

ES473 ENVIRONMENTAL GEOLOGY POLICIES AND PROCEDURES

Spring 2017 Term - Western Oregon University
4 CR TR 2:00 – 4:00 PM Natural Sciences Bldg, Rm 218

INSTRUCTOR: Dr. S. Taylor
OFFICE HOURS: T,R 1-2 PM; 4-5 PM
By Appointment

OFFICE: RM 210 Natural Sciences Bldg
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Class Web Sites: www.wou.edu/taylor moodle.wou.edu

COURSE DESCRIPTION:

This course serves as an upper division introduction to environmental geology. The emphasis is placed on the technical aspects of human interaction with near-surface environments of the Earth. The range of topics include an overview of environmental and land-use regulations, geomorphic hazards (soil erosion, flooding, mass wasting, landslide, debris flow, coastal erosion), tectonic hazards (earthquakes, tsunamis, ground disturbance, volcanic eruptions), water resource issues (source, supply and quality), engineering geology, mining impacts, and waste management.

COURSE GOALS AND LEARNING OBJECTIVES:

ES473 learning objectives are aligned with WOU Earth Science program outcomes and select components of the LEAP (Liberal Education and America's Promise; <http://aacu.org/leap>) learning outcomes developed by the Association of American Colleges and Universities. Upon successful completion of ES473 Environmental Geology, students will be able to demonstrate minimum competency in the following program areas:

1. Identify and describe natural and anthropogenic processes that influence environmental quality on Earth (PO1).
2. Apply algebraic, trigonometric, and statistical principles to geologic data collection and analysis (Q).
3. Summarize techniques that are used to mitigate natural and anthropogenic risks to the environment on Earth (PO1).

THE PROFESSOR'S PHILOSOPHY ON UPPER DIVISION EARTH SCIENCE / GEOLOGY COURSES:

The upper division Earth Science / Geology course sequence is designed for students who are willing to work hard, play hard, have fun, and learn in-depth skills / concepts in a professional academic setting. By default, our student population is very diverse with a wide array of skills, interests, and career goals. The student population ranges from serious Earth Science majors with focused career objectives, to Earth Science minors to Science Education majors. As such, the professor is charged with serving a diverse array of student interests and career goals in the most professional manner possible. The problem-solving and technical skills acquired via training in the Earth Sciences are highly valuable (and marketable), regardless of career track. Students are expected to actively participate in the learning process and make a significant contribution to the academic integrity of the Earth Science program at Western Oregon University. The ultimate goal of the program is to provide graduates with the academic skills that will enable them to be highly competitive in graduate school or the career marketplace. *GO TEAM!*

REQUIRED TEXT (available on moodle class site):

Keller, E.A., 2011, Environmental Geology, 9th Ed., Prentice Hall, 624 p., ISBN-10: 0321643755

ADDITIONAL READING:

Journal and assorted text readings to be provided by the instructor on an as-needed basis; visit class web site.

CLASS NOTES:

A comprehensive set of instructor class notes are available for download via the internet. The class web site is at URL <http://www.wou.edu/taylor> ... and follow the links to the "ES473 Environmental Geology" home page. The class notes, lab exercises, answer keys, and study guides are available as Adobe Acrobat Reader files (*.pdf file). Acrobat Reader is free and is installed on many campus PC's. Based on prior student suggestions, I have assembled my class notes and made them available. These notes may be printed at any campus internet station (e.g. ITC Bldg - Student Lab, Library, local department computer labs). The notes are in outline form and are very comprehensive. "Exam Study Guides" will also be posted on the web site as the term progresses. **Class notes for the days lecture are to be printed in hard-copy form, compiled in a three-ring binder, and brought to lecture each day. There are short-problems, diagrams, and notes that will be used on a regular basis. Moral of story: print out your notes a head of time!**

FIELD TRIPS AND GUEST LECTURES:

Local field trips and special guest lectures will be scheduled during the term, as time permits. Please be aware that additional scheduling and personal time will be required as the course develops. Field trip and guest lecture attendance is mandatory, however alternative assignments can be arranged on an as needed basis for students with irreconcilable time conflicts. ***Storal of Morey: Field trips and guest lectures will require additional time outside of the scheduled class period.***

EVALUATIONS AND EXPECTATIONS:

Student performance will be evaluated on the basis of lab exercises, writing assignments, oral presentations and/or two (2) exams. The following is a breakdown of evaluation points and letter grades:

Class/Lab Exercises (Midterm + Final Lab Portfolio)	150 pts	36%
Midterm Exam	100 pts	28%
Final Exam	125 pts	36%
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	370 pts	100%

Final Grading Scale

Percent Range of Total Points	Letter Grade	Percent Range of Total Points	Letter Grade
94-100%	A	77-79%	C+
90-94%	A-	73-76%	C
87-89%	B+	70-72%	C-
83-86%	B	67-69%	D+
80-82%	B-	63-66%	D
		60-62%	D-
		<60%	F

Exams: Exams will be administered at evenly spaced increments throughout the term; the final will be 20% comprehensive with test material drawn from throughout the term. Exams will largely consist of essay questions and homework-type problems. *Warning: the exams are very comprehensive and will likely require a full 2+ hours to complete, please plan accordingly.*

SPECIAL NOTE ON EXAM ANSWERS: Never use “etc.” in an essay or short answer on an exam. This means nothing in terms of demonstrating your content knowledge. Sketches and drawings help support your written word.

Make-Up Exams: Under NO circumstances will make-up exams be administered without prior arrangement (at least five days) and good reason. Please show up on exam day!

Class and Lab Assignments: Class and lab assignments will be worked BOTH during class time and outside of class time each week. You will have lab, reading, and homework assignments that **may** take up to 3 or 4 hours to complete outside of class time, maybe more in some cases, depending on your skill levels and ability. Please plan your schedule accordingly. Due dates for class exercises will be prescribed by the instructor. Late work will be accepted up to 1 week after the due date, but will be automatically assessed a penalty of -20% off the point total.

Due to the volume of students assigned to the instructor each term, he will not be able to grade the lab exercise work in detail. The homework and lab assignments will be checked for completeness, with questions randomly chosen for content and accuracy. Grade points will be assigned on the basis of these two criteria. Exercise answer keys will be posted on the class web site by the instructor. **It is your responsibility to: (1) check your work against the lab / homework keys, (2) make sure you understand how to complete the exercises, (3) find help if you have trouble with lab exercises, and (4) study / learn the exercise skills and material for the exams.**

A Note about Incompletes: No incomplete grades will be given during the last week of class. If you have a problem that warrants an incomplete, make arrangements prior to the last week (no exceptions!!).

Writing Assignments: Students are required to write a 500-800 word (~1-2 typed pages) summary for a series of field trips, speaker topics and journal articles that will be assigned. This exercise is designed to enhance the writing skills of students. The general format should include: (1) Introduction to the Problem / Issue, (2) Summary of Main Points, (3) Final Discussion of the Relevance of the Presentation / Field Trip to Environmental Issues in the State of Oregon, (4) References Cited, and (5) pertinent figures and tables (items 4 and 5 are in addition to the 1-2 type-written pages).

A variety of student writing guides are available on the class web site. The summaries should be neatly word-processed, double spaced, with 1 inch margins, and checked for spelling errors with a "spell checker" tool. *Miss-spelled* words will not be tolerated. Save your word-processing files as you may be required to modify and edit the summaries.

Learning Resources and Grade Outcomes: The class knowledge base will be derived from a combination of the following: (1) independent student reading outside of class; (2) independent student engagement of take-home lab exercises and quantitative problem solving; (3) independent student reading of web resources linked from the class web site; (4) systematic review and memorizing of class notes and ancillary reading materials, as directly linked from class web site and handed out in hard copy during class time; and (5) successful attendance, note taking, and engagement of in-class lectures delivered by the instructor. Instructor lectures are designed as interpretive translations to assist students in understanding the class content and to stay on track with the weekly schedule. Lectures are not intended as the primary knowledge transfer mechanism. Independent student engagement of readings, class notes and lab work outside of class time is the most important pathway to success.

DIGITAL LAB REPORTS: Weekly lab exercises represent a significant component of the class. Exercises are based on scientific observation, data analysis, and problem solving. Students will compile a Digital Lab Report consisting of a well-organized Acrobat *.PDF file containing completed lab exercises. Students will complete approximately one (1) long-format lab exercise per week of the term, multiple short-format "in-class" exercises, and reading/field trip summaries. Some of the completed work will be in digital format that can easily be converted to a *.PDF file directly using Windows 7 tools or Creative Suite Adobe Acrobat software available in the NS218A computer lab. Other lab work that is completed by hand/pencil/paper will be digitally captured by students using scanners in the NS218A and NS017 computer labs, or other available resources on campus. All individual lab exercises and summaries will be converted to PDF formats and combined with the others in the prescribed order, and assembled into one, single, merged PDF Digital Lab Report and uploaded to the Moodle Online Class Management System (moodle.wou.edu). Portfolio checklists will be provided before due dates, so that students can organize, assemble and label their portfolio sections in an orderly manner. The order of portfolio sections must follow the assigned check list!

General Lab Report Outline:

- I. Cover Page with student name, class, creative artwork;
- II. Table of Contents;
- III. Lab Work in checklist order with each task having its own cover page so work is clearly identifiable.

A model example lab report of the required quality and formatting may be downloaded at the following URL:
http://www.wou.edu/las/physci/taylor/g473/example_lab_portfolio.pdf

Digital Lab Reports will be graded once at Midterm and once at Final time. A total of four Moodle upload submissions will be scheduled at even increments throughout the term: Week 2 Moodle Test Upload, Week 5 Digital Lab Report 1, Week 9 Digital Lab Report 2, and Week 11 Final Lab Report. Lab reports will be checked for completeness and formatting at the prescribed due dates. An exercise task-list will be maintained as assignments evolve throughout the term. It is important to complete assignments on schedule, as they are designed to help students understand lecture concepts and aid in successfully achieving positive results on the exams.

Special Note: Do not use the Adobe Acrobat "Assemble Portfolio" tool. This tool appends all of the PDF documents as separate sub-files in random order. When combining PDF documents, the result should be one seamless PDF file, in the order prescribed, with no additional sub-menu management necessary. Any "Adobe Acrobat Portfolios" submitted in the improper format will be returned without grade for subsequent correction and resubmission.

OTHER REQUIRED MATERIALS:

Students will also need access to a scientific calculator, ruler, protractor, and desktop computer. You will be required to use these materials during lecture, lab, and exams. The NS218 and NS216 Natural Sciences Computer Labs will be available for student use during class time and at other times during the day. After hour and weekend use of the computer lab is possible, with prior arrangement.

STUDENT HONOR POLICY:

Plagiarism and cheating will not be tolerated. Cheating includes copying others work and using cheat sheets on exams. However, students are encouraged to interact in small groups during class assignments, i.e. you can freely discuss concepts in all portions of the class, except exams.

A NOTE ABOUT LAB EXERCISES:

Lab exercises will be quantitative in nature with an expectation that students have or will develop skills in the areas of applied algebra and trigonometry. Students will learn computer applications with emphasis on data analysis and problem solving in the Earth sciences. As such, lab exercises will require an additional time commitment outside of the scheduled weekly meeting (i.e. you will have "homework" and "projects" to work on outside of the scheduled class time).

STUDENTS WITH DISABILITIES:

Any student who has a disability that requires accommodation, please make an appointment to see me.

A NOTE ABOUT THE LAST WEEK OF CLASS:

Given that the Oregon University System employs the "quarter method" of academic scheduling, upper division courses are by nature "compressed" with much detailed information to cover in a relatively short period of time. Please note that most upper division text books are geared for courses at universities with a 16 week semester system (i.e. we are truly trying to pack 10 pounds of contaminated soil in a 5 pound bag). As such, the 10th week of class is as critical to content coverage as the 1st week. Students should anticipate a full slate of "normal" activities during the last week of class, including lectures, lab exercises, written reports, etc. The class is not over until after the final exam! **Plan your schedule accordingly!**

CHANGE OF SYLLABUS - POP QUIZZES - UNANNOUNCED HOMEWORK ASSIGNMENTS:

The instructor reserves the right to modify the syllabus and class schedule at any time during the term. Students will be notified of such changes in a timely manner. The instructor also reserves the right to administer pop-quizzes and assign unscheduled homework / class assignments at any time. All students will be responsible for completing this work and it will comprise part of the final class grade.

INSTRUCTOR TIMELINE FOR GRADING EXAMS AND LAB MATERIALS:

The instructor's class grades are due the Tuesday after final's week. All exams, lab materials, and assignments submitted by students throughout the term will be graded by that time, however the professor will make an effort to return graded materials within two weeks of the assigned due date.

A NOTE ABOUT LOST OR MISSING WORK:

The instructor will only grade work that is received and physically visible. Any missing work (lab assignments, homework, quiz/test answer sheets) will receive a "0" on the grade sheet. This policy applies to work lost by the student or instructor. If the student demonstrates that the work was turned in, but is missing due to instructor's error, then the student will be afforded an opportunity to make up the work and resubmit it for graded credit. Otherwise, the student will not receive credit for lost or missing work. In general, the instructor's assignment philosophy is: "turning something in, late or otherwise, is better than nothing at all", "better late than never", "something is worth more than nothing", "it's never too late to get your work done".

UPDATED CLASS SCHEDULE (4/6/17): This outline should be considered tentative at best. The following schedule may be modified as class ideas evolve throughout the term. Text readings are available on the class moodle site, “Keller” refers to the Environmental Geology textbook that is scanned and posted on Moodle. **NOTE: The class assignment list below is tentative and a work in progress, others to be determined as the class progresses.**

Week	Dates	Class Content	Text Reading
1	Apr 4, 6	Class Policies, Video Introduction Exercise Introduction (Cont.); Overview	Keller: <i>Intro, Earth Overview, Hazards Overview</i>
		<ul style="list-style-type: none"> • Class Assignment: Register as Student Members of the Association of Engineering and Environmental Geologists https://aegweb.site-ym.com/general/register_member_type.asp? • Homework Due April 6 – Reading Summary: Geologic Hazards in Oregon • Homework Due April 6 - Print out all of the Week 1-2 course notes available in the Bulletin Board Section of the class web site and organize them in a three-ring binder. 	
2	Apr 11	Introduction / Surface Processes	Keller: <i>Soils, Landslides</i>
	Apr 13	Landslide Hazards Class Assignment: Moodle Test Upload Due by Friday April 14, 11 PM	Keller: <i>Soils, Landslides</i>
3	Apr 18 Apr 20	Landslide Hazards/Debris Flow Lidar Technology and Hazards Mapping	Journal Article(s) Instructor Handouts
4	Apr 25 Apr 27	Rivers-Flood Hazards Rivers-Flood Hazards	Keller: <i>Rivers and Floods</i>
5	May 2	Field Trip: Landslide and Flood Mitigation in Monmouth Area (Depart WOU 1:30 PM)	Keller: <i>Water Resources</i>
	May 4	Introduction to River Restoration Moodle Upload: Digital Lab Report 1, Fri. May 5, 11 PM	Instructor Handouts / Journals
6	May 9	Midterm Exam	
	May 11	Waste Management	Keller: <i>Waste Management</i>
7	May 16	Field Trip: Coffin Butte Landfill (Depart WOU 1:30 PM)	Instructor Field Guide
	May 18	No Class – Out of Class Assignment Groundwater	Keller: <i>Water Resources</i>
8	May 23	Groundwater Resources / Regional Hydrology	Instructor Handouts/ Journals
	May 25	Field Trip: Mid-Willamette Hydrogeology (Depart WOU 1:30 PM)	Instructor Field Guide
9	May 30	Soil and Water Contamination	Keller: <i>Water Pollution</i> Instructor Handouts / Journals
	June 1	Field Trip: WOU Academic Showcase ES407 Seminar (1-4 PM) Moodle Upload: Digital Lab Report 2, Friday June 2, 11 PM	Instructor Handouts / Journals
10	June 6 June 8	Student Presentations: Case Studies / Journal Summary Student Presentations: Case Studies/ Journal Summary	Keller: <i>Environmental Health</i> Instructor Handouts
11	Week of June 12	Final Exam, final lab portfolios due, check schedule, Moodle Upload: Final Lab Report, Thurs. June 15, 11 PM	

ES473 Tentative Midterm Lab Report Checklist – To Be Finalized as Schedule Develops

Introductory Video Review Questions

http://www.wou.edu/las/physci/taylor/g473/intro_video_ex.pdf

Introduction to Quantitative Problem Solving / Hydrology Problems

<http://www.wou.edu/las/physci/taylor/g473/quantex.pdf>

Summary: Mitigating Natural Hazards in Oregon Reading

<http://www.wou.edu/las/physci/taylor/g473/specpr32.pdf>

Review of Drawing Topographic Profiles

http://www.wou.edu/las/physci/taylor/g473/Topo_Profile_Review_Exercise.pdf

Mass Wasting Hazards Lab Exercise (all of Part A and B)

http://www.wou.edu/las/physci/taylor/g473/landslides_ex8.pdf

Summary: Watershed Assessment and Restoration Reading

Introduction to Floods Video Clips – Student Summary Questions

Floods and Streams Lab Exercise (ex. 27-30)

http://www.wou.edu/las/physci/taylor/g473/river_lab_flood_analysis.pdf

Rip-9 Cascadia Subduction Zone Reading Summary

http://www.wou.edu/las/physci/taylor/g473/the_big_one_cascadia_quake_predictions.pdf

Seismology Video Summary Questions

http://www.wou.edu/las/physci/taylor/g473/earthquake_video_ex.pdf

In-Class Exercise (1-page) on Earthquake Recurrence Intervals

http://www.wou.edu/las/physci/taylor/g473/earthquake_recurrence_primer.pdf

Volcanic Hazards Lab Exercise (all of Part A)

http://www.wou.edu/las/physci/taylor/g473/volc_lab_ex4.pdf

ES473 Tentative Final Lab Report Checklist – To Be Finalized as Schedule Develops

Summary: Coffin Butte Landfill Field Trip

Solid Waste Management Video Review Questions

http://www.wou.edu/las/physci/taylor/g473/Waste_Management_Video_exercise.pdf

Groundwater Video Review Questions

http://www.wou.edu/las/physci/taylor/g473/groundwater_video_exercise.pdf

Group review questions – Basics of Well Drilling and Water Supply Design

<http://www.youtube.com/watch?v=8K6V450StO4>

Introduction to Groundwater Contour Maps (1-page exercise)

http://www.wou.edu/las/physci/taylor/g473/intro_groundwater_contouring.pdf

Hydrogeology Groundwater Flow Problem Set (Questions 1-4; 6,7; Darcy's Law)

<http://www.wou.edu/las/physci/taylor/g473/gwflow.pdf>

WOU Showcase / Senior Seminar Summaries

http://www.wou.edu/las/physci/taylor/g473/2012_AES_Esci_Abstracts.pdf

Aquifer Characterization Lab (exercises on p. 123, p. 128, p. 130)

http://www.wou.edu/las/physci/taylor/g473/groundwater_contamination_lab.pdf

Summary: Pacific Wood Processing Field Trip

Summary: Monmouth-Independence Hydrogeology Field Trip / Review Questions

http://www.wou.edu/las/physci/taylor/g473/hydro_field_guide.pdf

Willamette Valley Hydrogeology Review Questions (Woodward and others paper only – first section of questions)

http://www.wou.edu/las/physci/taylor/g473/willamette_hydro_review_questions.doc

Student Presentations – Powerpoint slide show and 1-page class note handout