SWS4307/SWS5308 Ecology of Waterborne Pathogens

Spring, 2026
Course Format: Hybrid, 3 credits

Instructor: Dr. Julie Meyer

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In-person office hours: Mondays, Period 3 (9:35 – 10:25 am)

Teaching Assistant

None

Course Description

Survival strategies, gene regulation and metabolism of waterborne pathogens. Methods for microbe detection and control.

Course Learning Objectives

The central objective of this course is to foster the student's ability to solve problems related to microbiological quality and safety of drinking and recreational waters. The development of problem-solving skills will require an in-depth understanding of microbial ecology concepts and methodologies for identifying and characterizing pathogens and their behaviors outside of their human hosts.

By the end of the course, the student will be able to:

- Identify common environmentally transmitted pathogens.
- Recommend appropriate detection methods for human waterborne pathogens.
- Evaluate factors contributing to the spread of environmentally transmitted pathogens.
- Recommend methods to reduce human exposure to waterborne pathogens.
- Create science communication documents to convey course concepts to a general audience.

Course Overview and Purpose

This course examines common waterborne pathogens from an ecological perspective, including how pathogens survive and are dispersed through the environment outside of human hosts. The course will also cover a variety of methods used to detect pathogens, the evolution of virulence and antimicrobial resistance, drinking water and wastewater treatment, and microbial risk assessment.

Course Prerequisites

MCB 3020 (Basic Biology of Microorganisms) or MCB 3023 (Principals of Microbiology) or MCB 4203 (Bacterial Pathogens), or equivalent.

Textbooks, Learning Materials, and Supply Fees

There are no supply fees associated with this course. Reading assignments and materials including lecture videos will be available through CANVAS/UF e-learning.

Technical Support

UF Computing Help Desk & Ticket Number: All technical issues require a UF Helpdesk Ticket Number. The UF Helpdesk is available 24 hours a day, 7 days a week. https://helpdesk.ufl.edu/ | 352-392-4357

Weekly Course Schedule

Discussion Date	Topic	Assignment Due Dates
Wed 1/14	Course Orientation	Course Orientation Quiz due 1/18 Introductions Discussion due 1/18
Wed 1/21	Module 1 Pathogens & Outbreaks	Quiz 1 due 1/25 Paper Discussion 1 due 1/25
Wed 1/28	Module 2 Culture-Dependent Detection Methods	Quiz 2 due 2/1 Paper Discussion 2 due 2/1
Wed 2/4	Module 3 Culture-Independent Detection Methods	Quiz 3 due 2/8 Paper Discussion 3 due 2/8 Escape Room due 2/8
Wed 2/11	Module 4 Water, Soil, and Air as Microbial Habitats	Quiz 4 due 2/15 Paper Discussion 4 due 2/15
Wed 2/18	Module 5 Rhizosphere and Phyllosphere	Quiz 5 due 2/22 Paper Discussion 5 due 2/22
Wed 2/25	Module 6 Biofilms	Quiz 6 due 3/1 Paper Discussion 6 due 3/1 Photo Scavenger Hunt #1 due 3/1
Wed 3/4	Module 7 Evolution of Virulence	Quiz 7 due 3/8 Paper Discussion 7 due 3/8
Wed 3/11	Module 8 Acquisition of Antibiotic Resistance	Quiz 8 due 3/15 Paper Discussion 8 due 3/15
	Spring Break – no class	No assignments due
Wed 3/25	Module 9 Biological Control of Pathogens	Quiz 9 due 3/29 Paper Discussion 9 due 3/29
Wed 4/1	Module 10 Drinking Water and Wastewater	Quiz 10 due 4/5 Paper Discussion 10 due 4/5 Photo Scavenger Hunt #2 due 4/6
Wed 4/8	Module 11 Food Safety	Quiz 11 due 4/12 Paper Discussion 11 due 4/12
Wed 4/15	Module 12 Pathogens and Environmental Change	Quiz 12 due 4/19 Paper Discussion 12 due 4/19
Wed 4/22	Module 13 Risk Assessment and Science Communication	Quiz 13 due 4/26 Paper Discussion 13 due 4/26 Sci Comm Assignment due 4/26

Grading Policy

Course grading is consistent with UF grading policies.

Course Grading Structure

Assignment Type	Point Value	Percent of Final Grade
Participation during in-person discussions	2 points per week	5%
Assignments (5)	3-10 points each	20%
Paper discussions (13)	10 points each	25%
Quizzes (14)	10-20 points each	25%
Final exam	50 points	25%

Grading Scale

Grade	Points	Percentage
A	4.00	91-100%
A-	3.67	89-90.9%
B+	3.33	85-88.9%
B	3.00	83-84.9%
B-	2.67	79-82.9%
C+	2.33	75-78.9%
C	2.00	73-74.9%
C-	1.67	69-72.9%
D+	1.33	65-68.9%
D	1.00	63-64.9%
D-	0.67	59-62.9%
S	0.00	below 58.9%

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF.

Please contact UMatterWeCare for additional and immediate support.

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Privacy and Accessibility Policies

[required for online courses, list all technology used]

- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Microsoft
  - Microsoft Privacy Policy
  - Microsoft Accessibility
- Perusall
  - Perusall Privacy Policy
  - Perusall Accessibility
- YouTube (Google)
  - YouTube (Google) Privacy Policy
  - YouTube (Google) Accessibility
- Zoom
  - Zoom Privacy Policy
  - Zoom Accessibility