VALDOSTA STATE UNIVERSITY

BIOLOGY 2900—SPRING 2020

INSTRUCTOR: Dr. J. A. NIENOW
OFFICE: 2089 Bailey Science Center; 249-4844
Office hours: TTh 2:00 to 3:00 or by appointment
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REQUIRED TEXT:

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

RECOMMENDED TEXT:

- Foster, J. W., Z. Aliabadi, J. L. Slonczewski. 2018. Microbiology, The Human Experience. Preliminary edition. W. W. Norton, New York.

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. 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, the first worth 75 points, the second worth 100 points, designed to demonstrate your laboratory skills. Estimated total from laboratory exams—175 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, iTunes, cell phones, 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, Spring 2020

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

WEEK 1		
1-13-20	LAB—Orientation; Lab safety; LAB—Hand-washing exercise	pp. ix-xiv; supplement exercise 35
1-14-20	LECTURE— Introduction to microbiology DISEASE OF THE DAY--Rabies	pp. 1-58
1-15-20	LAB—*Brightfield microscopy*: *Animal parasites* LAB—Set up *Ubiquity of Bacteria* and *The Fungi: Yeasts &Molds*	exercise 2, supplement exercise 6, 7
1-16-20	LECTURE— Introduction to microbiology DISEASE OF THE DAY—Smallpox	pp. 1-58
WEEK 2		
1-20-20	LAB—NO CLASS; MLK HOLIDAY	
1-21-20	LECTURE—NO CLASS; BUREAUCRACY	
1-22-20	LAB—Complete *Ubiquity of Bacteria* and *The Fungi: Yeasts & Molds* LAB—More microscopy: *Living protozoa, algae, cyanobacteria* LAB—Even more microscopy: *Bacterial types*	exercise 6, 7 exercise 5 supplement
1-23-20	LECTURE—Basic concepts in medical microbiology LECTURE—Microscopy DISEASE OF THE DAY--Bubonic plague	pp. 32-58 pp. 62-82
WEEK 3		
1-27-20	LAB—*Aseptic Techniques* LAB—*Smear preparation, Simple Staining* LAB—*Comparing yeasts and* E. coli	exercise 9 exercise 10, 11 Handout
1-28-20	LECTURE—Bacterial cell structure DISEASE OF THE DAY--Malaria	pp. 124-144
1-29-20	LAB—More microscopy: *Observing fungi* LAB—*Gram Staining*	handout exercise 14
1-30-20	LECTURE—Bacterial cell structure (continued) LECTURE—Eukaryotic cell structure DISEASE OF THE DAY--Ebola	pp. 124-144 pp. 144-152
WEEK 4		
2-3-20	LAB—*Enumeration of bacteria on natural foods* LAB—*Gram Staining (continued)*	handout exercise 14
2-4-20	**UNIT EXAM I**	
2-5-20	LAB—Complete: *Enumeration of bacteria on natural foods* LAB—Set up: *Selective and differential media: Streak onto PEA and MacConkey agar*	handout handout
2-6-20	LECTURE—Viruses & viroids DISEASE OF THE DAY—Cholera	pp. 350-382
WEEK 5		
2-10-20	LAB—Continue: *Selective and differential media: Streak from MacConkey onto Hektoen agar* LAB—Set up: *Effects of UV light* LAB—Begin: *Spore Staining* (*Bacillus* and *Staphylococcus*)	handout exercise 30 exercise 15

2-11-20	LECTURE— Dynamics of bacterial growth DISEASE OF THE DAY— Shigellosis & *Escherichia coli* infections	pp. 156-186
2-12-20	LAB—Continue: *Selective and differential media: Streak from Hektoen onto EMB agar* LAB—Complete: *Effects of UV light* LAB—Complete: *Spore staining*	handout exercise 30 exercise 15
2-13-20	LECTURE— Environmental influences on bacterial growth DISEASE OF THE DAY—Salmonellosis/Typhoid fever	pp. 156-186
WEEK 6		
2-17-20	LAB—Continue: *Selective and differential media: Streak from EMB agar onto nutrient agar (NA)* LAB—Set up: *Enumeration of virus particles*	handout handout
2-18-20	LECTURE— Intro to bacterial metabolism, the biochemistry of growth DISEASE OF THE DAY—Viral gastroenteritis	pp. 106-118
2-19-20	LAB—Complete: *Enumeration of virus particles* LAB—Select unknowns LAB—Set up: *Characterizing unknown bacteria I*	handout supplement exercises 18, 24, 25
2-20-20	**UNIT EXAM II**	
WEEK 7		
2-24-20	LAB—Complete: *Characterizing unknown bacteria I* LAB—Set up: *Characterizing unknown bacteria II*	Exercises 18, 24,25 exercises 26, 27
2-25-20	LECTURE—Bacterial metabolism DISEASE OF THE DAY--Polio	pp. 192-218
2-26-20	LAB—*Gram stain unknowns* LAB—Complete: *Characterizing unknown bacteria II* LAB—Set up: *Characterizing unknown bacteria III*	exercise 14 exercise 26, 27 exercise 27, 28
2-27-20	LECTURE— Bacterial metabolism DISEASE OF THE DAY—Measles (Rubeola & Rubella)	pp. 192-218
WEEK 8		
3-2-20	LAB—Complete: *Characterizing unknown bacteria III* LAB—Set up: *Characterizing unknown bacteria IV*	exercise 27, 28 exercise 27, 28
3-3-20	LECTURE— Bacterial genetics DISEASE OF THE DAY—Mumps & Chickenpox	pp. 225-244
3-4-20	LAB—Complete: *Characterizing unknown bacteria IV* LAB—*Identifying unknown bacteria* LAB—Set-up: *Staphylococcus aureus Experiment*	exercise 27, 28 handouts handouts
3-5-20	LECTURE—Bacterial genetics DISEASE OF THE DAY—Staphylococcal/streptococcal infections	pp. 225-244
WEEK 9		
3-9-20	**LAB QUIZ I**	
3-10-20	LECTURE—Bacterial genetics DISEASE OF THE DAY—Bacterial and viral meningitis	pp. 225-244
3-11-20	LAB—Continue: *Staphylococcus Experiment: Streak onto Mannitol salt agar* LAB—Set up: *Extracting DNA from bacteria* LAB—Set up: *PCR fingerprinting*	handout handout handout
3-12-20	**UNIT EXAM III**	
WEEK 10 – Spring Break, no lectures or labs		

WEEK 11		
3-23-20	Continue: *Staphylococcus experiment: streak onto Blood agar and DNA agar* LAB—*Gel electrophoresis of PCR products* LAB—*DNA extraction of unknown bacteria*	handout handout handout
3-24-20	LECTURE—Controlling metabolism DISEASE OF THE DAY--Influenza	pp. 244-254
3-25-20	LAB--Complete: *Staphylococcus experiment: Bead agglutination* LAB—Set up: *PCR-based analysis of unknown bacteria*	handout handout
3-26-20	LECTURE—Controlling metabolism DISEASE OF THE DAY—Bacterial pneumonia	pp. 244-254
WEEK 12		
3-30-20	LAB—Complete: *PCR-based analysis of unknown bacteria* LAB—Set up: *Antimicrobic Sensitivity Testing*	handout exercise 21
3-31-20	LECTURE—Host-microbe interactions and the disease process DISEASE OF THE DAY--Tuberculosis	pp. 524-560
4-1-20	LAB—Complete *Antimicrobic Sensitivity Testing* LAB—Intro to *Prevalence of Antibiotic Resistance in the Environment (PARE)* project	exercise 21 handout
4-2-20	LECTURE—Defenses: Innate immunity DISEASE OF THE DAY—Diphtheria & Whooping cough	pp. 456-482
WEEK 13		
4-6-20	LAB—Set up *PARE project*	handouts
4-7-20	LECTURE—Defenses: Innate immunity DISEASE OF THE DAY—*Clostridium* diseases	pp. 456-482
4-8-20	LAB—Complete *PARE project*	handout
4-9-20	**UNIT EXAM IV**	
WEEK 14		
4-13-20	LAB—Set up: *Transformation of E. coli*	handout
4-14-20	LECTURE—Defenses: Adaptive immunity DISEASE OF THE DAY—*Rickettsia* infections	pp. 480-560
4-15-20	LAB—Complete: *Transformation of E. coli* LAB—Set up: *ELISA*	handout handout
4-16-20	LECTURE— Defenses: Adaptive immunity LECTURE— Applications of adaptive immunity DISEASE OF THE DAY—*Chlamydia* & Gonorrhea	pp. 480-560 pp. 842-872
WEEK 15		
4-20-20	**LAB QUIZ II**	
4-21-20	LECTURE—Controlling disease (medications) DISEASE OF THE DAY-- Syphilis	pp. 397-422
4-22-20	LAB—Student presentations (6)	
4-23-20	LECTURE— Controlling disease (medications) DISEASE OF THE DAY—Viral hepatitis	pp. 397-422
WEEK 16		
4-27-20	LAB—Student presentations (6)	
4-28-20	LECTURE— Epidemiology DISEASE OF THE DAY—Genital herpes & HIV infections	pp. 878-902
4-29-20	LAB—Student presentations (6)	
4-30-20	**UNIT EXAM V**	

WEEK 17		
5-4-20	LAB—Student presentations (6)	
5-6-20	**COMPREHENSIVE FINAL EXAM @ 10:15 AM**	