

COURSE NAME; NUMBER; SEMESTER; MEETING DAYS, TIMES, AND PLACE.

Environmental Microbiology Lab 11:375:312/ Pollution Microbiology Lab 16:375:512

Fall 2018

Monday, CDL Room 109, 10:55 AM – 12:15 PM

Section 01 Monday, ENR Room 203, 12:35-3:35 PM

Section 02 Thursday, ENR Room 203, 12:35-3:35 PM

CONTACT INFORMATION:

Instructor(s): Dr. Abigail Porter

Office Location: Foran Hall, Room 312

Phone: 848-932-6382

Email: awporter@envsci.rutgers.edu

Office Hours: Thursday, 3:45-4:45 PM, ENR Room 203

COURSE WEBSITE, RESOURCES AND MATERIALS:

There is no required manual for this course. Lab modules (handouts) will be posted and available for download from the class SAKAI website.

COURSE DESCRIPTION:

This course is an introduction to microbiological techniques in an environmental context.

LEARNING GOALS:

Students completing this class will have learned:

1. how to apply math and basic science knowledge to interpret and solve environmental problems;
2. skills and techniques necessary for a successful career in the field;
3. how to design and conduct experiments and to analyze and interpret data;
4. how to work effectively in multidisciplinary teams;
5. how to communicate technical information effectively

ASSIGNMENTS/RESPONSIBILITIES, GRADING & ASSESSMENT:

- Lab results are due at the beginning of the lab period following collection of the final data.
- The Final Grade will be based on class participation (25 points), 7 lab results (10 points each), 11 pre-lab quizzes (5 points each), 1 safety quiz (10 points), 1 online activity and quiz (10 points), 1 scientific paper discussion (10 points), 2 short lab reports (25 points each), and 1 full lab report (50 points).

(Graduate students will also be responsible for completing a separate 10 page term paper (50 points))

- **Lab Reports:** You will be required to write **two** short lab reports (Growth Curve and Enzyme Assay Labs) and **one** full lab report during the semester. Short lab reports will be due in class 2 weeks after the final data is collected. The full lab report is due on the last day of classes. See the Lab Report Guide for instructions.
- **Term papers** (*graduate students only*) will be a critique of a current or newly proposed method used in environmental microbiology. The focus of discussion should be the strengths and limitations of the method as compared to alternatives. Papers should be ~10 pages long plus figures and refer to at least 5 original research papers. Topics need to be approved by the instructor. Titles and Outlines are due on September 30th. Final papers are due on October 31st.

ACCOMODATIONS FOR STUDENTS WITH DISABILITIES

Please follow the procedures outlined at <https://ods.rutgers.edu/students/registration-form>. Full policies and procedures are at <https://ods.rutgers.edu/>

ABSENCE POLICY

Attendance in lab is required. If you need to miss a class, please inform the instructor as soon as possible.

COURSE SCHEDULE:

Sept. 10	Lecture	Class Policies, Safety and Introduction	
Sept. 10/13	Lab	Lab #1 Field Sampling	*See Sakai Site for special notes about sampling trip and online safety quiz
Sept. 17	Lecture	Microbial Physiology I	
Sept. 17/20	Lab	Lab #2 Microscopy	
Sept. 24	Lecture	Microbial Physiology II	
Sept. 24/27	Lab	Lab #3 Bacterial Culture and Transfer (period 1)	
		Lab #4 Environmental Biofilms (period 1)	
		Lab #5 Coliforms (period 1)	
Oct. 1	Lecture	Bacterial Growth	
Oct. 1/4	Lab	Lab #3 Bacterial Culture and Transfer (period 2)	
		Lab #5 Coliforms (period 2)	
		Lab #6 Enumeration + Growth Curve (period 1)	
		Lab #7 Soil Microcosm (build microcosm)	
Oct 8	Lecture	Bacterial Metabolism	
Oct 8/11	Lab	Lab #4 Environmental Biofilms (period 2)	Scientific paper discussion
		Lab #5 Coliforms (period 3)	
		Lab #6 Enumeration + Growth Curve (period 2)	
		Lab #8 Winogradsky's Battery (build battery)	
Oct 15	Lecture	Biogeochemistry	
Oct 15/18	Lab	Lab #5 Coliforms (period 4)	
		Lab #8 Winogradsky's Battery (period 1)	
Oct.22	Lecture	Molecular Analysis	
Oct 22/25	Lab	Lab #4 Environmental Biofilms (period 3)	Lab #6 Mini Lab Due
		Lab #5 Coliforms (period 5)	
		Lab #8 Winogradsky's Battery (period 2)	
		Lab #9 DNA Extraction from Coliforms	

Oct. 29	Lecture	Enzymes and Soil Bacteria	
Nov. 29/1	Lab	Lab #5 Coliforms (period 6)	
		Lab #7 Soil Microcosms (period 2)	
		Lab #8 Winogradsky's Battery (period 3)	
		Lab #10 PCR for Coliform Functional Genes	
Nov. 5		No lecture. Complete online activity and quiz.	
Nov. 5/8	Lab	Lab #4 Environmental Biofilms (period 4)	
		Lab #7 Soil Microcosms (period 3)	
		Lab #8 Winogradsky's Battery (period 4)	
		Lab #10 PCR (period 2)	
		Lab #11 DNA Sequencing (period 1)	
Nov. 12	Lecture	Microbial Ecology	
Nov. 12/15	Lab	Lab #4 Environmental Biofilms (Period 5)	Lab #7 Mini Lab Due
		Lab #8 Winogradsky's Battery (period 5)	
		Lab #11 DNA Sequencing (period 2)	
		Lab #12 Biodegradation (period 1)	
Nov. 19	Lecture	Nutrient Cycles	
Nov. 19/20	Lab	Lab #8 Winogradsky's Battery (period 6)	Note: lab is on TUESDAY
		Lab #13 Nitrogen Cycle	
Nov. 26	Lecture	Biofilms	
Nov. 26/29	Lab	Lab #4 Environmental Biofilms (period 6)	Coliform Lab Report Due
		Lab #8 Winogradsky's Battery (period 7)	For Peer Review
		Lab #13 Nitrogen Cycle (period 2)	
Dec. 3	Lecture	Biodegradation/Bioremediation	
Dec. 3/6	Lab	Lab #8 Winogradsky's Battery (period 8)	Coliform Peer Review
		Lab #12 Biodegradation (period 2)	Comments Due
Dec. 10		No Lecture	
Dec. 12		Last Day of Classes	Revised Lab Report Due

ACADEMIC INTEGRITY

While work in the teaching lab is often done in pairs or in groups, any work that is submitted for a grade must be your own.

The university's policy on Academic Integrity is available at <http://academicintegrity.rutgers.edu/academic-integrity-policy>. The principles of academic integrity require that a student:

- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated and no student has an inappropriate advantage over others.
- the academic and ethical development of all students is fostered.
- the reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

STUDENT WELLNESS SERVICES

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ www.rhscaps.rutgers.edu/

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

Scarlet Listeners

(732) 247-5555 / <https://rutgers.campuslabs.com/engage/organization/scarletlisteners>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.