



ENST 320a: Water and Soil Sustainability

Fall 2023, TTH 2:00-3:20 pm

Section: 33021, 4 units

Location: WPH 207

Instructor: Dr. David Ginsburg, Professor (Teaching), ENST

Preferred Pronouns: he/him

Office: CAS 116

Office Hours: Thurs, 10:30 am to 12:00 pm or by appointment via Calendly: <https://calendly.com/ginsbuda>

Email: dginsbur@usc.edu

Course goals

ENST 320a presents an overview of the issues related to water and soil sustainability including soil development and management, the hydrologic cycle, the cycling of nutrients, soil and water pollution and food security. *Recommended preparation: ENST 100*

Classroom ground rules

- Share responsibility for including all voices in a conversation
- Listen respectfully to your classmate's and your instructor's viewpoints
- Be open to changing your perspectives based on what you learn from others
- Understand that we are bound to make mistakes in this space
- Understand that your words have effects on others
- Take group work during class and outside of lecture seriously
- Understand that your classmates may have different experiences from your own
- Make an effort to get to know your classmates
- Understand that there are different approaches to solving problems

Learning objectives

Student learning objectives are aligned with the ENST Program (see [link](#)) in which students will:

- Learn about water in the environment by focusing on water dynamics, pollution and how humans use and interact with water
- Investigate soil science to understand how the physical, chemical and biological properties of soil are important to humans and the environment
- Study how soil and water quality are intimately linked and their importance for food production and security worldwide

Course modality

ENST 320a will be taught as a synchronous, in-person course and you are expected to be present for each lecture section. Recorded lectures will not be provided to students via Zoom (or any other platform) unless accommodations have been requested via [OSAS](#). Students that miss class are expected to get notes from their classmates.

This course will primarily use Blackboard (Bb) for communication, information and turning in assignments. PDF copies of lecture slides and links to topics discussed during class will be made available on Bb after each lecture is completed. Additional readings will be assigned throughout the semester and will be announced in class, posted on Bb and via email. During some lectures, we will work with spreadsheet data (using MS Excel) and run data simulations or experiments as either a class or asynchronously (see course schedule for specific dates).

Textbook and Readings

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. Additional readings will be assigned throughout the semester and will be available on Bb

Description and assessment of assignments

You will be graded on the basis of your performance on exams, written assignments, course activities and participation during lectures. If there is a scheduling conflict with an exam, assignment or activity you must notify me via email at least two-weeks in advance to see if alternative arrangements can be made. If it is an excused absence (official USC travel, medical reasons, religious observation, etc.), I will do my best to provide you with a way to obtain the associated points. Otherwise, no make-ups will be allowed. If you miss an exam, quiz, activity, etc., you will receive a zero for that assignment.

Exam questions will be drawn from course readings, lecture materials and any related assignments, activities and discussions. Two separate exams (midterm and final) are scheduled over the course of the semester. The final exam is partially cumulative and will be comprised of ~20% cumulative and 80% new material covered in the course.

Both the midterm and final will be administered in the classroom via Bb (specific details will be discussed/posted closer to the date on the course schedule). Therefore, each student is *required* to bring a laptop computer to class on the day of the midterm and final (If you need to borrow a computer – see the [USC Computing Center Laptop Loaner Program](#) website for details). During exams, students are NOT allowed to work as a group, use notes, books, mobile devices, etc. Failure to comply with exam policies will result in a zero on that specific exam. Lecture section activity and assignment points comprise 70% of the total course grade. Laboratory activities and points (outlined in lab section schedule) make up 30% of the total course grade.

All assignments must be submitted by the stated deadlines. Late assignments will have 20% deducted each 24 hours, with the first 24 hr deduction starting 15 min after the deadline. Reminder: USC policy prohibits sharing of any course content outside of the learning environment.

Overview of graded course work:

- **Water-soil presentation:** This is a group assignment in which students (two per group) will present a water-soil-related topic (instructor approved) that is unrelated to the material being covered in class. Students will present their topic orally (10 min) during lecture and submit a written summary via Bb (2 page max, single spaced). Each group presentation is worth a total of 50 points (25 pts presentation; 15 pts summary; 5 pts title/topic submission, 5 pts evaluation).
- **Article analysis:** Students will critically read an assigned article (from either the primary or secondary literature) and provide a written summary (1 page max; single spaced) to questions posted online, which they will then submit via Bb. Students will discuss their findings during class on the day each assignment is due. Six separate article summaries are scheduled over the course of the semester and are worth a total of 48 points (8 pts each).

- **Soil analysis:** Students will analyze a set of soil data with Excel 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 and is worth a total of 45 points (15 pts in-class, 30 pts summary).
- **Data interpretation:** In-class activity in which students review and analyze data from the primary literature in order to answer critical questions as a group. Approximately 5-6 data interpretation activities will be randomly assigned throughout the semester and are part of the participation grade (40 points max). Students must be present in class to receive credit for these assignments (i.e., if absent, you will receive a zero for that particular assignment).

Grading Breakdown

Assignment	Points	% Lecture	% Course
Midterm	100	25%	17%
Final	120	30%	21%
Water-soil presentation	50	12%	9%
Article analyses (6 x 8 pts)	48	12%	8%
Soil analysis	45	11%	8%
Participation (data interp., disc, etc.)	40	10%	7%
Total	403	100%	70%*

*Lecture and lab sections comprise 70% and 30%, respectively, of total grade (575 pts overall)

Grading scale

Final course grades will be determined based on the percentage of points earned as outlined below. This scale may be adjusted depending on the progress of the class. If course taken as a "Pass" grade, you must earn a letter grade of C- or greater (see above) in course. A final point score at or below a D+ grade will result in a "No Pass".

A	94-100	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

Additional policies

Routine attendance and active participation are an important part of each class session. Participation will be evaluated via thought exercises, reading assignments, in-class quizzes and questions. You are responsible for all information, announcements, date changes and any other course material presented, regardless of your participation or presence in the classroom.

The use of phones and other devices for text messaging, email, social media use, and web-browsing is not permitted in class except where required for in-class work. Students are encouraged to use a paper notebook and pen for recording notes.

Course Schedule

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

Date	ENST 320a Course Topics, Activities and Assignments	Textbook and course readings
Aug 22	Water as a chemical	See Bb
Aug 24	Hydrosphere & hydrologic cycle	WREI Ch 3
Aug 29	Watersheds & water supply Article analysis & discussion 1	WREI Ch 5 See Bb
Aug 31	Watersheds & water supply, cont'd	WREI Ch 5, see Bb
Sep 04	Labor Day Holiday – No Class	
Sep 07	Water usage & treatment	WREI Ch 11
Sep 12	Water usage & treatment, cont'd Article analysis & discussion 2	WREI Ch 12 See Bb
Sep 14	Water-Soil Presentations #1 (1-6)	In-class activity
Sep 19	Soil development & properties	ENPS Ch. 1-2, Ch. 4
Sep 21	Soil development & properties, cont'd	ENPS Ch. 11, 14
Sep 26	Agriculture & food security Article analysis & discussion 3	See Bb
Sep 28	Agriculture & food security, cont'd	See Bb
Oct 03	Water-Soil Presentations #2 (7-12)	In-class activity
Oct 05	MIDTERM EXAM	
Oct 10	Microbiology & Fecal Indicator Bacteria	USGS FIB, see Bb
Oct 12	Fall Recess – No Class	
Oct 17	Surface & subsurface water dynamics	ENPS Ch 5, 6, WREI Ch 6
Oct 19	Water allocation and policy	WREI Ch 12, 13
Oct 24	Coastal pollution Article analysis & discussion 4	WREI Ch. 9 See Bb
Oct 26	Soil food webs	ENPS Ch. 10
Oct 31	Biogeochemical cycling	ENPS Ch 11, 12
Nov 02	Biogeochemical cycling, cont'd Article analysis & discussion 5	ENPS Ch 13 See Bb
Nov 07	Water-Soil Presentations #3 (13-17)	In-class activity
Nov 09	Soil data analysis (Excel data analysis)	In-class assignment
Nov 14	Fisheries and blue economy	See Bb
Nov 16	Fisheries and blue economy, cont'd Article analysis & discussion 6	See Bb
Nov 21	TBA	Asynchronous assignment
Nov 23	Thanksgiving Holiday – No Class	
Nov 28	Wrap up and review	
Nov 30	Water-Soil Presentations #4 (18-22)	In-class activity
Dec 07	FINAL EXAM: Thurs, Dec 7, 2:00-4:00 pm	

About the instructor

Dr. David Ginsburg is a Professor (Teaching) of Environmental Studies at the University of Southern California and a Research Associate in Invertebrate Zoology (Echinoderms) at the Natural History Museum of Los Angeles County. Ginsburg oversees undergraduate research projects across a range university- and externally-funded (ARPA-E, NSF) initiatives. He holds a Ph.D. in Marine Environmental Biology (USC), M.S. in Chemical Ecology (Univ of Guam) and B.A. in Biology from UC Santa Cruz, and has worked in a variety of marine environments from tropical coral reefs and temperate kelp forests to polar benthic habitats. Prior to joining the USC faculty, Ginsburg was a postdoctoral researcher in UCLA's Department of Civil and Environmental Engineering and a Marine Policy Fellow with NOAA. His teaching is focused on environmental studies and sciences, which includes hands-on learning and research experiences in the classroom and field. His awards include the USC Provost's Prize for Teaching with Technology and the Steven B. Sample Mentoring and Teaching Award.

Statement on Academic Conduct and Support Systems

Academic integrity

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask me if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and disability accommodations

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services](#) (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined

to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support systems

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

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

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

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

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) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.