

UNIVERSITY OF SOUTHERN CALIFORNIA
Environmental Studies Program
Spring 2016

ENST 320a: Water and Soil Sustainability

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Course Overview

Both water and soil are integral to human livelihood, and both are currently under threat. This class presents an overview of the issues related to water and soil sustainability including soil development and management, the hydrologic cycle, the cycling of nutrients through both soil and water, soil and water pollution, and food security related to soil and water issues.

Recommended prerequisite: ENST 100

Course Texts

1. Pennington, Karrie L. and Cech, Thomas V., Introduction to Water Resources and Environmental Issues, 457 pp., Cambridge. Referred to below as WREI
2. Plaster, Edward J., Soil Science and Management, 495 pp., Delmar-Cengage. Referred to below as SSM

Course Requirements

Routine attendance and active participation are an important part of each class session. For the best learning experience, you are expected to have read the course materials (see below) by the date it is discussed in class. You are responsible for information, announcements, date changes, and any other course material presented, regardless of your participation in the classroom. This course will also have a significant lab portion. It is important that you are prepared for lab by reading protocols and any other materials before lab.

Course Grading

You will be graded on the basis of your performance on exams, written assignments, group presentation, and class participation (e.g., study guide discussions, Blackboard assignments, etc.). Lecture presentations will be posted on Blackboard after the lectures. Exam questions will be drawn from course readings and lecture materials, and will include both multiple choice and essay questions. Each exam will be a midterm. **No make-up exams or assignments will be allowed without explicit permission.** If a student misses an exam and/or assignment, they will receive a zero for that portion of the course.

Below is a list of the graded assignments and their point value:

Midterm 1	Jan 18	100 pts	20%
Midterm 2	Jan 26	100 pts	20%
Final Exam	Feb 3	100 pts	20%
Soil lab report	Jan 25	50 pts	10%
Water quality lab report	Feb 1	50 pts	10%
Group Presentation	Feb 2	50 pts	10%
Participation	Rolling	50 pts	10%
Total Points		500 pts	100%

Written Assignments & Group Project

Students will independently write 2 lab reports based on the lab exercises we will conduct. At the end of the course, students will work together on a specific topic, which they will deliver as an oral presentation (see above for dates and point value). Lab report and project guidelines will be made available on Blackboard. The purpose of the lab reports is to practice synthesizing and analyzing results for meaning, and presenting them in a readable way. The goal of the group project is for students to research an environmental issue using the primary literature as well as other reputable sources, take an informed position on a given issue based on available information, and present their position to the class. All submissions will be evaluated for originality, accuracy and thoroughness of research, attention to detail, and quality of finished project.

Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>. Neither discrimination, sexual assault nor harassment is tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity <http://equity.usc.edu/> or to the Department of Public Safety <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources. Students are expressly prohibited from recording lectures.

Support Systems

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Statement on Religious Observation Accommodations

USC policy grants students excused absences from class for observance of religious activities. Students may be given an opportunity to make up work missed because of religious observance. We are responsive to requests for an excused absence when made in advance. Please note that this applies only to religious activities that necessitate a student’s absence from class and/or a conflict with a specific aspect of the course.

Course Schedule

For the best learning experience, you are expected to have read assigned material by the date it is discussed in class. Some readings will be posted online. The readings and schedule of topics may be adjusted throughout the semester depending on the progress of the class. Items in italics are lab exercises or readings for lab exercises. Some readings are primary literature that we will specifically be discussing in class. These readings are included in bold in the activities section.

Week 1

Date	Lecture and lab/afternoon activities	Associated Readings
11 Jan	Miss Christi to WIES; housing, lab, etc. orientations; set up lab space	
12 Jan	Introduction Water as a chemical The Hydrological Cycle <i>Form groups and research topics for final presentations</i>	WREI: Ch. 3, see Bb
13 Jan	Water supply and watersheds Discussion: Gleick – Soft path water, Peak water <i>Trip to Avalon: Waste management and landfill</i>	WREI: Ch. 5 See Bb
14 Jan	Soil: development and properties Environmental microbiology <i>Visit from Catalina Island Conservancy: water conservation and invasive species</i>	SSM: Ch. 2, 4, 5 See Bb
15 Jan	Environmental microbiology Soil: sustainability, damage, erosion, carbon Discussion: Saving soils and soil biodiversity	SSM: Ch 5, 6, see Bb

Week 2

Date	Lecture and lab/afternoon activities	Associated Readings
18 Jan	Midterm 1 <i>Soil sampling, soil texture, Eh, nutrients, pH, respiration</i>	<i>Soil manual (See Bb)</i>
19 Jan	<i>Morning: soil porosity analysis</i> <i>Afternoon: Grain size analysis</i>	<i>Methods (See Bb)</i>
20 Jan	Soil salinity and pH <i>Soil organisms/microscopy</i>	SSM: Ch 11, See Bb See Bb
21 Jan	Water dynamics of surface and subsurface, groundwater contamination <i>Finish up lab, Data analysis and discussion</i>	WREI Ch. 6, SSM Ch. 7, See Bb
22 Jan	Wetlands Carbon cycle Discussion: Barbier, Valiela – Wetland value <i>Work on lab report</i>	WREI Ch 9, SSM Ch. 12 (carbon section), See Bb

Week 3

Date	Lecture and lab/afternoon activities	Associated Readings
25 Jan	Nitrogen Cycle Phosphorus cycle, other cycles, synthesis Discussion: Cordell – The story of phosphorus <i>Lab report 1 due, 3PM</i>	SSM: Ch. 10 and 12 (sections on N, P, K), See Bb
26 Jan	Midterm 2 Fecal Indicator Bacteria Discussion: Alm et al. – FIB in sand <i>Cat Harbor and Two Harbors, FIB in water and sand</i>	See Bb <i>FIB method (see Bb)</i>
27 Jan	Water usage, treatment, and quality Discussion: Grant – Taking the waste out of wastewater <i>Introduction to aquaponics with Diane Kim</i> <i>Water quality and nutrients: sample collection and sensors</i>	WREI: Ch. 11, 12 See Bb
28 Jan	Coastal pollution and eutrophication <i>Water quality and nutrients: phosphate measurements</i>	See Bb DIP method (see Bb)
29 Jan	<i>Data analysis and discussion</i>	

Week 4

Date	Lecture and lab/afternoon activities	Associated Readings
1 Feb	Climate change <i>Lab report due, 5PM</i> <i>Work on presentations</i>	See Bb
2 Feb	Food Security Conservation Agriculture Discussion: Godfray, Foley – Food security <i>Group presentations</i>	SSM: Ch 16, Ch. 18 (water erosion) See Bb
3 Feb	Final Exam	