MICR 3100/BIOL 3100 GENERAL MICROBIOLOGY, FALL 2019

California State University, Los AngelesCollege of Natural and Social Sciences

Department of Biological Sciences

# Class Schedule

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| --- | --- | --- | --- | --- |
| Course  | Section | Date & Time | Room | Instructor |
| 92875 | 01-LEC | Tu, Th 12:15-1:30 PM | KH LH2 | Hyunsook Park |
| /var/folders/n2/mt1vx_5d16n65nr31qykqzrc0000gq/T/com.microsoft.Excel/WebArchiveCopyPasteTempFiles/PT_PIXEL_1.gif92876 | 02-LAB | Tu 9:00AM - 11:30AM | ASCL 226 | Everardo Robles-Martinez |
| /var/folders/n2/mt1vx_5d16n65nr31qykqzrc0000gq/T/com.microsoft.Excel/WebArchiveCopyPasteTempFiles/PT_PIXEL_1.gif93552 | 05-LAB | Th 1:50PM - 4:20PM | ASCL 226 | Everardo Robles-Martinez |
| 95623 | 06-LAB | M 10:55AM-2:25PM | ASCL 226 | Shakila Rahman |
| 95624 | 07-LAB | W 10:55AM-2:25PM | ASCL 226 | Shakila Rahman |

# Instructor Information

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| --- | --- | --- | --- | --- |
| Section | Instructor | Office  | Office Hours | e-mail |
| 01 | Hyunsook Park  |  ASCL 353 | M 11:00 AM – 1:00 PM | hpark8@calstatela.edu |
| 02/05 | Everardo Robles-Martinez | Lib Palmer Wing 2097/var/folders/n2/mt1vx_5d16n65nr31qykqzrc0000gq/T/com.microsoft.Excel/WebArchiveCopyPasteTempFiles/PT_PIXEL_1.gif | Th 9:30 – 10:30 AM | eroble27@calstatela.edu |
| 06/07 | Shakila Rahman | Lib Palmer Wing 2097 | W 2:30 – 4:30 PM | srahma18@calstatela.edu |

# Course Description

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 1/2 hours per week.h

**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.

# Required Course Materials

Textbook Microbiology: An Evolving Science 4th edition by Joan Slonczewski and John Foster, W. W. Norton & Company, NY. Available in the University bookstore. To purchase the ebook for selected chapters visit; [https://www.wwnorton.com/orders/intellipay/accessPurchase.asp?site=microbio\_ebook](https://email.calstatela.edu/exchweb/bin/redir.asp?URL=https://www.wwnorton.com/orders/intellipay/accessPurchase.asp?site=microbio_ebook).

Lab Manual MICR3100/BIOL3100 General Microbiology Lab manual (Compiled by Microbiology Faculties at CSULA, hard copy is available at the University bookstore, and electronic copy is available on Canvas).

# Course Policies

**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 absolutely no make up for any missed class activities. A fair calculation for the time required for this class should take into account the need to spend at least 2 hours of independent study for each class hour. Exam content will draw heavily from lectures. For laboratory, attendance is more strictly enforced and there will be point deduction for missing lab. Laboratory attendance is a course requirement. 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.

No Make-up Examinations: Missed events will be set as “0 points” unless satisfactorily justified with supporting documentation (e.g. doctor’s note). Students are responsible to obtain the missed information from their team mates and through self-study. There will be no make-up instruction.

Laboratory requirements: Students are required to wear a lab coat and closed toe shoes, and must have a notebook and writing supplies. Gloves will be provided when needed. Students with latex allergy must contact the instructor without delay. Students without a lab coat cannot participate and the affected lab section will be recorded as missed. An incomplete grade will be issued if more than 2 labs have been missed. Repeated failure to follow laboratory rules (including house keeping and safety rules) will result in point deductions.

Reading Materials: The LECTURE READINGS are from **Microbiology: An Evolving Science 4e**. The lecture topics, including chapter sections to read, are listed on the Schedule page. It is highly recommended that you read the material before the lecture in order to have a complete understanding of the topics being presented. Reading assignment will be assessed by weekly online quizzes. Student resources are available through the following link: <http://www.wwnorton.com/college/biology/mbio/>.

THE LAB READINGS are from the laboratory manual and the online contents provided on CANVAS. Read Lab manual, review Pre-lab video, and take pre-lab quiz before coming to each class.

# 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 submission will be subjected to point deduction.

**Online activities:** Lecture homework and Lab quizzes will be given via Canvas and the timeline of each activity will be given by the instructors. You will be given three attempts for the lecture activity and two attempts for the lab quizzes. **No make up will be given for missed activities and quizzes.**

**Smartwork5 Lecture Homework:** To begin the online lecture activity, click the Smartwork5 Chapter 1 homework link and you will be asked to register for the Smartworks 5. Once you register and sign in, you should be able to work on the online activity.

Please follow the steps in this video: <https://youtu.be/hKIkc5_Gmh8>. If you have questions about how to use Smartwork5, such as which browser to use, where to see your grade, or how to answer questions, you can view help notes with screenshots here: <http://wwnorton.knowledgeowl.com/help/smartwork5-students.>

Please note that it can take up to 48 hours for the grade that you earn in an assignment to fully report to your course gradebook.

If you have any questions about your grades contact Norton support at support.wwnorton.com and include the name of the assignment and your instructor’s name.

**Performance Evaluation**

**Lecture: 500 points**

 120 Smartwork5 Homework

 20 Case study (EVLIS)

 10 Symbiosis report

 100 Exam 1 (Bring Scantron Form No: 882-E)

 100 Exam 2 (Bring Scantron Form No: 882-E)

 150 Final (comprehensive) Examination (Bring Scantron Form No: 882-E)

**Laboratory: 350 points**

 100 Online Pre-Lab Quizzes

 60 Formal Laboratory Report (2 X 30 pts, Bacterial Growth Curve, Bacterial Identification)

 10 Microbiome assignment

 30 Thought Questions (Lab Manual) Check (2 pts X 15 chapters)

 50 Lab Midterm

100 Comprehensive Final Examination (includes written portion and practical portion)

Do not wait until the last moment to submit your work since Canvas is sometimes nonoperational. **Late work will not be accepted.**

**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% |

## 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.

**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.

**Computer/Internet Requirements** Students are expected to participate actively in the course using CSULA learning management system, [**Canvas**](https://calstatela.instructure.com/)**.**You will need to have an up-to-date browser, operating system and some additional software on your computer to take this class. Check the [ITS helpdesk](http://www.calstatela.edu/its/helpdesk/studentresources) link for student resources. Some of the documents in this course will be available to you in PDF form. If you do not have Adobe Acrobat Reader software on your computer, you can download it by going to [Adobe.com](http://get.adobe.com/reader/). This class will be in CETL Tech classroom equipped with up-to-date workstation and projection systems for multiple electronic devices, including connectors to laptops, and other portable devices. Students are encouraged to bring laptops or personal electronic devices for class lecture and activities.

**Please refer to this syllabus for all course procedural questions**. This syllabus is subject to change. If a change is made, the professor will immediately notify the class and post a revised syllabus.

# Course Communication

**Office Hours** To ensure that you will be seen promptly during office hours, arrange an appointment with me by email in advance. Drop-ins are fine, but if I am already meeting with another student you may have to wait. If you put in the effort required, you should learn a lot from this course. If you are having trouble, or are not learning what you hoped to learn, talk to me. I benefit from your feedback.

**Interaction with Instructor** The Instructor will make every effort to communicate frequently with students through announcements and postings within the Moodle site. Post any questions or comments you have about the course content and/or requirements in the *Muddiest Point* forum. Peer response to those questions are highly recommended and counted toward class participation. 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. 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>

# Helpful Student Resources

**Technical Resources** Information on CSULA technical support resources for students: (<http://www.calstatela.edu/cetl/technical-support-resources>)

**Student Support Services** Information on CSULA student support resources for students: (<http://www.calstatela.edu/cetl/student-support-resources>)

**Academic Support Services** Information on CSULA academic support resources for students: (<http://www.calstatela.edu/cetl/academic-support-resources>)

**Canvas Mentor Site** Information for students on how to be a successful online student and how to use Canvas: (<http://www.calstatela.edu/canvasmentor>)

# 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.

**Dropping and Adding**

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>.

**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. However, you are expected to familiarize yourself with Cal State L.A.’s policy on plagiarism. All work you submit must be your own scholarly and creative efforts. Cal State L.A. plagiarism as follows: “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.”

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| Week | Lecture | Readings/Assignments |
| 1 | Introduction  1. Microbial Life; origin and discovery | pp 1 - 36  |
| 2 | 2. Observing the Microbial Cell: Microscopy  | pp 37-76  |
| 3 | 3. Cell Structure and Function | pp 77 – 116   |
| 4 | 4. Bacterial Culture, Growth, and Development | pp 117 – 156   |
| 5 | 5. Environmental Influences and Control6. Viruses | pp 157 – 192 pp 193– 234  |
| 6  | **EXAM 1**7. Genomes and Chromosomes | pp 235-272  |
| 7 | 8. Transcription and Translation9. Gene Transfer & Mutation | pp 273 – 314 pp 315 – 356  |
| 8 | 10. Molecular Regulation | pp 317 – 400 pp 477-522  |
| 9 | 13. Energetics and Catabolism14. Respiration, Lithotrophy and Photolysis | pp 523-566   |
| 10  | 17. Origins and Evolution18. Bacterial Diversity | pp 645-688 pp 689-734  |
| 11 | 18. Bacterial Diversity19. Archaeal Diversity | pp735-772 |
| 12 | **EXAM 2**20. Eukaryotic Microbial Diversity | pp773-814  |
| 13 | 21. Microbial Ecology22. Microbes and Global Environment | pp 815-866pp 867-900 |
| 14  | 23. Human Microbiota and Innate immunity  | pp901-904  |
| 15 | THANKS GIVING WEEK (No class) |  |
| 16 | 24. The Adaptive Immune Response27. Antimicrobial Therapy | pp941-988pp 1091-1132 |
| Final Week | Lecture Final Exam (TBD)  |

**Lecture ScheduleLaboratory Schedule**

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| --- | --- | --- |
| Wk | Laboratory Exercises | Assignments |
| **New Activity** | **Follow Up/Discussion** | **Online activity** **(complete before each lab)** |
| 1  | **No Lab**  |
| 2 | Lab safety training/Introduction 1. Ubiquity of Microorganisms (1-1) |  |    |
| 3 | **No Lab**: **Labor Day week** |  |
| 4 | 2. Transfer and Isolation Techniques: 4-quadrant streaking 3. Microscopy (practice 1) – observation of sample slides, after use care  | (1-2) Ubiquity of microorganisms Motility Demo | Pre-Lab Videos: Aseptic technique, quadrant streak plating, motility test Pre-Lab Quiz 1  |
| 5 | 3. Microscopy (practice 2) 4. Staining of Microorganism: (4-2) Gram staining | (2-2) Observation – quadrant streaking |  Pre-Lab Videos: spear prep, gram stainingPre-Lab Quiz 2 |
| 6  | 5. Effects of the Environment on microbial growth (5-1 to 5-2); Read 5-3 and 5-4 but no active lab for these | (4-2) Gram staining review | Pre-Lab Video: Fluid Thioglycollate MediumPre-Lab Quiz 3 |
| 7 | 6. Serial Dilution7. Overview of bacterial growth curve | (5) Observation - Effects of the Environment on microbial growth Unit conversion and CFU calculation  | Pre-Lab Video: Micropipetting Pre-Lab Quiz 4 |
| 8  | **Lab Midterm** (Ex 1 – 6,written and Practical exam)  | (6) Serial Dilution data analysis |   |
| 9 | 7. Bacterial Growth Curve (Lab report-1) |  | Pre-Lab Quiz 5 |
| 10 | 9. Viral infection cycle: T4 phage infection cycle | (7) Discussion – developing growth curve /calculation of growth rate (Lab report discussion)  | Pre-Lab Video: T4 infection cycle Pre-Lab Quiz 6  |
| 11 | 10-1. Identification of microorganisms using16s rDNA - DNA isolation (10-1)  | (9) Plaque count, data analysis  | Pre-Lab Video: Pre-Lab Quiz 8  |
| 12 | 10-2. Amplification of 16S rDNA by PCR12. Antiseptics and Antimicrobials | (10-1) Discussion – Calculation of DNA concentration\*Announcement: Microbiome assignment | Pre-Lab Video: Polymerase Chain reactionPre-Lab Quiz 9  |
| 13 | **No Lab: Veterans Day Week** |  | Microbiome assignment |
| 14 | 10-3. Electrophoresis and excision of 16S rDNA 13. Blood leukocyte differentiation | Result analysis for Antiseptics and Antimicrobials(Lab report discussion) | Pre-Lab Video: Mycology, ElectrophoresisPre-Lab Quiz 10  |
|  15 | **No Lab: Thanks Giving Week** |  | Pre-Lab Video: Sequencing and BLAST analysis  |
| 16  | Lab Final Exam during Lab classes (written and Practical exam) |