

## Microbiology Syllabus: BL3100, Spring 2004

### Instructor information

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### Class Meeting

Lecture: MWF, 11:00-11:50, RIC 125

Lab Meeting: BL3101 LBA, MW, 1:20-3:10, Rm. RIC 227

Office Hours:M-F, 10-11; , 11-12 TR

Catalog Description: The morphology, physiology and nutrition of microorganisms and their role in nature and infection and immunity. The laboratory consists of a study of the techniques of microbiology, isolation, cultivation, observation, identification and immunological principles and practices. Lecture and Laboratory. Lab fee.

Prerequisite: BL 1180: Foundations of Biology, or BL 1200: Principles of General Biology or instructor approval. *Please note that if you have not had a General Biology course or it has been a while since you have had a General Biology course you will need to review AS SOON AS POSSIBLE material relating to chemical bonding patterns, molecules of biology, such as sugars, lipids, proteins and DNA/RNA, and eukaryotic cells found in Chapters 2 and 5.*

Corequisite: Students are required to be enrolled in the laboratory concurrently.

### Textbook information:

- Textbook: Foundations in Microbiology, by Talaro and Talaro, Wm. C. Brown Pub., Dubuque IA, 1996, 3rd Ed.
- Lab Manual: Microbiological Applications, Short Version, by Harold J. Benson, 8th Ed., William C. Brown

### Assigned reading

- The Demon in the Freezer by Richard Preston, 2002, Random House, New York.
- Flu, by Gina Kolata, 1999, Farrar, Straus and Giroux, New York.

Course Goals and Objectives: The goals of this class include:

- a historical perspective of microbiology and the development of the germ theory of disease, with emphasis on specific diseases and their causes
- the identification and definition of internal and external bacterial structures,
- understand the bacterial requirements for growth and their relationship to microbial metabolism,
- the physical and chemical control of bacterial growth,
- practice of aseptic techniques,
- the use of the light microscope and
- the isolation and identification of microorganisms by morphological and biochemical methods.

CONTENT OUTLINE: SUBJECT TO MODIFICATION

Main Themes in Microbiology (Ch. 1)

- History
- Tools

Epidemiology, Ch. 13

Prokaryotic Profiles (Ch. 4)

- Structure and Function
- Non-cellular World

EXAM 1, Feb. 13, 2004

Taxonomy (review Ch. 1 for background)

Viruses / AIDS (Ch. 24/25)

Microbial Nutrition (Ch. 7)

- Environmental Factors
- Study of Microbial Growth

EXAM 2, Mar 19, 2004

Metabolism (Ch. 8)

- Respiration vs. Fermentation

Physical and Chemical Control (Ch. 11 / 12)

- Physical Methods
- Chemical Methods
- Chemotherapy

EXAM 3, Apr. 16, 2004

-Immunology, Nature of Host Defenses, (Ch. 14)

-Innate and Acquired Immunity (Ch. 15)

-Genetics Ch. 9-tentative

FINAL COMPREHENSIVE EXAM, May 7, 2004; 10:30-12:30

Attendance policy: Regular and prompt attendance are expected. According to the Rockhurst Attendance policy, during the semester students are only permitted: 6 absences in MWF classes. Excessive absences may result in a DF grade. Attendance records will be maintained throughout the semester. Students will be informed by the Deans Office of a possible failure due to absences. Historic records indicate few students complete the course successfully who do not practice regularity and promptness in their attendance. Students who miss a lecture or lab are completely responsible for obtaining the material they missed. No make-up exams or labs will be given. Policy for missed exams is detailed in grading policy.

**IMPORTANT NOTICE ABOUT CHEATING:** Should the instructor suspect dishonesty / cheating affecting the student's grade, no overt action will be taken. If, however, the instructor becomes convinced beyond all doubt that dishonesty / cheating affecting the students grade is occurring or has occurred, that student will receive a grade of zero (0) for that grading effort. Should this experience be repeated a second time, the student will receive a failing grade for the course. Cheating includes plagiarism, cheating on exams, lab reports and stealing materials placed either on reserve or in the laboratory for everyone to use. I hope that you will work together with your fellow classmates, but copying a friend's answers does qualify as cheating... and it will catch up with you since lab exams will draw heavily from your experiences in the laboratory.

*Students are NOT permitted to remove specimens, cultures or equipment from the laboratory, under ANY circumstances!! Individuals removing these items from the laboratory will FLUNK the course.*

Exams and Grading Policy: The regular, lecture exams will be worth 100 points each. The final which is comprehensive will be worth 125 points. There will be no makeup exams. If you miss an exam the final exam will be weighted twice. For example, if you score 103/125 or 82% on the final exam, the test you missed will be scored as an 82%. If you miss more than one test, a 0 will be recorded. Borderline cases will be decided upon class attendance, class participation, general attitude and improvement. A poor general attitude includes incessant griping, complaining, sloppiness, tardiness, inattendance, disruptive behavior and coming to class and lab unprepared.

A 92.5-100 %	C 72.5%-77.4%
A-90-92.4%	C-70-72.4%
B+ 87.5%-89.9%	D+ 67.5-69.9%
B 82.5%-87.4 %	D 60-67.5%
B- 80-82.4 %	F Less than 60 %
C+ 77.5%-79.9%	

You will receive two grades for this class (one from lecture and one for lab). The lecture and lab grades will be computed together with the lab counting approximately 30% of the total points available. Both grades will be the same (either 2 A's, 2 B's etc.) since the points are calculated together. Please note: the grades for those students enrolled only in the lecture will be based on the grade they achieve in lecture. Please see lab outline for the schedule of topics to be covered and the dates of lab exams.

### **Microbiology Laboratory Outline, BL3101 LBA**

The laboratory is a very significant part of any introductory microbiology course. It should be a very rewarding experience, since it is exciting to start with something that you can't see and arrive at a positive identification of the microorganisms in question. Your lab grade is based on the following activities.

- lab performance and handling success - Skills test (20 pts)
- two lab practicals worth one worth 50 pts, second worth 75 pts.
- isolation and identification of 2 unknown microorganism (30 pts ea), due date: Apr. 28, 2003

Lab Exams will include the terms, techniques and procedures learned in the laboratory. Part of the lab grade may include how well you are able to perform simple but essential lab techniques. Please Note: It is possible to have some duplication between lab and lecture.

The first lab practical will be worth 50 points each. The final practical is comprehensive and will be worth 75 points. Due to the nature of the lab practicals there can be **ABSOLUTELY NO MAKE-UP EXAMS FOR LAB PRACTICALS.**

The following represents a **TENTATIVE** schedule. If it becomes necessary to change the lab schedule, students will be notified in advance. Students are REQUIRED to read the appropriate section BEFORE the laboratory session. If it is becoming a problem with students unprepared for labs, we will institute lab quizzes prior to the labs.

Two copies of guidelines and regulations for the laboratory will be handed out to the students in the laboratory. Please sign both copies, turn one in to the instructor and keep one copy for yourself. You are expected to abide by these Guidelines. Any violation will result in your losing 5 points for that day. We have received new microscopes for the Microbiology laboratory. These microscopes are very expensive!! Lab Groups will be assigned a microscope and will be expected to care for that microscope. If the microscopes are damaged during the course of the semester the student using that microscope will be expected to pay for the damages.

OSHA guidelines require that students wear goggles during the lab period when aerosolized infectious particles are a potential. It is suggested for the students own personal safety that they bring their own goggles to class. Students are also required to wear lab coats during the lab period. Students may use their own lab coats but these lab coats may not leave the laboratory during the course of the semester. At the end of the semester, student lab coats will be returned to them after autoclaving. Students may also rent lab coats from the Biology department. There will be a \$5 non-refundable processing fee for the cleaning of these lab coats for the next semester.

**ASSIGNMENTS:**

Assignment 1. Microbiology in Contemporary Literature. During the epidemiology section we will watch the video ...And the Band Played On. A study guide will be handed out before the video which you should complete and return to me. Worth 25 pts. Due date: Feb. 11, 2004.

Assignment 2: Study Guide for book, See attached Study Guide for assigned book; Ebola or Hot Zone. Due: Mar. 17, 2004. (40 pts)

Assignment 3. Identification of Unknown Microorganisms. After completing your experiments in the identification of your two unknown microorganisms in lab you will be expected to write up a summary of your data (with tables/charts etc) in written form. The length should be approximately 2 pages for each microorganism. worth 30 pts for each organism. Due date: Apr. 28, 2004.

Additional assignments as needed.

**NO LATE PAPERS WILL BE ACCEPTED.** Your papers are due at the beginning of class on the date they are due. **NO EXCEPTIONS!!!**

### Microbiology Lab Calendar (tentative)

<b>Jan 12</b>	<b>Jan 13</b>	<b>Jan 14</b>	<b>Jan 15</b>	<b>Jan 16</b>
		No lab, Read Aseptic technique chapter (7)		
<b>Jan 19</b>	<b>Jan 20</b>	<b>Jan 22</b>	<b>Jan 23</b>	<b>Jan 24</b>
MLK Day,		Orientation, Where in the World are Microbes		
<b>Jan 26</b>	<b>Jan 27</b>	<b>Jan 28</b>	<b>Jan 29</b>	<b>Jan 30</b>
Microscopy (1-4) And the Band Played On			Negative staining (10)	
<b>Feb 2</b>	<b>Feb 3</b>	<b>Feb 4</b>	<b>Feb 5</b>	<b>Feb 6</b>
Simple stain (11-12) / Streak Plate (19); Gram Stain (14)				
<b>Feb 9</b>	<b>Feb 10</b>	<b>Feb 11</b>	<b>Feb 12</b>	<b>Feb 13</b>
Gram Stain (14) / Motility (17)				
<b>Feb 16</b>	<b>Feb 17</b>	<b>Feb 18</b>	<b>Feb 19</b>	<b>Feb 20</b>
Skills Test		Skills test		
<b>Feb 23</b>	<b>Feb 24</b>	<b>Feb 25</b>	<b>Feb 26</b>	<b>Feb 27</b>
Spore Stain (15)		Lab Practical		
<b>Mar 1</b>	<b>Mar 2</b>	<b>Mar 3</b>	<b>Mar 4</b>	<b>Mar 5</b>
Microbiology of Water (48, 49)				
<b>Mar 8</b>	<b>Mar 9</b>	<b>Mar 10</b>	<b>Mar 11</b>	<b>Ma. 12</b>
Identification of Microbes (37-43)				
<b>Mar 13</b>	<b>Mar 14</b>	<b>Mar 15</b>	<b>Mar 16</b>	<b>Mar 17</b>
Spring Break				
<b>Mar 22</b>	<b>Mar 23</b>	<b>Mar 24</b>	<b>Mar 25</b>	<b>Mar 26</b>
Identification of Microbes (37-43)				
<b>Mar 29</b>	<b>Mar 30</b>	<b>Mar 31</b>	<b>Apr 1</b>	<b>Apr 2</b>
Identification of Microbes (37-43)				
<b>Apr 5</b>	<b>Apr 6</b>	<b>Apr 7</b>	<b>Apr 8</b>	<b>Apr 9</b>
Identification of Microbes (37-43)			Easter Break	
<b>Apr 12</b>	<b>Apr 13</b>	<b>Apr 14</b>	<b>Apr 15</b>	<b>Apr 16</b>
Easter Break		TBA		
<b>Apr 19</b>	<b>Apr 20</b>	<b>Apr 21</b>	<b>Apr 22</b>	<b>Apr 23</b>
Disinfectants, antiseptics, antibiotics, (29, 30, 32)				
<b>Apr 26</b>	<b>Apr 27</b>	<b>Apr 28</b>	<b>Apr 29</b>	<b>Apr 30</b>
Use Dilution Assay (29, 30, 32)				

**May 3**  
Lab Practical

**May 4**

**May 5**  
Study Day