Course Syllabus

Biology 205 Microbiology CRN 06916 (MW) Miramar College
Fall 2017 Room: S6-214 Trubovitz
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Course Information

Catalog Description: An introductory course covering the fundamental aspects of microbiology: taxonomy, structure, physiology, reproduction, genetics, control, immunology, and host-parasite relations. Basic techniques for culturing, staining, counting and identifying microorganisms are emphasized in the laboratory. Designed to meet the requirements to enter allied health or medical fields. Field trips may be taken during laboratory periods. Transfer Credit: CSU; UC.

Student Learning Outcomes:
Outcome 1: Critical thinking and application
   Student will be able to properly utilize and analyze results of common physiological, biochemical, medical and immunological assays and present these results to identify unknown bacteria.

Course Focus for Mastery
1. Differentiate among different categories of microbes
2. Apply basic principles of microbial structure, genetics, physiology, and ecology to the foundation of human-microbe interactions
3. Develop differential diagnoses, treatment strategies, and containment protocols for various patient scenarios
4. Understand the relationship between microbes and biotechnology, including environmental, industrial, and medical applications
5. Perform aseptic technique and demonstrate appropriate laboratory safety skills for working with chemicals and infectious microbes
6. Demonstrate mastery of basic microscopic and cytological staining techniques required for visualization of microbes
7. Perform techniques and calculations used in microbial quantitation
8. Utilize and properly interpret results of common physiological, biochemical, medical, and immunological assays

Topics for Lecture and Laboratory

<table>
<thead>
<tr>
<th>Knowledge/ Cognitive</th>
<th>Following Completion of the Microbiology Course students will be able to:</th>
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<tbody>
<tr>
<td>Cell Theory</td>
<td>Use examples of infections, treatment, and epidemiologic control to compare and contrast the characteristics of prions, viruses, bacteria, protozoan’s, and multi-cellular parasites.</td>
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<tr>
<td>Microbial Interactions</td>
<td>Explain the dynamics of commensally and pathological relationships that occur between microbes and humans.</td>
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<tr>
<td>Microbial Control</td>
<td>Evaluate methods of microbial control and apply the proper methods necessary when given a scenario.</td>
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<tr>
<td>Microbial Metabolism</td>
<td>Briefly describe sample metabolic pathways found in microorganisms and their implications for food production and human disease.</td>
</tr>
<tr>
<td>Microbial Genetics</td>
<td>Summarize basic bacterial genetic principles and analyze</td>
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</table>
Implications for mutation, genetic recombination, and bacterial control.

**Immune Response**
Articulate and diagram the role of the immune system in maintaining homeostasis, challenging infections, and fighting cancer.

**Skills/ Psychomotor**
Following Completion of the Microbiology Course students will be able to:

**Scientific Method Application**
Apply the scientific method by stating a question; researching the topic; determining appropriate tests; performing tests; collecting, analyzing, and presenting data; and finally proposing new questions about the topic.

**Lab Safety Skills**
Correctly perform microbiologic lab skills and display a habit of good lab practices that extends to relevant situations in the student’s homes.

**Attitudes and behavior/ Affective**
Following Completion of the Microbiology Course students will be able to:

**Appraisal of microbiologic information**
Retrieve, evaluate, and use microbiologic information regarding contemporary issues in the world and relevant to their everyday lives.

**Prerequisites:** Written English Proficiency (WEP) and a recent high school or college chemistry course with a grade of C or better. Because microbiology is a specialized science, Miramar College requires that you complete a basic life science such as Biology 105 and 106 AND chemistry before you attempt Microbiology. High School Chemistry and biology is not equivalent.

**NONATTENDANCE/FIRST CLASS**
The instructor will drop students who do not attend the first class meeting. Students, who cannot attend because of illness, religious observation, or a serious problem, should notify the instructor before the first class. Students who miss the first class meeting and do not plan to attend must log-on to Reg-e to drop the class to avoid receiving an "F" grade.

**IT IS THE STUDENT’S RESPONSIBILITY TO DROP BY THE PUBLISHED DEADLINES.**

**Special Notes for Microbiology:** Remember nothing worthwhile comes easy. More than other introductory biological sciences, the study of microbiology requires even the beginning student to learn and put into practice a series of unique techniques and concepts. We will constantly be concerned with your grasp of these fundamentals, your ability to follow both written and verbal directions, and your skills in observation and analysis.

This course in Microbiology is challenging. If you need to get an A or B grade – you must make sure you do it. Grading is not based on your career goals, but on class performance. If you are not able to get the grade of your desire you may need to repeat or investigate other alternative professional tracts as well.

**Safety** in this laboratory is another very important consideration. The basic micro practices are very similar to those you will encounter in the clinical setting. They are designed to help you develop the confidence, dexterity, and understanding to apply proper sterile techniques both in this lab and in your future professions. Your work will be observed and evaluated according to 1) the appropriate use and mastery of these techniques and 2) its independence. Although several exercises include group assignments, you are still expected to do your own inoculations,
observations, lab reports, unknowns, slides, and to work with your assigned microscope and not a shared one. Any student displaying careless, hazardous, or faulty techniques will be warned and directed to improve. If there is no improvement, steps will be taken to initiate a drop from the course.

**Lecture:** 1.5 hours 2 days a week  
**Laboratory:** 3 hours 2 days a week.

**Required Texts:**  
*Microbiology an Introduction* by Tortora 12th is best or 11th edition.  
*Lab Manual* Available at Mira Mesa Copy Center  
9363 Mira Mesa Blvd San Diego, CA 92126.

**Laboratory materials:** May be purchased from our Bookstore or any other source. This will include microscope slides (72), lens paper and bibulous paper an inoculating loop and needle. A long sleeve long coat (disposable is fine) and a container to hold slides are recommended.

**Time Management Estimate**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours/Week</th>
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</thead>
<tbody>
<tr>
<td>Class Time</td>
<td>4.5 X 2 = 9 / week</td>
</tr>
<tr>
<td>study Time</td>
<td>3 X 9 = 27</td>
</tr>
<tr>
<td>sleeping</td>
<td>8 X 7 = 56</td>
</tr>
<tr>
<td>meals + shopping</td>
<td>4 X 7 = 28</td>
</tr>
<tr>
<td>commuting</td>
<td>1 X 4 = 04</td>
</tr>
<tr>
<td>personal hygiene</td>
<td>1 X 7 = 07</td>
</tr>
<tr>
<td>total</td>
<td>= 131</td>
</tr>
</tbody>
</table>

hours/wk  
Spare time and time other courses = **5 hours 17 minutes / day**  

“Failure to prepare is preparing to fail” - John Wooden

**Syllabus:** A detailed syllabus study guide containing learning objectives, outlines, and vocabulary words has been compiled especially for this course. You will find it invaluable for organizing your note-taking and studies. These will be available on-line some will be handed out in class as well. These are intended to help guide your studies, but are not a contract limiting on what topics may be on exams. Read your textbook.  
**Attendance** is critical to your success. The instructor may drop you from class if you miss more than 4 labs. Most relevant learning occurs through direct involvement and reinforcement of techniques through repetition. You cannot compensate for missed work and safety procedures by merely reading the lab manual.  
**Grading:**  
Four lecture exams plus the final at 100 points each for 500 points.  
Four lab examinations are scheduled (360 points total). Lab exams will have you perform lab techniques and procedures from labs for a grade. Master them while you can.  
**Unknown reports** are worth 100 for the major and 40 for the enteric and staph/strept lab reports and 20 for morphological totaling 160 points.  
**Lab Technique:** 20 points based on good safe lab practices, preparation for lab and clean up and pre-lab write-ups or quizzes. Proper disposal of microbes and clean up are emphasized. These points also include maintenance of your equipment and supplies. Working well with others and being a good lab “citizen” are important criteria of this grade. Regular attendance and being on
time are important factors in technique grade. You will start at 0 for lab technique and lose points for poor practices.

**Grading:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>Lecture exams, 4 @ 100 pts each</td>
<td>= 400</td>
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<tr>
<td>Lecture final exam</td>
<td>= 100</td>
</tr>
<tr>
<td>Lab exams, 4 (1 @ 10pts, 3 @ 100pts)</td>
<td>= 310</td>
</tr>
<tr>
<td>Lab final (30 pts)</td>
<td>= 030</td>
</tr>
<tr>
<td>Major Unknown report</td>
<td>= 100</td>
</tr>
<tr>
<td>Enteric and Staph/ Strept UKns</td>
<td>= 040</td>
</tr>
<tr>
<td>Morphological Unknown</td>
<td>= 020</td>
</tr>
<tr>
<td>Lab Techniques (may lose up to 20)</td>
<td>= 000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>= 1000</td>
</tr>
</tbody>
</table>

**Grade Scale**

- **A** = 90 - 100 %
- **B** = 80 - 89.9 %
- **C** = 70 - 79.9 %
- **D** = 60 - 69.9 %
- **F** < 60 %

Grading is based on point totals, not your need for a grade. Not everyone may get an A or a B. All phones must be silenced during exams. If a restroom break is needed during an exam you must leave any phone on instructors desk while out of classroom.

**Make Up Exams:** Make up exams are discouraged and will be penalized heavily; they will be administered by pre-arrangement only with a 10% penalty no matter what the reason. The make up exams may be substantially different in format from the regular class exam. Limited or no lab make up work is possible even if a student has a compelling reason. It is the student's responsibility to become informed about notes, assignments, and announcements that were given during absences. Make up exams without pre-arrangement are not given!!!!