

Microbiology Lab (BIMM 121)–Fall 2019

Lecture: Sequoia 147 – 8:00am to 9:20am, Tuesday and Thursday
Labs: TATA 2101 (984873) – 9:30am to 12:20pm, Tuesday and Thursday
TATA 2102 (984874) – 9:30am to 12:20pm, Tuesday and Thursday

Instructor: Dr. Aubrie O'Rourke

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Office hours: by request between the hours of 12:20 to 1:20 Tuesday and Thursday.

Instructional Assistants (IAs):

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Welcome to Microbiology Laboratory and associated Lecture!

Here we will be using current techniques in microbial physiology, microbial genomics, microbial evolution, and microbial ecology to explore the role of microbes in health, industry, and the environment. Inquiry-based experiments will cover the fundamentals of both working with live microscopic organisms at the bench and bioinformatically analyzing their genomes at the computer. This class consists of three Modules as outlined in the lab manual. These include: Module 1. **Microbes and Health**, Module 2: **Microbes and Industry**, and Model 3: **Microbes and the Environment**.

BY THE END OF THE COURSE YOU'LL BE ABLE TO:

1. Appreciate the structure, physiology, and diversity of microorganisms.
2. Appreciate interactions of microbes with other organisms.
3. Appreciate interactions of microbes with their environment.
4. Detect and interpret evidence of microbial evolution.
5. Isolate, identify, grow, and quantitate microorganisms.
6. Execute laboratory tasks using aseptic technique.
7. Plan an experiment from a general outline of research objectives.
8. Analyze and interpret experimental data to draw accurate and statistically sound conclusions.
9. Communicate scientific research - its justification, methods, and findings - effectively.
10. Recognize unknowns in microbiology.
11. Value the relevance of microbiology today.

ASSESSMENTS and BASIS for FINAL GRADE:

1. PARAPHRASING HOMEWORK and REVISION.....	5%
2. LAB PRACTICAL.....	5%
3. LAB NOTEBOOK CHECKS (6 in total will take place in Lecture)	10%
4. MICROBES and HEALTH LAB REPORTS (PART 1 and 2 combined)	20%
5. MICROBES and INDUSTRY LAB REPORT.....	10%
6. MICROBES and ENVIRONMENT PRESENTATION.....	10%
7. MIDTERM EXAM.....	20%
8. FINAL EXAM.....	20%

GRADING SCALE

97-100 = A+

93-97 = A

90-93 = A-

87-90 = B+

83-87 = B

80-83 = B-

77-80 = C+

73-77 = C

70-73 = C-

60-70 = D

<60 = F

MATERIALS REQUIRED FOR THIS COURSE:

1. **Access to CANVAS:** Lab protocols, grades and other course information will be posted on CANVAS. Please make sure you are able access this platform. Your homework and lab reports will need to be submitted to Turnitin via CANVAS.
2. **Personal protective equipment (PPE):** You will need a **Lab coat that is used ONLY in this course**. You will also need **safety glasses** (you cannot use regular prescription glasses). The lab coat must extend to your knees.
3. **Lab Notebook:** Bound style, preferably with carbon copy paper included.
4. **Lecture Notes:** Lectures will not be podcast (my apologies); however, slides will be posted on CANVAS for each lecture. Please access them before class so that you may take notes on them.

NOTICE: The Packback tool will not be used in this course, if you purchased the access code from the bookstore please return it. If there is an issue with returns you may contact the lead instructor for this course Dr. Katherine Petrie for further assistance.

HOW TO SUCCEED IN THIS CLASS:

1. **Attend Lecture.** Unscheduled lab notebooks checks will take place in Lecture. Lectures will not be podcast.
 - You are not to be working on your prelab materials during lecture time.
 - If you have a question, raise your hand and ask in lecture. If you have a question that comes to you outside of class, add it to the discussion board on CANVAS and another student, an IA or Dr. O'Rourke will address it.
2. **COME PREPARED FOR LAB.**
 - Wear proper PPE.
 - If you will miss lab, documentation will need to be provided to Dr. O'Rourke and your IA, in order to qualify as an excused absence. Please also communicate the absence to your group members.
 - If health or a family emergency results in missing more than two labs, see Dr. O'Rourke to discuss the possibility of an "incomplete" grade for this course.
3. **Keep an organized Lab notebook.**
 - The guidelines for how to keep your notebooks are in the lab manual. Be sure to address all the questions listed in the lab manual for full credit.
 - There will be periodic lab notebook checks in LECTURE. To receive full points, the table of contents must be up to date and you must have kept your notebooks according the guidelines in the lab manual. You must have all work completed for the labs that took place up until the check as well as the purpose and procedures written out for the lab that occurs on the day of the check.

BIMM 121 SYLLABUS

TENTATIVE COURSE SCHEDULE:

WEEK date	Module 1: Microbes and Health		Module 2: Microbes and Industry		Module 3: Microbes and the Environment	
	Lecture	Lab	Lecture	Lab	Lecture	Lab
0. Thursday (9/26/2019)	Intro to course	Lab 1				
1. Tuesday (10/1/2019)	Biofilms and Health, model microbes	Lab 2				
1. Thursday (10/3/2019)	Dilutions and Biofilm assays	Lab 3				
PARAPHRASING HOMEWORK - DUE FRIDAY (10/4/2019)						
2. Tuesday (10/8/2019)	Microscopy	Lab 4				
2. Thursday (10/10/2019)	Microbial Diversity and microbial genomes	Lab 5				
PARAPHRASING HOMEWORK REVISIONS - DUE FRIDAY (10/11/2019)						
3. Tuesday (10/15/2019)	DNA extraction and Illumina library prep overview	Lab 6 <u>Lab Practical</u>				
3. Thursday (10/17/2019)	Illumina sequencing and other technologies	Lab 7				
4. Tuesday (10/22/2019)	Overview of techniques for analysis of Illumina sequencing datasets	Lab 8				
4. Thursday (10/24/2019)	<u>Midterm</u>			Lab 9		
Module 1: BIOFILM LAB PART I REPORT - DUE MONDAY (10/28/2019)						
5. Tuesday (10/29/2019)			Fermentation	Lab 10		
5. Thursday (10/31/2019)	Discuss Tape Station results		Natural CRISPR	Lab 11		
6. Tuesday (11/5/2019)		Lab 12	Differential identification	Lab 12		

TENTATIVE COURSE SCHEDULE (continued from previous page):

6. Thursday (11/7/2019)		PCR, known CRISPR loci in L. A.B.	Lab 13		
7. Tuesday (11/12/2019)		Sanger sequencing	Lab 14		
7. Thursday (11/14/2019)			Lab 15	Photosynthesis and tolerance to change	Lab 15:
MICROBIAL ZOO - DUE FRIDAY (11/15/2019)					
8. Tuesday (11/19/2019))		BLAST, CRISPRS and the Microbiome	Lab 16		Lab 16
8. Thursday (11/21/2019)	FINAL EXAM	FINAL EXAM	Lab 17	FINAL EXAM	Lab 17
Module 2: YOGURT LAB REPORT - DUE FRIDAY (11/22/2019)					
9. Tuesday (11/26/2019)		Thanksgiving - NO LECTURE or LAB 18			
9. Thursday (11/28/2019)					
10. Tuesday (12/3/2019)	Module 3: Presentations		Lab 19		
10. Thursday (12/6/2019)	Module 3: Presentations		Lab 20		
FINALS WEEK	Module 1: BIOFILM LAB PART II LAB REPORT - DUE TUESDAY (12/10/2019)				

Statement on Academic Integrity:

Academic dishonesty (including, but not limited, to cheating and plagiarizing) will not be tolerated. Students found to have committed academic dishonesty will be referred to the UCSD academic integrity office and may receive a failing grade for the course.

Statement on Inclusivity:

Everyone will come to this course with different backgrounds, knowledge, and perspectives. We want to create a classroom culture that respects this human diversity. Accommodations can be made for students with a letter from OSD. Please see Dr. O'Rourke for follow up.

Prepare yourself to journey to the outskirts of what is currently known!

