DEPARTMENT: Environmental Health

COURSE NUMBER: EH548  SECTION NUMBER: 000  SEMESTER: Spring 2015

CREDIT HOURS: 3

COURSE TITLE: Research Methods for Studies of Water & Health

COURSE TIME: Mondays, 9-11:50am  LOCATION: GCR 107 & CNR 6th floor teaching lab

INSTRUCTOR NAME: Karen Levy
EMAIL: karen.levy@emory.edu
PHONE: 404.727.4502

SCHOOL ADDRESS OR MAILBOX LOCATION: 2019 CNR
OFFICE HOURS: Weds 1:30-2:30pm or by appointment. Please notify me if you plan to come by.

TEACHING ASSISTANT: Debbie Lee
EMAIL: debbie.lee@emory.edu
OFFICE HOURS: Thurs 1-3pm or by appointment; 2040Q CNR (PhD student area)

BRIEF COURSE DESCRIPTION

This hands-on course covers methods needed to carry out field studies focused on water and health. Through lecture and laboratory exercises, students will learn critical skills in measuring water quality exposure assessment and waterborne disease health outcomes that will enable them to conduct their own field studies and analyze the resulting data. The focus will be on issues of microbiological contamination in developing countries, but chemical contamination and domestic cases will also be covered.

PREREQUISITES

GH 529 (Water and Sanitation in Developing Countries) or Equivalent (with permission from instructor)

ENROLLMENT

Limited to 20 students due to constraints of laboratory space

ACADEMIC HONOR CODE

The RSPH requires that all material submitted by a student in fulfilling his or her academic course of study must be the original work of the student.
LIST SCHOOL LEVEL, DEPARTMENT, AND/OR PROGRAM COMPETENCIES

RSPH Competencies
- Use analytic reasoning and quantitative methods to address questions in public health and population-based research
- Describe environmental conditions, including biological, physical and chemical factors, that affect the health of individuals, communities and populations
- Describe the use of epidemiology methods to study the etiology and control of disease and injury in populations
- Describe behavioral, social and cultural factors that contribute to the health and well being of individuals, communities and populations
- Assess global forces that influence the health of culturally diverse populations around the world

EH/GEH Competencies
- Describe major environmental risks to human health ranging from the local to global scale
- Assess the sources and movement of contaminants through the environment
- Characterize the magnitude, frequency and duration of environmental exposures
- Apply the principles of toxicology to assess health effects of environmental exposures
- Apply the principles of epidemiology to assess health effects of environmental exposures
- Appraise the environmental, behavioral and social factors that contribute to the emergence, re-emergence, and persistence of infectious diseases
- Assess the major forces that influence the health of populations around the world.

LIST LEARNING OBJECTIVES ASSOCIATED WITH THE COMPETENCIES
- Understand key issues in designing studies of water and health
- Learn theory behind and how to carry out microbiological assessment of water quality
- Learn theory behind and how to carry out physiochemical assessment of water quality
- Learn how to carry out field evaluation of water treatment technologies
- Learn how to carry out observational studies & observational techniques
- Learn how to design surveys specific to studies of water & health
- Learn how to carry out qualitative interviews

EVALUATION

Evaluation will be based on
Class participation 15pts (attendance and participation)
Timely completion of lab tasks 4 pts (4 assignment @1 pt each)
Lab write-ups 30 pts (3 assignments @ 10 pts each)
Final project benchmarks 36 pts (1 assignment @ 1pt; 7 assignments @5 pts each)
Final project 15-20 min oral presentation 5 pts
Final project write-up 10 pts

Late assignments will be penalized by 10% of the assignment’s value per day past the due date.

Attendance at all class sessions is MANDATORY. Please contact instructor for any extenuating circumstances. Absences with a valid excuse must be pre-approved by course instructor, otherwise students will lose 1pt per absence (pro-rated for portions of class missed)
**JANUARY 12 – MEET @CLASSROOM**

**LECTURE:** Course Introduction, Microbial Indicators of Water Quality [Levy]

**LECTURE:** Review of lab safety / sample collection procedures [Lee]

**Assignments:**

Due Jan. 26:

(1) Take EHSO Lab safety course [http://www.ehso.emory.edu/training/index.cfm](http://www.ehso.emory.edu/training/index.cfm). Enroll in Research Laboratory Safety (course code 240150) [1 pt]

(2) Readings:

**REQUIRED:**


**OPTIONAL:**

- CDC Microbiological Indicator Testing in Developing Countries: A Fact Sheet for the Field Practitioner. Version 1, December 2010.

(3) Collect water sample <24 hours before lab on Jan. 26

**JANUARY 19 – MLK DAY, NO CLASS**

**JANUARY 26– MEET @TEACHING LAB**

**LAB 1: Microbial Indicators of WQ**

*We will break up into 2 groups, one group will meet 9-11am, the other group 11am-1pm*

**Assignments:**

Due Jan. 27:

(1) Read results of WQ assays after 24 ± 2 hrs. of incubation

Due by Jan. 28 @12pm:

(2) Upload Lab 1 results [1 pt]

Due by Feb. 1 @ midnight:

(3) Lab 1 Write-up [10 pts]

Due by Feb. 2:

(4) Readings: WHO Drinking Water Quality Guidelines. 2008. Ch. 8: Chemical Aspects

**FEBRUARY 2– MEET @TEACHING LAB**

**LAB 2: Chemical Indicators of WQ**

*We will break up into 2 groups, one group will meet 9-11am, the other group 11am-1pm*

**Assignments:**

Due by Feb. 3 @12pm:

(1) Upload Lab 2 results [1 pt]

Due by Feb. 8 @ midnight:

(2) Lab 2 Write-up [10 pts]

Due by Feb. 9:

(3) Readings: TBA
FEBRUARY 9‒MEET @CLASSROOM
LECTURE: Waterborne Disease Epidemiology [Quick]
DISCUSSION of Group Projects

Assignments
Due Feb. 16:
(1) Meet with project groups to discuss project ideas & prepare presentation of proposal. [1 pt]
(2) Readings: TBA

FEBRUARY 16‒MEET @CLASSROOM
STUDENT PRESENTATIONS: Draft project proposals (5-10 min per group)
LECTURE: Intervention Trials [Clasen]

Assignments
Due Feb. 22 @midnight:
(1) Meet with project groups to draft project protocol. [5 pts]
(2) Readings:
• Hennink, Hutter & Bailey. 2011. Qualitative Research Methods. Ch. 6: In-depth Interviews

FEBRUARY 23‒MEET @CLASSROOM
LECTURE & ACTIVITY: Qualitative Interviews [Caruso]

Assignments:
Due March 1 @midnight:
(1) Meet with project groups to draft interview guide. [5 pts]
Due March 2:
(2) Reading:
• WHO 2011. Evaluating Household Water Treatment Options: Health-based targets and microbiological performance specifications

MARCH 2‒MEET @TEACHING LAB
LAB 3: Water Purification/Sterilization
*We will break up into 2 groups, one group will meet 9-11am, the other group 11am-1pm

Assignments:
Due March 3:
(1) Read results of WQ assays after 24 ± 2 hrs. of incubation
Due by March 4 @12pm:
(2) Upload Lab 3 results [1 pt]
Due by March 8 @ midnight:
(3) Lab 3 Write-up [10 pts]
Due by March 16:
(4) Readings:
• Hennink, Hutter & Bailey. 2011. Qualitative Research Methods. Ch. 8: Observation
• Ram et al. Is structured observation a valid technique to measure handwashing behavior?
  Use of acceleration sensors embedded in soap to assess reactivity to structured observation.
Due by March 22:
(5) Write-up of Interview results. Reminder here just in case you want to carry out your interviews over Spring Break!
**MARCH 9—SPRING BREAK, NO CLASS**

**MARCH 16—MEET @CLASSROOM**

**LECTURE & ACTIVITY: Structured Observations [Freeman]**

Assignments:
Due March 22 @midnight:
  1. Write-up of in-depth interviews [5 pts]

Due March 23:
  2. Readings:
     - Rea and Parker. 2005. Designing and Conducting Survey Research: A Comprehensive Guide: Ch. 1: An Overview of the Sample Survey Process; Ch. 2: Designing Effective Questionnaires: Basic Guidelines; Ch. 3: Developing Survey Questions; Ch. 9: Selecting a Representative Sample

**MARCH 23—MEET @CLASSROOM**

**LECTURE & ACTIVITY: Survey Development Using ODK Software [Levy]**
*Please bring your laptops to class!*

Assignments:
Due March 29 @midnight:
  1. Meet with groups to develop structured observation form and protocol. [5 pts]

Due March 30:
  2. Readings:
     - FSMA Facts. [Link](http://www.fda.gov/downloads/Food/GuidanceRegulation/FSMA/UCM360242.pdf)

**MARCH 30—MEET @CLASSROOM**

**LECTURE: Salmonella in the environment [Lee]**

**FIELD TRIP: Tour of Emory Water Reclamation Facility**

Assignments:
Due April 5 @midnight:
  1. Meet with groups to develop survey questions and create survey in ODK. [5 pts]

Due April 6:
  2. Readings: TBA

**APRIL 6—MEET @MATH & SCIENCES BLDG (ROOM TBA)**

**LECTURE & ACTIVITY: CDC PARASITOLOGY @CDC [Mathison]**

Assignment:
Due April 12 @midnight:
  1. Carry out structured observation & draft write-up of results [5 pts]

**APRIL 13—MEET @CLASSROOM**

**PANEL DISCUSSION: Emory student field experiences**

Assignment:
Due April 19 @midnight:
   (1) Carry out surveys & draft write-up of results [5 pts]
   (2) Readings: TBA

**APRIL 20—MEET @CLASSROOM**
LECTURE & FIELD TRIP: CDC Water Quality lab [Hill]

Assignment:
Due April 27:
   (1) Meet with groups to develop final project presentation [5 pts]

**APRIL 27—MEET @CLASSROOM**
FINAL STUDENT PRESENTATIONS

Assignments:
Due May 1 @ midnight:
   (1) Write-up of Final Project [10 pts]