SWS 6323

ADVANCED MICROBIAL ECOLOGY

Credit Hours: 3
Semester: SPRING 2026
Online Synchronous Meetings: MWF Period 5 (11:45 am - 12:35 pm)

INSTRUCTORS: Dr. Julie Meyer, juliemeyer@ufl.edu, (352) 273-8189
Dr. Masa Fujimoto, mfujimoto@ufl.edu, (352) 294-3131

OFFICE HOURS: Student hours are available by appointment.

COURSE WEBSITE: https://ufl.instructure.com/courses/

COURSE COMMUNICATIONS: Students may ask questions by contacting the instructors by email or through CANVAS.

REQUIRED BOOK (EBOOK AVAILABLE FREE THROUGH CANVAS):

Schimel. 2011. Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded. ISBN: 9780199760244

RECOMMENDED BOOK:

Douglas, Bahr, & Olson. 2022. The Narrative Gym for Science Graduate Students and Postdocs: Using the ABT Framework for Proposals, Papers, Presentations, and Life in General. ISBN: 9798359465182

MATERIALS AND SUPPLIES FEES: None.

COURSE DESCRIPTION: This course will cover the mechanics of performing research in microbial ecology from start to finish. Topics include defining a scientific problem, choosing appropriate methods, interpreting results, and effective scientific communication. Recent primary literature will be evaluated for these areas as well as for their contributions to the field of microbial ecology. Mastery of course topics will be applied to the development of a short research proposal in microbial ecology.

PREREQUISITES: SWS5305C Soil Microbial Ecology or consent of instructor.

COURSE GOALS AND/OR OBJECTIVES: The central objective of this course is to foster the student's ability to solve problems related to microbial ecology.

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

- Evaluate primary research literature in microbial ecology in terms of methodology, interpretation of data, and narrative structure.
- Develop an experimental design with appropriate sampling techniques, analytical methods, and replication.
- Write a 2-page NSF-style research proposal for a microbial ecology project.

INSTRUCTIONAL METHODS: All class meetings will be conducted synchronously through zoom. Class meetings will be a mix of instructor-led and student-led discussions of microbial ecology concepts, reviews of primary literature, experimental design, and science communication. Instructional materials will be available through CANVAS/UF e-learning.

COURSE POLICIES:

ATTENDANCE/MAKE-UP POLICY: It is the instructor's expectation that each student will keep up with posted lectures, readings, and other assignments. All modules and assignments are open on the first day of the semester, and all due dates are posted at the start of the semester in the syllabus. Therefore, late assignments will not be accepted in the absence of extenuating circumstances. If you have a valid excuse, such as a family or medical emergency, please contact the dean of students' office with documentation of your absence. They will notify your instructors, who will then make appropriate extensions for the missed work. Requirements for make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

EXAM DATES/POLICIES: There will be no exams for this course.

COURSE TECHNOLOGY: All course materials, including recorded class meetings, readings, assignments, and quizzes will be administered through CANVAS/UF e-learning. For help with CANVAS, please contact the UF Help Desk:

- http://helpdesk.ufl.edu
- (352) 392-HELP - select option 2

ONLINE COURSE EVALUATION: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing online evaluations via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting disability.ufl.edu/students/get-started. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

UNIVERSITY POLICY ON ACADEMIC CONDUCT: UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

CLASS DEMEANOR OR NETIQUETTE: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions, and chats.

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.

GETTING HELP:

For issues with technical difficulties for Canvas, please contact the UF Help Desk at:

- http://helpdesk.ufl.edu
- (352) 392-HELP (4357)
- Walk-in: HUB 132

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from the Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Other resources are available at http://www.distance.ufl.edu/getting-help for:

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please visit http://www.distance.ufl.edu/student-complaints to submit a complaint.

GRADING POLICIES:

METHODS BY WHICH STUDENTS WILL BE EVALUATED AND THEIR GRADE DETERMINED

The final grade reflects the individual student's mastery and comprehension of the subject material presented during the semester. The grading will not be based on a bell curve. Weighting of assignments/exams is listed in the table below.

Assignment Weights	
Quizzes (6 quizzes, 20 points each)	40%
Research Development Assignments (6 assignments, 10 points each)	20%
Research Proposal (100 points)	25%

Paper discussion leadership (10 points)	5%
Analysis practicum (3 assignments, 10 points each)	10%
Total	**100%**

QUIZZES:

Quizzes will be conducted every other week and will assess microbial ecology concepts covered in lectures, discussions, and readings. The format of quizzes may include multiple choice and short answer questions.

RESEARCH DEVELOPMENT ASSIGNMENTS:

Research development assignments will be due every other week (opposite of quiz weeks). These assignments will include development of sections of the final research proposal (for example, a budget, an abstract) that will be evaluated for their scientific merit and writing structure. The student will receive feedback on these sections to improve the content for the final proposal. Additional assignments include the evaluation of publicly available successful proposals.

RESEARCH PROPOSAL:

Students will develop a 2-page NSF Graduate Research Fellowship style proposal incorporating the sections developed in the research development assignments. The research proposal will be evaluated with the NSF merit review criteria.

PAPER DISCUSSION LEADERSHIP:

Students will lead the discussion of a peer-reviewed research or review paper, to be selected at the beginning of the course. Students will turn in an outline or slides that highlight the main takeaways of the paper or points to be discussed.

ANALYSIS PRACTICUM:

Students will execute analytical pipelines on example data to produce a figure or other data product. Evaluation will be based upon the completion of the analytical task as well as the interpretation of the data product.

GRADING SCALE:

91-100%	A
89-90.9%	A-
85-88.9%	B+
83-84.9%	B
79-82.9%	B-
75-78.9%	C+
73-74.9%	C
69-72.9%	C-
65-68.9%	D+
63-64.9%	D
59-62.9%	D-
below 58.9%	E

INFORMATION ON CURRENT UF GRADING POLICIES FOR ASSIGNING GRADE POINTS:

Current UF Grading policies are found here:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.asp

TENTATIVE COURSE SCHEDULE:

Week	Topic	Assignments
1	Course Orientation	
2	Module 1. Microbiomes & Microbiota	Research development: Draft research question
3	Module 2. Molecular Ecology Techniques	Quiz 1
4	Module 3. Environmental Sampling Techniques	Research development: Draft experimental scheme
5	Module 4. Big Data and Tiny Organisms	Quiz 2
6	Module 5. Statistical Analyses & Data Visualization	Research development: Draft proposal budget
7	Module 6. Ecological Theories I: Diversity, Richness, and Evenness	Quiz 3
8	Module 7. Ecological Theories II: Dispersal, Community Assembly, and Succession	Research development: Draft proposal abstract
9	Spring Break	No assignments due
10	Module 8. Environmental and spatiotemporal gradients	Quiz 4
11	Module 9. Microbial Activities	Research development: Draft proposal approach
12	Module 10. Microbial Interactions	Quiz 5

13	Module 11. Managing Microbial Communities	Research development: Evaluate NSF proposal
14	Module 12. Isolation of Microbes	Quiz 6
15	Module 13. Managing microbial communities	Final research proposal