Marine and Environmental Microbiology

OCS/BIOL 4090

Fall 2018 – M/W/F 9:30 – 10:20 am

215 Williams Hall

The purpose of this course is to provide students with an overview of concepts regarding the characteristics and ecology of microorganisms in our world. This includes discussion of the methodology used to investigate these microorganisms, and how this methodology is applied to understanding the roles of microorganisms in various marine, estuarine, terrestrial, extra-terrestrial, and human-related environments. Throughout this course, students will gain an appreciation of how microorganisms rule the planet, affecting every aspect the environment we live in.

Course Learning Objectives:

1) Demonstrate knowledge of a broad survey of the discipline, including the methodology and underlying principles that govern marine and environmental microbiology.
2) Demonstrate the ability to read and discuss scientific literature related to marine and environmental microbiology.

Instructor:

Dr. Jennifer R. Brum

office: 2201 Energy, Coast and Environment Building
email: jbrum1@lsu.edu

Office hours:

I have no officially scheduled office hours. BUT, I am available whenever you would like to discuss anything about the course! This can be before class or after class, or you can talk to me or send me an email so we can schedule a time when we can meet.

Textbook:

There is no assigned textbook for this course. Scientific papers will be posted on Moodle as the reading material for most lectures.

Lectures:

- Assigned reading will be posted to Moodle 1 week prior to each lecture.
- Figures and images from each lecture (as PowerPoint and PDF files) will be posted to Moodle at least 1 day prior to the lecture.
- Students are expected to take their own notes during each lecture. (See note on Disability Services below).

Grading:

Overview:

- 3 Exams = 75% of the student's final grade
- 4 In-class Discussions = 25% of the student's final grade
- Assigned grades for all graded items will be posted to Moodle within 1 week of the submission of the graded item or in-class discussion (except in the case of unforeseen circumstances).

Midterm Exams:

- There will be 2 midterm exams during the semester, each worth 25% of the student's final grade.
- These midterm exams are take-home, and all available resources may be used to complete them (except for help from the instructor).
- The midterm exams will be due at or before the start of class, 1 week after they are distributed (see Course Schedule below).

Final Exam:

- The final exam will take place at the scheduled time during final exam week (see Course Schedule below), and will be worth 25% of the student's final grade.
- The final exam will consist of an 8-minute presentation describing a proposed research project, with 2 minutes for audience questions following the presentation.
- Topics for the proposed research may include anything covered within the course.
- The presentations may be given by groups of up to 3 students. Students will sign up for groups prior to the final exam presentation.
- Scheduled class times during the week prior to the final exam week will be used for students to work on their proposal presentations.

In-class Discussions:

- There will be 4 in-class discussions during the semester (see Course Schedule below), and each will be worth 6.25% of the student's final grade.
- Discussions will be based on assigned reading of topics.
- The loose structure of in-class discussions is as follows:
    - 20 minutes in assigned groups to prepare for the discussion based on questions posed by the instructor at the start of class
    - 20 minutes for groups to present their answers to posed questions regarding the discussion topics, and for the class to discuss these topics
    - 10 minute wrap-up of discussion led by the instructor, with participation from the students
- Grading will be based on student preparation for the discussion and student participation during the discussion.

Makeup Policy:
The makeup policy for this course is based upon communication between the student and the instructor. Students are responsible for communicating the reasons for any absence for any graded portion of this class within the time frames given below. If the student has any questions about a scheduled or unscheduled absence, they are expected to communicate with the instructor in a timely fashion, either in-person or over email, regarding the absence.

- **Midterm Exams:**
  - In the event of a *scheduled* student absence on the date of the deadline for submission (e.g., travel for student organizations, court appearances including jury duty, etc.):
    - The student will inform the instructor at least 1 week prior to the scheduled absence.
    - The student will provide official documentation describing the reason for the absence.
    - The student may submit the take-home exam prior to the scheduled deadline for submission either in-person or via email.
  - In the event of an *unscheduled* student absence on the date of the deadline for submission (e.g., illness, traffic accident, etc.):
    - The student will contact the instructor via email within 24 hours.
    - The student will provide official documentation describing the reason for the absence.
    - The student will be provided additional time to submit the take-home exam.

- **Final Exam:**
  - In the event of a *scheduled* student absence on the date of the deadline for the final exam (e.g., travel for student organizations, court appearances including jury duty, etc.):
    - The student will inform the instructor at least 1 week prior to the scheduled absence.
    - The student will provide official documentation describing the reason for the absence.
    - The student will present their final exam presentation to the instructor in-person at an alternate time to be scheduled by the student and instructor.
  - In the event of an *unscheduled* student absence on the date of the deadline for submission (e.g., illness, traffic accident, etc.):
    - The student will contact the instructor via email within 24 hours.
    - The student will provide official documentation describing the reason for the absence.
    - The student will present their final exam presentation to the instructor in-person at an alternate time to be scheduled by the student and instructor.

- **In-class Discussions:**
  - In the event of a *scheduled* student absence on the date of the in-class discussion (e.g., travel for student organizations, court appearances including jury duty, etc.):
    - The student will inform the instructor at least 1 week prior to the scheduled absence.
    - The student will provide official documentation describing the reason for the absence.
    - The grade for the in-class discussion will be removed from the calculation of the student's final grade for the course.
  - In the event of an *unscheduled* student absence on the date of the deadline for submission (e.g., illness, traffic accident, etc.):
    - The student will contact the instructor via email within 24 hours.

- The student will provide official documentation describing the reason for the absence.
- The grade for the in-class discussion will be removed from the calculation of the student's final grade for the course.

Cheating and Plagiarism Policy:
Cheating or plagiarism will not be tolerated. It is recommended that students review the *LSU Student Handbook* and *Code of Conduct*. These documents can be found on the Dean of Students webpage. Students suspected of cheating or plagiarism will be referred to the Dean of Students as per requirements in the LSU *Student Handbook*.

Students who violate the LSU Code of Student Conduct (https://saa.lsu.edu/code) will be referred to Student Advocacy and Accountability. Academic misconduct at LSU includes but is not limited to, cheating, plagiarism, collusion, falsifying academic records, and any act designed to give an unfair academic advantage to the student. The outcome will range from failing the assignment to failing the class. Suspension from LSU is the common outcome for multiple academic violations.

Grading Scale:
- Posted midterm and final grades will be rounded to the nearest whole number.
- Letter grades will be defined as follows:

97-100	A+	70 to <73	C-
93 to <97	A	67 to <70	D+
90 to <93	A-	63 to <67	D
87 to <90	B+	60 to <63	D-
83 to <87	B	0 to <60	F
80 to <83	B-		
77 to <80	C+		
73 to <77	C		

Disability Services:
Louisiana State University is committed to providing reasonable accommodations for all persons with disabilities. If you have a disability for which you may require accommodations you are required to register with Disability Services (115 Johnston Hall; (225)578-5919). Students that receive accommodation letters, please meet with the instructor to discuss the provisions of those accommodations as soon as possible.

Course Schedule:
The course schedule on the following page is subject to change. Any changes to the course schedule will be communicated to the students via email. Please also see the course Moodle page for updated course schedules.

Day	Date	Exams / Discussions / Presentations	Topic
Monday	20-Aug		Course overview / Intro
Wednesday	22-Aug		Methods -- Who is there? Part 1
Friday	24-Aug		Methods -- Who is there? Part 2
Monday	27-Aug	**Class Discussion**	How to read a scientific paper
Wednesday	29-Aug	**Class Discussion**	PCR vs metagenomics
Friday	31-Aug		Methods -- What are they doing? Part 1
Monday	3-Sep		**Labor Day Holiday -- No Class**
Wednesday	5-Sep		Methods -- What are they doing? Part 2
Friday	7-Sep		Methods -- What are they doing? Part 3
Monday	10-Sep		Virus-host interactions Part 1
Wednesday	12-Sep		Virus-host interactions Part 2
Friday	14-Sep	**Class Discussion** **Mid-term 1 Exam Distributed**	Piggyback-the-Winner
Monday	17-Sep		Review of concepts in microbial ecology
Wednesday	19-Sep		Global spatial studies Part 1
Friday	21-Sep	**Mid-term 1 Exam Due**	Global spatial studies Part 2
Monday	24-Sep		Go over Mid-term Exam 1
Wednesday	26-Sep		Global spatial studies Part 3
Friday	28-Sep		Long-term time series studies
Monday	1-Oct		Climate change microbiology
Wednesday	3-Oct		Polar microbiology - Permafrost
Friday	5-Oct		**Fall Holiday -- No Class**
Monday	8-Oct		Polar microbiology - Marine
Wednesday	10-Oct		Low-oxygen marine environments
Friday	12-Oct		Biofilms
Monday	15-Oct		Particles
Wednesday	17-Oct		Soil and sediment microbes Part1
Friday	19-Oct	**Mid-term 2 Exam Distributed**	Soil and sediment microbes Part2
Monday	22-Oct		Coral reef microbiology
Wednesday	24-Oct		Deep-sea microbes
Friday	26-Oct	**Mid-term 2 Exam Due**	Hydrothermal vents
Monday	29-Oct		Guest Lecturer, Dr. Cameron Thrash
Wednesday	31-Oct		Go over Mid-term Exam 2
Friday	2-Nov		Astrobiology
Monday	5-Nov		Subsurface geomicrobiology
Wednesday	7-Nov	**Class Discussion**	Oil spills - Dispersant or no dispersant?
Friday	9-Nov		Microbial symbionts Part 1
Monday	12-Nov		Microbial symbionts Part 2
Wednesday	14-Nov		Human microbiome
Friday	16-Nov		Microbiology of the built environment
Monday	19-Nov		Waterbourne disease ecology
Wednesday	21-Nov		**No Class**
Friday	23-Nov		**Thanksgiving Holiday -- No Class**
Monday	26-Nov		Go over final exam requirements -- Work on proposals
Wednesday	28-Nov		Work on proposals
Friday	30-Nov		Work on proposals
Wednesday	5-Dec	**Final Exam (3-5 pm)**	Present proposals