



Dr. DeEtta Mills

Office OE 116C; Phone: 305 348 7410

Office hours Tues and Thurs 1000-1200pm **or by appointment (preferred)**

EMAIL: millsd@fiu.edu

Recommended Textbooks: Slonczewski & Foster, *Microbiology: An Evolving Science* (2<sup>nd</sup> Ed) OR Brock's *Biology of Microorganisms*, 11<sup>th</sup> edition, or any basic microbiology/microbial ecology text

PDFs of current journal articles about studies in microbial ecology, along with additional course material, will be sent out as attachments using Blackboard, and will be **required reading**. All exams will be short essay. There are two required special projects.

**Course description:** The study of microbial ecology with an emphasis on microbial interactions, ecosystems, methods, microbial communities, their biogeochemical interactions with the environment and each other and/or hosts.

**Course objectives:** To understand the principles of microbial ecology, including examples from aquatic and terrestrial environments and microbial relationships with each other, their environment, with various hosts (plants, animals, humans), symbiosis, and cell communication.

**Active learning component/semester report:** "Create your own microbe" project; Winogradsky columns

**Tentative class schedule: (subject to change)**

Date	Topic
Jan 10-12	Introduction to the course; what is microbial ecology? Species concepts in microbiology
Jan 17-19	Bacterial niches – environmental factors, tolerance, requirements

Jan 24-26	Microbial populations; <b>special project overview (“Design a Bacterium”)</b> ; Microbial interactions
Jan 31-Feb 2	Diversity and complexity of microbial interactions; Microbial communities; Symbioses
Feb 7-9	Food webs; Horizontal gene transfer, insertion elements, and plasmids;
Feb 14-16	Biofilms; intra- and inter-cell communication in biofilms
<b>Feb 21</b>	<b>Exam 1: Phase I of special project due Sat, Feb 25th, Noon</b>
Feb 23	DNA markers and methodology; introduction to NexGen sequencing; an the age of “omics”; Metagenomics; metatranscriptomics, metaproteomics, metabolomics
Feb 28-Mar 2	Microbial processes – physiological ecology; Microbial mediation of biogeochemical cycles – carbon
Mar 7-9	Microbial mediation of biogeochemical cycles – sulfur; Microbial mediation of biogeochemical cycles - nitrogen
Mar 14-16	<b>No class; spring break!!</b>
Mar 21-23	Microbial mediation of biogeochemical cycles – iron, other metals
Mar 28	Microbes and stress; Microbes and extreme environments
Mar 30:	<b>Exam 2: Phase II of special project due Sat, April 1<sup>st</sup>, (no joke!) by noon.</b>
Apr 4-6	Microbe/host interactions
Apr 11-13	Bacterial communication; Antibiotics and resistance in the environment; <b>student powerpoint presentations</b>
Apr 18-20	Student power point presentations; <b>final reports due on or before Apr 20<sup>th</sup>, noon</b>

**\*\*\*\*\*Final exam\*\*\*\*\* Exam week: TIME AND DAY TBD**

### *Grading policy*

The emphasis is on understanding the material presented in class on **two levels** – (a) detailed knowledge of specific examples of microbial ecology, and (b) a conceptual grasp of the underlying principles of microbial ecology. **Critical thinking skills will be emphasized so you can synthesize and connect concepts that are introduced.**

There will be two exams plus a comprehensive final exam. No exam will be dropped but if you get a higher grade on the final than any one of the other two exams, the final grade will be substituted for the lowest grade before averaging. The grade for the final will not be dropped.

**All exams are mandatory. Exams will be short essay. No makeup exams are given.**

The two in-semester exams will be **50%** of your grade, the final exam will be **10%** of your grade, and the **special projects, participation and attendance will count for 40% of your grade.** Pre- and post-assessment will be given as well as pop quizzes that will be part of your attendance and participation grade.

Grading scale: The final grade will be calculated based on the following scale:

90- 100 A  
80-89 B  
70-79 C  
60-69 D  
59 or below F

Academic Misconduct:

Florida International University is a community dedicated to generating and imparting knowledge through excellent teaching and research, the rigorous and respectful exchange of ideas, and community service. All students should respect the right of others to have an equitable opportunity to learn and honestly demonstrate the quality of their learning. Therefore, all students are expected to adhere to a standard of academic conduct, which demonstrates respect for themselves, their fellow students, and the educational mission of the University. All students are deemed by the University to understand that if they are found responsible for academic misconduct, they will be subject to the Academic Misconduct procedures and sanctions, as outlined in the Student Handbook.

**Academic Misconduct: Full handbook and information can be found at:**

<http://www.fiu.edu/~oabp/misconductweb/1acmisconductproc.htm>

**DEFINITION OF ACADEMIC MISCONDUCT:** Academic Misconduct is defined as the following intentional acts or omissions committed by any FIU student:

**1.01 Cheating:** The unauthorized use of books, notes, aids, electronic sources; or assistance from another person with respect to examinations, course assignments, field service reports, class recitations; or the unauthorized possession of examination papers or course materials, whether originally authorized or not. Any student helping another cheat may be found guilty of academic misconduct.

**1.02 Plagiarism:** The deliberate use and appropriation of another's work without any indication of the source and the representation of such work as the student's own. Any student who fails to give credit for ideas, expressions or materials taken from another source, including internet sources, is guilty of plagiarism. Any student helping another to plagiarize may be found guilty of academic misconduct.

**1.08 Academic Dishonesty:** In general, by any act or omission not specifically mentioned above and which is outside the customary scope of preparing and completing academic assignments and/or contrary to the above stated policies concerning academic integrity.

**If found cheating, YOU WILL RECEIVE AN "F" FOR THE CLASS, NO EXCEPTIONS.**