

VALDOSTA STATE UNIVERSITY

BIOLOGY 2900—FALL 2015

INSTRUCTOR: Dr. J. A. NIENOW

OFFICE: 2089 Bailey Science Center; 249-4844

Office hours: TTh 9:30 to 10:30, or by appointment

EMAIL: jnienow@valdosta.edu

REQUIRED TEXT:

- Lab Manual for BIOL 3100 Microbiology, Valdosta State University. McGrawHill Higher Education, New York. ISBN 9781308191034

RECOMMENDED TEXT:

- Nester, E. W., D. G. Anderson, C. E. Roberts, Jr., M. T. Nester. 2012. Microbiology, A Human Perspective. 7th or 8th Edition. McGrawHill Higher Education, New York.

OTHER RESOURCES:

- <http://www.valdosta.edu/~jnienow>
- BlazeView

PREREQUISITES: Chemistry 1152K.

COURSE GOALS:

- Students will acquire basic knowledge of bacteriology, immunology, and virology with an emphasis on applications and disease processes.
- Students will gain experience with some basic techniques used for studying microorganisms in the laboratory including aseptic technique, transfer and culture of bacteria, identification and quantification of bacteria, and antibiotic sensitivity testing. Students will learn how to prepare and give an oral presentation on a clinical microbiological topic.

ATTENDANCE: Students are responsible for attending class and for the material presented in all classes. There will be no make-ups of missed labs, quizzes, and other assignments. However, students who miss more than three labs will have 20 points deducted from their point total for each lab missed. Exams missed without prior permission of the instructor may be made up, but the final score on the exam will be reduced by 25%. It is the student's responsibility to contact the instructor to set up a time to take a make-up exam. Arrangements for a make-up exam must be made within 1 week of the missed exam, otherwise no make-up will be given and the student will receive 0 points for the exam. Students who have missed 20% of regularly scheduled class meetings, especially labs, are subject to a failing grade for the course.

ATTIRE: Lab aprons will be provided and must be worn during lab. SANDALS, FLIP-FLOPS AND OTHER OPEN-TOED SHOES ARE NOT PERMITTED IN LAB.

LECTURE EXAMS: There will be four unit exams. The first 3 exams will each be worth 125 points, the last will be worth 225 points. The exams will include a mixture of multiple choice and short answer questions. Expect the later exams, especially the fourth, to include some material covered in the earlier exams. The dates of these exams are included in the attached schedule of lectures. DO NOT MISS THESE EXAMS WITHOUT PRIOR PERMISSION. If you are caught cheating on an exam you will receive no points. CELL PHONES MUST BE OFF AND OUT OF SIGHT DURING THE EXAM. IF I SEE OR HEAR YOUR CELL PHONE DURING THE EXAM, YOU WILL BE TOLD TO TURN YOUR EXAM IN IMMEDIATELY. IF YOU LEAVE THE EXAM ROOM DURING THE EXAM FOR ANY REASON, YOU WILL BE TOLD TO TURN IN YOUR EXAM IMMEDIATELY. Estimated total from lecture exams—600 points.

LABORATORY EXAMS: There will be two laboratory exams, each worth 75 points. These will include a mix of explanations of laboratory procedures and opportunities to demonstrate your laboratory skills. Estimated total from laboratory exams—150 points.

ADDITIONAL LABORATORY GRADES: Periodically you will be asked to complete informal and formal reports of your lab work. Estimated total from laboratory reports – 100 points.

ORAL REPORTS: All students will be required to prepare and deliver a 7 minute talk on a microbiological subject (see separate handout). **PRESENTATION OF AN ORAL REPORT IS MANDATORY. FAILURE TO GIVE AN ORAL REPORT WILL RESULT IN A ZERO FOR THE ENTIRE LAB PORTION OF THE GRADE!!!** Points for this talk will be distributed as follows: copies of two references from the scientific literature--20 points; printouts of the draft power point slides--30 points; printout of the final version of the power point slides—20 points; presentation of the oral report--80 points. Estimated total for the oral report assignment – 150 points.

GRADING: Your grade will depend on how well you do on the exams, quizzes, and reports. Expect the following grading scale (based on the total number of points actually assigned):

A = 90 - 100 %
B = 80 - 89 %
C = 70 - 79 %
D = 60 - 69 %
F < 60 %

DROPPING A COURSE WITHOUT PENALTY: In order to officially drop a course without penalty, a student must obtain and fill out a drop/add form from the Registrar's Office, acquire appropriate signatures, and return the completed form to the Registrar's Office before the designated date (published in the academic calendar). If you don't officially withdraw, and instead just stop coming to class, you will receive an F for the course. It will then take three A's in science classes cancel out that F and bring your GPA back up to 3.0 so you can maintain your scholarship.

SPECIAL NOTE 1: Grades will be neither posted nor given out over the telephone.

SPECIAL NOTE 2: Students requesting classroom accommodations or modifications because of a documented disability should discuss this need with the instructor at the beginning of the semester. These students must contact the Access Office for Students with Disabilities located in Farber Hall. The phone numbers are 245-2498 (V/VP) and 219-1348 (TTY).

STUDY TIPS

- It is recommended that you form small study groups and study together in the library or other locations without TV, stereo or other distractions.
- Before you begin reading a chapter, make a very quick outline using the chapter subheadings, this will give you some idea of what the chapter is all about and how it is organized.
- You should read ahead of the schedule. So when you come to class you can ask questions.
- Answer the review questions at the ends of the chapters.
- When studying, ask yourself how this information would be applied.
- Come to office hours and ask questions if there is material you do not understand.
- Ask questions in class!!

**SCHEDULE OF LECTURES AND LABS
BIOLOGY 2900, FALL 2015**

Note: Pacing and testing dates may be changed if the need arises. Attend class regularly.

WEEK 1		
8-17-15	LAB--Orientation; Lab safety; Hand-washing exercise	exercise 1
8-18-15	LECTURE—Intro to microbiology, historical perspective	Chapters 1
8-19-15	LAB-- <i>Brightfield microscopy; Protozoa, algae, and cyanobacteria</i> LAB—Set up <i>Ubiquity of Bacteria</i> and <i>The Fungi: Yeasts and Molds</i>	exercises 2 & 5 exercises 6 & 7
8-20-15	LECTURE—Cell structure	Chapter 3

WEEK 2		
8-24-15	LAB--Complete <i>Ubiquity of Bacteria</i> and <i>The Fungi: Yeasts and Molds</i> LAB— <i>Aseptic Techniques</i>	exercises 6 & 7 exercise 9
8-25-15	LECTURE—Cell structure (continued)	Chapter 3
8-26-15	LAB—More microscopy, <i>Comparing yeasts and E. coli</i> LAB—Work on <i>Smear preparation, Simple Staining</i> LAB—Set up <i>Selective and differential media</i>	handout exercises 12 & 13 handout
8-27-15	LECTURE—Cell structure (continued)	Chapter 3

WEEK 3		
8-31-15	LAB—Complete <i>Selective and differential media</i> LAB—Work on microscopy, staining, <i>Negative Staining</i>	handout exercise 14
9-1-15	LECTURE—Cell structure (continued)	Chapter 3
9-2-15	LAB— <i>Gram Staining</i>	exercise 15
9-3-15	LECTURE—Viruses & viroids	Chapter 13

WEEK 4		
9-7-15	LABOR DAY HOLIDAY	
9-8-15	LECTURE—Viruses & viroids	Chapter 13
9-9-15	LAB— <i>Gram Staining</i> LAB— <i>Spore Staining</i>	exercise 15 exercise 16
9-10-15	LECTURE EXAM I	

WEEK 5		
9-14-15	LAB— <i>Enumeration of bacteria on natural foods</i> LAB— <i>Acid-fast staining</i>	handout exercise 17
9-15-15	LECTURE— Dynamics of bacterial growth	Chapter 4
9-16-15	LAB—Complete <i>Enumeration of bacteria on natural foods</i> LAB—Set up Isolation of bacteria from natural foods (Streak plates) LAB—Set up <i>Enumeration of virus particles</i>	handout handout handout
9-17-15	LECTURE— Environmental influences on bacterial growth	Chapter 5

WEEK 6		
9-21-15	LAB—Complete <i>Enumeration of virus particles</i> LAB—Continue isolations LAB—Set up <i>Morphological Study of an Unknown Bacterium</i> LAB—Set up <i>Motility Determination; Cultural Characteristics</i>	handout handout exercise 24 exercise 18, 25
9-22-15	LECTURE— Metabolism, the biochemistry of growth	Chapter 6
9-23-15	LAB—Continue isolations LAB—Complete <i>Morphological Study of an Unknown Bacterium</i> LAB—Complete <i>Motility Determination; Cultural Characteristics</i> LAB—Set up <i>Physiological Characteristics</i>	handout exercise 24 exercise 18, 25 exercises 26, 27, 28
9-24-15	LECTURE— Metabolism, the biochemistry of growth	Chapter 6

WEEK 7		
9-28-15	LAB—Continue isolations LAB—Complete <i>Physiological Characteristics</i> LAB— <i>Identification of Unknown Bacterium</i>	handout exercises 26, 27, 28 handout
9-29-15	LECTURE—Applications: industrial microbiology	Chapters 30, 31
9-30-15	LAB QUIZ I	
10-1-15	LECTURE—Applications: industrial microbiology	Chapters 30, 31

WEEK 8		
10-5-15	LAB—Set up <i>Enterotube System</i> LAB—Set up <i>Staphylococcus Experiment</i>	exercise 29 handout
10-6-15	LECTURE—Controlling metabolism	Chapter 7
10-7-15	LAB—Complete <i>Enterotube System</i> LAB—Complete <i>Staphylococcus Experiment</i>	exercise 29 handouts
10-8-15	LECTURE EXAM II	Chapter 7

WEEK 9		
10-12-15	FALL BREAK	handout
10-13-15	FALL BREAK	Chapter 8
10-14-15	LAB—Set up <i>Genetic analysis of bacteria</i>	handout
10-15-15	LECTURE—Bacterial genetics	Chapter 8

WEEK 10		
10-19-15	LAB—Continue <i>Genetic analysis of bacteria</i>	handout
10-20-15	LECTURE—Bacterial genetics	Chapter 9
10-21-15	LAB—Complete <i>Genetic analysis of bacteria</i>	handout
10-22-15	LECTURE—Applications	Chapter 9

WEEK 11		
10-26-15	LAB—Set up <i>Transformation of E. coli</i>	handout
10-27-15	LECTURE—Host-microbe interactions and the disease process	Chapter 16
10-28-15	LAB—Complete <i>Transformation of E. coli</i> LAB— Set up <i>Lethal Effects of UV Light</i>	handout exercise 20
10-29-15	LECTURE—Defenses: Innate immunity	chapter 14

WEEK 12		
11-2-15	LAB—Complete <i>Lethal Effects of UV Light</i> LAB—Set up <i>Antimicrobial Sensitivity Testing</i>	exercise 20 exercise 21
11-3-15	LECTURE—Defenses: Adaptive immunity	Chapter 15
11-4-15	LAB—Complete <i>Antimicrobial Sensitivity Testing</i> LAB—Intro to <i>Prevalence of Antibiotic Resistance in the Environment (PARE)</i> project	exercise 21 handout
11-5-15-15	LECTURE—Defenses: Adaptive immunity	Chapter 15

WEEK 13		
11-9-15	LAB—Set up <i>PARE project</i>	handouts
11-10-15	LECTURE—Defenses: Adaptive immunity	Chapter 15
11-11-15	LAB—Complete <i>PARE project</i>	handout
11-12-15	LECTURE EXAM III	

WEEK 14		
11-16-15	LAB—Conduct <i>ELISA</i>	handout
11-17-15	LECTURE—Applications of adaptive immunity	Chapter 18
11-18-15	LAB QUIZ II	
11-19-15	LECTURE—Applications of adaptive immunity	Chapter 18

WEEK 15		
11-23-15	LAB—Student presentations (6)	
11-24-15	LECTURE— Controlling disease (medications)	Chapter 20
11-25-15	THANKSGIVING HOLIDAY	
11-26-15-	THANKSGIVING HOLIDAY	

WEEK 16		
11-30-15	LAB—Student presentations (6)	
12-1-15	LECTURE— Controlling disease (epidemiology)	Chapter 19
12-2-15	LAB—Student presentations (6)	
12-4-15		

WEEK 17		
12-7-15	LAB—Student presentations (6)	
12-8-15	STUDY	
12-9-15	LECTURE EXAM IV @ 8:00 AM	