

VALDOSTA STATE UNIVERSITY

BIOLOGY 2260—Fall 2023

INSTRUCTOR: Dr. J. A. NIENOW

OFFICE: 2089 Bailey Science Center; 249-4844

Office hours: MW 3:30 to 5:00, TTh 9:30 to 10:30 or by appointment

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RECOMMENDED TEXTS:

- Foster, J. W., Z. Aliabadi, J. L. Slonczewski. 2021. Microbiology, The Human Experience. 2nd edition. W. W. Norton, New York.
- Any other microbiology book published within the past 10 years that fits your wallet.

OTHER RESOURCES:

- BlazeView – PowerPoints, Lab exercises, Assignments, Kaltura recordings, etc.

PREREQUISITES: None

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 expected to attend lectures and participate in lab exercises. They are responsible for the material presented in all classes whether they were in attendance or not. Lectures will be recorded in Kaltura and posted in BlazeView in case you happen to miss a lecture. Labs are more problematic since we work with live cultures and perform complex procedures. Therefore, do not expect to be able to make-up missed labs; if you do miss a lab for any reason you will receive a zero for the exercise. Students who have missed 20% of regularly scheduled class meetings, especially labs, are subject to a failing grade for the course.

ATTIRE: Lab aprons, face shields and glove 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. All the exams will be on-line in BlazeView. Lecture exams will consist of 76 multiple choice questions that you will have to answer correctly in 75 minutes. BE PREPARED. The final exam will consist of 150 multiple choice questions that you will have to answer in 120 minutes. Again, BE PREPARED. The dates of these exams are included in the attached schedule of lectures. DO NOT MISS THESE EXAMS WITHOUT PRIOR PERMISSION. 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. If you are caught cheating on an exam you will receive 0 points. Estimated total from lecture exams—700 points.

LABORATORY EXAMS: There will be two laboratory exams. The first, a lab skills test, is worth 75 points; you may use any notes you wish for this exam. The second will consist of 25 PowerPoint slides illustrating some of the procedures and tests conducted during the lab. Each slide will have two questions requiring either an explanation of the purpose and set-up of the procedure, details of the material used in the procedure, or an analysis of the results, and will be displayed for 60 seconds. You may use a completed study guide, but no other materials, during the exam. This exam is worth 100 points. Estimated total from laboratory exams—175 points.

ADDITIONAL LABORATORY GRADES AND ASSIGNMENTS: 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. Once an assignment has been handed back, you can no longer turn it in for credit. On the other hand, if the posted grade is not satisfactory to you, you can turn in another version. But the same rule applies—the corrected version must be submitted before the assignment has been returned to the class. Absolutely no assignment will be accepted later than 5: 00 pm the day of the last class meeting (Monday of finals week). 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). Points for this talk will be distributed as follows: references from the text-- 5 points; copies of two references from the primary scientific literature--20 points; printouts of the power point slides and the presentation of the oral report--125 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 complete the process with 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.

SPECIAL NOTE 1: Grades will be neither posted nor given out over the telephone. All of the grades for assignments, labs, and exams will be listed in BlazeView. If you want to calculate your grade at any point you should create a spreadsheet of your own, with one row for assigned points and one row for earned points (what you earned on the assignment). Each time a new grade appears, enter the maximum number of points possible for the assignment in the assigned points row and the number of points you earned on the assignment in the earned points row. To figure out your grade at any point simply sum the number of assigned points and sum the number of earned points separately, then divide the sum of the number earned by the sum of the number assigned and multiply by 100.

SPECIAL NOTE 2: Non-Discrimination and Title IX Statement: Valdosta State University (VSU) upholds all applicable laws and policies regarding discrimination on the basis of race, color, sex (including sexual harassment and pregnancy), sexual orientation, gender identity or expression, national origin, religion, age, veteran status, political affiliation, or disability. The University prohibits specific forms of behavior that violate Title IX of the Education Amendments of 1972. Title IX of the Education Amendments of 1972 prohibits discrimination on the basis of sex in education programs and activities that receive federal funding. VSU considers sex discrimination in any form to be a serious offense. Title IX refers to all forms of sex discrimination committed against others, including but not limited to: sexual harassment, sexual assault, sexual misconduct, and sexual violence by other employees, students or third parties and gender inequity or unfair treatment based on an individual's sex/gender. The designated Title IX Coordinator for VSU is Ms. Selenseia Holmes. To view the full policy or to report an incident visit: <https://www.valdosta.edu/administration/student-affairs/title-ix/>

SPECIAL NOTE 3: Accommodations Statement: Students with disabilities who are experiencing barriers in this course may contact the Access Office (<https://www.valdosta.edu/student/disability/>) for assistance in determining and implementing reasonable accommodations. The Access Office is located in University Center Room 4136 Entrance 5. The phone numbers are 229-245-2498 (V), 229-375-5871. For more information, please visit VSU's Access Office or email: access@valdosta.edu. To request reasonable accommodations for pregnancy and childbirth, contact Ms. Myia Miller, Title IX Compliance Officer, at maburden@valdosta.edu. Please note, you will be required to provide documentation from an appropriately licensed medical professional indicating the requested accommodations are medically necessary.

SPECIAL NOTE 4: As a student, you may experience a range of challenges that can interfere with learning, such as strained or violent relationships, death and loss, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. VSU services are available and treatment does work. You can learn more about confidential mental health services available on campus at <https://www.valdosta.edu/hopeconnect>. In addition, someone you know may be distressed or need support. You can help by making a referral to the BIT Team. The VSU BIT Team's purpose is to promote a safe and productive learning, living, and working environment by addressing the needs of students. You are encouraged to fill out a referral if you know a classmate in need of help. There are several ways to contact the BIT Team: 1) Email your

concern to vsubmit@valdosta.edu; or 2) Fill out the anonymous Concerning Behavior Reporting Form at <https://www.valdosta.edu/administration/student-affairs/student-conduct-office/our-services.php>. For more information about the BIT Team at <https://www.valdosta.edu/administration/student-affairs/bit.php>

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.
- Attend lecture in person and ask questions in class!! If you cannot attend lecture, be sure to watch the recordings posted in the Kaltura Media Gallery in BlazeView.

SCHEDULE OF LECTURES AND LABS BIOLOGY 2260, Fall 2023

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

WEEK 1		
8-14-23	LAB--Orientation; Lab safety; Lab safety quiz (on-line) LAB-- <i>Hand-washing exercise</i>	Lab Exercise 1
8-15-23	LECTURE— Introduction to microbiology DISEASE OF THE DAY-- Smallpox	pp. 1-58
8-16-23	LAB—Set up <i>Ubiquity of Bacteria and Fungi</i> LAB-- <i>Brightfield microscopy: Animal parasites</i>	Lab Exercise 2
8-17-23	LECTURE—Introduction to microbiology (continued) DISEASE OF THE DAY— Bubonic plague	pp. 1-58
WEEK 2		
8-21-23	LAB—Complete <i>Ubiquity of Bacteria and Fungi</i> LAB— <i>Microbial Scavenger Hunt</i>	Lab Exercise 3
8-22-23	LECTURE—Basic concepts in medical microbiology LECTURE—Microscopy DISEASE OF THE DAY—Epidemic Typhus	pp. 32-58 pp. 62-82
8-23-23	LAB— <i>Aseptic Techniques</i> LAB— <i>Observing Fungi</i> LAB— <i>Observing Bacterial Capsules</i>	Lab Exercise 4
8-24-23	LECTURE—Bacterial cell structure DISEASE OF THE DAY--Malaria	pp. 124-144 exercise 9
WEEK 3		
8-28-23	LAB— <i>Smear preparation and staining</i> LAB— <i>Comparing yeast and bacteria</i>	Lab Exercise 5
8-29-23	LECTURE—Bacterial cell structure (continued) DISEASE OF THE DAY—Ebola hemorrhagic fever	pp. 124-144
8-30-23	LAB— <i>Gram Staining</i>	Lab Exercise 6
8-31-23	UNIT EXAM I	
WEEK 4		
9-4-23	LABOR DAY HOLIDAY—NO CLASS	
9-5-23	LECTURE—Eukaryotic cell structure DISEASE OF THE DAY--Cholera	pp. 144-152
9-6-23	LAB—Set up: <i>Enumeration of bacteria on natural foods</i>	Lab Exercise 7
9-7-23	LECTURE—Eukaryotic infectious agents LECTURE— Viruses & viroids DISEASE OF THE DAY— <i>Shigella</i> and <i>E. coli</i> infections	pp. 350-382
WEEK 5		
9-11-23	LAB—Set up <i>Resistance of bacteria to UV light</i> LAB—Complete: <i>Enumeration of bacteria on natural foods</i> LAB—Set up Identifying bacteria from produce: <i>Isolation of bacteria from natural on Selective and differential media (Streak plates using PEA & MacConkey agar)</i>	Lab Exercise 8
9-12-23	LECTURE— Viruses & viroids DISEASE OF THE DAY—Salmonellosis/Typhoid fever	pp. 350-382
9-13-23	LAB—Complete <i>Effects of UV light</i> LAB— <i>Spore staining</i> LAB—Continue <i>Isolation of bacteria from natural foods (EMB agar)</i>	Lab Exercise 9

9-14-23	LECTURE— Dynamics of bacterial growth DISEASE OF THE DAY—Bacterial food poisonings	pp. 156-186
WEEK 6		
9-18-23	LAB--Set up <i>Enumeration of virus particles</i> LAB—Continue <i>Isolation of bacteria from natural foods (Nutrient agar (NA))</i>	Lab Exercise 10
9-19-23	LECTURE— Environmental influences on bacterial growth DISEASE OF THE DAY—Viral gastroenteritis; amoebic dysentery	pp. 156-186
9-20-23	LAB—Set up <i>Effectiveness of disinfectants</i> LAB—Complete <i>Enumeration of virus particles</i> LAB—Continue <i>Isolation of bacteria from natural foods (NA)</i>	Lab Exercise 11
9-21-23	UNIT EXAM II	
WEEK 7		
9-25-23	LAB—Complete <i>Effectiveness of disinfectants</i> LAB—Set up <i>Identifications - Part I: Morphology, motility, & cultural characteristics</i>	Lab Exercise 12
9-26-23	LECTURE—Intro to bacterial metabolism DISEASE OF THE DAY— Polio	pp. 106-118
9-27-23	LAB—Complete <i>Part I: Morphology, motility, & cultural characteristics</i> LAB—Set up <i>Identifications - Part II: Fermentations</i> LAB— <i>Gram stain of unknowns</i>	Lab Exercise 13
9-28-23	LECTURE— Bacterial metabolism DISEASE OF THE DAY-- Measles (Rubeola & Rubella)	pp. 192-218
WEEK 8		
10-2-23	LAB—Complete <i>Identifications - Part II: Fermentations</i> LAB—Set up <i>Identifications - Part III: Fat & protein metabolism</i>	Lab Exercise 14
10-3-23	LECTURE— Bacterial metabolism DISEASE OF THE DAY— Mumps & Chickenpox	pp. 192-218
10-4-23	LAB—Complete <i>Identifications - Part III: Fat & protein metabolism</i> LAB— <i>Identification of Unknown Bacterium</i> LAB—Set up <i>Staphylococcus aureus Experiment: Inoculation of SM medium</i>	Lab Exercise 15
10-5-23	LECTURE—Controlling metabolism DISEASE OF THE DAY— Bacterial and viral meningitis	pp. 244-254
WEEK 9		
10-9-23	FALL BREAK – NO CLASS	handouts
10-10-23	FALL BREAK – NO CLASS	
10-11-23	LAB— <i>DNA extraction -- unknowns</i>	Lab Exercise 16
10-12-23	LECTURE—Controlling metabolism DISEASE OF THE DAY—Staph and Strep infections	pp. 244-254
WEEK 10		
10-16-23	LAB—Continue <i>Staphylococcus aureus Experiment: Streak onto Mannitol-Salt agar</i> LAB—Set up <i>PCR-based analysis of unknown bacteria</i> LAB— <i>RFLP-based fingerprinting (gel electrophoresis)</i>	Lab Exercise 17
10-17-23	UNIT EXAM III	
10-18-23	LAB—Continue <i>Staphylococcus Experiment: Streak onto DNA agar and Blood agar</i> LAB—Continue <i>PCR-based analysis of unknown bacteria (gel electrophoresis)</i>	Lab Exercise 18
10-19-23	LECTURE—Bacterial genetics DISEASE OF THE DAY—Influenza	pp. 225-244

WEEK 11		
10-23-23	LAB--Complete <i>Staphylococcus</i> Experiment: Slide agglutination LAB—Set up <i>Antimicrobial Sensitivity Testing</i>	Lab Exercise 19
10-24-23	LECTURE—Bacterial genetics DISEASE OF THE DAY—Coronavirus infections	pp. 225-244
10-25-23	LAB—Complete <i>Antimicrobial Sensitivity Testing</i>	Lab Exercise 20
10-26-23	LECTURE—Host-microbe interactions and the disease process DISEASE OF THE DAY--Bacterial pneumonia	pp. 524-560
WEEK 12		
10-30-23	LAB—Set up <i>Transformation of E. coli</i>	Lab Exercise 21
10-31-23	LECTURE—Defenses: Innate immunity DISEASE OF THE DAY— Diphtheria & Whooping cough	pp. 428-482
11-1-23	LAB—Complete <i>Transformation of E. coli</i> LAB— <i>ELISA</i> LAB—Intro to <i>Prevalence of Antibiotic Resistance in the Environment (PARE)</i> project	Lab Exercise 22
11-2-23	LECTURE—Defenses: Innate immunity DISEASE OF THE DAY— Tuberculosis	pp. 456-482
WEEK 13		
11-6-23	LAB—Set up <i>PARE Project: Dilutions</i>	Lab Exercise 23
11-7-23	UNIT EXAM IV	
11-8-23	LAB—Complete <i>PARE project: Counting</i>	Lab Exercise 24
11-9-23	LECTURE—Defenses: Adaptive immunity DISEASE OF THE DAY—Viral hepatitis	pp. 480-560
WEEK 14		
11-13-23	LAB QUIZ I	
11-14-23	LECTURE—Applications DISEASE OF THE DAY— <i>Chlamydia</i> & Gonorrhea	pp. 842-872
11-15-23	LAB QUIZ II	
11-16-23	LECTURE—Controlling disease (medications) DISEASE OF THE DAY-- Syphilis	pp. 397-422
WEEK 15		
11-20-23	LAB—Student presentations (6)	
11-21-23	LECTURE—Controlling disease (medications) DISEASE OF THE DAY—Genital herpes & genital warts	pp. 397-422
11-22-23	THANKSGIVING HOLIDAY—NO CLASSES	
11-23-23	THANKSGIVING HOLIDAY—NO CLASSES	
WEEK 16		
11-27-23	LAB—Student presentations (6)	
11-28-23	LECTURE—Epidemiology DISEASE OF THE DAY— HIV infections	pp. 878-902
11-29-23	LAB—Student presentations (6)	
11-30-23	UNIT EXAM V	
WEEK 17		
12-1-23	LAB—Student presentations (6)	
12-2-21	COMPREHENSIVE FINAL EXAM @ 8:00 AM	