

# USC Dornsife

Dana and David Dornsife  
College of Letters, Arts and Sciences

**ENST 320a: Water and Soil Sustainability**

**Units: 4**

**Spring 2020, TTh 2-3:20 PM**

**Location:** Online via Zoom/Blackboard

**Dr. Scott Applebaum**, Assistant Professor (Teaching)  
(he/him/his)

**Email:** [sappleba@usc.edu](mailto:sappleba@usc.edu)

**Office Hours:** TBA via Zoom

## Course Description and Rationale

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.

## Learning Objectives

Through this course students will be able to:

- Describe the key processes of the hydrologic cycle
- Collect and analyze watershed characterization data
- Predict impacts of soil and water resource practices on nutrient cycles at local to global scales
- Interpret how the anthropogenic impacts on water movement through the environment can feedback to impact humans and society
- Describe the physical, chemical and biological properties of soil and their importance in maintaining ecosystem services
- Explain how soil and water quality are intimately linked and their importance for food production and security worldwide
- Learning objectives in this course are aligned with those of the Environmental Studies Program: <https://dornsife.usc.edu/environmental-studies/learning-objectives>.

**Recommended preparation:** ENST 100

## Course Notes

This course will use Blackboard for communication, information and turning in assignments. Lecture slides will be made available after the lecture is given. Additional readings will be assigned throughout the semester, and these will be announced on Blackboard as well as in class. Sometimes computers will be used in class to work with real life data in Excel and run simple simulations. This course requires in depth reading and critical analysis outside of lecture, as it is a four-unit course.

## Required Readings and Supplementary Materials

1. Pennington, Karrie L. and Cech, Thomas V., Introduction to Water Resources and Environmental Issues, 457 pp., Cambridge. **Referred to below as WREI**
2. Brady, Nyle C. and Weil, Raymond R., Elements of Nature and Properties of Soils, Pearson. **Referred to below as ENPS**
3. Selected primary literature articles: Available online via Blackboard

## Communication and Course Technology

- **Blackboard web portal:** Course communications including announcements, course materials, lecture notes, assignments, grade postings, discussions, instructions and submission of completed assignments will be conducted via **Blackboard** (<https://blackboard.usc.edu>). Students are responsible for checking the course website regularly. **Please notify the instructors in the event of any mistakes or difficulties accessing materials.**

- **Zoom teleconferencing:** Synchronous lectures, course activities and office hours via **Zoom**.
- **Email:** If you have questions or need to schedule an appointment (if you are unable to visit during scheduled office hours) please contact the instructors via email. The clearer and more professional your email inquiry, the easier it is for us to address your needs. **Therefore, please read and recheck your message for clarity before sending.** We try our best to respond to emails within 24 hrs. However, if you do not receive a response within that time you may send a follow up inquiry. **Note:** *Please consult the provided course resources before your email (Blackboard, syllabus, assignment instructions, announcements, etc.) as these resources can answer many of your questions. Nevertheless, do not hesitate to contact us if you still need assistance!*
- **USC technology support:**
  - [Zoom information for students](#)
  - [Blackboard help for students](#)
  - [Software available to USC Campus](#)

#### Grading Breakdown

Assignment	Points	Percent of Total
Exam 1	100	28.5
Exam 2	100	28.5
Articles and reading guides (6 x 5pts)	30	10.3
Watershed mapping	40	11.4
Soil data analysis	40	11.4
In-class work, quizzes, discussions, etc	35	9.9
<b>Total</b>	<b>350</b>	

Course final grades will be determined using the following scale (which may be adjusted depending upon progress of the class):

Grade	Percent	Grade	Percent
A	95-100	C	73-76
A-	90-94	C-	70-72
B+	87-89	D+	67-69
B	83-86	D	63-66
B-	80-82	D-	60-62
C+	77-79	F	59 and below

#### Course Community and Discussion Conduct:

- Share responsibility for including all voices in the conversation
- Listen respectfully
- Be open to changing your perspectives based on what you learn from others
- Understand that both students and instructors will make mistakes in this space
- Understand that your words have effects on others
- Take pair work or small group work seriously
- Understand that others will come to these discussions with different experiences from your own
- Make an effort to get to know other students in the class
- Understand that there are different approaches to solving problems

#### Description and Assessment of Assignments (see grading breakdown, above)

**Exams:** Questions will be drawn from course readings, lecture materials and discussions.

**Reading guides:** Read articles from the primary literature (peer-reviewed research) and answer supplied questions in order to participate and engage in lecture discussions.

**Watershed mapping/analysis:** Use of Google Earth tools and Excel (or similar spreadsheet software) to manipulate and explore real world data and test some basic hypotheses about watershed structure and function.

**Soil data analysis:** Students will work hands-on and analyze a set of soil data with Excel and submit a brief summary, which will include comments on soil health and other parameters discussed in class.

**Water pollution analysis:** Students will work hands-on and evaluate different water filtration methods and submit a brief summary. The report will include comments on managing the pollution of water resources and current water policy measures.

### Course-Specific Policies

**Attendance and participation:** Students are strongly encouraged to attend scheduled synchronous course activities (Zoom meetings). Active participation in class discussions and activities is necessary! However, synchronous sessions will be recorded and available through Blackboard. Students who miss Zoom meetings are responsible for finding out about any in-class announcements and activities, and must contact the instructors for alternate assignments to the in-class activities.

**Late assignments:** Late assignments must be uploaded to Blackboard/TurnItIn (as specified for each assignment or activity). Late assignments incur a 5% penalty per day unless otherwise specified.

**Missed exams:** UNPLANNED ABSENCES: You may be excused from an exam only in the event of a documented illness or emergency as outlined by university policy, with notification to the instructor within 48 hours. An invalid excuse, or the excuse turned in late, will result in a score of zero for the activity missed. If you miss the final examination and have provided a valid medical excuse within 72 hours of the examination time, a final course grade of incomplete (IN) will be recorded, and you will be permitted to take a make-up final examination during the following semester. If you have an emergency on exam day, please contact the instructors as soon as you are able (preferably, before the exam).

PLANNED ABSENCES: Students that miss an examination or graded activity for observance of a religious holy day should be aware of the University's policy on such absences, published at: <http://orl.usc.edu/religiouslife/holydays/absences.html>. If the absence is approved as determined by the USC Office of Religious Life, a reasonable accommodation will be provided. If you have any anticipated exam date conflicts due to athletic schedules or religious holidays, you **must** email the instructors *two weeks in advance* to see if alternative arrangements can be made (under reasonable circumstances). Otherwise, make-up exams will not be given except in extreme emergencies (see above).

**Policy on Re-grades:** Assignments will be graded in the context of expectations set by an initial evaluation of all student responses. If you feel that an error was made in the grading of an examination or lab activity, you must: 1) Prepare a printed statement explaining why you feel your grade was incorrect, and 2) submit this and your original examination to your instructor within one week of the time the examination or assignment was returned to you. Your entire exam or assignment may be re-graded and, as a result, your grade may increase or decrease from a requested re-grade. No frivolous reasons will be accepted for requesting grade changes.

**Synchronous session recording notice:** Synchronous sessions will be recorded and provided to all students asynchronously via Blackboard.

### Sharing of course materials outside of the learning environment

*Reminder:* USC policy prohibits sharing of any synchronous and asynchronous course content outside of the learning environment:

*SCampus Section 11.12(B)*

*Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relation to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).*

### Course Schedule: A Weekly Breakdown

For the best learning experience, review assigned readings or other material prior to class meetings. Article and supplemental readings will be posted on Blackboard. Readings and schedule may be adjusted throughout the semester depending on progress of the class.

Week of:	Topics/Daily Activities	Readings	Due Dates
Jan 18 <i>Week 1</i>	Water as a chemical Hydrosphere & hydrologic cycle	WREI Ch 1, 3	
Jan 25 <i>Week 2</i>	Watersheds & water supply <b>Article 1 discussion (Grant)</b>	WREI Ch 5 See Bb	Friday by 5PM: Reading guide 1
Feb 1 <i>Week 3</i>	Water usage & treatment	WREI Ch 11	
Feb 8 <i>Week 4</i>	Water allocation law Microbiology & Waterborne pathogens <b>Article 2 discussion (Medema et al)</b>	WREI Ch 12, 13 See Bb	Friday by 5PM: Reading guide 2
Feb 15 <i>Week 5</i>	Nutrient cycles	See Bb	
Feb 22 <i>Week 6</i>	Eutrophication and HABs <b>Article 3 discussion (Griffith et al)</b>	WREI Ch 4 Bb/Griffith lecture	Friday by 5PM: Reading guide 3
Mar 1 <i>Week 7</i>	Review and catch-up <b>Exam 1: Thursday, Mar 3</b>		Friday by 5PM: Watershed mapping activity
Mar 8 <i>Week 8</i>	Soil development & properties <b>Article 4 (Amundson) discussion</b>	ENPS Ch. 1-2, Ch. 4 (4.1-4.5, 4.7, 4.8), Ch. 11 (11.4-11.8), 14 (14.1-14.3, 14.11, 14.13)	Thursday by 5PM: Reading guide 4
Mar 15 <i>Week 9</i>	Microbes & soil food webs <b>Soil data analysis activity</b>	ENPS Ch. 10 See Bb	Soil report due following Tues by 5pm
Mar 22 <i>Week 10</i>	Tue Mar 23 Wellness day (no classes) Agriculture & food security <b>Article 4 (Clark and Tilman) discussion</b>	See Bb	Thursday by 5PM: Reading guide 5
Mar 29 <i>Week 11</i>	Surface & subsurface water dynamics Groundwater contamination <b>Water pollution activity</b>	ENPS Ch 5, 6; WREI Ch 6	
Apr 5 <i>Week 12</i>	Wild caught & aquaculture fisheries <b>Article 5 (Barbier and Valiela) discussion</b>	See Bb	Thursday by 5PM: Reading guide 6
Apr 12 <i>Week 13</i>	Estuaries and coastal pollution <b>Estuary pollution activity and</b>	WREI Ch. 9, Bb	
Apr 19 <i>Week 14</i>	Thursday, Apr 22 Wellness day (no classes)		
Apr 26 <i>Week 15</i>	Wrap-up/review		
May 6	Exam 2 (Final): 2:00 - 4:00 PM		

## Academic and Student Support Systems

**Computer Support** - For Zoom or general IT USC Support: Phone: (24/7): 213-740-5555; Email [consult@usc.edu](mailto:consult@usc.edu)

For Blackboard Support: Phone: 213-740-5555 (option 2, assistance 24/7) [blackboard@usc.edu](mailto:blackboard@usc.edu)

**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 Part B, Section 11, "Behavior Violating University Standards" [policy.usc.edu/scampus-part-b](http://policy.usc.edu/scampus-part-b). Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, [policy.usc.edu/scientific-misconduct](http://policy.usc.edu/scientific-misconduct).

**Counseling and Mental Health** - (213) 740-9355 – 24/7 on call; [studenthealth.usc.edu/counseling](http://studenthealth.usc.edu/counseling)  
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

**National Suicide Prevention Lifeline** - 1 (800) 273-8255 – 24/7 on call; [suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)  
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

**Relationship and Sexual Violence Prevention Services (RSVP)** - (213) 740-9355(WELL), press "0" after hours – 24/7 on call; [studenthealth.usc.edu/sexual-assault](http://studenthealth.usc.edu/sexual-assault). Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

**Office of Equity and Diversity (OED)** - (213) 740-5086 | Title IX – (213) 821-8298; [equity.usc.edu](http://equity.usc.edu), [titleix.usc.edu](http://titleix.usc.edu). Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

**Reporting Incidents of Bias or Harassment** - (213) 740-5086 or (213) 821-8298; [usc-advocate.symplicity.com/care-report](http://usc-advocate.symplicity.com/care-report). Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

**The Office of Disability Services and Programs** - (213) 740-0776; [dsp.usc.edu](http://dsp.usc.edu). Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

**USC Campus Support and Intervention** - (213) 821-4710; [campussupport.usc.edu](http://campussupport.usc.edu). Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

**Diversity at USC** - (213) 740-2101; [diversity.usc.edu](http://diversity.usc.edu). Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

**USC Emergency** - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call; [dps.usc.edu](http://dps.usc.edu), [emergency.usc.edu](http://emergency.usc.edu). Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

**USC Department of Public Safety** - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call; [dps.usc.edu](http://dps.usc.edu)  
Non-emergency assistance or information.