MICR 3100/BIOL 3100 GENERAL MICROBIOLOGY, Fall 2016

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

INSTRUCTOR INFORMATION

Instructor: Dr. Hyunsook Park
Office Location: ASCL353
Telephone: 323-343-2060
Email: hpark8@calstatela.edu
Office Hours: (Class) Tu/Th 2:00 -3:00 pm (Appointment only) Mon/Wed 11:00 am-1:30 pm
Class Days/Time: Tu/Th 12:15 PM – 1:30 PM
Classroom: SH C237

Instructor: Everado Robles
Office Location: ASCB 356
Telephone: TBA
Email: eroble18@calstatela.edu
Office Hours: Monday/Wednesday 10:00 am to 11:00 am and Tuesday/Thursday from 8:15 am to 9:15

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.

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


LAB MANUAL MICR3100/BIOL3100 General Microbiology Lab manual (Compiled by Microbiology Faculties at CSULA and available at the University bookstore and bookmart).
## COURSE OUTLINE

### Lecture Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture</th>
<th>Readings/Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/23</td>
<td>Introduction / 1. Microbial Life; origin and discovery</td>
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<tr>
<td></td>
<td>8/25</td>
<td>2. Observing the Microbial Cell: Microscopy</td>
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<tr>
<td>2</td>
<td>8/30</td>
<td>2. Observing the Microbial Cell: Microscopy (continues)</td>
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<tr>
<td></td>
<td>9/1</td>
<td>3. Cell Structure and Function</td>
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<tr>
<td>3</td>
<td>9/6</td>
<td>4. Bacterial Culture, Growth, and Development</td>
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<tr>
<td></td>
<td>9/8</td>
<td>5. Environmental Influences and Control</td>
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<tr>
<td>5</td>
<td>9/20</td>
<td>8. Transcription and Translation</td>
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<tr>
<td>7</td>
<td>10/4</td>
<td>14. Respiration, Lithotrophy and Photolysis</td>
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<tr>
<td></td>
<td>10/6</td>
<td>MIDTERM</td>
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<tr>
<td>8</td>
<td>10/11</td>
<td>17. Origins and Evolution</td>
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<td></td>
<td>10/13</td>
<td>18. Bacterial Diversity</td>
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<td></td>
<td>10/20</td>
<td>19. Archaeal Diversity</td>
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<td>10</td>
<td>10/25</td>
<td>20. Eukaryotic Microbial Diversity</td>
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<tr>
<td></td>
<td>11/3</td>
<td>23. Human Microbiota and Innate immunity</td>
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<tr>
<td>12</td>
<td>11/8</td>
<td>Field trip</td>
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<tr>
<td></td>
<td>11/10</td>
<td>23. Innate immunity-continue</td>
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<tr>
<td></td>
<td>11/17</td>
<td>New Flashes Presentation</td>
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<tr>
<td>14</td>
<td>11/22</td>
<td>25. Microbial Pathogenesis</td>
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<tr>
<td></td>
<td>11/24</td>
<td>No Class</td>
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<tr>
<td>15</td>
<td>11/29</td>
<td>27. Antimicrobial Therapy</td>
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<tr>
<td></td>
<td>12/2</td>
<td>Career Day, Final Review</td>
</tr>
</tbody>
</table>

**Final Week**

<p>| Lecture | Final exam Thursday Dec 8th, 11:20 AM to 1:20 PM |</p>
<table>
<thead>
<tr>
<th>Week</th>
<th>Laboratory Exercises</th>
<th>Assignment</th>
</tr>
</thead>
</table>
| 1    | 1. Lab safety training  
2. Basic microbiology prep  
3. Ubiquity of Microorganisms |            |
| 2    | [continue]Observation – Pour plating, Ubiquity of microorganisms  
4. Practice of aseptic technique, subculturing and quadrant streaking | Quiz1 |
| 3    | [continue]Observation – Aseptic technique, quadrant streaking  
5. Staining of microorganisms and Microscopy | Quiz2 |
| 4    | 6. Environmental factors affecting microbial growth  
7. Pipetting experiment I (Assessment) |            |
| 5    | [continue]Observation - Environmental factors  
8. Bacterial Growth Curve | Quiz 3  
Lab Report 1 (Due: 10/11/2016) |
| 6    | 9. Viral infection cycle: T4 phage infection cycle (Edvotak)  
10. Bacterial Transformation - pGLO | Quiz 4 |
| 7    | [continue]Viral Infection cycle/pGLO : observation and analysis  
11. Antibiotic Producer from Soil 1: primary isolation  
12. Identification of microorganisms using16s rDNA 1- isolation | Lab Report 2 (Due: 11/15/2016) |
| 8    | [continue]Antibiotic Producer from Soil 2- Isolation of pure colony  
Identification of microorganisms using16s rDNA 2- PCR | Quiz 5 |
| 9    | [continue] Antibiotic Producer from Soil 3- test for antibiotic production  
Identification of microorganisms using16s rDNA 3- electrophoresis and excision  
13. Mycology-mycomount | Quiz 6 |
| 10   | [continue] Antibiotic Producer from Soil 4- evaluation  
Identification of microorganisms using16s rDNA 4- sequencing  
14. Radial immunodiffusion assay  
15. Blood leukocyte differentiation | Quiz 7 |
| 11   | [continue] Identification of microorganisms using16s rDNA 5- BLAST analysis  
16. C. difficile toxicity assay  
17. Kirby Bauer Test, Antiseptics | Quiz 8 |
| 12   | Field trip (Hyperion Waste water treatment plant), Time TBA | Quiz 9 |
| 13   | [continue] Data interpretation and Discussion  
Pipetting Exercise II | Quiz 10 |
| 14   | Thanks giving week - no class |            |
| 15   | Lab Final Exam during Lab classes (written and Practical exam) |            |
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 color pencils. 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.

READING MATERIALS: The LECTURE READINGS are from Microbiology: An Evolving Science. 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. Student resources are available through the following link: http://www.wwnorton.com/college/biology/mbio/. THE LAB READINGS are from the laboratory manual. Read Lab manual before you come to the class. You must have lab coat and closed toe shoes in order to stay in the laboratory. Repeated failure to follow laboratory rules (including house keeping and safety rules) will result in point deductions.

ASSIGNMENTS AND GRADING POLICY

Assignment due dates will be notified on Moodle 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 Moodle. For Moodle quizzes/problems, email notice will be sent as soon as the quizzes are available. You will have 48 hours to visit and complete the quiz on Moodle. There will be no make up for missed 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 QUIZZES: Post-Lecture and Post-Lab quizzes will be given via Moodle. Each quiz will be available for 48 hours after its announcement during lecture. You will be given two attempts and higher score will be counted toward final grades. No make up will be given for missed quizzes.

NEWS FLASHES on microbiology related issues (10 points): Group project (3 students per group).

- Student will work in pairs. They will scan the general news (print or online) for anything that relates to microbiology and excites them (Flu vaccine, new bacterial species, bacterial genome, biofuels, astrobiology, biotechnology, etc.) and for the chosen topic they need to find a second news article from a different source reporting on the same issue. An article from a science journal or lay publication dedicated to science is NOT appropriate.
- Using the course textbook, student will gather scientific information to better understand the news.
- Students will then prepare a 3 slide PowerPoint (template will be posted) and present the news and scientific background to the class. This will be a 5 min presentation. In addition, students will upload their PowerPoint on Moodle before they present.
- We will establish in class a schedule for the presentations. (Tentatively 11/17/2016)
**CAREER OPPORTUNITIES** for graduates with a Microbiology major/emphasis (10 points): Group project (2 students per group).

- Student will work in pairs and search for job opportunities for graduates with a degree or emphasis in microbiology using various web sites such as those listed below and turn in as summary for **five different job announcements**.

- You need to find the following information for each job: job search site where you found the job, job title, requirements (program, experience, advance degree), job responsibility, work environment, salary (if available), and other specification. A template will be posted on Moodle and you will upload your project via Moodle. The information will be made available to all students, so you have a great starting point for future career options.

- Job search sites include but not limited to the following:
  - ASMcareerconnections.org
  - Jobs. Science careers.org
  - indeed.com
  - linkedin.com
  - Careerbuilder.com

- **Due date:** 12/2/2016, upload via Moodle.

**PERFORMANCE EVALUATION**

**Lecture:** 450 points

- 100 Online Post-Lecture Quizzes (10 with 10 points each)
- 10 News flash
- 10 Microbiology career report
- 30 Active learning
- 100 Midterm Examination (Bring Scantron Form No: 882-E)
- 200 Final (comprehensive) Examination (Bring Scantron Form No: 882-E)

**Laboratory:** 350 points

- 100 Online Post Lab Quizzes (10 with 10 points each)
- 60 Formal Laboratory Report (2 X 30 each, Bacterial Growth Curve, Bacterial Identification)
- 150 Comprehensive Final Examination (includes written portion and practical portion)
- 40 Laboratory notebook + participation

Make sure you learn how to submit your assignments electronically in Moodle. The instructors will not accept assignments submitted as hard copy or by email. Do not wait until the last moment to submit your work since Moodle 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:

<table>
<thead>
<tr>
<th>Letter</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100%</td>
</tr>
<tr>
<td>A-</td>
<td>90% - 92%</td>
</tr>
<tr>
<td>B+</td>
<td>87-89 %</td>
</tr>
<tr>
<td>B</td>
<td>83% - 86%</td>
</tr>
<tr>
<td>B-</td>
<td>80% - 82%</td>
</tr>
<tr>
<td>C+</td>
<td>77% - 79%</td>
</tr>
<tr>
<td>C</td>
<td>73% - 76%</td>
</tr>
<tr>
<td>C-</td>
<td>70% - 72%</td>
</tr>
<tr>
<td>D+</td>
<td>67% - 69%</td>
</tr>
<tr>
<td>D</td>
<td>63% - 66%</td>
</tr>
<tr>
<td>D-</td>
<td>60% - 62%</td>
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<tr>
<td>F</td>
<td>below 60%</td>
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</tbody>
</table>

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 (9/6/2016), 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, Moodle. 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 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. 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)

MOODLE MENTOR SITE Information for students on how to be a successful online student and how to use Moodle: (http://www.calstatela.edu/moodlementor)

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.”

For Q2S planning and advisement contact: UNDECLARED MAJORS University Academic Advisement Center (UAAC) Library Palmer Wing (PW) Room 1040A (323) 343-3150 http://www.calstatela.edu/academicadvisementcenter
Declared MAJORS: Their College Advisement Center
Natural and Social Sciences (NSS) Advisement Center King Hall (KH) D-1051 (323) 343-5284 http://web.calstatela.edu/academic/nssd/AdvisementCenter/StudentServices.php