

ENST 335: Science, Health and the Environment
Units: 4
Spring 2019, TTh 9:30-10:50am

Location: WHP 207

Instructor: Jill Sohm
Office: CAS 116B
Office Hours: TBA
Email: sohm@usc.edu
Phone: 213-821-0534 (office)
818-824-4296 (Google Voice)

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 computers will be used in class to work with real life data in excel, run simple simulations, and do mapping – 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

Texts:

- Selendy, J.M.H. (2011) Water and Sanitation Related Diseases. Wiley-Blackwell.
- Money, N.P. (2014) Microbiology: A Very Short Introduction. Oxford University Press.
- 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 we will not be covering 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. They will be worth 5 points each.

All three exams will cover material immediately after the preceding exam (or beginning of class for midterm 1) up to the exam. The final exam will be a midterm. Exams will focus on lecture and reading material. 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.

Grading Breakdown

Assignment	Points	Percent
Midterm 1	100	22
Midterm 2	100	22
Final	100	22
Disease paper	65	14
Group presentation	50	11
Reading guides (6)	30	6
Air pollution data collection	10	2
In class map exercise	5	1
TOTAL	460	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

	Topics/Daily Activities	Readings and Homework	Deliverable/ Due Dates
Jan 8	Introduction		
Jan 10	Microbiology basics	Money Ch. 1	
Jan 15	Microbiology, human health and disease (including immunology and vaccines)	Money Ch. 5; CDC Lesson 1, sec. 10	
Jan 17	Epidemiology basics	CDC Les. 1, sec. 1, 6, 8, 11	
Jan 22	Epidemiology case study and the importance of water for health	Selendy Ch. 2	
Jan 24	Environmentally transmitted fungal diseases: Histoplasmosis, Cryptococcus	Galgiani (Coccidioides), Histo on emedicine (BB)	Reading guide 1 due – Kidd 2007
Jan 29	Environmentally transmitted fungal diseases: Valley Fever; Disease along the river game	Disease along the River (BB)	Submission of topic for paper
Jan 31	Environmentally transmitted bacterial diseases: Cholera	Baumgardner (BB) Selendy Ch. 5, 15.5, 14	Reading guide 2 due – Pascual 2000
Feb 5	Midterm 1		
Feb 7	Environmentally transmitted bacterial diseases: soil associated diseases, infectious diarrhea, Trachoma	Baumgardner (on BB) Selendy Ch. 5, 15.5, 14	
Feb 12	Finish bacterial diseases; Environmentally transmitted viral diseases: Poliomyelitis, rotavirus, norovirus	Money Ch. 4, WHO polio factsheet, CDC rotavirus pink sheet, Hall 2013	Reading guide 3 due – eradic. polio
Feb 14	Continue environmentally transmitted viral diseases: Poliomyelitis, rotavirus, norovirus	Money Ch. 4, WHO polio factsheet, CDC rotavirus pink sheet, Hall 2013	
Feb 19	Environmentally transmitted protistan diseases: Giardia, Cryptosporidium, Entamoeba histolytica, Naegleria	Marshall (BB)	
Feb 21	Helminths: Guinea worm, blood fluke, Pinworm, Roundworm	Selendy Ch. 7, 10, 13	
Feb 26	Disease mapping exercise		
Feb 28	Vector borne diseases: Malaria, Dengue fever, Bubonic plague, Lyme		Reading guide 4 due - Frith
Mar 5	Guest lecture from LA County Vector Control		

Mar 7	Continues vector borne diseases: Malaria, Dengue, Bubonic plague, Lyme	Selendy Ch. 9, 12, 32	Disease paper due
Mar 10-17	SPRING BREAK - NO CLASS		
Mar 19	Environmental change and the spread of disease	Selendy Ch. 31, Worldwatch report 181 Pg. 15-22 (BB)	Submission of topic for presentation
Mar 21	Midterm 2		
Mar 26	Epidemics caused by how we live: influenza, mad cow, antibiotic resistance	Taubenberger, Columbus (BB)	Reading guide due 5 - Drury
Mar 28	Sanitation	Selendy Ch. 20, 21, 22	
Apr 2	Building a biosand filter	Selendy Ch. 18	
Apr 4	Environmental toxicology and epidemiology	Friis Ch. 2 (BB)	
Apr 9,11	Water pollution and disease	Selendy Ch. 23, 24, 25, 29	Reading guide 6 due – Hanna-Atisha
Apr 16	Air pollution and disease (indoor and outdoor)	Tibbetts (BB)	
Apr 18	Freeway pollution and children's health with fabulous guest speaker Ed Avol		
Apr 23,25	Presentations		
Final	8-10AM: FINAL EXAM		

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