

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

Spring Quarter, 2017

MWF 8:30-10:20 AM Room T370/376

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OFFICE HOURS: By Appointment

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OFFICE HOURS: By Appointment

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)

<https://nepis.epa.gov/Exe/ZyPDF.cgi/P1002D57.PDF?Dockkey=P1002D57.PDF>

Difco™ & BBL™ Manual – online

http://www.bd.com/ds/technicalCenter/misc/difcobbmanual_2nded_lowres.pdf

EPA 2012 Recreational Water Quality Criteria Fact Sheet

<https://www.epa.gov/sites/production/files/2015-10/documents/rec-factsheet-2012.pdf>

COURSE: There will be four lectures and then an exam (during the middle of the second week of class), then there will be six weeks of laboratory experiments. For nine weeks you will be in T370 for class between 8:30-10:30 am. Each week, starting the week of April 10, you will look up papers on what we are doing in class and be prepared to give a brief presentation on the work.

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 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 Mon.

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. Please note each student will present one paper each week for 6 weeks. In addition, a minimum of eight questions by each student about another student's presentation is required to receive 100% for participation.

- If you have your cell phone out you will be asked to leave and will lose points.
- If you are late to class, you will lose points. If you are chronically late to class or have your cell phone out (≥ 3 times without a valid reason) you will be will not be able to pass the course. Missing the bus is not a valid excuse nor is not returning to Seattle before the start of class at 8:30 AM on March 27, 2017.
- If you miss the class for illness, you must contact Dr. Roberts or one of the TAs before class to let them know.
- You cannot make up a class that you miss because it is a laboratory class.
- After the first four classes, which are lecture, no computers, phones or tablets will be allowed out. If they are, you will lose points, which can lead to not passing this required class.

Final Exam End of Quarter (35%): Closed book in class. Given June 2, 2017.

COURSE SCHEDULE:

Lecture	
March 27	Introduction/overview
March 29	Lab Safety
March 31	Sampling & Experimental Design
April 3	QA/QC and Regulations
April 5	Exam – Closed Book/Notes
Laboratory	
April 7	Laboratory preparation
April 10, 12, 14	MPN multiple tube fermentation, Colilert
April 17, 19, 21	IDEXX and membrane filtration to detect enterococci/ <i>E. coli</i>
April 24, 26, 28	Surface sampling for vancomycin resistant enterococci
May 1, 3, 5	No Class. Students are encouraged to attend the AEC in Wenatchee (May 1-3)
May 8, 10, 12	Surface sampling for <i>S. aureus</i> and methicillin-resistant <i>S. aureus</i> (MRSA)
May 15, 17, 19	Airborne Microbial contaminants
May 22, 24, 26	<i>Salmonella</i> in chicken
May 29	No Class – Memorial Day Holiday
May 31	Turn in homework, talk about papers detecting <i>Salmonella</i> in food, and Review session with TAs
June 2	Final Exam – Closed Book/Notes

LABORATORY POLICIES:

- Everyone must have a laboratory coat; we will provide them.
- Everyone needs a bound laboratory notebook with lines by April 7, 2017.
- No food, drink, gum, computers, tablets or phones allowed in the lab spaces.
- 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 a session. There are not make-up sessions. Excuses for missing class are student is very sick or at a 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 (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 anything 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!**

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.

ACADEMIC INTEGRITY STATEMENT:

Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the [SPH Academic Integrity Policy](#). Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.