

## **BIMM 121- Laboratory in Microbiology Course Syllabus**

**Instructor:** Giorgia Pirino, Ph.D.

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*Please include BIMM121 your full name, ID, and IA name in all emails to Dr. Pirino*

**Office Hours:** Tuesdays, 6:30-7:30PM in York 2300. 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:** Aaron Angerstein ([aangerst@ucsd.edu](mailto:aangerst@ucsd.edu)); Rachel To ([r1to@ucsd.edu](mailto:r1to@ucsd.edu)); Andrew Quach ([a6quach@ucsd.edu](mailto:a6quach@ucsd.edu)); Dereck Hollingworth ([d1hollin@ucsd.edu](mailto:d1hollin@ucsd.edu))

### **Course Time and Location**

Lecture: Tuesday & Thursday, 8:00-9:20 AM in CSB 001;

Lab B01: Tuesday & Thursday, 9:30AM-1:20PM in York 2310;

Lab B02: Tuesday & Thursday, 9:30AM-1:20PM in York 2332.

Lab B03: Tuesday & Thursday, 2:30PM-6:20PM in York 2310;

Lab B04: 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 Cognella.

<b>Course Point Breakdown</b>	<b>Points</b>	<b>%</b>
Competency	15	7.5
Lab Notebook	15	7.5
Class Participation	10	5
<i>Class discussion (5 points)</i>		
<i>iClickers (5 points)</i>		
Homework	40	20
Midterms	120	60
<b>Total Points for the course</b>	<b>200</b>	<b>100</b>

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### Grading Scale

<b>Letter Grade</b>	<b>%</b>	<b>Letter Grade</b>	<b>%</b>
<b>A+</b>	<b>(99.0 - 100%)</b>	<b>A</b>	<b>(93.0-98.99%)</b>
<b>A-</b>	<b>(90.0 - 92.99%)</b>	<b>B+</b>	<b>(88.5 - 89.99%)</b>
<b>B</b>	<b>(83.0 - 88.4%)</b>	<b>B-</b>	<b>(80.0 - 82.99%)</b>
<b>C+</b>	<b>(78.5 - 79.99%)</b>	<b>C</b>	<b>(73.0 - 78.4%)</b>
<b>C-</b>	<b>(70.0 - 72.99%)</b>	<b>D</b>	<b>(60.0 - 69.99%)</b>
<b>F</b>	<b>(X &lt; 60%)</b>		

Final grades are calculated on a straight scale and they are not curved. IAs will alternate grading of homework among the lab sections. If a midterm exam is graded by IAs, each IA will grade the same questions consistently for all the exams. This grading system allows fairness among the lab sections and usually excludes the need of normalizing final grades among lab sections.

### 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 and proper lab attire. Failure to do so will consist in subtraction of points (at least 1 point per lab). No exceptions!

- Eye protection (safety glasses preferred, standard prescription eye glasses are not sufficient) must be worn all the times while in the lab, unless otherwise instructed
- A Sharpie permanent marker pen, preferably fine point (not extra fine or regular; avoid red)

### 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 or take the lab in a different quarter. These absences will be considered unexcused
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, and 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 *within* the same day. No retroactive documentation will be accepted after 24 hours of missing a lab.
8. You need to inform both the IA and the instructor of any proposed absence as well as your team members. 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 from 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 organisms included in each category
- Eukaryotic vs. prokaryotic cells differences
- Metabolic pathways
- Metric system

*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 (sometimes lectures won’t be synchronized with the lab, therefore, it is necessary to read ahead before going to lab)
- Then you will go to lab and actually see all those tests and concepts in action.
- Then go back and quickly re-read 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 midterms, lab reports and homework assignments, student evaluations will be based on the following criteria:

1. Lab techniques will be evaluated in class. These competency tests will be unannounced.
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, dilutions, 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, including proper PPE
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. Consult Appendix V in your lab manual. *Notebook checks will be unannounced.*

#### *How to organize your notebook*

- **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, what temperature, conditions, 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 (examples will be provided)

- 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 (this part should be started in the lab and completed at home)
  - 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 (except the midterm exam 1 on dilution maths). Students may use the lecture slides, guidelines posted on TritonEd, and lab manual as a guide to see what topics to focus for the exams. Midterm exams require understanding of a topic and ability to apply them, not just memorization. *In order to pass the course, students must have a 70% average grade for the three midterm exams.*

### Homework and Lab report Deadlines and Submission:

1. A hard copy of your homework is due in lecture of the day on which your report is due. **All homework assignments submitted after the end of lecture are automatically late and lose 20% of the points. Any homework submitted within 24 hours from the deadline, past the end of lecture, would lose 50% of the points. No homework will be accepted after the second calendar day.** This policy apply to any assignment in the course
2. In addition to the hard copy of some assignments/reports, 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; student names will never be stored in the Turnitin database. Use of the Turnitin.com service is subject to the terms of use agreement posted on the Turnitin.com site.

## Assignments

Homework# (HM)	Description	Due date	Points
HM 1	Scientific method activity	Tue Jan 15    Lecture	5
HM 2	Online Library Tutorial	Tue Jan 22 @11:59PM	3
HM 3	Growth curve	Tue Feb 5    Lecture	8
HM 4	Unknown organism analysis	Tue Mar 13    Lecture	15
HM 5	Microbiology paper	Mon Mar 18    TBD	10
<b>Total</b>			<b>40</b>

## Midterm Exams

Midterm 1 (in lecture): Thu Feb 7	15 points
Midterm 2 (in lecture): Thu Feb 14	50 points
Midterm 3 (in lecture): Thu Mar 15	55 points

## Extra credit opportunities

Description	Due date	Points
Yogurt worksheet	Thu Mar 7    Lab	4

## 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.

**Dilution maths:**

Among the lab skills that students will acquire in this lab, students will receive a training on dilutions. Thus, we will practice both the manual dilutions (how to manually set them up in the lab) and the maths behind that. Dilution videos, practice problems, and workshop will be provided during the course. There will also be a formal assessment to evaluate this skill.

**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 or internet sources 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/forged 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 by week 1: <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 of 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 70%.*