

ENV H 433: Environmental & Occupational Sampling and Analysis III - Microbial Contaminants

Spring Quarter, 2016
MWF 8:30-10:20 AM
Health Sciences building- Room T370/376

<https://canvas.uw.edu/courses/1040354>

INSTRUCTOR: Marilyn C. Roberts
Professor
Department of Environmental and Occupational Health Sciences
Office: HSB F161D
Phone (206) 543-8001
E-mail: marilyn@u.washington.edu

OFFICE HOURS: By Appointment

TEACHING ASSISTANTS: OFFICE HOURS: By Appointment
Karen Michael: E-mail: kem82@uw.edu
Erika Keim: E-mail: ekeim@uw.edu

COURSE DESCRIPTION: This course will review the sampling and analysis of microbiological contaminants in water, air, and on surfaces. Topics covered will include legal considerations, sampling and experimental design, routes of exposure, sources of exposure, standard methods, QA/QC, and data management. This course will be of use for public health professionals, microbiologists, civil and environmental engineers, and environmental scientists.

COURSE OBJECTIVES: At the conclusion of this class, students should be able to:

- Recognize the various microbial contaminants in environmental and occupational settings
- Distinguish between the methods for sample collection and processing of microbial contaminants in different environmental and occupational exposure situations
- Categorize the methods for detection of microbial contaminants for different environmental and occupational exposure situations
- Formulate an appropriate experimental design for assessing environmental and occupational exposures to microbial contaminants
- Describe the advantages and disadvantages of using indicator organisms in environmental and occupational exposure assessment
- Identify the various indicator organisms in different environmental and occupational exposure situations
- Explain basic chemical and bio-safety laboratory precautions
- Describe quality assurance and quality control (QA/QC) procedures used in conducting environmental microbiology research
- Analyze, report, and manage scientific data related to environmental and occupational health sciences

- Recognize the importance of the legal and regulatory framework related to environmental and occupational exposures to microbial contaminants
- Critically evaluate papers in the scientific literature and identify strengths and weaknesses of the science article

TEXTS AND REFERENCES: There is no required text for this course. Assigned readings and course materials will be available on the course webpage. The following texts are recommended references for this course:

Multiple-tube fermentation technique (9221)/total coliforms
<http://courses.washington.edu/envh433/Readings/coliform.PDF>

EPA Method 1604: Total coliforms and *E. coli* in water by membrane filtration using a simultaneous detection technique (MI medium)
<http://www.epa.gov/microbes/documents/1604sp02.pdf>

Difco™ & BBL™ Manual – online
http://www.bd.com/ds/technicalCenter/misc/difcobbblmanual_2nded_lowres.pdf

COURSE: There will be lectures and then an exam (on the 5th day of class), then there will be six weeks of laboratory experiments. Ten weeks you will be in T370 for class between 8:30-10:20 AM. Each week, starting the week of April 11th, you will look up papers on what we are doing in class and be prepared to give a brief presentation on the work by Mon of each week.

GRADING:

First Exam Week 2 (25%): Students will be examined for their mastery of the material presented in the introductory lectures during weeks 1 and 2. The exam will consist of approximately 20 questions and the format will be multiple choice, short answer and true/false. Exam will be closed book.

Weekly Laboratory Reports (20%): Questions for each lab will be provided that need to be answered at the end of each week of class. This will be turned in weekly to the Canvas site. In general, the reports will be due before class on Monday.

Participation in class (20%): Answering questions in class, general participation will be noted as well as giving critically evaluations on papers in the scientific literature with identification of its strengths and weaknesses for of relevant papers taken from the literature that correlates with the method used in the laboratory that week.

If you have your cell phone or computer out, you will be asked to leave and lose points. Exception computers can be out during the first 4 lectures.

If you are late to class, you will lose points. If you are chronically late to class or have your cell phone (3 times without an excuse you will be asked to leave class, missing class 3 times you will not be able to pass the course)

If you miss the class for illness you must contact Dr. Roberts or one of the TA's before class

You cannot make up a class that you miss because it is a laboratory class.

After the first 4 classes which are lecture no computers, phones or tablets will be allowed to be out. If they are you will be asked to leave and lose points. Experiments should be printed out and placed in you laboratory notebook

Final Exam End of Quarter (35%): Closed book

DISABILITY RESOURCES FOR STUDENTS (DRS): Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. If you have not yet established services through DRS, but have a temporary or permanent disability that requires accommodations (this can include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability@uw.edu. Requests for accommodations or services must be arranged in advance.

Course Schedule	
Lecture	
Date	Topic
March 28	Introduction/overview
March 30	Lab safety
April 1	Sampling and experimental design
April 4	QA/QC and Regulations
April 6	Exam- closed book/notes
Laboratory	
April 8	Laboratory preparation: practice your technique
April 11, 13, 15	MPN multiple tube fermentation, Colilert®
April 18, 20, 22	IDEXX and membrane filtration to detect enterococci/ <i>E. coli</i>
April 25, 27, 29	Surface sampling for vancomycin resistant enterococci
May 2, 4, 6	Surface sampling for <i>S. aureus</i> and methicillin-resistant <i>S. aureus</i> [MRSA]
May 9, 11, 13	Airborne Microbial contaminants
May 16, 18, 20	<i>Salmonella</i> in chicken
May 23	Turn in homework, talk about papers detecting <i>Salmonella</i> in food and Review session with TA's
May 25	Review session
May 27	No class
May 30	Memorial Day- No class
June 1	Final exam- Closed book/notes

LABORATORY POLICIES:

- Everyone must wear a laboratory coat, we will provide them
- Everyone needs a bound laboratory notebook with lines by April 8, 2016
- No food, drink or gum, computers, tablets or phones allowed in the lab spaces (kept under the lab bench)
- No open-toe shoes and no shorts or short skirts (scrub pants are available for purchase). You may change shoes in the hallway before entering the lab space.
- Let TAs or Dr. Roberts know ahead of time if you cannot make session. There are not make-up sessions. Excuses for missing class are student is very sick or at a scientific meeting
- **Arrive on time and be ready to start right at 8:30 AM, this is critical**
- Turn in assignments on time, late assignments will be marked down
- Come to class prepared and on-time (keep up with reading)
- Be courteous (No newspapers, audible cell phones, PDAs, beepers)
- All backpacks and personnel items will be stored underneath the desks **do not leave in the hallway since there have been problems with items going missing**
- Once you know what you are doing for the lab you can start when you get in
- You should be able to finish lab in the 2-hour time period
- **ASK QUESTIONS!**