

VALDOSTA STATE UNIVERSITY

BIOLOGY 2900—FALL 2016

INSTRUCTOR: Dr. J. A. NIENOW

OFFICE: 2089 Bailey Science Center; 249-4844

Office hours: MT 3:00 to 5:00, Th 1:00 to 2:00 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>

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 five unit exams and a comprehensive final exam. The unit exams will each be worth 100 points; the final exam will be worth 200 points. The exams will include a mixture of multiple choice and short answer questions. 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—700 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: Some of your lab work will be assessed and assigned points based on the quality of the work. In addition you will occasionally be asked to complete informal and formal reports of your lab work. Most of these assignments have specified due dates; pay attention them. Absolutely no assignment will be accepted later than 5: 00 pm the day of the last lecture. Estimated total from laboratory work – 500 points.

ORAL REPORTS: All students will be required to prepare and deliver a 10 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 power point slides--50 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: Valdosta State University (VSU) is committed to creating a diverse and inclusive work and learning environment free from discrimination and harassment. VSU is dedicated to creating an environment where all campus community members feel valued, respected, and included. Valdosta State University prohibits discrimination on the basis of race, color, ethnicity, national origin, sex (including pregnancy status, sexual harassment and sexual violence), sexual orientation, gender identity, religion, age, national origin, disability, genetic information, or veteran status, in the University's programs and activities as required by applicable laws and regulations such as Title IX. The individual designated with responsibility for coordination of compliance efforts and receipt of inquiries concerning nondiscrimination policies is the University's Title IX Coordinator: Maggie Viverette, Director of the Office of Social Equity, titleix@valosta.edu, 1208 N. Patterson St., Valdosta State University, Valdosta, Georgia 31608, 229-333-5463.

SPECIAL NOTE 3: Students with disabilities who are experiencing barriers in this course may contact the Access Office for assistance in determining and implementing reasonable accommodations. The Access Office is located in Farbar Hall. The phone numbers are 229-245-2498 (V), 229-375-5871 (VP) and 229-219-1348 (TTY). For more information, please visit VSU's Access Office or email: access@valdosta.edu.

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 2016

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

WEEK 1		
8-15-16	LECTURE-- Introduction to microbiology	Chapter 1
	LAB--Orientation; Lab safety; Hand-washing exercise	pp. ix-xiv; supplement
8-17-16	LECTURE—Cell structure	Chapter 3
	LAB-- <i>Brightfield microscopy: Animal parasites</i> LAB—Set up <i>Ubiquity of Bacteria</i> and <i>The Fungi: Yeasts and Molds</i>	exercise 2, supplement exercise 6, 7
8-19-16	LECTURE—Cell structure	Chapter 3
WEEK 2		
8-22-16	LECTURE—NO CLASS; Review basic chemistry	Chapter 2
	LAB—NO LAB	
8-24-16	LECTURE—NO CLASS; Review basic chemistry	Chapter 2
	LAB—NO LAB	
8-26-16	LECTURE—NO CLASS; Review basic chemistry	Chapter 2
WEEK 3		
8-29-16	LECTURE—Cell structure	Chapter 3
	LAB—Complete <i>Ubiquity of Bacteria</i> and <i>The Fungi: Yeasts and Molds</i> LAB—More microscopy: <i>Living protozoa, algae, cyanobacteria, molds</i>	exercise 6, 7 exercise 5
8-31-16	LECTURE—Cell structure (continued)	Chapter 3
	LAB— <i>Aseptic Techniques</i> LAB—Work on <i>Smear preparation, Simple Staining</i> LAB—More microscopy: <i>Comparing yeasts and E. coli</i>	exercise 9 exercise 10, 11; handout
9-02-16	LECTURE—Cell structure (continued)	Chapter 3
WEEK 4		
9-05-16	LABOR DAY—NO CLASS	
	LABOR DAY—NO LAB	
9-07-16	LECTURE—Viruses & viroids	Chapter 13
	LAB—Set up: <i>Enumeration of bacteria on natural foods</i> LAB— <i>Gram Staining</i>	handout exercise 14
9-09-16	LECTURE EXAM I	
WEEK 5		
9-12-16	LECTURE— Dynamics of bacterial growth	Chapter 4
	LAB-- Complete: <i>Enumeration of bacteria on natural foods</i> LAB—Set up <i>Selective and differential media</i>	handout exercise 16
9-14-16	LECTURE— Environmental influences on bacterial growth	Chapter 5
	LAB—Finish <i>Selective and differential media</i> LAB—Set up Isolation of bacteria from natural foods (Streak plates) LAB—Set up <i>Enumeration of virus particles</i> LAB— <i>Spore staining</i>	handout exercise 10 handout exercise 17
9-16-16	LECTURE— Metabolism, the biochemistry of growth	Chapter 6

WEEK 6		
9-19-16	LECTURE— Metabolism, the biochemistry of growth	Chapter 6
	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
9-21-16	LECTURE— Metabolism, the biochemistry of growth	Chapter 6
	LAB—Continue isolations LAB—Complete <i>Morphological Study of an Unknown Bacterium</i> LAB—Complete <i>Motility Determination; Cultural Characteristics</i>	handout exercise 24 exercise 18, 25
9-23-16	UNIT EXAM II	
WEEK 7		
9-26-16	LECTURE—Applications: industrial microbiology	Chapters 30, 31
	LAB—Set up <i>Physiological Characteristics I</i> LAB— <i>Gram stain of unknowns</i>	exercise 26, 27
9-28-16	LECTURE—Controlling metabolism	Chapter 7
	LAB—Complete <i>Physiological Characteristics I</i> LAB—Set up <i>Physiological Characteristics II</i>	exercise 26, 27 exercise 27, 28
9-30-16	LECTURE—Controlling metabolism	Chapter 7
WEEK 8		
10-03-16	LECTURE—Controlling metabolism	Chapter 7
	LAB—Complete <i>Physiological Characteristics II</i> LAB—Set up <i>Staphylococcus aureus Experiment</i> LAB— <i>Identification of Unknown Bacterium</i>	exercise 27, 28 handouts handouts
10-05-16	LECTURE—Bacterial genetics	Chapter 8
	LAB QUIZ I	handouts
10-07-16	LECTURE—Bacterial genetics	Chapter 8
WEEK 9		
10-10-16	FALL BREAK—NO CLASS	
	FALL BREAK—NO LAB	
10-12-16	LECTURE—Bacterial genetics	Chapter 8
	LAB—Continue <i>Staphylococcus aureus Experiment</i> LAB—Set up DNA extraction	exercise 29 handout
10-14-16	UNIT EXAM III	Chapter 8
WEEK 10		
10-17-16	LECTURE—Applications	Chapter 9
	LAB—Set up Enterotubes LAB—Set up <i>Genetic analysis of bacteria using PCR</i>	handout
10-19-16	LECTURE—Applications	Chapter 9
	LAB—Complete Enterotubes LAB—Complete <i>Genetic analysis of bacteria using PCR</i> LAB—Set up <i>Transformation of E. coli</i>	handout handout
10-21-16	LECTURE—Applications	Chapter 9
WEEK 11		
10-24-16	LECTURE—Host-microbe interactions and the disease process	Chapter 16
	LAB—Complete <i>Transformation of E. coli</i> LAB—Set up <i>Antimicrobial Sensitivity Testing</i>	handout exercise 21
10-26-16	LECTURE—Host-microbe interactions and the disease process	Chapter 16
	LAB—Complete <i>Antimicrobial Sensitivity Testing</i>	exercise 21

	LAB—Intro to <i>Prevalence of Antibiotic Resistance in the Environment (PARE)</i> project	handout
10-28-16	LECTURE—Defenses: Innate immunity	Chapter 14
WEEK 12		
10-31-16	LECTURE—Defenses: Innate immunity	Chapter 14
	LAB— <i>PARE project I</i>	handouts
11-02-16	LECTURE—Defenses: Adaptive immunity	Chapter 15
	LAB— <i>PARE project II</i>	handout
11-04-16	UNIT EXAM IV	
WEEK 13		
11-07-16	LECTURE—Defenses: Adaptive immunity	Chapter 15
	LAB— <i>PARE project III</i>	handouts
11-09-16	LECTURE—Defenses: Adaptive immunity	Chapter 15
	LAB—ELISA	handout
11-11-16	LECTURE—Defenses: Adaptive immunity	Chapter 15
WEEK 14		
11-14-16	LECTURE—Immunologic disorders	Chapter 17
	LAB— LAB QUIZ II	
11-16-16	LECTURE—Applications	Chapter 18
	LAB—Student presentations (6)	
11-18-16	LECTURE—Applications	Chapter 18
WEEK 15		
11-21-16	LECTURE—Applications	Chapter 18
	LAB—Student presentations (6)	
11-23-16	THANKSGIVING HOLIDAY—NO CLASS	Chapter 20
	THANKSGIVING HOLIDAY—NO LAB	
11-25-16	THANKSGIVING HOLIDAY—NO CLASS	
WEEK 16		
11-28-16	LECTURE— Controlling disease (medications)	Chapter 20
	LAB—Student presentations (6)	
11-30-16	LECTURE— Controlling disease (medications)	Chapter 20
	LAB—Student presentations (6)	
12-02-16	UNIT EXAM IV	
WEEK 17		
12-05-16	LECTURE— Review	
	LAB—Student presentations (6)	
12-09-16	COMPREHENSIVE FINAL EXAM @ 8:00 AM	