




2018

Syllabus: Drinking Water, Sanitation, and Global development

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**CE-ENGIN 597D: Drinking water, sanitation, and global development
Spring 2018**

Instructor: Emily Kumpel
Lecture: Tu, Th 11:30AM-12:45PM
Enrollment: Open to Seniors and Graduate students with a GPA \geq 3.0
Prerequisites: CE-ENGIN 370 or permission from the instructor

Syllabus Version 2 (March 2018)

RATIONALE: Within the past three decades, more than 2.6 billion people have gained access to an improved water source and 2.1 billion have gained access to an improved sanitation facility. However, *improved* does not always mean people have safe, reliable, accessible, or equitable water and sanitation services. Waterborne diseases continue to cause an estimated 500,000 deaths each year. What causes waterborne diseases, and what is the role of engineered systems in their spread or prevention? How can we evaluate interventions to improve health and well-being? How can research address these challenges?

COURSE OBJECTIVES:

By the end of the course, students will be able to:

- Describe categories of waterborne diseases, pathogens, and indicator organisms most relevant to lower-income settings.
- Critically evaluate the ability of engineered water and sanitation interventions to provide both health and non-health benefits.
- Identify challenges to maintaining successful interventions in different contexts.
- Evaluate engineering and health-based research studies in the area of water and sanitation in developing communities.

READINGS & ASSIGNMENTS:

(1) *Readings and assignments:* All readings and assignments will be posted to moodle.umass.edu for you to download. These are an integral part of this class. I expect you to come to class having read the assignment listed for that day and be ready to participate in discussions throughout the class periods.

Weekly assignments will be due **every Thursday through Moodle** by the start of class time. These questions will cover the reading for the current and previous class session. Some of these will involve posting to class forums and/or responding to classmates' submissions. Late assignments will accrue a penalty of a 10% deduction from the total score for each day late.

(2) *Midterm:* There will be one midterm exam consisting of short answer and essay questions based on lecture material, readings, and assignments.

(3) *Debates:* There will be three debates during class periods in which teams will present structured arguments for or against a particular water, sanitation, or hygiene intervention. You will participate in 1-2 of the debates (depending on the final class enrollment) and be an audience member in the others. You will be assigned to a group and a side of the argument, and will be expected to prepare your arguments by submitting a written outline prior to the debate. As a participant, you will be expected to submit a written review after the in-class debate. Attendance is required.

(4) *Final Paper:* There will be two options for conducting a literature review on a topic of your choice. 1) (For research-oriented students) A literature review on a topic related to the themes of the class with identification of areas for future research, written in the format of a research paper; or 2) (For practitioner-oriented students) A critical review of peer-reviewed research on a WASH topic or theme, written for a policy/practitioner audience. The final paper is due through Moodle at the scheduled final exam date and time. There will be deadlines and opportunities for peer and instructor review on this assignment earlier in the semester.

GRADING:

| | |
|--------------------------------------|-----|
| Readings, assignments, participation | 25% |
| Midterm Exam (Week 6) | 25% |
| Debates (Weeks 9-12) | 25% |
| Final paper (Week 15) | 25% |

COURSE WEBSITE AND MATERIALS:

All readings and assignments will be posted on moodle.umass.edu.

COURSE SCHEDULE (SUBJECT TO CHANGE)

| Week | Date | Topic | Due |
|-------------|---------------------|---|------------|
| 1 | Jan 23 (Tue) | Introduction and history | |
| | Jan 25 (Thu) | Sustainable Development Goals | |
| 2 | Jan 30 (Tue) | Water, Sanitation, and Health | |
| | Feb 1 (Thu) | Classification, sources, and exposure | HW 1 |
| 3 | Feb 6 (Tue) | Pathogens | |
| | Feb 8 (Thu) | Pathogens | HW 2 |
| 4 | Feb 13 (Tue) | Indicators | |
| | Feb 15 (Thu) | Detection methods | HW 3 |
| 5 | Feb 20 (Tue) | Removal and Inactivation | |
| | Feb 22 (Thu) | Removal and Inactivation | HW 4 |
| 6 | Feb 27 (Tue) | Midterm Exam | |
| | Mar 1 (Thu) | Interventions | HW 5 |
| 7 | Mar 6 (Tue) | Water quantity | |
| | Mar 8 (Thu) | Access | HW 6 |
| | <i>March 12-16</i> | <i>No class (spring break)</i> | |
| 8 | Mar 20 (Tue) | Writing workshop | |
| | Mar 22 (Thu) | Non-health impacts, piped water | HW 7 |
| 9 | Mar 27 (Tue) | Sustainability and participation | |
| | Mar 29 (Thu) | Compliance and storage | HW 8 |
| 10 | Apr 3 (Tue) | Debate 1 | |
| | Apr 5 (Thu) | Sanitation | HW 9 |
| 11 | Apr 10 (Tue) | Sanitation | |
| | Apr 12 (Thu) | Debate 2 | HW 10 |
| 12 | <i>Apr 18 (Tue)</i> | <i>Monday class schedule - no class</i> | |
| | Apr 19 (Thu) | Sanitation guest lecture | HW 11 |
| 13 | Apr 24 (Tue) | Debate 3 | |
| | Apr 26 (Thu) | Multidimensional interventions | HW 12 |
| 14 | May 2 (Tue) | Summary and synthesis | |
| | May 9 | No final exam - final project due by 5pm | |

Writing Center:

The Writing Center is located in W. E. B. Du Bois Library and provides free support on any writing you do while at UMass, whether for a course or not. Trained tutors are available to work with you (in person or [online](#)) as you plan, draft, and revise your writing. Please visit www.umass.edu/writingcenter for hours and [information about making appointments](#). If you have questions about the UMass Writing Center, please email writingcenter@acad.umass.edu or call [413-577-1293](tel:413-577-1293).

Classroom Policies

Academic Honesty Policy Statement

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. The procedures outlined below are intended to provide an efficient and orderly process by which action may be taken if it appears that academic dishonesty has occurred and by which students may appeal such actions. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent.

For more information about what constitutes academic dishonesty, please see the Dean of Students' website: http://umass.edu/dean_students/codeofconduct/acadhonesty/

Disability Statement

The University of Massachusetts Amherst is committed to making reasonable, effective and appropriate accommodations to meet the needs of students with disabilities and help create a barrier-free campus. If you are in need of accommodation for a documented disability, register with Disability Services to have an accommodation letter sent Professor Kumpel. It is your responsibility to initiate these services and to communicate with faculty ahead of time to manage accommodations in a timely manner. For more information, consult the Disability Services website at: <http://www.umass.edu/disability/>