USC Dornsife
Dana and David Dornsife College of Letters, Arts ar

ENST 335: Science, Health and the Environment

Units: 4
Spring 2021, MW 2-3:20

Location: Zoom

Instructor: Jill Sohm
Office: CAS 116B
Office Hours: by appointment (https://calendly.com/jill_sohm)
Email: sohm@usc.edu
Phone: 818-824-4296 (Google Voice)

Classroom ground rules

- 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 we are bound to make mistakes in this space.
- Understand that your words have effects on others.
- Take pair work or small group work seriously.
- Understand that others come to these discussions with different experiences from yours.
- Make an effort to get to know other students.
- Understand that there are different approaches to solving problems.

Course Description/Rationale

In the 20th century, human population growth exploded, aided heavily by the knowledge gained during that time about infectious diseases, sanitation, immunity, antibiotics, etc. In the developed world, deaths from infectious diseases have given way to diseases from old age, but the rest of the world has not yet caught up. Many of the diseases that are most widespread are spread through the environment or are increased because of environmental degradation. Understanding the role of the environment in these diseases is key to controlling them. With continued environmental damage, developing and developed nations are now finding themselves at risk from emerging diseases and those caused by water and air pollution. The health of the human race is inextricably linked to the health of the planet, and this class aims to plumb the depths of this topic for understanding of how to increase both in the future.

Learning Objectives

- Gain background knowledge in microbiology, epidemiology, parasitology
- Understand the ecology and life cycles of diseases that are transmitted from the environment
- Appreciate the ecology and life cycles of diseases whose transmission is effected by environmental degradation
- Discover the importance of environment and climate on disease throughout the world
- Explore the implications of climate change on disease transmission

- Understand how to break the cycle of environmentally transmitted diseases
- Discuss sanitation and its role in preventing disease
- This course is consistent with the Student Learning Objectives of the Environmental Studies Program: https://dornsife.usc.edu/environmental-studies/learning-objectives/

Prerequisite(s): BISC 103 or 120

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 an email reminder sent to the class. Sometimes we will work with real life data in excel, run simple simulations, and do mapping. 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

Texts:

- CDC (2011) Principles of Epidemiology in Public Health Practice, Lesson 1. Available at: http://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson1/index.html

Other resources:

- CDC disease pages: http://www.cdc.gov/DiseasesConditions/
- CDC Emerging and Zoonotic Infectious Diseases: http://www.cdc.gov/ncezid/
- WHO disease pages: http://www.who.int/topics/en/

Description and Assessment of Assignments and Exams

The written assignment will involve writing a 6-7 page (~1500 word) research paper on an infectious disease that relates to the environment that do not cover in class. The paper will address the life cycle of the organism that causes the disease, how it is transmitted, how human activity/environmental change has affected its spread, and how this knowledge can be used to prevent transmission. The written assignment will be assessed for completeness of content, as well as writing clarity/quality.

The group presentation will be a case study of a disease you are interested in and how one country, city, or region implemented a public health campaign to reduce the disease. The group presentation will be assessed for its content and the quality of delivery by the students.

Reading guides will involve reading primary literature, answering questions outside of class, turning them in ahead of time, and a discussion of the paper in class and will be assessed for completeness.

Students will complete in class exercises where they will gather disease data, manipulate it, do basic statistical analyses and map it with a choropleth map, and consider the changes in disease distribution over time.

Students will create a water filter at home with easily accessible materials. Each student will present their water filter, and turn in a short description of their filter and the theory behind it's effectiveness. I will reimburse you for supplies needed to be purchased, up to $10.

This semester we will be examining the COVID pandemic throughout the semester. As part of this, students will listen to podcasts, turn in a few answers to questions relating to those podcasts, and be prepared to discuss them in class.

Assessment this semester will shorter quizzes throughout the semester. Every three weeks, we will have a quiz online, with a total of 5. These will be open note. There will be no make-ups for missed quizzes, and if there is a scheduling conflict, you must notify me 2 weeks in advance. Failure to comply with exam policies will automatically result in a grade of "0" for that particular exam.

Grading Breakdown

Assignment	Points	Percent
Quizzes (5)	125	42%
Disease paper	50	17%
Final presentation	40	13%
Reading guides (5)	20	7%
Podcast questions (5)	20	7%
R exercises (3)	15	5%
Water filter summary	30	10%
TOTAL	300	100%

Grading Scale

Course final grades will be determined using the following scale

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59 and below

Additional Policies

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. Make-up exams will also be more difficult, so it is in your best interest to take the exam on the day it is scheduled. If you have an emergency on exam day, you must get in touch with me before the exam if possible. Assignments will not be accepted late. Additionally:

- Come to class prepared
- Be respectful of me 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

	Videos/audio to watch before class	Topics/Daily Activities	Readings and Homework	Deliverable/ Due Dates
Jan 18		Martin Luther King Jr Day: NO CLASS		
Jan 20		Introduction		
Jan 25	Microbiology basics, Naked Scientist podcast: origin of COVID	Check in on microbiology and discussion of podcast	Open Stax Microbiology: 1.1,1.3 (3.3 & 3.4 for reference)	**Podcast questions**
Jan 27	Microbiology, human health and disease	Disease modeling	Open Stax Microbiology: 15.1; CDC Lesson 1, sec. 10	
Feb 1	Epidemiology basics (including immunology and vaccines)	John Snow case study (history of epidemiology), vaccines	CDC Les. 1, sec. 1, 6, 8, 11	
Feb 3		Epidemiology case study: importance of water for health, Downloading and manipulating data in R	Selendy Ch 5 (skip sections on specific agents)	
Feb 8		***Quiz on intro, microbiology, epidemiology*** Environmentally transmitted fungal diseases: Histoplasmosis	Histo on eMedicine	
Feb 10	Environmentally transmitted fungal diseases: Cryptococosis, Valley Fever	Check in/discussion on fungal diseases and reading guide	CDC: Valley fever	Submission of topic for paper; Reading guide 1 – Kidd 2007
Feb 15		Presidents Day: NO CLASS		
Feb 17	Environmentally transmitted bacterial diseases: soil associated diseases (tetanus), Trachoma; COVID: Cautionary tales podcast	Check-in on bacterial diseases Podcast discussion	Baumgardner, Selendy Ch.14	podcast questions
Feb 24		***Quiz on Fungal and bacterial diseases***		

Mar 1	Environmentally transmitted viral diseases: Poliomyelitis	Check in on polio Reading guide discussion	OpenStax Micro: 6.1, WHO polio factsheet	Reading guide 3 due – eradic. polio
Mar 3	Environmentally transmitted viral diseases: rotavirus, norovirus	R data exercise: descriptive stats and correlation	CDC rotavirus pink sheet, Hall 2013	
Mar 8		Cryptosporidium case study activity; Environmentally transmitted protistan diseases: Giardia, Cryptosporidium	Marshall	
Mar 10	Helminths: Guinea worm, Giant Roundworm, Shisto; COVID: Uncertain hour – essential work	Check-in on helminths COVID podcast discussion	Selendy Ch. 7, 10, 13	**Podcast questions**
Mar 15		***Quiz on viral, protistan and helminth diseases*** R data exercise: mapping		
Mar 17	Vector borne diseases: Malaria, Dengue fever, Bubonic plague	Check in and reading guide discussion	Selendy Ch. 9, 12, 32	Reading guide 4 due - Frith
Mar 22		**Guest lecture from LA County Vector Control**		
Mar 24	Vector borne diseases: Lyme	Check in on Lyme		Disease paper due
Mar 29	Epidemics caused by how we live: influenza COVID: Uncertain Hour – quarantines and equity	Check-in on inflenza COVID podcast discussion	Taubenberger	**Podcast questions**
Mar 31		***Quiz on vector borne disease and influenza*** Sanitation and water lecture	Selendy Ch. 20, 21, **22**	Submission of topic for presentation
Apr 5	Building a water filter	Short presentations on water filters	Selendy Ch. 18	Summary of your water filter
Apr 7		**Wellness day: NO CLASS**		
Apr 12	Environmental toxicology and epidemiology	Cancer Alley readings exercise and discussion	Friis Ch. 2; assigned pollution reading	

Apr 14	Water pollution and disease (arsenic and lead)	Reading guide discussion	Selendy Ch. 24	Reading guide 5 due – Hanna-Atisha
Apr 19		Freeway pollution and children's health with fabulous guest speaker **Ed Avol**		
Apr 21	Air pollution and disease (indoor and outdoor) COVID: How the pandemic ends	Check in on air pollution COVID podcast discussion	Tibbetts	**Podcast questions**
Apr 26		***Quiz: water, sanitation, pollution***		
Apr 28		**Presentations**		
May 10		**2-4PM: FINAL PRESENTATIONS**		

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