

SYLLABUS
BEGINNINGS IN MICROBIOLOGY
Biology 240 Summer Session, 2008

Lecture: Mon, Tues, Wed, Thursday 10-11:50 AM
Lab: Tues, Thursday 12:30-4:30 PM

Instructor: Dr. Pam Wagaman
Email:
Office phone:
Office: Bunnell 307E
Office hours: Friday, 9:00-11:00 or by appointment

T.A.s

Text: Microbiology: A Human Perspective, 2007. Nester, Anderson, Roberts, and Nester. McGraw Hill.(5th edition)
Online Learning Center: www.mhhe.com/nester7

Lab Manual: Beginnings in Microbiology Lab Manual. Martinson.

Other materials: Permanent black Sharpie marker for lab, old shirt or lab coat for lab, safety glasses

Course goals/objectives:

Goal: Students will understand the basics of microbiology, with an emphasis on microbial growth, control, and role in human disease.

Objectives:

- You will be able to demonstrate knowledge of the requirements for microbial growth and control.
- You will demonstrate basic skills in microbiological lab techniques (aseptic technique, microscopy, staining, identification, and control/assessment of microbial growth).
- You will be able to recognize the basic roles of host and microbe in the disease process.
- You will be able to read, research and discuss topics of importance to public health and biotechnology found in everyday news media.

Course outline:

Lecture and lab topics are coordinated so that the concepts introduced in lecture are reinforced through the lab exercises. The lecture portion of the course is divided into three main sections:

1. The biology of bacteria:
 - a. Structure of bacterial cells
 - b. Growth of bacteria

c. Control of bacterial growth

2. Bacterial genetics:

Basics of DNA replication, transcription (DNA→RNA), and translation (RNA→protein)

3. Bacteria and disease:

- a. Basics of the immune response and immune disorders
- b. Host-microbe interactions
- c. Introduction to epidemiology
- d. Body systems and their diseases

Prerequisites:

While the only prerequisite for this class is a high school diploma or GED, it is strongly recommended that students have at least 1 semester each of biology and chemistry.

Grading:

There are two parts to this course: lecture and lab, worth a total of 750 points. The lecture portion of the course accounts for 450 points (60%) and the lab portion accounts for 300 points (40%).

Breakdown of assignments:

Lecture:

- | | |
|-------------------------------|---------|
| • Infectious disease report | 50 pts |
| • Exams (2 @ 100 points each) | 200 pts |
| • Final Exam | 200 pts |

Lab:

- | | |
|-------------------------------------|---------|
| • Lab manual (varies with exercise) | 100 pts |
| • Lab quizzes (2 @ 25 points each) | 50 pts |
| • Group case study presentations | 50 pts |
| • Lab practical | 100 pts |

Explanation of assignments:

Infectious disease report: Web links to articles from magazines or newspapers will be posted on Blackboard (hard copies will also be available). Links to a variety of resources will also be made available to students. You will select a topic to read and research, and write a short (500 word) report on the article. The reports will be posted to a discussion forum on Blackboard. Reports will contain the following elements, each worth 10 pts.

1. a brief statement of the problem or topic
2. introductory material (for example, if the article is about strep infections, describe *Streptococcus* and tell a little about the types of infections discussed)
3. a statement of what research was done to solve a problem or answer a question, or discussion presented in the paper (make it brief—use bullet points);

4. comments by you (such as why this article is of importance, what you think should be done next, or what you wish the authors had addressed)
5. resources. (Author, Year or Date, Title, Source, pages if applicable)

Resource format (examples)

Online article: Jeffrey Perkel. Jan. 24, 2008. Key Anthrax Virulence Factor Discovered. HONselect; www.hon.ch/News/HSN

Magazine or journal: E. Nudler and P. Tierno. 2008. Key Anthrax Virulence Factor Discovered. Proc. National Acad. Sci. p. 321-322.

Newspaper: Jane Doe. Jan. 24, 2008. Key Anthrax Virulence Factor Discovered. Fairbanks Daily News-Miner. p. 3.

Group case study presentations: Case studies will be made available electronically and by hard copy. Groups of 4 students will select one study. Each person in the group will research the study. The team will then work together to prepare and present a 10 minute presentation to the class.

Lab:

Lab exercises are an integral part of this course. Missing two labs is equivalent to dropping the lab portion of the class, and a grade of F will be given. In general, missed labs cannot be made up due to the extensive amount of prep work that goes into preparing for the lab. If you must miss a lab, please let myself and/or your T.A. know as soon as possible so that we can attempt to accommodate you. Keep in mind that many of the exercises are completed over the course of two or more lab periods. Completion of the lab exercises (recording results and observations), as well as developing good lab techniques are critical to successful completion of this course. Please come to lab prepared (review the lab exercises beforehand), and be on time. I have tried to arrange the labs so that they correlate with lecture topics as much as possible.

You are responsible for completing all parts in the lab manual of the exercises we cover in this class. This includes recording results and observations, and answering brief questions about your results. Since each lab exercise is different, the number of points varies for each exercise. Basically, if you do all the exercises, record your results, and provide thoughtful answers to all questions, you will receive full credit. Failure to completely answer questions will result in partial credit being given. Your lab manuals will be collected and graded twice during the session.

Your proficiency in and understanding of general microbiological techniques will be assessed during the lab practical, given at the end of the semester (July 1) It is very important to thoroughly understand the concepts covered in lab, as well as to be proficient in standard methods such as pure culture techniques, Gram staining, and microscopy. So as you go through the lab exercise, take your time and make sure you understand what you are doing. You will have plenty of opportunities to practice your techniques, as well. Don't be afraid to ask questions! It is the best way to understand both the laboratory exercises and the supporting concepts learned in lecture.

Attendance:

I strongly recommend that you attend all lectures. Due to the shortened timeframe of the summer session, you will miss a lot of material and discussion if you miss one class. I generally do not take attendance in lecture, but will note absences in lab.

Lecture outlines and exams:

Lecture outlines will be provided at the beginning of each lecture. I will include a list of terms that you should know, as well as a few questions/statements on the key points of the lecture. Due to the compressed schedule for this session, it is very important that you keep up with the reading and study! McGraw-Hill provides excellent study tools at the end of each chapter, as well as online quizzes and interactive learning tools. However, let the lecture outlines guide you in preparing for exams since I will not cover everything in each chapter. A review session will be held before the final exam, and if you need further clarification on lecture or text materials, please bring it up in class or make an appointment to talk with me.

Courtesy Items:

Food: Food and drink are strictly prohibited in lab. Please do not bring food into the lecture, as it is a distraction to other students. Drinks may be brought into lecture.

Cell phone: Cell phones will not be permitted in either lab or in lecture. Please turn them off and leave them stored. Messages may be returned during break.

Laptop computers: I prefer that students do not bring laptop computers to class for note taking, as some students are distracted by the clicking of the keyboard.

Disabilities Services:

The Office of Disability Services insures that UAF students have equal access to campus and course materials. I will work with the Office of Disabilities Services (Whitman Bldg., Room 203, 474-7043) to provide reasonable accommodation to students with documented disabilities.

Academic integrity:

It is assumed that the work you do for this course is your own, and not that of someone else. All aspects of the UAF Student Code of Conduct apply (see the summer sessions catalog). In lab we will sometimes be working with partners, and it is expected that each partner will contribute equally to the exercise.

Grades:

Grades are given as follows:

- A 90% or higher
- B 80%-89%

C	70%-79%
D	60%-69%
F	<60%

Grades will not be graded on a curve. If you have concerns about your grades, please do not wait until the last week to come to me for help—I may be able to offer suggestions for study. Remember that the objective of this course is for you to learn enough basic microbiology to read news articles, listen intelligently to the media, carry on a conversation, and understand basic concepts of microbiology!

Biology 240: Beginnings in Microbiology
 Summer Session, 2008
 Lecture Schedule

Date	Topic	Text Pages	Assignment Due
May 27	Introduction Microscopy	1-18 41-48	
May 28	Chemistry and macromolecules	19-40	
May 29	Structure of prokaryotic cells	48-85	
June 2	Microbial growth and control	87-130	
June 3	Metabolism	131-166	
June 4	DNA, RNA, and Proteins	167-218	
June 5	Mutations and repair	(167-218)	Lab Quiz #1
June 9	EXAM I Biotechnology	219-244	
June 10	Viruses	337-364	
June 11	Antimicrobial Drugs	495-520	
June 12	Innate and Adaptive Immune Response	365-412	Turn in lab manual for grading
June 16	Application of Immunology	413-432	
June 17	Immunological Disorders	433-450	
June 18	Host-microbe Interactions	451-474	
June 19	Epidemiology and Nosocomial Infections	475-493	Lab Quiz #2
June 23	EXAM II Anatomy/Physiology of the Skin Diseases of the Skin	521-548	
June 24	Anatomy/Physiology of the Respiratory System Diseases of the Respiratory System Anatomy/Physiology of the Alimentary System	573-608 609-647	

	Diseases of the Alimentary System		
June 25	Anatomy/Physiol of the Nervous System Diseases of the Nervous Systems and Wounds	549-572 681-707	
June 26	Physiol and Diseases of the Blood and Lymphatic System	709-732	Deadline to post infection reports/ Case Study Presentations
June 30	GenitoUrinary Disease STDs and HIV	649-679; 733-758	
July 1	Review		LAB PRACTICAL— Turn in Lab Manual for final grade
July 2	FINAL EXAM		