

VALDOSTA STATE UNIVERSITY

BIOLOGY 2900—FALL 2019

INSTRUCTOR: Dr. J. A. NIENOW

OFFICE: 2089 Bailey Science Center; 249-4844

Office hours: MW 1:00 to 2:00, TTh 2:00 to 3:00 or by appointment

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REQUIRED TEXT:

- Foster, J. W., Z. Aliabadi, J. L. Slonczewski. 2018. Microbiology, The Human Experience. Preliminary edition. W. W. Norton, New York.
- Lab Manual for BIOL 3100 Microbiology, Valdosta State University. McGrawHill Higher Education, New York. ISBN 9781308191034

OTHER RESOURCES:

- 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. IF YOU ARRIVE IN FOR LABS SANDALS OR FLIP-FLOPS YOU WILL BE SENT HOME TO CHANGE.

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: 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 2019

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

WEEK 1		
8-19-19	LAB--Orientation; Lab safety; LAB-- <i>Hand-washing exercise</i>	pp. ix-xiv; supplement exercise 35
8-20-19	LECTURE— Introduction to microbiology DISEASE OF THE DAY--Rabies	pp. 1-58
8-21-19	LAB-- <i>Brightfield microscopy: Animal parasites</i> LAB—Set up <i>Ubiquity of Bacteria</i> and <i>The Fungi: Yeasts & Molds</i>	exercise 2, supplement exercise 6, 7
8-22-19	LECTURE—Introduction to microbiology (continued) DISEASE OF THE DAY—Smallpox	pp. 1-58
WEEK 2		
8-26-19	LAB—Complete <i>Ubiquity of Bacteria</i> and <i>The Fungi: Yeasts & Molds</i> LAB—More microscopy: <i>Living protozoa, algae, cyanobacteria</i>	exercise 6, 7 exercise 5
8-27-19	LECTURE—Basic concepts in medical microbiology LECTURE—Microscopy DISEASE OF THE DAY—Bubonic plague	pp. 32-58 pp. 62-82
8-28-19	LAB— <i>Aseptic Techniques</i> LAB—Work on <i>Smear preparation, Simple Staining</i>	exercise 9 exercise 10, 11
8-29-19	LECTURE—Bacterial cell structure DISEASE OF THE DAY--Malaria	pp. 124-144
WEEK 3		
9-02-19	LABOR DAY HOLIDAY—NO CLASS	
9-03-19	LECTURE—Bacterial cell structure (continued) DISEASE OF THE DAY—Ebola hemorrhagic fever	pp. 124-144
9-04-19	LAB— <i>Comparing yeasts and E. coli</i> LAB-- <i>Negative Staining</i>	handout exercise 9
9-05-19	UNIT EXAM I	
WEEK 4		
9-09-19	LAB— <i>Gram Staining</i>	exercise 14
9-10-19	LECTURE—Eukaryotic cell structure LECTURE— Viruses & viroids DISEASE OF THE DAY--Cholera	pp. 144-152 pp. 350-382
9-11-19	LAB—Set up: <i>Enumeration of bacteria on natural foods</i> LAB— <i>Gram Staining</i>	handout exercise 14
9-12-19	LECTURE— Viruses & viroids DISEASE OF THE DAY—Shigellosis	pp. 350-382
WEEK 5		
9-16-19	LAB—Complete: <i>Enumeration of bacteria on natural foods</i> LAB—Set up <i>Selective and differential media & Isolation of bacteria from natural foods (Streak plates using PEA & Hektoen agar)</i> LAB— <i>Spore staining</i> LAB—Set up <i>Effects of UV light</i>	handout handout Exercise 10 exercise 15 exercise 30
9-17-19	LECTURE— Dynamics of bacterial growth DISEASE OF THE DAY— <i>Escherichia coli</i> infections	pp. 156-186

9-18-19	LAB—Complete <i>Effects of UV light</i> LAB—Continue <i>Selective and differential media & Isolation of bacteria from natural foods (MacConkey agar)</i>	exercise 30 handout exercise 10
9-19-19	LECTURE— Environmental influences on bacterial growth DISEASE OF THE DAY— Salmonellosis/Typhoid fever	pp. 156-186
WEEK 6		
9-23-19	LAB—Continue <i>Selective and differential media & Isolation of bacteria from natural foods (EMB agar)</i>	handout exercise 10
9-24-19	LECTURE—Intro to bacterial metabolism DISEASE OF THE DAY—Viral gastroenteritis	pp. 106-118
9-25-19	LAB—Complete <i>Enumeration of virus particles</i> LAB—Continue isolations (Nutrient agar) LAB—Set up <i>Morphological Study of an Unknown Bacterium</i> LAB—Set up <i>Motility Determination; Cultural Characteristics</i>	handout exercise 24 exercise 18, 25
9-26-19	UNIT EXAM II	
WEEK 7		
9-30-19	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</i> LAB— <i>Gram stain of unknowns</i>	exercise 24 exercise 18, 25 exercise 26, 27
10-01-19	LECTURE— Bacterial metabolism DISEASE OF THE DAY--Polio	pp. 192-218
10-02-19	LAB—Complete <i>Physiological Characteristics I</i> LAB—Set up <i>Physiological Characteristics II</i>	exercise 26, 27 exercise 27, 28
10-03-19	LECTURE— Bacterial metabolism DISEASE OF THE DAY— Measles (Rubeola & Rubella)	pp. 192-218
WEEK 8		
10-07-19	FALL BREAK—NO CLASSES	
10-08-19	FALL BREAK—NO CLASSES	
10-09-19	LAB—Complete <i>Physiological Characteristics II</i> LAB— <i>Identification of Unknown Bacterium</i>	exercise 27, 28 handouts
10-10-19	LECTURE—Controlling metabolism DISEASE OF THE DAY—Mumps & Chickenpox	
WEEK 9		
10-14-19	LAB QUIZ I	
10-15-19	LECTURE—Controlling metabolism DISEASE OF THE DAY— Bacterial and viral meningitis	pp. 244-254
10-16-19	LAB—Set up <i>Staphylococcus aureus Experiment</i> LAB—Set up <i>DNA extraction -- unknowns</i> LAB—Set up <i>DNA fingerprinting</i>	exercise 52 handouts handouts
10-17-19	UNIT EXAM III	
WEEK 10		
10-21-19	LAB—Continue <i>Staphylococcus aureus Experiment</i> LAB—Continue <i>PCR-based fingerprinting (gel electrophoresis)</i> LAB—Set up <i>PCR-based analysis of unknown bacteria</i>	exercise 52 handouts handouts
10-22-19	LECTURE— Bacterial genetics DISEASE OF THE DAY--Influenza	pp. 225-244
10-23-19	LAB—Complete <i>Staphylococcus Experiment</i> LAB—Continue <i>PCR-based analysis of unknown bacteria (gel electrophoresis)</i>	handout handout
10-24-19	LECTURE— Bacterial genetics DISEASE OF THE DAY— Bacterial pneumonia	pp. 225-244

WEEK 11		
10-28-19	LAB—Complete <i>Genetic analysis of bacteria using PCR</i> LAB—Set up <i>Antimicrobial Sensitivity Testing</i>	handout exercise 21
10-29-19	LECTURE—Host-microbe interactions and the disease process DISEASE OF THE DAY--Tuberculosis	pp. 524-560
10-30-19	LAB—Complete <i>Antimicrobial Sensitivity Testing</i>	exercise 21
10-31-19	LECTURE—Defenses: Innate immunity DISEASE OF THE DAY—Diphtheria & Whooping cough	pp. 428-482
WEEK 12		
11-04-19	LAB—Set up <i>Transformation of E. coli</i>	handout
11-05-19	LECTURE—Defenses: Innate immunity DISEASE OF THE DAY— <i>Clostridium</i> diseases	pp. 456-482
11-06-19	LAB—Complete <i>Transformation of E. coli</i> LAB—Intro to <i>Prevalence of Antibiotic Resistance in the Environment (PARE)</i> project	handout handout
11-07-19	UNIT EXAM IV	
WEEK 13		
11-11-19	LAB—Set up <i>PARE project</i>	handouts
11-12-19	LECTURE—Defenses: Adaptive immunity DISEASE OF THE DAY— <i>Rickettsia</i> infections	pp. 480-560
11-13-19	LAB—Complete <i>PARE project</i>	handout
11-14-19	LECTURE—Defenses: Adaptive immunity DISEASE OF THE DAY— <i>Chlamydia</i> & Gonorrhea	pp. 480-560
WEEK 14		
11-18-19	LAB—Set up <i>ELISA</i>	handouts
11-19-19	LECTURE—Applications DISEASE OF THE DAY-- Syphilis	pp. 842-872
11-20-19	LAB QUIZ II	
11-21-19	LECTURE—Controlling disease (medications) DISEASE OF THE DAY—Viral hepatitis	pp. 397-422
WEEK 15		
11-25-19	LAB—Student presentations (6)	
11-26-19	LECTURE—Controlling disease (medications) DISEASE OF THE DAY—Genital herpes	pp. 397-422
11-27-19	THANKSGIVING HOLIDAY—NO CLASSES	
11-28-19	THANKSGIVING HOLIDAY—NO CLASSES	
WEEK 16		
12-02-19	LAB—Student presentations (6)	
12-03-19	LECTURE—Epidemiology DISEASE OF THE DAY— HIV infections	pp. 878-902
12-04-19	LAB—Student presentations (6)	
12-05-19	UNIT EXAM V	
WEEK 17		
12-09-19	LAB—Student presentations (6)	
12-11-19	COMPREHENSIVE FINAL EXAM @ 10:15 AM	