

# ELEMENTARY MEDICAL MICROBIOLOGY

## BIOL 217, SPRING 2005, MOREHEAD STATE UNIVERSITY

Lecture: 9:10 am - 10:10 am Tuesday, Thursday & Friday (2); 311 Lappin Hall

Lab: 10:20 am - 12:30 pm Tuesday, 346 Lappin Hall

Instructor: Dr. Janelle Hare

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Office hours: M 11:30-12:30; W, Th 12:40-1:40; Th, F 10:20-11:20; or by appointment

Course webpage <http://people.morehead-st.edu/fs/jm.hare/biol217.html>



**Course description:** ELEMENTARY MEDICAL MICROBIOLOGY. (3-2-4); Prerequisites: Chemistry 101 or Chemistry 112. An elementary microbiology course for students interested in understanding the characteristics and activities of microorganisms and their relationship to health and disease. NOT ACCEPTABLE FOR BIOLOGY MAJORS OR MINORS.

### Required Texts

Lecture: *Introduction to Microbiology*, 8<sup>th</sup> ed. Tortora, Funk & Case, Benjamin Cummings, 2003.

Lab: *Microbiology Laboratory Theory & Applications*. M.J. Leboffe & B.E. Pierce, Morton, 2002.

You must purchase (and use) a lab coat for lab work.

### Course Goals: Through this coursework, you will...

1. Understand the activities and basic structural and biochemical characteristics of microorganisms, AND how these features relate to human health and disease
2. Learn how infectious diseases are diagnosed, treated, and, hopefully, prevented.
3. Understand the relationships between microbial growth, disease, and growth control via antimicrobials, disinfection and sterilization.
4. Realize the necessity for aseptic technique in health care, and acquire basic aseptic techniques and laboratory skills for sampling & manipulating microorganisms.
5. Use diverse information resources to help find information about, and appreciate, the contributions that microbiologists have made to medicine

### Course Content:

- I. Fundamentals of Microbiology and Germ Theory
- II. Survey of Microorganisms: Bacteria, Fungi & Viruses
- III. Microbial Growth and Growth Control: How does it relate to Disease?
- IV. Interactions Between Microbes and Hosts
- V. Specific Infectious Diseases & Public Health Issues

I will work with you to provide direction, guidance, & feedback -- but you must come to me if you are having difficulties. I see this as the mark of a wise, hard-working student. If you don't understand something from class or lab, please let me know so I can help you to do your best! To do your best in this course:

- attend all the classes
- look at that day's outline on Blackboard to guide you in doing the readings before class
- take detailed notes in class & review your notes later that same day through active engagement
- look at the "how to study biology" link on the BIOL217 course webpage
- look in the book to help clear up any confusion and enhance your notes, AND/OR
- come see me for help

**Attendance:** Students are responsible for all material assigned or covered in class regardless of attendance. You are expected to read chapter assignments and the lab manual material before the scheduled lecture or lab period. If you miss more than **two (2) days** without a valid medical or university excuse, your course grade may be decreased one **(1) letter grade** (e.g. from an A to a B). **Common courtesy** indicates that coming to class late, leaving part-way through class (without having informed me ahead of time), or talking with your neighbors is disruptive to everyone and disrespectful. Similarly, no cell phone/pager use is allowed in class or lab.

## GRADING SYSTEM

You must take the exams on the date specified. **You must contact me PRIOR to missing any exam with a valid excuse (see next)**, or provide me with a documented medical or university excuse within 24 hours after the absence to take a make-up exam. This exam may be different than the exam taken by your classmates. If an assignment is due at the beginning of class and you are late, your grade for that assignment will be reduced by 10%, with an additional 25% grade reduction for each additional day the assignment is late.

Your grade will be based on the percentage of points earned on:

Assignment/test	Points worth
3 lecture exams	Total of 150
2 laboratory practicals	Total of 100
Laboratory exercise intro & worksheets	Total of 25
4 quizzes (lecture & lab)	Total of 40
Microbe Book	75
“Microbes in the News”	20
Nursing journal list & summary	25
Note taking & test questions	15
Final (half comprehensive, half from last set of lectures)	100
<b>TOTAL</b>	<b>550</b>

<b>90-100 %:</b>	<b>A</b>
<b>80-89.9 %:</b>	<b>B</b>
<b>70-79.9 %:</b>	<b>C</b>
<b>60-69.9 %:</b>	<b>D</b>
<b>Below 60%:</b>	<b>E</b>

### Important Dates:

March 14	Mid-term grades due
March 21-25	Spring Break
March 31	Last day to drop a class
Friday, 5/13	Final, 8-10 am

There is no "curve" and your grade will not be below that designated based upon percentage points earned, e.g., at least a B will be awarded for a student who earned 80 %. I may consider class attendance, participation and improvement in cases where a student's grade is on the borderline. Grades are, however, not based on effort, but on demonstrated mastery of the material. Remember, an "A" is for Excellent work; a "B", Above Average; a "C", Average work (note: not 'bad' work)... I do not give people estimates of their current grade on the phone or over e-mail. You are welcome to come to my office, and I will give you an estimate of your current grade then.

### Assignments

...are due at the beginning of class unless otherwise specified. Detailed descriptions of assignments will be made available on the course website/Bboard a week or two before they are due. I encourage you to turn in a copy of your paper to me before it is due (at least 3 days), and I will offer comments & suggestions for improving the content and writing. I will not 'pre-grade' it, however. All written assignments must be word-processed, double-spaced, with font no larger than 12 point, with all margins set at 1". Documents should be saved with a ".doc" (MS Word) extension, as I cannot reliably access ".wps" files.

1) **Class notes: once during the semester:** take and post your notes from class on the Discussion Forum of Blackboard. Based on that day's lecture, you must also think up and include 2-3 relevant, potential test questions (short answer format only), and their answers with your class notes. This must be done before the next class period. We will use these questions in a review. You must sign up for a day by Tuesday, January 25.

2) **Microbe Book.** You will choose & research one particular microbe and various aspects of the disease it causes. You'll write 4 short assignments on this topic throughout the semester, which when put together, will be one chapter in a Microbe Book that I will assemble and provide to the entire class.

Topic signup: Give organism's scientific name, disease it causes & why your chose it: (**Feb. 1<sup>st</sup>**):5 pts

Part I: Taxonomic classification of the organism & its history of discovery (**Feb. 8<sup>th</sup>**):15 pts

Part II: Physical structure of your pathogen & how it responds to stains (**March 3<sup>rd</sup>**):15 pts

Part III: Disease mechanisms, diagnosis & treatment (**March 29<sup>th</sup>**):15 pts

Part IV: Public health issues regarding the disease/microbe, e.g. vaccine status (**April 14<sup>th</sup>**):15 pts

**Revisions** of parts I-IV & turning in 2 questions based on your MB chapter (**April 29<sup>th</sup>**), 10 points

3) **List of Ten Professional Journal Titles: due Jan. 27**

Go to the library, investigate the types of scientific professional journals dealing with microbes that are relevant to your field (nursing, respiratory therapy, or dietetics), and provide a list of 10 journals available.

4) **Disease Article Summary: due April 21<sup>st</sup>**

You will choose a journal article written about the microbe you chose for your Microbe Book, and summarize specific aspects of the article (in your own words) in a 1-2 page written assignment. Specifics TBA. The article could be:

OPTION 1: an article dealing with a scientific experiment on the microbe,

OR: OPTION 2: a case study article dealing with a specific case of disease caused by the microbe.

5) **“Microbes in the News”** Because one goal of the class is to be microbe-“literate”, i.e., to be able to understand & communicate the info about microbes in the world around us, you will bring in a total of 3 CURRENT (2005) articles/news pieces throughout the semester. These must be about a recent or current topic from class. You can simply hand one in for 3 points, or get 7 points if you tell the class how it relates. Two of these can be done on Bb. You may do an extra one if you wish.

6) **Once during the semester:** you’ll introduce one lab exercise listed on the syllabus, using a transparency to highlight the goals of the exercise, how the exercise works, why we’re doing it, and potential outcomes. More than one person will potentially be doing this per lab day. Sign-up by 1/20.

**Rules of conduct:** You must abide by the laboratory rules explained in lab. You will not be allowed to work in lab if you are not wearing appropriate attire (e.g. lab coat, closed toe shoes, hair up, etc). You must read the assigned lab manual reading for that day BEFORE attending lab. Count on spending the full lab period in lab.

**Bonus questions:** Some days, I may start the day with a 1 bonus point picture/question from that day’s reading assignment ; OR at the end of a day, I might pose a question whose answer can be found in the reading for the next class period. If you hand me a 3X5 index card with the **correct answer** at the **beginning of the next class**, you will earn 1 bonus point. These bonus points, and the occasional bonus point on an exam, are the only bonus points available. “Extra credit” assignments are not available in this class.

**Plagiarism:** Because I want you to learn from doing your own work, I will speak about how to write so you do not plagiarize other people’s ideas, and show you examples. There are links on the course website to help you understand what is and isn’t plagiarism. For example: if you copy many words (word for word) from a website/book/article, and then include the reference for that material, this is still plagiarism. You **MUST use your own words** to relay the information you have learned! Plagiarism is unacceptable and will be dealt with as described in Appendix F of the Eagle Guide. The consequences will range from failing that assignment/test, to failing the course or even being asked to leave the University. Please ask me if you have a question about whether your work might be considered plagiarism.

**Accommodation:** Any student who feels that he or she needs an accommodation for any sort of disability, please contact the MSU disability officer, Ms. Debra Reed, AY214 (3-2005). In addition, MSU has a variety of services to help students develop their study skills, available at the Center for Academic Services and Student Support Services, and tutoring services at the Learning Lab (3-5200).

**Communication:** When I need to contact you, I will use e-mail and Blackboard. I only have your official University e-mail address, so if you do not check your University e-mail address, please go to <https://www.moreheadstate.edu/aimsweb/students.html> to have your official University e-mail automatically sent to a different, “preferred” (e.g. Yahoo or Hotmail) e-mail address.

**Enrolling in this course on Blackboard: (You will not need to do this every time.)**

- 1) Go to <http://online.moreheadstate.edu> on your internet browser. Click on the “login” button.
- 2) Enter your username and password. Username = 7-digit student ID number, preceded by “m”. Password = last 4 digits of your SSN and the four digits of your birth year.
- 4) Click the “login” button & click on the tab marked “Courses”.
- 6) Choose the “College of Science and Technology” line on the right side of the page.
- 7) Click on the “Biological and Environmental Sciences” line.
- 8) Scroll down until you see the title of this course. Click on the “Enroll” button to the right.
- 9) You can now enroll in this course. **If you have problems, contact Distance Learning, at 783-2082.**

**BIOL217 Spring 2005 Tentative lecture & lab schedule**

For specific reading assignments within each chapter, refer to that day's class outline on Blackboard.

<b>Date</b>	<b>Lecture</b>	<b>Reading</b>	<b>Lab Experiment (reading)</b>	<b>Assignments</b>
T, 1/ 18	Syllabus, Assignments Germ Theory of Disease	Ch1	Microbial ubiquity: 2-1 Asepsis: 2-13	
Th, 1/20	History & scope of microbiology	Ch1		
T, 1/25	Microscopy	Ch3	Microbial observation 2-2 Microscopy: 3-1	
Th, 1/27	Four key biomolecules/Chemistry	Ch2, p. 26, 37-49		List of journals due
Fri, 1/28	Microbes & Diseases Biodiversity	Ch10, p. 276-289		<b>Q1:</b> class material from 1/18-1/27
T, 2/1	Prokaryotic and Eukaryotic Cells	Ch4	Staining bacteria: 3-4	MB topic sign-up
Th, 2/3	Prokaryotic "options"	Ch4		
T, 2/8	Prokaryotes and Eukaryotes	Ch4	Gram stain: 3-6 Motility test: 5-28	MBI Due
Th, 2/10	Prokaryotic Genetics	Ch8		
Fri, 2/11	<b>Exam 1</b>			
T, 2/15	Viruses	Ch13	Stains: acid fast: 3-7 endospore: 3-9	
Th, 2/17	Viruses	Ch13		
T, 2/22	Fungi	Ch12	Examine fungi: 10-1	
Th, 2/24	Fungi	Ch12		
Fri, 2/25	Microbial growth	Ch6		<b>Q2:</b> Fungi/Viruses
T, 3/1	Microbial growth control	Ch7	<b>Lab practical 1</b>	
Th, 3/3	Microbial growth control/Antibiotics	Ch7,20		MBII Due
T, 3/8	Antibiotics & antibiotic resistance	Ch20	Bacterial isolation: 4-1 Antibiotic Resistance: 2-14	
Th, 3/10	<b>Exam 2</b>			
Fri, 3/11	Principles of disease	Ch15		
T, 3/15	How microbes cause disease	Ch14	Epidemiology: 7-11	
Th, 3/17	Nosocomial Infections	Ch14		
<b>SPRING BREAK!!!</b>				
T, 3/29	Non-specific immune responses	Ch16	Differential/Selective media 4-6, 4-8	MBIII Due
Th, 3/31	Specific immune responses	Ch17		<b>Q3:</b> Ch14, 15
Fri, 4/1	Specific immune responses	Ch17		
T, 4/5	Vaccines	Ch17	Blood typing: 9-5 immunology	
Th, 4/7	<b>Exam 3</b>			
T, 4/12	Skin diseases: bacterial	Ch21	Diff/Selective media 4-2 Blood Agar 5-26	
Th, 4/14	Skin diseases: viral, fungal	Ch21		MBIV due
Fri, 4/15	Urinary tract diseases	Ch26		
T, 4/19	Sexually transmitted diseases	Ch26	Clinical sample: UTI; 6-2	
Th, 4/21	Foodborne/Digestive tract diseases	Ch25		Article summary
T, 4/26	Foodborne/Digestive tract diseases	Ch25	Water testing: 7-1	
Th, 4/28	Respiratory diseases	Ch24		
Fri, 4/29	Respiratory diseases	Ch24		MB Re-do Due
T, 5/3	Review/catch-up		<b>Lab practical 2</b>	
Th, 5/5	Microbial Jeopardy			