ENST 335: Science, Health and the Environment
Units: 4
Spring 2018, TTh 9:30-10:50am

Location: WHP 107

Instructor: Jill Sohm
Office: CAS 116B
Office Hours: Tues 11-12; Wed 10-11:30
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:

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
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 and 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.

Grading:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tbody>
<tr>
<td>Midterm 1</td>
<td>100 pts (22%)</td>
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<tr>
<td>Midterm 2</td>
<td>100 pts (22%)</td>
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<tr>
<td>Final exam</td>
<td>100 pts (22%)</td>
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<tr>
<td>Written assignment</td>
<td>65 pts (15%)</td>
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<tr>
<td>Group presentation</td>
<td>50 pts (11%)</td>
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<tr>
<td>Reading guides</td>
<td>30 pts (7%)</td>
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</tbody>
</table>

Grading scale: A = 92.5-100%
A- = 89.5-92.4%
B+ = 86.5-89.4%
B = 82.5-86.4%
B- = 79.5-82.4%
C+ = 76.5-79.5%
C = 72.5-76.4%
C- = 69.5-72.4%
D = 59.5-69.4%
F = <59.5%

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

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>% of Grade</th>
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</thead>
<tbody>
<tr>
<td>Midterm 1</td>
<td>100</td>
<td>22.5</td>
</tr>
<tr>
<td>Midterm 2</td>
<td>100</td>
<td>22.5</td>
</tr>
<tr>
<td>Final</td>
<td>100</td>
<td>22.5</td>
</tr>
<tr>
<td>Disease paper</td>
<td>65</td>
<td>14.5</td>
</tr>
<tr>
<td>Group presentation</td>
<td>50</td>
<td>11</td>
</tr>
<tr>
<td>Reading guides (6)</td>
<td>30</td>
<td>7</td>
</tr>
</tbody>
</table>

TOTAL 445 100

Grading Scale (Example)
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 us 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

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics/Daily Activities</th>
<th>Readings and Homework</th>
<th>Deliverable/ Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction</td>
<td>Money Ch. 1</td>
<td></td>
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<tr>
<td></td>
<td>Microbiology basics</td>
<td></td>
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<tr>
<td>Week 2</td>
<td>Microbiology, human health and disease (including immunology and vaccines)</td>
<td>Money Ch. 5; CDC Lesson 1, sec. 10</td>
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<tr>
<td></td>
<td>Epidemiology basics</td>
<td>CDC Lesson 1, sec. 1, 6, 8, 11</td>
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<tr>
<td>Week 3</td>
<td>Epidemiology case study and the importance of water for health</td>
<td>Selendy Ch. 2</td>
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<td></td>
<td>Environmentally transmitted fungal diseases: Histoplasmosis, Cryptococcus</td>
<td>Galgiani (Coccidioides), Histo on emedicine (BB)</td>
<td>Reading guide 1 due – Kidd 2007</td>
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<tr>
<td>Week 4</td>
<td>Environmentally transmitted fungal diseases: Valley Fever; Disease along the river game</td>
<td>Disease along the River (BB)</td>
<td>Submission of topic for paper</td>
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<tr>
<td></td>
<td>Environmentally transmitted bacterial diseases: Cholera</td>
<td>Baumgardner (BB) Selendy Ch. 5, 15.5, 14</td>
<td>Reading guide 2 due – Pascual 2000</td>
</tr>
<tr>
<td>Week 5</td>
<td>Midterm 1</td>
<td>Baumgardner (on BB) Selendy Ch. 5, 15.5, 14</td>
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<td></td>
<td>Environmentally transmitted bacterial diseases: soil associated diseases, infectious diarrhea, Trachoma</td>
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<td>Week 6</td>
<td>Environmentally transmitted viral diseases: Poliomyelitis, rotavirus, norovirus</td>
<td>Money Ch. 4, WHO polio factsheet, CDC rotavirus pink sheet, Hall 2013</td>
<td>Reading guide 3 due – eradic. polio</td>
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<td>Week 7</td>
<td>Environmentally transmitted protistan diseases: Giardia, Cryptosporidium, Enamoeba hystolitica, Naeglaeria Helminths: Guinea worm, blood fluke, Pinworm, Roundworm</td>
<td>Marshall (BB)</td>
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<td>Selendy Ch. 7, 10, 13</td>
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<tr>
<td>Week 8</td>
<td>Microscopy: identification of protists and helminth eggs</td>
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<td>Selendy Ch. 9, 12, 32</td>
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<td>Week 9</td>
<td>Guest lecture from LA County Vector Control Vector borne diseases: Malaria, Dengue fever, Bubonic plague, Lyme</td>
<td>Reading guide 4 due - Frith</td>
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<tr>
<td>Week 10</td>
<td>Environmental change and the spread of disease Midterm 2</td>
<td>Selendy Ch. 9, 12, 32 Paper due</td>
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<tr>
<td>Week 11</td>
<td>Epidemics caused by how we live: influenza, mad cow, antibiotic resistance Sanitation</td>
<td>Selendy Ch. 20, 21, 22 Submission of topic for presentation</td>
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</tr>
<tr>
<td>Week 12</td>
<td>Building a biosand filter Environmental toxicology and epidemiology</td>
<td>Selendy Ch. 18 Friis Ch. 2 (BB)</td>
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<tr>
<td>Week 13</td>
<td>Water pollution and disease</td>
<td>Selendy Ch. 23, 24, 25, 29</td>
<td></td>
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<tr>
<td>Week 14</td>
<td>Air pollution and disease</td>
<td>Tibbetts (BB) Reading guide 6 due - Hennig</td>
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<tr>
<td>Week 15</td>
<td>Presentations</td>
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<tr>
<td>Final</td>
<td></td>
<td>Date: For the date and time of the final for this class, consult the USC Schedule of Classes at classes.usc.edu.</td>
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</tbody>
</table>

**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](http://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](http://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](http://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](http://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](http://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](http://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](http://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](http://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](http://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](http://dps.usc.edu)