

**UNIVERSITY OF SOUTHERN CALIFORNIA**  
**Environmental Studies Program Problems Without**  
**Passports 2016**  
**ENST 320a: Water and Soil Sustainability in the Field**

**Overview:** ENST 320a In the Field is a special section of the Water and Soil Sustainability course (currently taught on the University Park Campus), and one of several courses included in the Summer 2016 Problems Without Passports program. The course will be conducted on the Wrigley campus with enhanced research, lab and field studies. Additionally, human population growth will be examined as we examine the requirements for maintaining an ecologically sustainable balance among island residents, visitors, and the environment itself. Students will explore this issue by visiting the city of Avalon on Catalina, the largest population center on any of the Channel Islands, and speaking with community leaders and resource managers in the waste, power, and water fields. Recommended prerequisite courses: ENST 100.

**Format:** We will meet daily for lectures and discussions led by the course instructors and/or a guest lecturer (see Course Schedule). After our morning meeting, we will discuss the day's activities and venture into the laboratory and/or the field. Throughout the course, students will work together in pairs or groups of three to complete specific goals, which we will discuss in detail during the morning session. Occasionally, the course will continue into the evening where we will discuss and analyze data collected in the laboratory and/or field.

**Required Texts:**

1. Pennington, Karrie L. and Cech, Thomas V. (2005), Introduction to Water Resources and Environmental Issues, 457 pp., Cambridge. Referred to below as WREI.
2. Plaster, Edward J. (2009) 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:**

<b>Midterm 1</b>	Jul 30; 10AM	100 pts	20%
<b>Midterm 2</b>	Aug 6; 10AM	100 pts	20%
<b>Final Exam</b>	Aug 12; 10AM	100 pts	20%
<b>Soil lab report</b>	Aug 5; 5PM	50 pts	10%
<b>Water quality lab report</b>	Aug 12; 5PM	50 pts	10%
<b>Group Presentation</b>	Aug 13; 9:30AM	50 pts	10%
<b>Participation</b>	Rolling	50 pts	10%
<b>Total Points</b>		<b>500 pts</b>	<b>100%</b>

### **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. Projects should focus on a specific soil or water issue and the solutions to it; examples include dam removal, the Delta Tunnels project, or desalinization as a source of fresh water in the water starved west.

### **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](mailto: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](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.

**Students are expressly prohibited from recording lectures**

### **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

<b>Date</b>	<b>Lecture and lab/afternoon activities</b>	<b>Associated Readings</b>
25 Jul	Introduction Water as a chemical The Hydrological Cycle <i>Form groups and research topics for final presentations</i>	WREI: Ch. 3, see Bb
26 Jul	Water supply and watersheds <b>Discussion: Gleick – Soft path water, Peak water</b> <i>Field trip: TBD</i>	WREI: Ch. 5
27 Jul	Water usage, treatment, and quality <b>Discussion: Grant – Taking the waste out of wastewater</b> <i>Field trip: TBD</i>	WREI: Ch. 11, 12
28 Jul	Soil: science & applications; development and management <b>Discussion: Saving soils and soil biodiversity</b> <i>Field trip: TBD</i>	SSM: Ch. 2, 4, 6
29 Jul	Environmental microbiology <b>Discussion: Alm – Fecal indicator bacteria in sand</b> <i>Work on projects/study for midterm</i>	SSM: Ch 5, see Bb
30 Jul	<b>MIDTERM 1: 10AM</b>	

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Week 2

<b>Date</b>	<b>Lecture and lab/afternoon activities</b>	<b>Associated Readings</b>
1 Aug	Miss Christi to WIES (leaves San Pedro 7:30am); housing, lab, etc. orientations; set up lab space; hike	
2 Aug	<i>Morning: Soil sampling, soil texture, Eh, nutrients, pH, respiration</i> <i>Afternoon: Grain size analysis and soil porosity analysis</i>	<i>Soil manual (See Bb)</i> <i>Methods (See Bb)</i>
3 Aug	Soil: sustainability, damage, erosion, carbon Soil salinity and pH <i>Soil organisms/microscopy, finish up lab</i>	SSM: Ch 6, 11, See Bb See Bb
4 Aug	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
5 Aug	Wetlands Carbon cycle <b>Discussion: Barbier, Valiela – Wetland value</b> <i>Lab reports due: 5PM</i>	WREI Ch 9, SSM Ch. 12 (carbon section), See Bb
6 Aug	<b>MIDTERM 2: 10AM</b>	

Week 3

<b>Date</b>	<b>Lecture and lab/afternoon activities</b>	<b>Associated Readings</b>
8 Aug	Nitrogen Cycle <i>Cat Harbor and Two Harbors, FIB in water and sand</i>	SSM: Ch. 10, 12 (sec. on N, P, K), See Bb <i>FIB method (see Bb)</i>
9 Aug	Phosphorus cycle, other cycles, synthesis <b>Discussion: Cordell – The story of phosphorus</b> <i>Introduction to aquaponics with Diane Kim</i> <i>Water quality and nutrients: sample collection and sensors</i>	SSM: Ch. 10 and 12 (sections on N, P, K) See Bb
10 Aug	Coastal pollution and eutrophication Climate change <i>Water quality and nutrients: phosphate measurements</i>	See Bb <i>DIP method (see Bb)</i>
11 Aug	Food Security Conservation Agriculture <b>Discussion: Godfray, Foley – Food security</b> <i>Data analysis and discussion</i>	SSM: Ch 16, Ch. 18 (water erosion) See Bb
12 Aug	MIDTERM 3: 10AM <i>Lab reports due: 5PM</i>	
13 Aug	Group presentations Depart Catalina on the Catalina Express (2:30pm)	