

## Microbiology Syllabus: BL3100, Spring 2009

### Instructor information

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Office Hours:MWF, 10-11, T, 1-3

### Class Meeting

Lecture: MWF, 11:00-11:50, SC 302;  
Class Key: H48750E236  
Lab: BL3101 LBA, MW, 1:20-2:45, SCI 227;  
Class Key: M48751B911

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 1250:General Biology I or BL 2830 Introduction to Human Anatomy and Physiology I. *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.*

### Textbook information:

- Textbook: Foundations in Microbiology, by Talaro and Talaro, Wm. C. Brown Pub., Dubuque IA, 7th Ed.
- Lab Manual: Microbiological Applications, Short Version, by Harold J. Benson, 11th Ed., William C. Brown
- Einstruction clickers

Course Themes: The themes of this class include:

- scientific method as a process for explaining natural phenomenon
- a historical perspective of microbiology and the development of the germ theory of disease, with emphasis on specific diseases and their causes
- the taxonomic structure of life
- the identification and definition of internal and external bacterial structures
- outline the major groups of DNA and RNA viruses that infect humans with emphasis on the diseases that these viruses cause
- the bacterial requirements for growth and their relationship to microbial metabolism.
- the physical and chemical control of bacterial growth

CONTENT OUTLINE: SUBJECT TO MODIFICATION

Main Themes in Microbiology (Ch. 1)

- History
- Tools
- Taxonomy (Ch. 1)
- Prokaryotic Profiles (Ch. 4)
  - Structure and Function
  - Non-cellular World
- EXAM 1, Feb. 20, 2009
- Metabolism (Ch. 8)
  - Respiration vs. Fermentation
- Microbial Nutrition (Ch. 7)
  - Environmental Factors
  - Study of Microbial Growth
- EXAM 2, Mar 27, 2009
- Viruses (Ch. 6) / AIDS (Ch. 24/25)
- Physical and Chemical Control (Ch. 11)
  - Physical Methods
  - Chemical Methods
- EXAM 3, Apr 24, 2009
- Chemotherapy and antibiotics (Ch. 12)
- FINAL COMPREHENSIVE EXAM, May 11, 2009, 10:30-12:30.

**Grading Policy and Examinations:** 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.

|                  |                |              |
|------------------|----------------|--------------|
|                  | A 92.5-100 %   | A-90-92.4%   |
| B+ 87.5%-89.9%   | B 82.5%-87.4 % | B- 80-82.4 % |
| C+ 77.5%-79.9%   | C 72.5%-77.4%  | C-70-72.4%   |
| D+ 67.5-69.9%    | D 62.5-67.5%   | D- 60-62.4%  |
| F Less than 60 % |                |              |

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 As, 2 Bs 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.

### **Lecture Assignments:**

Assignment 1: Self-Introduction. You will write a short introduction e-mail to me by Jan 26, 2009. In this e-mail you should include your name, year, major, career aspirations and why, and a brief description of yourself. This email should be written from your Rockhurst account and should be labeled in the subject line Micro introduction (worth 10 points).

### **Readings Assignments**

- Legionnaire's Disease – 1976
- Diphtheria and Dogsleds
- Four Corners, New Mexico – 1993, How to study an outbreak
- The Crippler – Infantile Paralysis
- Smallpox
- Prions – Of Cannibals, Sheep and Mad Cows.

Others: AIDS, Influenza

There are questions throughout these readings that will help you study for announced quizzes. These will be administered using einstruction clickers. These quizzes will be worth 10 points each. However, at the end of the semester, the quizzes and assignment 1 will be equivalent to one exam score (100 points). You may miss one announced quiz. If you miss other quizzes, they will be scored as a 0. If you miss other quizzes, they will be scored as a 0.

Please Note: NO LATE PAPERS WILL BE ACCEPTED. Your papers are due at the beginning of class on the date they are due.

### **Course Policies.**

**Attendance policy:** Regular and prompt attendance are expected. According to the Rockhurst Attendance policy, during the semester students are only permitted: 6 consecutive absences. Excessive absences may result in a withdrawal from the course. Attendance records will be maintained throughout the semester. Tardiness will be treated as an absence. The Deans Office will be notified of a possible problem due to excessive 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.

**Academic Honesty Policy:** Rockhurst University is a learning community. Consistent with the mission and purpose, “it is expected that academic honesty and integrity guide the actions of the community.” It is the responsibility of the student to adhere to the guidelines pertaining to integrity established for a given course as well as those established by the University. “Academic dishonesty includes but is not limited to copying or the offering of, requesting, receiving or using the unauthorized assistance or information in examinations, tests, reports, computer programs, term papers or other assignments, plagiarism (appropriation of ideas, language, or work of another without sufficient attribution or acknowledgment that the work is not one’s own), manipulation of data, or unauthorized removal of material from the laboratory.” Taken from Rockhurst College Catalog, 2008-2010 p. 50-53.

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. I hope that you will work together with your fellow classmates, but copying a friend's answers or an answer from any other source without properly citing it does qualify as cheating. **Please note: *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.***

**Electronic devices.** Please turn your cell phones off upon the start of class. Cell phones will not be allowed during an exam for any reason, even for use as calculators. If you have an obligation that requires your cell phone be on, please see the instructor. No MP3 music players, Ipods or cell phones will be allowed during an exam. These may not even be out during an exam.

### **Student Responsibilities**

- Students are required to come to class and lab prepared. This includes
  - reading the chapter (lab exercises) before coming to class,

- bringing einstruction clickers to class and lab
- printing lecture outlines to class which are available to the students at [www.math-cs.ucmo.edu/~cooperj](http://www.math-cs.ucmo.edu/~cooperj)
- Students are required to turn in the assignments on time on the date they are due. Late assignments will not be accepted.
- Students are required to follow the Academic honesty policy, p. 50, 2008-2010 College Catalog.
- Students are required to turn off their cell phones prior to class and lab and leave them off for the duration of the class or lab periods.
- Cell phones, mp3 players and iPods may not be used during an examination and must be put away out of site.
- During an exam, students are required to place their backpacks and belongings (including ball caps) at the front of the classroom and leave them there until they turn in their exams.
- Students are required to wear lab coats and have goggles at every lab period beginning Sept. 8, 2008.
- Students are responsible for the care and cleaning of the equipment assigned to them in the laboratory, including but not limited to microscopes.
- Students are required to treat others with respect.

### **Rockhurst University Statements**

Rockhurst University is committed to providing reasonable accommodations for students with disabilities. Please contact Sandy Waddell, Director of Access Services (Massman Hall, Room 7, (816) 501-4689, [sandy.waddell@rockhurst.edu](mailto:sandy.waddell@rockhurst.edu)) to provide documentation and request accommodations. If accommodations have already been approved by the Access Office, please communicate with the instructor of this course regarding these arrangements by the second week of class in order to coordinate receipt of services.

Student contact information must be kept current in order to receive important notices from Rockhurst University. Your contact information is online via your BannerWeb Account. Please check your local address, local phone number and emergency contact information on BannerWeb and revise as needed. Please check your RU email account in addition to any other email accounts you may have. Accounts are activated at the Computer Services Help Desk (Conway 413).

### **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 (exams and assignments).

#### **Lab Content**

- Practice of aseptic techniques
- Use of the light microscope
- Staining techniques
- Enumeration of bacteria
- Isolation and identification of microorganisms by morphological and biochemical methods.

#### **Lab Exams:**

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.

- lab performance and handling success - Skills test (20 pts) Mar 2 and 4, 2009.

- two lab practicals worth one worth 50 pts, second worth 75 pts, Feb. 25, 2009.

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.**

***Lab Assignments:***

**Isolation and identification of 2 unknown microorganisms** (30 pts ea). Following completion of your experiments in the identification of your two unknown microorganisms, 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: 1 May 2009. Please Note: **NO LATE PAPERS WILL BE ACCEPTED.** Your papers are due at the beginning of class on the date they are due.

**Pre-Lab quizzes** will be administered on Monday on \* dates on the lab calendar using einstruction clickers. There are 8 lab quizzes scheduled worth 5 points each. These lab quizzes will represent 15% of your grade in lab. You may miss one announced quiz. If you miss other quizzes, they will be scored as a 0. No make-up lab quizzes will be given.

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.

Removing material from the laboratory placed for all to use is considered cheating. *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.*

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.

## **Microbiology Lab Calendar (tentative)**

### **Jan 21-23, 2009**

Lab Safety, p. ix; Aseptic technique chapter (Ex. 8, p. 63), Microscopy orientation (Handout,

### **Jan 26-30 2009**

Where in the World are Microbes? (Handout), Microscopy cont.,  
-Talaro, pp. 70-79

### **Feb 2-6, 2009\***

Pure Culture techniques (handout and Ex. 9, p. 73), Simple stain (Ex. 10 , p. 87, and 11, p. 91)  
-Talaro, pp. 57-69.

### **Feb. 9-13, 2009\***

Negative staining (Ex. 12, p. 93); Gram Stain (Ex 14, p. 101)  
-Talaro, pp. 78-82

### **Feb. 16-20, 2009\***

Gram Stain (Ex. 14, p. 101), Motility (Ex. 17, p. 115)  
-Talaro, pp. 97-100; 90-93.

### **Feb. 23-27, 2009\***

Spore Stain (Ex. 15, p. 105) Lab Practical  
-Talaro, pp. 104-106

### **Mar 2-6, 2009**

Skills test

### **Mar 9-13, 2009**

Spring Break

### **Mar 16-20, 2009\***

Bacterial Population Counts (Ex. 20, p. 139)  
-Talaro, pp. 206-211

### **Mar 23-27, 2009**

Identification of Microbes (handout, Ex. 36-41, p. 239+)

### **Mar 30-Apr 3, 2009\***

Identification of Microbes (handout, Ex. 36-41, p. 239+)

### **Apr 6-10, 2009\***

Identification of Microbes (handout, Ex. 36-41, p. 239+)

### **Apr 13-17, 2009**

Easter Break; Identification of Microbes (handout, Ex. 36-41, p. 239+)

### **Apr 20-24, 2009 \***

Evaluation of antiseptics / disinfectants (ex. 34, p. 223, Kirby Bauer, Ex. 33, p. 215)

### **Apr 27-May 1, 2009**

Use Dilution assay (handout)

### **May 4, 2009**

Lab practical