DEPARTMENT: Environmental Health

COURSE NUMBER: EH548  SECTION NUMBER: 000  SEMESTER: Spring 2016

CREDIT HOURS: 3

COURSE TITLE: Research Methods for Studies of Water & Health

COURSE TIME: Mondays, 9-11:50am  LOCATION: GCR P41 & 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: Mon 2-4pm or by appointment. Please notify me if you plan to come by.

TEACHING ASSISTANT: Kirsten Fagerli
EMAIL: kirsten.fagerli@emory.edu
OFFICE HOURS: Mon 2-4pm or by appointment; Location TBD

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
EHSO safety completion 1 pt
Class participation 15pts (attendance and participation)
Timely completion of practice labs 4 pts (2 assignment @ 2 pts each)
Lab write-ups 20 pts (2 assignments @ 10 pts each)
Final project benchmarks 31 pts (3 assignments @ 10pts; 1 assignments @ 1 pt each)
Final project progress reports 4 pts (2 reports @ 2 pts each)
Final project 15-20 min oral presentation 10 pts
Final project write-up 15 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)
ALL ASSIGNMENTS ARE DUE ON MONDAYS @ MIDNIGHT UNLESS OTHERWISE SPECIFIED

JANUARY 11 – MEET @CLASSROOM
LECTURE: Course Introduction [Levy]
LECTURE: Review of lab safety / sample collection procedures [Fagerli]

Assignments:
Due Jan. 11:
(1) Take EHSO Lab safety course http://www.ehso.emory.edu/training/index.cfm. Enroll in Research Laboratory Safety (course code 240150) [1 pt]

JANUARY 18 – MLK DAY, NO CLASS
Due Jan. 25:
(1) Readings:
REQUIRED:
• Ashbolt et al. Indicators of microbial water quality.  2001. pp. 289-316
OPTIONAL:
• CDC Microbiological Indicator Testing in Developing Countries: A Fact Sheet for the Field Practitioner. Version 1, December 2010.

JANUARY 25 – MEET @CLASSROOM
LECTURE: Sewage Aging [Mattioli]
LECTURE & ACTIVITY: Microbial Indicators [Levy]

Assignments:
Due Feb. 1:
(1) Practice Boxplot Assignment [2 pts]
(2) Collect water sample <24 hours before lab on Feb. 1
**February 1—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 Feb. 2:

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

Due by Feb. 3 @12pm:

(2) Upload Lab 1 results

Due Feb. 8:

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

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

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**February 8—Meet @Classroom**

**LECTURE: Produce Safety [Lee]**

**LECTURE: Water Quality Testing on the Chattahoochee River [Tim Pojunas]**

**DISCUSSION: Group Projects**

**Assignments:**

Due Feb. 15:

(1) Collect water sample <24 hours before lab on Feb. 15

(2) Practice serial dilutions assignment [2 pts]

(3) Reading:
   - WHO 2011. Evaluating Household Water Treatment Options: Health-based targets and microbiological performance specifications

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**February 15—Meet @Teaching Lab**

**LAB 2: Water Purification/Sterilization**

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

**Assignments:**

Due Feb. 16:

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

Due by Feb. 17 @12pm:

(2) Upload Lab 2 results

Due by Feb. 22:

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

(2) Meet with project groups to discuss project ideas & prepare presentation of proposal

(3) Readings:
FEBRUARY 22– MEET @CLASSROOM
LECTURE: Water Chemistry [Gribble]
STUDENT PRESENTATIONS: Draft project proposals (5-10 min per group)

Assignments:
Due Feb. 29:
(1) Draft survey questions for group project [1 pt]
(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

FEBRUARY 29– MEET @CLASSROOM
LECTURE & ACTIVITY: Survey Development Using ODK Software [Levy]
*Please bring your laptops to class, and Android phones if you have them!

Assignment:
Due March 14:
(1) Draft ODK form [10 pts]
(2) 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. The American journal of tropical medicine and hygiene (2010) vol. 83 (5) pp. 1070-6

MARCH 7– SPRING BREAK, NO CLASS

MARCH 14– MEET @CLASSROOM
LECTURE & ACTIVITY: Structured Observations [Freeman]

Assignments:
Due March 21:
(1) Structured observation draft form & protocol [10 pts]
(2) Readings:
  • Hennink, Hutter & Bailey. 2011. Qualitative Research Methods. Ch. 6: In-depth Interviews

MARCH 21– MEET @CLASSROOM
LECTURE & ACTIVITY: Qualitative Interviews [Caruso]

Assignments:
Due March 28:
(1) Group presentations on project plans & protocols [10 pts]
LECTURE & ACTIVITY: CDC PARASITOLOGY @CDC [Mathison]
STUDENTPRESENTATIONS: Group Presentations of Project Plans (5 min per group)

Assignments:
Due April 4:
(1) Readings:
   • Schilling et al. 2013. The Challenge of Promoting Interventions to Prevent Disease in Impoverished Populations in Rural Western Kenya. AJPH, 103(12).

APRIL 4– MEET @CLASSROOM
LECTURE: Waterborne Disease Epidemiology [Quick]
GROUP MEETING: Meet with instructors to discuss project progress

Assignments:
Due April 11:
(1) Progress report via email [2 pts]
(2) Readings: TBA

APRIL 11– MEET @CLASSROOM (TBA)
LECTURE & FIELD TRIP: CDC Water Quality lab [Hill]

Assignments:
Due April 18:
(1) Progress report via email [2 pts]
(2) Readings: TBA

APRIL 18– MEET @CLASSROOM
PANEL DISCUSSION: Emory student field experiences
LECTURE: PFOA [Steenland]

Assignments:
Due April 25:
(1) Meet with groups to develop final project presentation [10 pts]
(2) Write-up of Final Project [15 pts]

APRIL 25– MEET @CLASSROOM
FINAL STUDENTPRESENTATIONS