

# MICR 3100/BIOL 3100 GENERAL MICROBIOLOGY, SPRING 2023

DEPARTMENT OF BIOLOGICAL SCIENCES  
COLLEGE OF NATURAL AND SOCIAL SCIENCES  
CALIFORNIA STATE UNIVERSITY, LOS ANGELES

## COURSE Description

Welcome to the wonderful world of microbiology!

General Microbiology class includes fundamental biological principles and applications of microbes. Lecture introduces the structure, function, growth, nutrition, and genetics of various microorganisms, metabolism and biochemistry, microbial diversity and ecology, and applied and medical microbiology. Laboratory introduces basic microbiology techniques including aseptic techniques, microscopy, and basic microbial physiology tests and further explore more sophisticated microbiology experiments including quantitative culture of microorganisms, isolation of antibiotic producers, and several medical microbiology experiments. Lecture 3 hours per week: laboratory 2 <sup>1/2</sup> hours per week.

**Prerequisites:** BIOL 1200 and CHEM 1110

## COURSE OBJECTIVES/OUTCOMES

Upon successful completion of this course, students will be able to:

1. Demonstrate the understanding of fundamental biological principles of microbes.
2. Demonstrate the understanding of the structure, function, growth, and metabolisms of microbes.
3. Demonstrate the understanding of microbial evolution, diversity and their role in the ecosystem.
4. Demonstrate the understanding of human microbiota, microbial pathogenesis, and host defense mechanisms.
5. Perform basic microbiology techniques including aseptic techniques, microscopy, and basic microbial physiology tests.

## CLASS SCHEDULE

Course	Section	Date & Time	Room	Instructor
32270	01-LEC	Tu, Th 12:15-1:30 pm	SH358B	Hyunsook Park
32271	02-LAB	Tu 8:00 am - 10:30 am	ASCL229	Shakila Rahman
32272	03-LAB	Tu 1:50 pm - 4:20 pm	ASCL229	Hyunsook Park
32273	04-LAB	Th 8:00 am - 10:30 am	ASCL229	Shakila Rahman
32274	05-LAB	Th 1:50 pm - 4:20 pm	ASCL229	Shakila Rahman

## INSTRUCTOR INFORMATION

Section	Instructor	Office / Zoom ID	Office Hours	e-mail
01/03	Hyunsook Park (she/her)	Zoom ID 517 436 0951 ASCL 353	Tu/Th 11:00 am - 12:00 pm	<a href="mailto:hpark8@calstatela.edu">hpark8@calstatela.edu</a>
02/04/05	Shakila Rahman	Library Palmer Wing, Room 2097	M 9am-10 am Zoom office is available upon request	<a href="mailto:srahma18@calstatela.edu">srahma18@calstatela.edu</a>

\* If you have any schedule conflicts with the scheduled office hours by instructors, please feel free to reach out to us. We are happy to set up a separate meeting schedule to assist you.

## REQUIRED COURSE MATERIALS

### TEXTBOOK - LECTURE

We will primarily use Prescott Microbiology, 11<sup>th</sup> edition, McGraw-Hill, 2020 (ISBN: 9781265867577, hard copy) You may purchase an e-book: (ISBN: 9781265836986). Both versions include the Connect access code. You may purchase the Connect access code separately.

### LAB MANUAL

The lab manual will be provided in pdf format on Canvas. You will need to print out and bring a loose leaf-bound hard copy to the lab class. If you cannot open the pdf file, please download free [Adobe Acrobat Reader DC software](#) for your Windows, Mac OS, and Android devices to view, print, and comment on PDF documents. You are responsible for recording the results from each lab activity and answering the thought questions. The instructors will collect the lab manual occasionally to check the completion of data collection/thought questions. This work will be graded on completion.

### TECHNOLOGY REQUIREMENTS

To succeed in this class, you will need access to:

- A Connect Access ID, which is included with a textbook purchase.
- A working computer. During the COVID19 crisis, the Dean of Students has some laptops available on loan to students. [Learn more here.](#)
- Access to the Internet, although--with the exception of several short videos (none more than about 8 minutes--you will need it for low-bandwidth activities such as reading things on Canvas or using the library databases.

You will also need familiarity with the following types of software.

- A word processing program such as MS word (available free to you as a CSULA student. [Learn more here](#)) or Google docs.
- PowerPoint (available free to you as a CSULA student. See above link). Or some other slide presentation program.
- Zoom (for class and office hours), Use zoom link in the course navigation column.
- An up-to-date browser (Chromes works well with Canvas) and operating system.
- Some of the documents in this course will be available to you in PDF form. You will need download and install [Adobe Acrobat Reader](#) on your computer.

### HOW TO SET UP CONNECT ACCOUNT

Please review the tutorials on how to register for the Connect Virtual Class resources.

- Registration video walkthrough - <https://www.mheducation.com/highered/support/connect/first-day-ofclass/canvas.html>
- Smartbook 2.0 – <http://video.mhhe.com/watch/4ywCxRWkYPeKCcnZCWnMhR>
- Tech Support – <https://mhedu.force.com/CXG/s/ContactUs>
- Basic Troubleshooting - <https://mhedu.force.com/CXG/s/article/Basic-Troubleshooting>
- ReadAnywhere App - <https://itunes.apple.com/us/app/readanywhere/id1237370775?mt=8>

## COURSE POLICIES

### ATTENDANCE

**Lecture attendance** Students are responsible for all material presented in class, including announcements about changes in course procedures. There will be several active learning activities during class without prior announcement and will be incorporated to class performance. There will be no make up for any missed class activities. Please communicate with me if you need to miss class (preferably before the class is missed).

**Laboratory attendance** is a course requirement and there will be point deduction for missing lab. If you are late more than 10 min for the lab, 5 points will be deducted. If you are absent from lab without satisfactorily justified and documented reason, 10 points will be deducted.

### FACE COVERING

Face coverings are required at Cal State LA while indoors or in a campus vehicle, unless you are alone. Find more details about COVID-19 protocols and answers to frequently asked questions related to the pandemic on the [University's Health Watch website](#).

### EXAMINATIONS MAKE-UP POLICY

Missed events will be set as "0 points" unless satisfactorily justified with supporting documentation (e.g. doctor's note). There will be no make-up instruction. Students are responsible to obtain the missed information from their team mates and review the lecture recording.

### READING MATERIALS

The TEXTBOOK READING ASSIGNMENTS will be on Connect Microbiology Smartbook 2.0 offered by McGraw-Hill, which is accessible via Canvas. Students are expected to finish reading assignment before beginning of new chapter to receive credit for reading assignments.

### PERFORMANCE EVALUATION

#### ASSIGNMENTS AND GRADING POLICY

Assignment due dates will be notified on CANVAS (and will be announced in class). An overall assignment, tests, and participation grade will be given based on the completeness and care evident in your homework and your test grades. Periodic quizzes/class activities will be given in class or on CANVAS, and email notice will be sent as soon as they are available. There will be no make up for missed activities/assignments/quizzes. Take advantage of time, study partners, email, and office hours to study your notes, objectives, and practice problems, and to complete your assignments well. **Late work will not be accepted.** *If you encounter any issues in submitting assignments, please make sure to contact me immediately. I encourage students to double check to ensure that your submission appears on Canvas prior to the deadline. Make sure I have access to your completed assignment by the deadline, even if it means attaching it to the email to ensure that I have it.*

### GRADING

#### **Lecture: 500 points (62.5%)**

100	Lecture Video Review/Chapter Practice Quizzes	(12.5%)
100	Class activity – problem set (5pts each)/attendance	(12.5%)
30	Current event report(10pts), Symbiosis report (10pts), necrobiome(10pts)	(3.75%)
75	Exam 1	(9.375%)
75	Exam 2	(9.375%)
120	Final Exam	(15%)

#### **Laboratory: 300 points (37.5%)**

30	Connect Virtual Lab Assignment Activity (10 activities)
20	Microbiome report
20	Thought Questions (Lab Manual) Check
20	ELVIS Case study
30	Formal Lab Report 1 - Bacterial Fitness
20	Lab Report 2 - Identification of Bacteria by 16s rDNA sequencing
60	Midterm Exam (includes written and practical portions)
100	Final Exam (includes written and practical portions)

## **Grades:**

Based on the % points achieved out of the total achievable points the students can earn:

A	92 - 100%	C	69% - 72%
A-	88% - 91%	C-	65% - 68%
B+	84% - 87 %	D+	61% - 64%
B	80% - 83%	D	56% - 60%
B-	76% - 79%	D-	51% - 55%
C+	73% - 75%	F	below 50%

*NOTE: CANVAS MAY NOT FULLY REFLECT YOUR CORRECT GRADE UNTIL THE FINAL GRADE IS CALCULATED. IT CAN GIVE YOU A GOOD IDEA, BUT TO KNOW YOUR ACTUAL STANDING IN THE COURSE, MAKE SURE TO CALCULATE YOUR GRADE AS DESCRIBED ABOVE. IN BORDERLINE CASES (PASSING/NON-PASSING OR GRADE LEVELS), PARTICIPATION AND PERFORMANCE IN LECTURE AND LABORATORY WILL BE CONSIDERED FOR THE FINAL GRADE.*

## **DROP POLICY**

The drop policy established by the university will be strictly followed. After the no record drop deadline, students may drop a course only for "serious and compelling reasons". Failing a course is not an acceptable reason for withdrawal. Acceptable documentation is required verifying the reason for the withdrawal. See the Schedule of Classes for information. Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Students should be aware of the current deadlines and penalties for adding and dropping classes: <https://get.calstatela.edu/Registrar.htm>.

## **INCOMPLETE GRADE POLICY**

Incomplete grades can only be assigned when the majority of the coursework has been completed (essentially all work except the final exam), and the student is passing the course (grade of C or better). The submission of an Incomplete Grade Form is required.

## **COURSE COMMUNICATION**

### **OFFICE HOURS**

To ensure that you will be seen promptly during office hours, zoom office will be open during the prescheduled office hour. Students are welcome to drop by to discuss any issues related to class. If there is another student shows up before you connecting to zoom office, you will be assigned in an waiting room until the previous appointment ends. You may arrange another time for advisement, if you have schedule conflict with predetermined office hour. Please email me in advance.

### **INTERACTION WITH INSTRUCTOR**

We will make every effort to communicate frequently with students through announcements and postings within the Canvas site. Post any questions or comments you have about the course in the [Q&As - Ask or Answer a Question](#) forum. Peer response to those questions is an excellent way of facilitating the engaged learning community among students. Your participation will be counted and added toward class participation points. Questions of a more personal nature can be sent to the instructor via email. As a student, you should expect to receive feedbacks and responses to postings within 48 hours. The instructor will post an announcement alerting the students if he or she will be unavailable for more than a day.

### **EMAIL**

All emails pertaining to the course must come from your CSULA email account. E-mail correspondence with the professor must be professional. Include the following in your subject line: Name, Course and section number, general topic. Now is the time to start practicing for the job market, graduate school applications, business correspondence, etc. When you send a sloppy, unpunctuated e-mail (e.g., from your iPhone), you are conveying a

message of non-professionalism, laziness, and indifference; this will hurt you dearly in the professional world. Having the discipline to write professional correspondence will benefit you!

### **NETIQUETTE**

When posting on the discussion boards and chat rooms it is important to understand how to interact with one another online, *netiquette*. You can read more about the rules of netiquette at <http://www.albion.com/netiquette/index.html>

### **HARDSHIPS**

If something happens during our course that makes it difficult or impossible for you to complete course work or attend class for an extended period of time, please inform me. I do not need to know all the details of your personal concerns, but if you need me to take into consideration your extenuating circumstances, I encourage you to let me know as soon as possible rather than at the end of the course. If I have knowledge of your hardship, I may be able to accommodate you, or I may be able to refer you to other people on campus for further assistance. If you wait until the end of the course to tell me about your concerns or challenges, I may not be able to provide sufficient assistance.

## LECTURE SCHEDULE

	Lecture	Assignments
Week 1	Class Introduction 1. The Evolution of Microorganisms and Microbiology	Each Week: Lecture video review/quizzes In class activity
Week 2	2. Microscopy 3. Bacterial Cell Structure	
Week 3	3. Bacterial Cell Structure 4. Archaeal Cell Structure	
Week 4	6. Viruses and Other Acellular Infectious Agents 7. Bacterial and Archaeal Growth	Current Event Report Due
Week 5	8. Control of Microorganisms in the Environment	
Week 6	Exam 1 9. Antimicrobial Chemotherapy	
Week 7	11. Catabolism: Energy Release and Conservation	
Week 8	13. Bacterial Genome Replication and Expression	
Week 9	14. Regulation of Bacterial Cellular Processes	
Week 10	Spring Break	
Week 11	16. Mechanisms of Genetic Variation Exam 2	
Week 12	19. Microbial Taxonomy and the Evolution of Diversity	Symbiosis Report Due
Week 13	20-23 Microbial Diversity: Archaea and Bacteria	
Week 14	24-25 Protist and Fungi 27 Microbial Interaction	
Week 15	32-33 Innate and Adaptive Immunity	Necrobiome Report Due
Week 16	34 The Microbe-Human Ecosystem	
Final	Final Exam (TBD)	

## LABORATORY SCHEDULE

Laboratory Exercises		Activity/Discussion	Assignments (points)
1	<ul style="list-style-type: none"> <li>No in-person meeting</li> </ul>	(Online) Lab safety training/Introduction EHS online safety training video	Connect Lab - Virtual Lab Tutorial, Lab Safety Personal, Lab Safety Hand Washing
2	Lab group assign Lab Safety Sheet sign/turn in 1. Ubiquity of Microorganisms		Connect Lab – Ubiquity of Microorganisms Canvas – Microbiome Activity (20pts)
3	2. Aseptic Technique	1-2. observation of microbial colonies 2-1. Aseptic technique 2-2. Transfer and Isolation Techniques: 4-quadrant streaking 2-3. Motility agar inoculation (demo)	Connect lab – Aseptic techniques 1 and 2, Quadrant streaking
4	2. Aseptic Technique  3. Microscopy	2-2. observation of 4-quadrant streaking result 2-3. observation of motility agar 2-4. Inoculation of single colony Microscopy practice	Connect Lab – Microscopy (operation, oil immersion, smear prep)
5	4. Gram staining	Gram staining practice Microscopy – oil immersion	Connect Lab –acid fast staining/capsule staining/endospore staining
6	5. Effects of the Environments on microbial growth	Review - Gram staining Experiment set up	Connect Lab – microbial growth (pH, osmotic pressure, Temp, oxygen)
7	6. Antiseptics and Antimicrobial Agents <b>Midterm review (Ex 1-5)</b>	Experiment set up Review - Effects of the Environments (result)	Connect Lab – control of microbial growth (Kirby Bauer, antiseptics)
8	6. Effectiveness of antiseptics and antibiotics data analysis <b>Midterm exam</b>	Review- antiseptic and antimicrobial - data analysis	Midterm exam (60 pts)
9	7. Serial Dilution 8-1. Bacterial Fitness – hypothesis generation  9. Identification of Unknown Bacteria-ELVIS Case Study	Experiment set up Group discussion (bring tech devices)  Introduction to the assignment	Connect Lab – Quantitative dilution, colony counts Group assignment - hypothesis with justification Due by the end of the week
10	Spring Break (No Class)		
11	8-2. Bacterial Fitness	Experiment set up ELVIS Case Study (Group discussion)	CANVAS - ELVIS Case Study Worksheet (20)
12	8-3. Serial dilutions and plating  10-1. Identification of microorganisms using 16S rDNA	Review - Formal Report Rubric (Bacterial Fitness) DNA isolation	
13	8-4. Data analysis: 10-2. Amplification of 16S rDNA by PCR	Colony count and group discussion	Connect Lab - Bacterial Transformation, PCR, gel electrophoresis
14	10-3. Electrophoresis and excision of 16S rDNA	Electrophoresis and excision Gel Extraction Review – BLAST search Review – Identification Report Rubric	Formal Report 1 due (30)
15	10-4. DNA Sequencing and Bioinformatic analysis 12. Blood leukocyte differentiation (microscopy)	Final exam review	Connect Lab – Sars-CoV2 Diagnostics, Blood Cell Count
16	Lab Final Exam during Lab classes (written and Practical exam)		Final Exam (100) Identification Report due (20)

## HELPFUL STUDENT RESOURCES

Cal State LA offers many resources to students. Get your money's worth by checking them out and using them!

### TECHNOLOGY RESOURCES

If you experience technical difficulties or require to obtain free softwares, please contact the IT Help Desk.

ITS FREE software for students: <http://www.calstatela.edu/its/software/personal-computers>

ITS Helpdesk information: <http://www.calstatela.edu/its/helpdesk>

Other ITS resources: <http://www.calstatela.edu/its/helpdesk/studentres>

### OFFICE OF STUDENTS WITH DISABILITIES

Cal State LA offers many resources to provide reasonable accommodations for persons with documented disabilities. Students need to contact the Director of Student Accessibility and Support Services (<http://www.calstatela.edu/osd>) and the professor as early in the semester as possible to ensure that classroom and academic accommodations are implemented in a timely fashion. All communication between students, Student Accessibility and Support Services, and the professor will be strictly confidential.

### UNIVERSITY LIBRARY ONLINE RESOURCES DEAN OF STUDENTS

Way more than books and databases. Free movies anyone? <https://www.calstatela.edu/library>

For questions about student services (including emergency housing and food) and many more:

<http://www.calstatela.edu/deanofstudents>

### COUNSELING AND PSYCHOLOGICAL SERVICES

If you are struggling, we offer resources to help! <http://www.calstatela.edu/studenthealthcenter/caps>

### STUDENT HEALTH CENTER

Offers many services, including low cost prescriptions (including birth control)!

<http://www.calstatela.edu/studenthealthcenter>

### ERIKA J. GLAZER FAMILY DREAMERS RESOURCE CENTER

Are you undocumented? Do you have a friend who is? Our Dreamers Center exists to serve you!

<http://www.calstatela.edu/gfdrc>

## COURSE & UNIVERSITY POLICIES

### STUDENT HANDBOOK

Information on student rights and responsibilities, academic honesty, standards of conduct, etc., can be found in Schedule of Classes for the current quarter (<http://www.calstatela.edu/classschedule/>) under Policies and Procedures.

### AMERICANS WITH DISABILITIES ACT (ADA)

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. For more information visit the website at

<http://web.calstatela.edu/univ/osd/atlc.php>.

### ACADEMIC HONESTY/ PLAGIARISM

Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at <http://www.calstatela.edu/academic/senate/handbook/ch5a.htm> as well as in the current Schedule of Classes. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation. All cell phones and other electronic devices are to be turned off during the exams.

Many incidents of plagiarism result from students' lack of understanding about what constitutes plagiarism. At Cal State L. A., plagiarism is defined as the act of using ideas, words, or work of another person or persons as if they were one's own, without giving proper credit to the original sources. All work you submit must be your own scholarly and creative efforts. All writing assignments will be checked by Turnitin app on CANVAS.

\* This syllabus is subject to change. If a change is made, the professor will immediately notify the class and post a revised syllabus.