.A. office for those of you who would like to attend these trips. These field trips are meant to be enjoyable, and active learning experiences. All field trips leave from the "round-a-bout" northwest of Johnson Hall.

LECTURE SCHEDULE

	READING	TOPIC
Week 1	Ch. 1 & 9 (Text)	Evolution of the Earth and Solar System; Internal Structure NW Component: Students will learn about how the earth and solar system evolved. Students will learn about how the earth became compositionally zoned. I & S Component: Students will learn that long-term changes of the composition of the Earth's atmosphere and oceans are intrinsically linked to its geophysical changes and origin of life itself.
	Special Reading 1:	Mojzsis, S.J. (2001) Life and the Evolution of Earth's atmosphere, in Earth Inside and Out, edited by E. Mathez New Press, New York, pp. 32-39.
Week 2	Ch. 10 (Text)	Plate Tectonics (How science works?)
	Special Reading 2:	Maslin, M. (2013) How a changing landscape and climate shaped early humans. *The Conversation* November 7, 2013.
Week 3	Ch. 2 (Text)	Minerals (Formation, Structure and Identification)
	Special Reading 3:	USGS Special Publications: 1. Energy and mineral science at the U.S. Geological Survey, 2. Do we take minerals for granted?, 3. Rare-earth elements (REEs)-vital to modern technologies and lifestyles.
Week 4	Ch. 3	Igneous Processes and Rocks; Uses for igneous rocks.

	Special Reading 4:	Downtown Rock Hound: A Seattle Geology Tour, by: David B. Williams (article written for *Seattle Times*).
Week 5	Ch. 4 Special Reading 5:	Volcanism; Volcanic Hazards USGS Cascade Volcano Observatory: 1. Cascade Volcanic Hazards, 2. Monitoring Cascade Volcanoes
Midterm		**Wednesday February 12th (Kane 130)** **(3:30 – 4:20 pm)** Bring scanton form and #2 pencil.
Week 6	Ch. 5 Special Reading 6:	Weathering Processes 1. Safe Drinking Water Foundation Publication: Acid Rain (www.safewater.org). 2. Top Five Endangered Heritage Sites (www.cyark.org) Jan. 9, 2009.
Week 6/7	Ch. 6 Special Reading 7:	Depositional Environments and Sedimentary Rocks 1. How cement is made? (www.heidelbergcement.com), 2. The History of Concrete (R. Steiger. 1995. *Concrete Journal,* Pub. #J950585), 3. The Concrete Conundrum (www.chemistryworld.org) *Chemistry World,* March, 2008.
Week 7/8	Ch. 8 Special Reading 8:	Stratigraphy, Geologic Time & Numerical Dating "Age and legality of ivory revealed by carbon-14 dating can fight poachers." (http://phys.org/news/2013-07-age-legality-ivory-revealed-carbon-.html).
Week 8/9	Ch. 7	Metamorphism and Metamorphic Rocks; Uses for metamorphic minerals and rocks in society.
Week 9	Ch. 12 Special Reading 9:	Deformation of Rock; Geologic Structures "Unlocking the mysteries of the Parthenon." (http://www.smithsonianmag.com/history/unlocking-mysteries-of-the-parthenon-16621015/?no-ist
Week 10	Ch. 11 Special Reading 10:	Earthquakes and Tectonic Hazards Earthquake Hazards in the Pacific Northwest (http://pnsn.org/outreach/earthquakehazards).
Week 10	Ch. 20	Human Use of Earth's Resources: fossil fuels, alternative energy, mineral resources.
Week 10	Ch. 19	Climate Change: Cause (natural and anthropogenic) and implications.
Final		**Friday March 13th (Kane 130)** **(3:30 – 4:20 pm)** Bring scanton form and #2 pencil.