ENST 320a: Water and Soil Sustainability
Units: 4
Spring 2019, TTh 2:00-3:20 pm

Location: WPH 206

Instructors:
Dr. Scott Applebaum
Assistant Professor (Teaching)
Office: CAS 116
Office Hours: TBA
Email: sappleba@usc.edu

Course Description/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
• Students will gain in depth knowledge of water in the environment, focusing on how water moves through the environment, how humans use and interact with water and pollution of water
• Students will explore soil science in order to understand how the physical, chemical and biological properties of soil are important to humans and the environment.
• Students will learn 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 may be assigned periodically throughout the semester, and these will be announced in class, posted on Blackboard and via email messages sent to the class. Sometimes computers will be used in class to work with real life data in excel and run simple simulations – students will be notified when computers are needed. This course involves a lot of 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

Description and Assessment of Assignments
You will be graded on the basis of your performance on exams, written assignments, group presentations 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, lecture materials and discussions.

The Final Exam is partially cumulative and will include ~20% of material covered in the first two-thirds of the course; the remaining ~80% of the Final Exam will include only material covered after the second midterm (the last third of the course). *If there is a conflict with an exam, you must email the instructor 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.* If a student misses an exam and/or assignment due to an unexcused absence, they may receive a zero for that portion of the course. During exams, students will NOT be allowed to have notes, books, cell phones, etc. Only pens/pencils and a calculator are required. Failure to comply with exam policies will automatically result in a grade of “0” for that particular exam. (Midterm 1, 2 & Final; 325 total)

Students will analyze a set of soil data in class and submit a brief write up at a later date. The write-up will include comment on the health of these soil data based on what we have learned in class. (40 pts)

Reading guides: This assignment involves reading primary literature, answering questions outside of class and turning them in ahead of time, and a discussion of the paper in class. (see course schedule; 5 pts each, 40 pts total)

Grading Breakdown

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tbody>
<tr>
<td>Midterm 1</td>
<td>100</td>
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<tr>
<td>Midterm 2</td>
<td>100</td>
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<tr>
<td>Final</td>
<td>125</td>
</tr>
<tr>
<td>Soil data analysis</td>
<td>40</td>
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<tr>
<td>Reading guides</td>
<td>40</td>
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<tr>
<td>Field trip attendance</td>
<td>10</td>
</tr>
<tr>
<td>Class project</td>
<td>100</td>
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</table>

Grading Scale
Course final grades (based on percent total points) will be determined using the following scale: >93 = A; 90-92 = A-; 87-89 = B+; 83-86 = B; 80-82 = B-; 77-79 = C+; 73-76 = C; 70-72
= C−; 67-69 = D+; 63-66 = D; 60-62 = D−; <59 = F. Note: This scale may be adjusted depending on progress of the class.

**Additional Policies**
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. Roll will be taken periodically in the form of thought exercises, reading assignments, and in-class questions. You are responsible for information, announcements, date changes, and any other course material presented, regardless of your participation in the classroom.

As mentioned above, if there is a conflict with an exam, you must email the instructors 2 weeks in advance to see if arrangements can be made (under reasonable circumstances). Otherwise, make-up exams will not be given except in extreme emergencies. Note that make-up exams will be more difficult (because the instructors will need to rewrite the exam specifically for you!), so it is in your best interest to take the exam on the day it is scheduled. If you have an emergency on an exam day, you must get in touch with us before the exam. Assignments will not be accepted late.

Additionally:
- Come to class prepared
- Be respectful of the instructors and other students in class
- Please leave cell phones outside the classroom or turned off
- If you have to miss class make sure you arrange to get notes and announcements

**Course Schedule: A Weekly Breakdown**
For the best learning experience, you are expected to have read assigned material by the date it is discussed in class. Article and supplemental readings will be posted online. The readings and schedule of topics may be adjusted throughout the semester depending on progress of the class.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics/Daily Activities</th>
<th>Readings</th>
<th>Assignment/Due Dates</th>
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</thead>
<tbody>
<tr>
<td>Tues, Jan 14</td>
<td>Water as a chemical</td>
<td>See Bb</td>
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<tr>
<td>Thurs, Jan 16</td>
<td>Hydrosphere &amp; hydrologic cycle</td>
<td>WREI Ch 3</td>
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<tr>
<td>Tues, Jan 21</td>
<td>Watersheds &amp; water supply Article 1 discussion (Vörösmarty)</td>
<td>WREI Ch 5</td>
<td>Reading guide 1</td>
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<tr>
<td>Thurs, Jan 23</td>
<td>Watersheds &amp; water supply</td>
<td>WREI Ch 5</td>
<td></td>
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<tr>
<td>Tues, Jan 28</td>
<td>Water usage &amp; treatment Article 2 discussion (Grant)</td>
<td>WREI Ch 11, 12</td>
<td>Reading guide 2</td>
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<tr>
<td>Thurs, Jan 30</td>
<td>Water usage &amp; treatment</td>
<td>See Bb</td>
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<tr>
<td>Tues, Feb 4</td>
<td>Microbiology &amp; Fecal Indicator Bacteria Article 3 discussion (Karkman)</td>
<td>See Bb</td>
<td>Reading guide 3</td>
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<td>Thurs, Feb 6</td>
<td>Microbiology &amp; Fecal Indicator Bacteria</td>
<td>See Bb</td>
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<tr>
<td>Tues, Feb 11</td>
<td>MIDTERM 1</td>
<td></td>
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<td>Thurs, Feb 13</td>
<td>Soil development &amp; properties</td>
<td>ENPS Ch 1, 2</td>
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<td>Tues, Feb 18</td>
<td>Soil damage &amp; sustainability Article 4 discussion (Amundson)</td>
<td>ENPS 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)</td>
<td>Reading guide 4</td>
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Statement on Academic Conduct and Support Systems

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 Part B, Section 11, “Behavior Violating University Standards” 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, http://policy.usc.edu/scientific-misconduct.

Support Systems:
Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

**Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086**
Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

**Bias Assessment Response and Support**
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

**The Office of Disability Services and Programs**
Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

**Student Support and Advocacy – (213) 821-4710**
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

**Diversity at USC**
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

**USC Emergency Information**
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

**USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.**
Provides overall safety to USC community. dps.usc.edu