BIMM 121- Laboratory in Microbiology
Course Syllabus

Instructor: Giorgia Pirino, Ph.D. Email: gpirino@ucsd.edu
Office: H&SS 1145F
Office Hours: TBA. You are encouraged to take advantage of office hours. Office hours function as a relaxed forum to ask questions and discuss course content. Please present your questions regarding the course material in person, not by email. I cannot guarantee an answer to your email, unless it is an urgent issue. *Office Hours will start in week 2.*

Instructional Assistants: Rachel Kim-Chie (r1to@ucsd.edu), Jacob Wozniak (jwozniak@ucsd.edu), Daniel Tyler (datyler@ucsd.edu), and Lourdes Myjak (lmyjak@ucsd.edu)

Course Time and Location
Lecture: Tuesday & Thursday, 8:00-9:20 AM in CSB 01;
Lab A01: Tuesday & Thursday, 9:30 AM-1:20 PM in York 2310;
Lab A02: Tuesday & Thursday, 9:30 AM-1:20 PM in York 2332;
Lab A03: Tuesday & Thursday, 2:30PM-6:20PM in York 2310;
Lab A04: Tuesday & Thursday, 2:30PM-6:20PM in York 2332.

Course Description

This course is designed to illustrate processes central to microbiology and to familiarize students with skills required for handling, working with, and characterizing different microorganisms. Emphasis will be on sterile techniques, cultivation of different microorganisms, their morphological and biochemical characterization, their physiology, antibiotic susceptibility profiling, tools use for identifying unknown bacteria. At the end, students will be able to appreciate microbes' involvement in everyday life. Throughout the course, students will receive training in accurate data entry and analysis, scientific reasoning, and scientific writing.

Textbook

Custom manual available through University Readers.

Course Point Breakdown	**Points**	**%**
Competency	70	7.0
Lab Notebook	42	4.2
Class Participation (*Class discussion/ iClickers)*	56	5.6
Scientific method activity in lab 1	17	1.7
Homework #1-6	270	27
Quizzes #8 (15 points each)	120	12
Midterms	415	41.5
Total Points for the course	**1000**	**100**

Regrade Requests:

All regrade requests should be submitted in writing *within 5 days* of receiving the graded material. Please check the regrade policy on TritonEd for more information.

Equipment:

For this lab you will need to purchase:

- A lab notebook (bound notebook, regular or spiral bound). Carbon notebook not necessary. Loose-leaf binders not allowed.
- A lab coat
- Eye protection (safety glasses preferred, standard prescription eye glasses are not sufficient).
- A Sharpie permanent marker pen, preferably fine point (not extra fine or regular)

Attendance and Absences:

1. Your attendance is required at EVERY lab and through the entire lab period, until all the experimental work for the day is completed.
2. Absences will NOT be treated lightly. Attendance in the lab is **mandatory**. The labs are set up for groups of two or more and your absence will place an unnecessary burden on your partner. *There are no make up labs and you will not be allowed in the lab on non-lab days or in the other Micro lab sections*, although you may be asked to make up the work from the day you missed.
3. Documentation will be required for all unavoidable absences.
4. If you are likely to have interviews for graduate school, etc., please schedule them on non-lab days.

5. All absences without prior notification/permission and the appropriate paperwork will be considered unauthorized.
6. **50-point penalty** for the first unauthorized, unexplained absence from the lab. If there is a second such absence, you will be asked to drop the course or will be given an F.
7. If you are ill on a lab day or have an emergency, e-mail (instructor, IA, or lab partner) before the start of the lab. If you are ill enough to miss lab you must go to the student health center and provide documentation of your illness.
8. You need to inform both the IA and the instructor of any proposed absence. Only the instructor can decide whether or not the reason for an absence is sufficient to call it an authorized absence.

Reading for the lab

Reading ahead of the course:
I will assume that you all have a basic understanding of, and reasonably good memory of the following from lower division bio or form high school. If you don't remember, you may wish to read ahead:

- Scientific Method: brush up on this concept – there are several online sites, including Wikipedia, that do a good job of explaining dependent, independent, and controlled variables as well as the difference between a control experiment and a regular experiment.
- Definition of microbes and an understanding of the different groups of microbes (e.g. bacteria, fungi). You are not required to memorize all the names – you should, however, have at least a basic idea as to the types of organism included in each category
- Eukaryotic vs. prokaryotic cells structure.

Reading during the course:

- Read the chapters before you come to lecture. After week I will post guidelines to reading the chapters in the folder under "Readings" on TritonEd
- When you are in the classroom, I will go over the basics as required, any fundamental concepts that you do find or might find difficult, that are important, or that are particularly exciting or newsworthy.
- Then you will go to lab and actually see all those tests and concepts in action.
- Then go back and quickly reread the material in light of the lecture and lab work and you will find that it becomes very clear since you are already familiar with most of it.

As often as possible, I will give you questions/problems to think about that should apply the concepts you learned in class. Thinking about and attempting to answer these questions and participating in any classroom/lab discussion is the best practice you can have for midterms, lab reports, and practicing science in general.

Lab Performance and Lab Participation (Competency)

In addition to quizzes, midterms, lab reports and homework assignments, student evaluations will be based on the following criteria:

1. Lab techniques will be evaluated in class
2. Lab workshop participation

Subjective student evaluations will be based on the following criteria:

1. Pre-lab preparation
2. Careful management of lab procedures (e.g., sterile technique, proper waste disposal, experimental procedures, etc.)
3. Ability to adapt to unforeseen procedural changes
4. Caliber of thinking before asking questions
5. Scientific approach (e.g., proper use of notebooks, controls, experimental design)
6. Accuracy
7. Independence
8. Safety consciousness
9. General neatness in lab

Please note**: You will be expected to get into the habit of methodical, well-planned and organized work by the mid-term. This will help you with the experiments in the second half of the course.**

Notebook

A spiral bound or composition notebook is OK. All notebooks should have a table of contents and should be handwritten so on the first lab day leave several blank pages at the beginning of your notebook. Number your pages. Entries should be made in chronological order and EVERY day. Each day's entries on each experiment should begin with a brief (1 – 2 sentences) summary of work done on the same experiment the previous day.

How to organize your notebook (further instructions will be provided in the lab)

- **Table of contents** – update everyday – leave at least 4-5 pages for updating

- Start a new page each day for each new experiment– NO EXCEPTIONS!
- NEVER skip pages. Do not fill in data retroactively.
- It is best to start a new experiment on a new page.
- Help the reader follow the thread of an experiment from one day to another. When you resume the experiment, write "continued from page ___." Then go back to where you last left off and write "continued on page ____."

Each experiment should have:

- **Purpose of experiment**
  - only necessary once, at the beginning of an experiment
- **Procedure**
  - Outline or page from which protocol was taken
  - Note any changes
  - Note who did which part of the procedure – who inoculated controls, etc
  - Note which organisms you used – name and species of the controls, etc
  - Errors
- **Observations**
  - Write – in detail
  - Draw – enlarged, labeled, and including as much detail as possible
  - Questions and connections
- **Conclusion or summary**
  - If you just started an experiment, you may not have conclusions to write yet, and it is OK. You must include conclusions after looking at results.
  - Answer any questions in the manual or that were raised in class.
  - Number your pages

Midterms

There will be 3 midterm exams throughout the course (see schedule). Midterm exams will consist mostly in short answer-questions with an emphasis on lab topics. Students may use the lecture slides, guidelines posted on TritonEd, and lab manual as a guide to see what topics to focus for the three exams. *In order to pass the course, students must have a 66% average grade for the three midterm exams.*

Homework and Lab report Deadlines and Submission:

1. A hard copy of your homework is due in the first 5 minutes of the lab period of the day on which your report is due. **All homework assignments submitted more than 10 minutes after start of lab are automatically late and lose 10% of the points. Any homework submitted the next calendar day would lose 50% of the points. No homework will be accepted after the second calendar day.**
2. There is only one lab paper and it is due the Tuesday of finals week. Any lab paper turned in one day late will lose 50% of the points. Any lab paper turned in more than one day late will not be graded.
3. In addition to the hard copy of the assignments/report, you are required to submit an electronic copy to Turnitin.com. A link to the e-submission website will be provided on Ted. Failure to submit onto Turnitin.com by the deadline will results in 0 (zero points) recorded for that report. It is your responsibility to verify that your submission has been successful. Check the deadline of the Turnitin.com submission and make sure you adhere to it. Students agree that by taking this course all required papers would be subject to review for textual similarity by Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the terms of use agreement posted on the Turnitin.com site. Some homework assignments also require Turnitin.com assignments.
4. Additional points may be taken for late electronic submissions.

Assignments

Homework# (HM)	Description	Due date	Points
HM 0	Scientific method activity	first day of lab	17
HM 1	Simple dilutions	Jan 25 Lab	20
HM 2	Growth curve	Feb 6 Lab	33
HM 3	Complex dilutions	Feb 13 Lab	23
HM 4	Online Library Tutorial	Feb 23 11:59PM	20
HM 5	Unknown organism analysis	Mar 6 Lab	96
HM6:	Concept analysis paper	Mar 20 1PM	79
Total			**287**

Midterm Exams
Midterm 1 (in lecture): Thu Feb 1st
Midterm 2 - Dilutions (in lab): Tue Feb 20th
Midterm 2 (in lecture): Thu Feb 22nd
Midterm 3 (in lab): Thu Mar 15th

Quizzes
Quizzes are pop quizzes. They will be held without prior notice in the first 10 minutes of the lab section. If you are late, you will not be given extra time to complete the quiz. Quizzes will focus on the experiments that you will be performing in the lab on that day and the required readings (this includes experiments not already performed and/or experiments started but not finished in the previous lab). On TritonEd you will find documents to help you focus on what is important per each topic.

An extra quiz will be offered to make up for any missed quizzes since there will be no make up quizzes. Students who have already taken all the quizzes may also choose to take the extra quiz and drop the lowest score of the total quizzes.

Extra credit opportunities

Description	**Due date**	**Points**
Extra Credit (EC) Pre course safety survey	Jan 9 8AM	3
Yogurt worksheet	TBA Lab	10
Extra Credit(EC) Post course safety survey	Mar 14 11:59PM	3

Class Participation
Participation in class is very important. The classroom should be active all week, not just during class hours. Student class participation should incorporate responses to their peers, their opinions, pertinent information regarding subjects covered in class, from microbiology topics that students have read, and examples from their experience. The distinguishing feature of a well done class discussion might include an objective and critical analysis of lecture notes, reading assignments and what you have experienced. *Students should seat next to their team members during lecture to facilitate discussion.* Class participation points will be assigned via 2 ways: iClickers and class discussion (see below).

Class Discussion
Students will receive points for participating, which implies discussion within their team and other classmates, NOT for giving a correct answer. In the spirit of scholarly discussion, the instructor expects responses and viewpoints that agree and disagree with others as long as they

apply to the topic and are respectful. In our learning model, the heart of active learning occurs through discussions that help students test their ideas, reinforce what they have learned, and share resources with others in the class. Students **who participate in discussion** (see above) **and** are present for 85% of the lectures will receive full credit.

iClickers

To facilitate class discussion, we will use iClickers during lecture. Students will receive points for clicking, NOT for giving a correct answer. Students who participate in iClickers and are present (clicking) for at least 85% of the lectures will receive full credit.

We will start recording iClickers participation in week 1. iClickers are available for purchase at the UCSD bookstore. Once you have purchased your Clicker, you can register it on TritonEd – go to the tools section and look for the iClicker registration link. I strongly recommend the i>Clicker 2 as it is very convenient. Older versions of i>Clicker are acceptable if you already have one, but you may need to reset your clicker every time it goes into sleep mode. **Do NOT count on sharing a clicker with another student in the same quarter as the software only records scores for one student, even if both of you are in different classes. After registration, your iClicker is linked to your name on the class roster. Therefore, sharing iClickers is illegal.**

Regrade Requests:

All regrade requests should be submitted in writing within 5 days of receiving the graded material. Please check the regrade policy on TritonEd for more information. The final paper won't have a regrade, since it won't be given back to students.

Course Website/TritonEd

This course is on TritonEd (https://tritoned.ucsd.edu) and should automatically appear on your TritonEd account as soon as you register for the class. We will use TritonEd to post information on experiments, exams, schedules, readings and practice material, experimental data, report guidelines, etc. This website will also be used to post any announcements that pertain to the entire class. Please check the site regularly and update yourself on the information provided.

University Policy on Integrity of Scholarship

The principle of honesty must be upheld if the integrity of scholarship is to be maintained by an academic community. The University expects that both faculty and students will honor his principle and in so doing protect the validity of University grading. This means that all academic work will be done by the student to whom it is assigned, without unauthorized aid of any kind. Instructors, for their part, will exercise care in planning and supervising academic work, so that honest effort will be encouraged.

Student Responsibility:
Students are expected to complete the course in compliance with the instructor's standards. No student shall engage in any activity that involves attempting to receive a grade by means other than honest effort; for example:

- No student shall knowingly procure, provide, or accept any unauthorized material that contains questions or answers to any examination or assignment to be given at a subsequent time.
- No student shall complete, in part or in total, any examination, or assignment for another person.
- No student shall knowingly allow any examination or assignment to be completed, in part or in total, for himself or herself by another person.
- No student shall plagiarize or copy the work of another person and submit it as his or her own work.
- **If any work is plagiarized from that of another student, both students will be reported to the Office of Academic Integrity, even if one of the students has graduated already. Remember that most graduate schools check the undergraduate records for any indications of dishonesty before awarding a degree.**
- No student shall alter/forge graded class assignments or examinations and then resubmit them for regrading.
- No student shall submit substantially the same material in more than one course without prior authorization.

Please sign the online pledge to UCSD academic integrity through the following link: https://academicintegrity.ucsd.edu/forms/form-pledge.html

The link is also available through TritonEd, under the academic integrity's folder. After completing the pledge, you will receive a confirmation email. Please forward it to your IA.

Accommodations/Special needs
Anyone who has any special needs associated with health or other issues that affect your ability to take this class or that require any special accommodation should tell me on or before the first day of lab. Such special needs include allergies, immune challenges, pregnancy, or any other situations that might affect your safe functioning in this lab. Please do not hesitate to bring any questions or issues to our notice. Our primary concern is your safety in this lab. If you have any questions or doubts, please feel free to contact me or to ask the Student Informational Services.

Final Notes

Every technician/researcher who works in a lab is expected to come to the lab prepared, with a thorough understanding the experiments they are about to conduct. This is basic lab competence, and to do otherwise would be negligence. It requires advance study, before arriving in the lab. Nearly all the students in this class are graduating in June. Think of this as "on the job training!"

***Note**: Just coming to lab does not ensure that you will get a passing grade in the class. You must hand in all assignments and get a passing score (70%, cumulative) on those assignments to get a C- in the class. You will not pass the course if the combined score for your three midterm exams is less than 66%.*