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Biology Department, College of Arts & Sciences, Valdosta State University

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SPRING 2012---COURSE SYLLABUS\*

**BIOL 2900, Sections A & B. Microbiology in Health and Disease (CRN 21370 & 21371) – 4 credit hours**

<b>Class:</b>	TR		8:00-9:15 am, 2022 Bailey Science Center
<b>Laboratory:</b>	TR	<u>Section A</u>	10:00-11:25 am, 2068 Bailey Science Center
	TR	<u>Section B</u>	2:00-3:25 pm, 2068 Bailey Science Center

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**Instructor:** Dr. Jenifer Turco  
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**Office Hours:** Tues. 4:30-5:30 pm & Thurs. 12:30-1:30 pm; or by appointment.

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**Course Description:**

**BIOL 2900 Microbiology in Health and Disease 3-3-4 (4 credit hours)**

**Corequisite:** CHEM 1152K. An introductory microbiology course with emphasis upon the role played by microorganisms in health and disease. Open to students who plan to enter the health or allied health fields without a major in biology. Two 1.5 hour laboratory periods per week.

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**Textbook:** **MICROBIOLOGY, A HUMAN PERSPECTIVE, Sixth Edition**  
by Eugene W. Nester, Denise G. Anderson, C. Evans Roberts Jr., and Martha T. Nester. McGraw-Hill 2009 (The very recently published 7<sup>th</sup> edition of this book may also be used.)

**Laboratory Manual:** **BENSON'S MICROBIOLOGICAL APPLICATIONS, LABORATORY MANUAL IN GENERAL MICROBIOLOGY (short version), Twelfth Edition**  
by Alfred E. Brown. McGraw-Hill, Inc. 2012

**Other Materials:** calculator that is not part of a cell phone or other electronic device; permanent, medium- or fine-tip marking pen (Sharpie) for labeling cultures in lab; one CD or jump drive for oral presentation; one file folder (or other type of thin, light-weight folder) for handing in assignments (NO 3-RING BINDERS, PLEASE); paper clips or stapler/staples for organizing references and assignments

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**SPECIAL NOTES TO STUDENTS:**

1. In order to respect the privacy of each student, exam scores and grades will not be posted, given out by telephone, or sent to students by email.
  2. Students should consult the VSU Student Handbook, Undergraduate Catalog, Spring Semester Calendar, Schedule of Classes, & Registration Guide for information about VSU policies and procedures regarding registration, drop/add, and withdrawal. March 1 is midterm. Students are not permitted to withdraw after midterm except in cases of hardship.
  3. 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).
  4. Cell phones and music players (ipod, mp3) may not be used at any time in class or lab. Students are especially cautioned to be certain that cell phones are silenced during examinations. Should a cell phone ring during an exam, the student's exam will be terminated.
  5. Please use the rest room before you come to class to take an exam. Should a student need to leave the classroom during an exam, the student's exam will be terminated.
  6. Students must read and follow the Biology Department policy on plagiarism (available online through the departmental web site). The instructor may use a variety of methods for detecting plagiarism. Each student must be particularly careful to do his/her own writing on the oral presentations and on any lab reports that are completed individually. Plagiarism will result in a grade of "0" for the assignment. A student who plagiarizes on more than one assignment will receive a grade of "F" in the course.
  7. No disruptive behavior will be tolerated during class or lab. A student who engages in disruptive behavior will be asked to leave. If necessary, the campus police will be contacted.
  8. Students who wish to use laptop computers as part of the class are required to sit in the first three rows of the classroom.
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**\*This is a tentative syllabus. Changes to this syllabus will be announced during class or laboratory periods; alternatively, changes may be posted on BlazeView.**

## COURSE OBJECTIVES

After successful completion of this course, the student should be able to:

- (1) Describe the physical properties, biochemical composition, cellular characteristics, growth, metabolism, functions, significance, and control of different types of microorganisms and helminths.
- (2) Describe the physical properties, biochemical composition, replication strategies, functions, significance, and control of viruses and other non-cellular infectious agents.
- (3) List several activities of microorganisms that are beneficial to humans and the environment.
- (4) Describe the innate defenses and the adaptive immune response of a human to a foreign antigen.
- (5) Explain how infectious diseases are transmitted, giving specific examples.
- (6) List the major types of virulence factors observed in pathogenic bacteria, giving specific examples.
- (7) List and describe human diseases that are due to specific bacteria, fungi, protozoa, helminths, viruses, and prions.
- (8) Properly handle microorganisms and specimens in a biosafety level 2 laboratory.
- (9) Use a compound light microscope to examine various types of microorganisms.
- (10) Keep accurate records of microscopic observations, as well as other laboratory and field work.
- (11) Use culture media to grow bacteria and fungi in the laboratory.
- (12) Use staining techniques and physiological tests as aids in bacterial identification. List and describe several molecular methods that are used in detecting and identifying microorganisms and viruses.
- (13) Use dilutions to determine colony-forming units per milliliter in a bacterial suspension and the plaque-forming units per milliliter in a viral suspension.
- (14) Analyze and interpret the results of experiments conducted in the laboratory.
- (15) Use library and electronic resources to obtain formal scientific articles related to a particular topic in microbiology.
- (16) Read and understand current scientific literature related to microbiology and immunology.
- (17) Convey orally information from the scientific literature related to microbiology and immunology.

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### Alignment of Assignments with Course Objectives:

The course objective(s) aligned with each assignment are given on the last page of this syllabus.

### Alignment of Course Objectives with Educational Outcomes:

The **Student Learning Goals for the Core Curriculum in the University System of Georgia (USG)** are available online at <http://www.valdosta.edu/academic/VSUCore.shtml>. Each Core Area (A1, A2, B, C, D, and E) has one or more learning goals. There are also three additional learning goals for the Core Curriculum as follows: **Learning Goal 1: US Perspectives (US Goal)**: Students will demonstrate an understanding of the United States and its cultural, economic, political, and social development; **Learning Goal 2: Global Perspectives (GL Goal)**: Students will demonstrate an understanding of the cultural, religious, or social dimensions of societies around the world; and **Learning Goal 3: Critical Thinking (CT Goal)**: Students will identify, evaluate, and apply appropriate models, concepts, or principles to issues, and they will produce viable solutions or make relevant inferences.

The **VSU General Education Outcomes** (numbered 1-8) are available online at <http://www.valdosta.edu/pers/gened.shtml>. The **Biology Undergraduate Educational Outcomes** (numbered 1-5) are available in the VSU Undergraduate Catalog.

Course objectives (1) through (7) relate to USG Core Curriculum Learning Goals for Core Area D; VSU General Education Outcomes 5 and 7; and Biology Undergraduate Educational Outcomes 2, 3, 4, and 5.

Course objectives (8) through (12) relate to USG Core Curriculum Learning Goals for Core Area D; Learning Goal 3, Critical Thinking; VSU General Education Outcome 5; and Biology Undergraduate Educational Outcome 1. In addition, course objective (12) relates to VSU General Education Outcome 3.

Course objectives (13) and (14) relate to USG Core Curriculum Learning Goals for Core Area D; Learning Goal 3, Critical Thinking; VSU General Education Outcome 5; and Biology Undergraduate Educational Outcome 1.

Course objective (15) relates to USG Core Curriculum Learning Goals for Core Area D; VSU General Education Outcome 3, and Biology Undergraduate Educational Outcome 1.

Course objective (16) relates to USG Core Curriculum Learning Goals for Core Area D; Learning Goal 3, Critical Thinking; VSU General Education Outcomes 3, 4, 5, and 7; and Biology Undergraduate Educational Outcomes 2 through 5.

Course objective (17) relates to USG Core Curriculum Learning Goals for Core Area D; Learning Goal 3, Critical Thinking; VSU General Education Outcomes 3, 4, 5, and 7; and Biology Undergraduate Educational Outcomes 2 through 5.

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**BIOLOGY 2900 Microbiology in Health and Disease - Class and Lab Schedule**  
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<b>Date</b>	<b>Topics/Lab Exercises</b> (Additional notes for lab exercises)	<b>Related material in text (6<sup>th</sup> ed)</b>
Tues. Jan. 10	General course information Introduction to microbiology <u>Assigned Reading: Textbook, Chapter 2--(Review Chapter 2 on your own)</u>	<b>Chap. 1</b>
Tues. Jan. 10L	>LAB WILL NOT MEET ON THIS DAY.	
Thurs. Jan. 12	Introduction to microbiology Structure of prokaryotic and eukaryotic cells	<b>Chap. 1</b> <b>Chap. 3</b>
Thurs. Jan. 12L	>BRIEF LAB ORIENTATION >LABORATORY SAFETY, READ HANDOUT & P. XI-XVI IN LAB MANUAL >MICROSCOPE CARE AND USE & MICROSCOPE CHECKLIST ( <u>Read before next lab.</u> ) >EX. 1, MICROSCOPY ( <u>Read before next lab; answer questions on p. 9-11.</u> ) > <i>Program #1: The Microbial Universe</i> >SUPPL. EX., HANDWASHING <b>Wash your hands before leaving lab!</b>	
Tues. Jan. 17	Structure of prokaryotic and eukaryotic cells	<b>Chap. 3</b>
Tues. Jan. 17L	>LAB ORIENTATION >LABORATORY SAFETY, HANDOUT & P. XI-XVI IN LAB MANUAL >MICROSCOPE CARE AND USE & MICROSCOPE CHECKLIST >EX. 5, PROTOZOA, ALGAE, & CYANOBACTERIA Prepare wet mounts of natural water samples. Draw examples of protozoa, algae, & cyanobacteria.) Answer questions on pages 44-45.	
Thurs. Jan. 19	Structure of prokaryotic and eukaryotic cells	<b>Chap. 3</b>
Thurs. Jan. 19L	INTRODUCTION TO VARIOUS TYPES OF CULTURE MEDIA >EX. 8, ASEPTIC TECHNIQUE	
Tues. Jan. 24	Structure of prokaryotic and eukaryotic cells Eukaryotic microorganisms Multicellular parasites	<b>Chap. 3</b> <b>Chap. 12</b>
Tues. Jan. 24L	>FINISH EX. 8, ASEPTIC TECHNIQUE (Complete results/questions, p. 69-70.) >EX. 6, UBIQUITY OF BACTERIA On p. 48, complete steps 1-7, but omit step 6. >EX. 7, FUNGI (Page 54, Mold Study. You will prepare the plates we will use next week. Work in groups of 4 & expose 2 plates of Sabouraud dextrose agar to air for one hour. Expose one plate inside the building & the other plate outside. Incubate the plates at room temperature for one week.)	

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<b>Date</b>	<b>Topics/Lab Exercises</b>	<b>Related material in text (6<sup>th</sup> ed)</b>
Thurs. Jan. 26	EXAM 1 (Class & lab material covered through Jan. 24)	
Thurs. Jan. 26L	<p>&gt;EX. 10, SMEAR PREPARATION &amp; EX. 11 , SIMPLE (POSITIVE) STAINING (On a single slide, prepare a smear of <i>Saccharomyces cerevisiae</i>, and a separate smear of <i>Escherichia coli</i>. Use the technique for preparing smears from solid media [see Ex. 10, p. 86], &amp; stain with crystal violet [see Ex. 11].) We will use paper towels instead of bibulous paper. Use this slide in the exercise below (SUPPL. EX.).</p> <p>&gt;SUPPL. EX., EXAMINATION OF STAINED SLIDES AND WET MOUNTS OF THE YEAST <i>Saccharomyces cerevisiae</i> (A FUNGUS) AND THE BACTERIUM <i>Escherichia coli</i> (<b>Hand in your drawings to the instructor at the end of lab.</b>)</p> <p>&gt;ADDITIONAL SIMPLE STAIN - MOUTH SWAB (Directions: Using a sterile swab, swab your gums, the inside of your cheek, and your teeth. Deposit collected sample onto a dry slide. Allow slide to air dry. Then gently heat fix. Stain with methylene blue for 1 min. Wash gently and blot dry. Examine the slide using the low, high dry, and oil immersion objectives. Look for epithelial cells and oral bacteria. Using the extra space on p. 95, make a drawing of the specimen as it appears with the oil immersion objective.)</p>	
Tues. Jan. 31	Eukaryotic microorganisms	<b>Chap. 12</b>
	Multicellular parasites	
	Dynamics of microbial growth	<b>Chap. 4</b>
Tues. Jan. 31L	<p>&gt;EX. 9, PURE CULTURE TECHNIQUES, STREAK-PLATE METHOD ONLY (We will use Method B, the Quadrant streak – Use swab in tube from Ex. 6 as the mixed culture.)</p> <p>&gt;FINISH EX. 6, BACTERIA (Complete results/questions, p. 49-51) (If time permits, prepare smears from 3 different bacterial colonies from Ex. 6 plates on a single slide. Use the technique for preparing smears from solid media [see Ex. 10, p. 86], &amp; stain [see Ex. 11].) Draw the organisms as they appear with the oil immersion objective on the bottom of p. 48.</p> <p>&gt;EX. 7, FUNGI [Fungi (Mold) study - Do NOT open mold cultures in the lab. Open them only in the biological safety cabinet. You will use transparent tape to prepare slides of two or more different molds. The instructor will describe this procedure. Examine the slides using the low power (10x) objective and the high dry (40x) objective. Draw the specimens at both magnifications on the lab report. Also record a description of the appearance of the fungal colonies. Complete drawings/questions, p. 57-58.]</p>	
Thurs. Feb. 2	Dynamics of microbial growth	<b>Chap. 4</b>
	Microbial metabolism (selected topics)	<b>Chap. 6</b>
Thurs. Feb. 2L	<p>&gt;<i>Program #3: Metabolism</i></p> <p>&gt;Continue EX. 9, STREAK-PLATE TECHNIQUE (repeat, if necessary – use a <b>minute</b> amount of growth from a plate or slant.) (Complete results, part 1, page 79; answer questions 1, 3, 6 &amp; 8, pages 80-81.)</p> <p>&gt;EX. 12, NEGATIVE STAINING (We will use the method in Fig. 12.1. On page 92, omit step 4, oral organisms.)</p>	
Tues. Feb. 7	Microbial metabolism (selected topics)	<b>Chap. 6</b>
	Prokaryotic Diversity (selected tables)	<b>Chap. 11</b>

Date	Topics/Lab Exercises	Related material in text (6 <sup>th</sup> ed)
Tues. Feb. 7L	<p>&gt;EX. 14, GRAM STAINING (Prepare smears from nutrient agar slant cultures as described on p.86 of lab manual. Complete drawings/questions, p. 109-112; omit questions 1 &amp; 2 on p. 112.)</p> <p>&gt;DISTRIBUTION OF GENERAL UNKNOWN CULTURES (<b>RECORD THE GENERAL UNKNOWN NUMBER</b>). <b><u>Prepare subcultures (stock cultures) of the unknown. Also prepare a streak-plate of the unknown (See Ex. 9, Method B), and gram stain it.</u></b> Record dates, work done, drawings, etc., on your own unknown record sheet. Also record the results on the descriptive chart on page 235 in the lab manual. During the next few lab periods, you will use your unknown in each of the stains (Gram, acid fast, &amp; endospore stains), so that you will be completing EX. 34, MORPHOLOGICAL STUDY OF UNKNOWN BACTERIUM, as you proceed. <u>Please read EX. 34.</u></p> <p>&gt;<b>YOUR LAB REPORT ON THIS GENERAL UNKNOWN</b> should be organized in a thin folder that contains the following: (i) a well-organized and complete copy of your (each student's) unknown record sheets, including drawings; (ii) a <u>neat and complete</u> copy of the descriptive sheet (p. 235 in lab manual) with the results of all of the tests performed (do not make your own table—use the one in the lab manual or a photocopy of it), (iii) a statement about which group in <i>Bergey's Manual of Determinative Bacteriology</i> your unknown belongs to; and (iv) a paragraph describing what you have learned about the properties and metabolism of your unknown organism from the tests you did. <b><u>Do NOT describe the methods used for performing the various tests in your report.</u></b> Please note that the <i>Bergey's Manual of Systematic Bacteriology</i> that is discussed in the lab manual in EX 39 is VERY DIFFERENT from <i>Bergey's Manual of Determinative Bacteriology</i>. <b><u>Do NOT use EX. 39 to determine the group to which your unknown belongs.</u></b></p>	
Thurs. Feb. 9	<p>Microbial metabolism (selected topics)</p> <p>Prokaryotic Diversity (selected tables)</p> <p>DNA replication, transcription, &amp; translation</p>	<p><b>Chap. 6</b></p> <p><b>Chap. 11</b></p> <p><b>Chap. 7</b></p>
Thurs. Feb. 9L	<p>&gt;CONTINUE WORK ON GRAM STAINING KNOWN AND UNKNOWN CULTURES.</p> <p>&gt;EXAMINE STREAK PLATE OF UNKNOWN. Measure diameter of colonies in mm and record a description of the colonies on your unknown record sheet and on the descriptive chart on p. 235. Information on colony description can be found on p. 240 (Ex.35).</p> <p>&gt;<b><u>HAND IN 3 STAPLED ARTICLES IN A THIN FOLDER (FORMAL ARTICLES FROM PEER-REVIEWED, PROFESSIONAL, SCIENTIFIC JOURNALS – 30 POINTS). These articles will be used to prepare your oral presentation. PLEASE NOTE THAT FULL CREDIT WILL NOT BE GIVEN IF APPROPRIATE ARTICLES ARE NOT HANDED IN INITIALLY.</u></b></p>	
Tues. Feb. 14	<p>DNA replication, transcription, &amp; translation</p>	<p><b>Chap. 7</b></p>
Tues. Feb. 14L	<p>&gt;EX. 35, CULTURAL CHARACTERISTICS OF UNKNOWN BACTERIUM</p> <p>&gt;INOCULATE NEW STOCK CULTURES OF UNKNOWN</p> <p>You will use your unknown for each of the following 2 procedures/tests:</p> <p>&gt;(1) <u>Inoculate your unknown into a tube of fluid thioglycollate medium.</u> [See EX. 24, EFFECTS OF OXYGEN ON GROWTH (Please read p. 169-171 to learn about oxygen requirements of microorganisms and about fluid thioglycollate medium.)]</p> <p><b>Continued on next page.....</b></p>	

Date	Topics/Lab Exercises	Related material in text (6 <sup>th</sup> ed)
Tues. Feb. 14L	<p>.....continued from preceding page</p> <p>&gt;(2) <u>Inoculate your unknown into a tube of motility medium.</u> [See EX. 17, MOTILITY DETERMINATION, TUBE METHOD ONLY. You will also test <i>Staphylococcus aureus</i> and <i>Proteus vulgaris</i> as controls in EX. 17.]</p> <p>&gt;EX. 16, ACID-FAST STAINING (Ziehl-Neelsen method—<b>please see procedure below.</b> You will also perform this stain on your unknown. (Complete drawings/questions, p. 110-112; omit questions 1 &amp; 2 on p. 112.) Record results for unknown on your record sheet and on page 235.</p> <p><u>Ziehl-Neelsen procedure:</u> Use 0.1% albumin solution instead of water for preparing the smears. On one slide prepare a smear of a mixture of <i>Mycobacterium smegmatis</i> &amp; <i>Staphylococcus aureus</i>, as well as a separate smear of your unknown. Allow the smears to air dry, and then heat fix them. Put on gloves, and try to be neat. (You are responsible for cleaning up any spills of carbol fuchsin.) Cover the smears with a cut piece of paper towel that does not extend over the edges of the slide. Hold the slide with a clothespin or slide holder and soak the towel with carbol fuchsin. Heat the slide <u>intermittently</u> over the flame of the bunsen burner so that it “steams” for 5 minutes. Do NOT let the paper towel dry out—add more carbol fuchsin as needed. Allow the slide to cool and then remove the paper towel. Proceed with steps 2 through 7 as described in the lab manual in Figure 16.1 on page 108.</p>	
Thurs. Feb. 16	EXAM 2 (Class and lab material covered through Feb. 14)	
Thurs. Feb. 16L	<p>&gt;Record results from cultures inoculated on Tues.on your record sheet and on page 235.</p> <p>(1) Draw or record description of fluid thioglycollate tube, and determine oxygen requirement of your unknown bacterium.</p> <p>(2) Draw or record description of motility tube, and determine motility of unknown.</p> <p>&gt;COMPLETE EX. 17, MOTILITY DETERMINATION, TUBE METHOD (Record results for <i>S. aureus</i> and <i>P. vulgaris</i>, p. 117. Answer questions 1, 2, 3, 5, &amp; 6, p. 117-118.)</p> <p>&gt;EX. 15, SPORE STAINING (Modified Schaeffer-Fulton Method) On one slide prepare a smear of the <i>Bacillus</i> species provided as well as a separate smear of your unknown. Allow smears to air dry, and then heat fix them. Put on gloves, and try to be neat. (You are responsible for cleaning up any spills of malachite green.) Complete drawings/questions, p. 109-112; omit questions 1 &amp; 2 on p. 112. Record results for unknown on record sheet and on p. 235.</p>	
Tues. Feb. 21	Viruses	<b>Chap. 13 &amp; 14</b>
Tues. Feb. 21L	<p>&gt;EX. 28, ULTRAVIOLET LIGHT: LETHAL EFFECTS (This exercise will be slightly modified.)</p> <p>&gt;INOCULATE NEW STOCK CULTURES OF UNKNOWN</p> <p>&gt;SUPPL. EX., VARIOUS MEDIA</p> <p>(CULTURES FOR DESOXYCHOLATE AGAR AND PHENYL ETHYL ALCOHOL AGAR: <i>Escherichia coli</i>, <i>Staphylococcus aureus</i>, <i>Pseudomonas aeruginosa</i>, &amp; unknown) (CULTURES FOR BLOOD AGAR: <i>E. coli</i>, <i>S. aureus</i>, <i>Bacillus cereus</i>, &amp; unknown)</p> <p>&gt;A throat culture will also be made on a blood agar plate.</p>	
Thurs. Feb. 23	Viruses	<b>Chap. 13 &amp; 14</b>

Date	Topics/Lab Exercises	Related material in text (6 <sup>th</sup> ed)
Thurs. Feb. 23L	>FINISH SUPPL. EX., VARIOUS MEDIA (Complete table with exercise & answer questions.) Record results for unknown on unknown record sheet & on p. 235. <b>Consider the following question: Is the pattern of growth of your unknown on the selective media consistent with the results you obtained in the Gram stain? If not, you will need to repeat the gram stain with a fresh culture.</b> >FINISH EX. 28, ULTRAVIOLET LIGHT: LETHAL EFFECTS (Observe demonstration. Record results & answer questions on p. 193-194.)	
Tues. Feb. 28	Bacterial genetics (selected topics) Recombinant DNA & biotechnology Classification & Identification of Prokaryotes	<b>Chap. 8</b> <b>Chap. 9</b> <b>Chap. 9, 10, &amp; 11</b>
Tues. Feb. 28L	>EX. 36, OXIDATION & FERMENTATION TESTS >EX. 37, HYDROLYTIC REACTIONS (In this exercise you will use tributyrin agar instead of spirit blue agar. A clear zone around the bacterial growth indicates a positive reaction for lipid hydrolysis on tributyrin agar.) >EX. 38, MULTIPLE TEST MEDIA (We will do <u>ONLY</u> the test for hydrogen sulfide production using SIM medium.) > <u>DISCUSSION THE USE OF BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY</u> BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY is on reserve in the library for your use. <b><u>Do NOT use EX. 39 in the lab manual.</u></b>	
Thurs. Mar. 1	Classification & Identification of Prokaryotes Control of microbial growth	<b>Chap. 9, 10, &amp; 11</b> <b>Chap. 5 (required reading)</b>
Thurs. Mar. 1L	>FINISH EX. 36, OXIDATION AND FERMENTATION TESTS, ( <b><u>except Voges-Proskauer (VP) test must be incubated until the next lab.</u></b> ) >FINISH EX. 37, HYDROLYTIC REACTIONS; >FINISH EX. 38. (SIM medium only) Record results for unknown on record sheet and on p. 235. Be sure that you understand the chemical basis for each test performed, as well as how each test is interpreted. > <u>DISCUSSION ABOUT THE USE OF BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY.</u> <b><u>Do NOT use EX. 39 in the lab manual.</u></b>	
Tues. Mar. 6	Classification & Identification of Prokaryotes Control of microbial growth	<b>Chap. 9, 10, &amp; 11</b> <b>Chap. 5 (required reading)</b>
Tues. Mar. 6L	>FINISH VOGES-PROSKAUER (VP) TEST FROM EX. 36. >SUPPL. EX., ENUMERATION OF BACTERIA ASSOCIATED WITH FRESH PRODUCE (SPREAD-PLATE TECHNIQUE) >WORK DILUTION PROBLEMS (SEE PAGES IN COURSE PACKET) >EX. 30, EFFECTIVENESS OF ALCOHOL > <i>Program #9: Microbial Control</i>	<b>Chap. 5 (required reading)</b>
Thurs. Mar. 8	EXAM 3 (Class and lab material covered through March 6)	
Thurs. Mar. 8L	>FINISH SUPPL. EX., BACTERIA ASSOCIATED WITH FRESH PRODUCE (Record results on board and on your copy of exercise.) >WORK DILUTION PROBLEMS >FINISH EX. 30, EFFECTIVENESS OF ALCOHOL (Record results on computer & on p. 203; answer questions on p. 204.)	

<b>Date</b>	<b>Topics/Lab Exercises</b>	<b>Related material in text (6<sup>th</sup> ed)</b>
SPRING BREAK		
Tues. Mar. 20	Antimicrobial medications	<b>Chap. 21 (required reading)</b>
Tues. Mar. 20L	>VIDEO SEGMENTS ABOUT ANTIBIOTIC RESISTANCE >SUPPL. EX., PLAQUE ASSAY OF A PHAGE SUSPENSION >EX. 32, EVALUATION OF ANTISEPTICS (This exercise will be slightly modified.) >EX. 31, KIRBY-BAUER METHOD >WORK DILUTION PROBLEMS <b><u>HAND IN LAB REPORT ON GENERAL UNKNOWN</u></b>	
Thurs. Mar. 22	Antimicrobial medications Innate immunity	<b>Chap. 21 (required reading)</b> <b>Chap. 15</b>
Thurs. Mar. 22L	>VIDEO SEGMENTS ABOUT ANTIBIOTIC RESISTANCE (additional) >FINISH SUPPL. EX., PLAQUE ASSAY OF A PHAGE SUSPENSION (Complete results on board & on your copy of exercise.) >WORK DILUTION PROBLEMS. >FINISH EX. 32, ANTISEPTICS (Record results on board & in lab manual on p. 219. Answer questions on p. 219-220.) >FINISH EX. 31, KIRBY-BAUER METHOD (Record results on board & on p.213; answer questions on p. 214.)	
Tues. Mar. 27	Adaptive immunity	<b>Chap. 16</b>
Tues. Mar. 27L	> <i>Program #12, Microbes and Human Diseases</i> Applications of immune responses >WORK ELISA AND IMMUNOFLUORESCENCE PROBLEMS (COURSE PACKET) <b>STUDENT ORAL PRESENTATIONS</b>	<b>Chap. 17</b>
Thurs. Mar. 29	SUPPL. EX., <i>Staphylococcus aureus</i> EXPERIMENT Adaptive immunity Applications of immune responses Immunologic Disorders	<b>Chap. 16</b> <b>Chap. 17</b> <b>Chap. 18 (required reading)</b>
Thurs. Mar. 29L	SUPPL. EX., <i>Staphylococcus aureus</i> EXPERIMENT >WORK ELISA AND IMMUNOFLUORESCENCE PROBLEMS (COURSE PACKET) <b>STUDENT ORAL PRESENTATIONS</b>	
Tues. Apr. 3	Host-Microbe Interactions Epidemiology	<b>Chap. 19 (required reading)</b> <b>Chap. 20 (required reading)</b>
Tues. Apr. 3L	>CONTINUE SUPPL.EX., <i>S. aureus</i> experiment (Record results on board. <u>We will omit the Kirby-Bauer antibiotic sensitivity tests.</u> Also remember to inoculate plate of tryptic soy agar with presumptive <i>S. aureus</i> isolate for agglutination test on Thursday.) <b>STUDENT ORAL PRESENTATIONS</b>	



<b>Date</b>	<b>Topics/Lab Exercises</b>	<b>Related material in text (6<sup>th</sup> ed)</b>
Thurs. Apr. 5	Host-Microbe Interactions Epidemiology Skin infections	<b>Chap. 19 (required reading)</b> <b>Chap. 20 (required reading)</b> <b>Chap. 22 (required reading)</b>
Thurs. Apr. 5L	>FINISH SUPPL. EX., <i>S. aureus</i> >LATEX AGGLUTINATION TEST FOR <i>S. aureus</i> IDENTIFICATION – There is no writeup for this test. In the lab manual, Ex. 56 describes a similar agglutination test; however we will use reagents from a different manufacturer. The instructor will summarize the principle of the test and will give directions at the beginning of the lab. RECORD RESULTS from <i>S. aureus</i> EX. & latex test on board & in chart. >QUESTIONS ABOUT ELISA AND IMMUNOFLUORESCENCE PROBLEMS (COURSE PACKET) >PICK UP TWO 50-ML TUBES AND FILL THEM COMPLETELY WITH WATER FROM A NATURAL SOURCE SUCH AS A POND, STREAM, RIVER, OR SWAMP. DO NOT COLLECT BOTTLED WATER OR TAP WATER. <b>STUDENT ORAL PRESENTATIONS</b>	
Tues. Apr. 10	Skin infections  Wound infections Respiratory system infections	<b>Chap. 22 (required reading)</b> <b>Chap. 12, section 12.5 (required reading)</b> <b>Chap. 23 (required reading)</b> <b>Chap. 24 (required reading)</b>
Tues. Apr. 10L	REMEMBER TO BRING NATURAL WATER TO LAB ON THIS DAY EX. 45, BACTERIOLOGICAL EXAMINATION OF WATER: MOST PROBABLE NUMBER DETERMINATION (We will do only the presumptive test.) <b>STUDENT ORAL PRESENTATIONS</b>	
Thurs. Apr. 12	EXAM 4 (Class and lab material covered through April 10)	
Thurs. Apr. 12L	COMPLETE EX. 45, BACTERIOLOGICAL EXAMINATION OF WATER: MPN DETERMINATION >SUPPL. EX., BACTERIOLOGICAL ANALYSIS OF URINE ( <b>RECORD URINE UNKNOWN #</b> ) <b>STUDENT ORAL PRESENTATIONS</b>	
Tues. Apr. 17	Respiratory system infections Digestive system infections & foodborne/waterborne illness	<b>Chap. 24 (required reading)</b>  <b>(For required reading, see Apr. 19)</b>
Tues. Apr. 17L	>CONTINUE SUPPL. EX., BACTERIOLOGICAL ANALYSIS OF URINE (We will inoculate the Enterotube; however, <u>we will omit the Kirby-Bauer antibiotic sensitivity tests.</u> ) >EX. 41, ENTEROTUBE II SYSTEM <b>STUDENT ORAL PRESENTATIONS</b>	
Thurs. Apr. 19	Digestive system infections & foodborne/waterborne illness   HIV disease	<b>Chap. 25 (required reading)</b> <b>Chap. 32, p. 795-798; 805-810, req. reading)</b> <b>Chap. 31, p. 786-788; 792-793, req. reading)</b> <b>Chap. 12, section 12.5 (required reading)</b> <b>Chap. 29 (required reading)</b>

Date	Topics/Lab Exercises	Related material in text (6 <sup>th</sup> ed)
Thurs. Apr. 19L	>FINISH SUPPL. EX., BACTERIOLOGICAL ANALYSIS OF URINE & EX. 41, ENTEROTUBE II (Record results on board & complete pages in course pack.) >SUPPL. EX., PROTOZOA AND ANIMAL PARASITES <b>STUDENT ORAL PRESENTATIONS</b>	
Tues. Apr. 24	HIV disease Genitourinary infections Nervous system infections	<b>Chap. 29 (required reading)</b> <b>Chap. 26 (required reading)</b> <b>Chap. 27 (required reading)</b>
Tues. Apr. 24L	>FINISH SUPPL. EX., PROTOZOA AND ANIMAL PARASITES <b>STUDENT ORAL PRESENTATIONS</b>	
Thurs. Apr. 26	Nervous system infections Blood and Lymphatic infections	<b>Chap. 27 (required reading)</b> <b>Chap. 28 (required reading)</b> <b>Chap. 12, section 12.5 (required reading)</b>
Thurs. Apr. 26L	<b>STUDENT ORAL PRESENTATIONS</b>	
Wed. May 2	COMPREHENSIVE FINAL EXAM (10:15 am -12:15 pm)	

## ADDITIONAL INFORMATION

**Course content:** We will not be covering all of the material in the textbook and lab manual. Students are encouraged to read those sections of the textbook and lab manual that pertain to the topics covered. In addition, students are especially encouraged to make use of the illustrations, tables, review questions, and chapter summaries. The instructor will also provide study questions related to the topics covered; these questions or questions based on them may be asked in class (please see class participation/recitation points on page 12. **Reading of some chapters in the textbook is required, as noted in the schedule. In addition, special assigned readings from the textbook, lab manual or other sources may be announced in class or lab.**

### Class:

- Students should review the attendance policy for class that is described on page 11.
- During class, each student will give a brief, informal, oral presentation (approximately 3 minutes) about an article selected from a list provided by the instructor. For this presentation, the student should speak to the class and may also write on the board. PowerPoint will NOT be used during this presentation.
- Students will be encouraged to study after each class and to participate in class by responding to questions asked by the instructor. So that each student has an opportunity to respond, the instructor will randomly call on students. **If a student is not prepared to answer, he/she may pass but will forfeit some of the participation/recitation points. During the semester, each student will be asked to respond four times. The number of participation/recitation points will be based on the best 3 of the 4 responses. If a student is absent when he/she is asked to respond, this will count as a pass or zero.**

### Laboratory:

- Students are expected to attend ALL laboratory sessions, to be on time at the beginning of the period, and to complete all assigned laboratory exercises. There will be no makeups for the laboratory exercises. Laboratory participation points will be awarded based on the instructor's observations of each student's involvement in lab work, problem solving, and lab discussions. These points will be easy to obtain if a student is engaged while in the laboratory. Absences from labs/oral report periods are addressed in a separate section on page 11.
- Microscopes will be assigned and spot checks will be made to ensure that they are clean and properly stored. Misuse or mishandling of the microscopes will result in the loss of points (20 points per occurrence). After you have finished using your microscope, please consult the "microscope checklist" to be certain that you have followed the proper procedures.
- Students must prepare for each day's lab work **before** coming to the laboratory. Preparation includes reading the laboratory exercises for the day, as well as any additional materials in the course packet and comments in the syllabus concerning the day's labs. Proper preparation will allow students to complete the exercises in an efficient and informed manner.

4. Each student is expected to record the results of the lab exercises and to answer the related questions, as noted in the syllabus. In some cases, **lab reports** are to be handed in as indicated in the course schedule. If a student misses a portion of the lab work relating to a required lab report, the student's report will be worth a maximum of 85% of the points allotted for the report. **For the drawings (Jan. 26) each student must turn in his or her own report. For the general unknown, students may prepare their reports individually, or they may work with their lab group or partners and turn in joint reports.**

5. **Oral presentations:** During the laboratory portion of the course, each student will be required to give an 8- to 9-minute **oral report** on a scientific article selected from a list provided by the instructor. Two additional minutes will be allotted for answering questions from the audience. Students will draw numbers to indicate the order in which they will select articles and give their presentations. Once a topic article is chosen it may not be changed. Students should search electronic databases to find related, supporting, formal, peer-reviewed articles in the scientific literature. Some peer-reviewed, scientific and medical journals are available in the Odum library in print and/or online. Supporting articles may be obtained through interlibrary loan; however, this process takes time. **The major focus of the presentation should be the original article chosen. However, at least two supporting, formal articles (in addition to the original article chosen)** from PEER-REVIEWED, PROFESSIONAL JOURNALS must be used to prepare the presentation. Only one of these two supporting articles may be a review article; the remaining article must be a primary source or case study. Articles must list references at the end, and these references must be cited within the article. Informal articles, Web sites, Internet articles or fact sheets, newspaper articles, magazine articles, book reviews, and letters to the editor are NOT acceptable. Students should make every effort to ensure the accuracy of the information in their reports. Should a report contain inaccurate information, the presenter should expect to be questioned about it as well as about the source of the information.

For their presentations, students are encouraged to use PowerPoint software. Students using PowerPoint must use a version that is compatible with the version available in the microbiology lab. If you are in doubt, please bring your PowerPoint presentation to the lab at least one week before the day of your presentation to verify that it will run. If you do not check your presentation ahead of time, you are responsible for having a backup method for showing your illustrations. Full-size print-outs of your PowerPoint slides are useful as backups, since they may be shown using the ELMO projector. Students electing not to use PowerPoint should use other illustrations. Illustrations may be placed on a large poster or they may be shown on the ELMO projector. Transparencies and handouts may also be used.

PLEASE NOTE: There will be no makeups for the oral presentations. ON THE DAY OF THE PRESENTATION, THE STUDENT MUST TURN IN A COPY OF HIS/HER POWERPOINT PRESENTATION, ILLUSTRATIONS, AND ANY NOTES USED DURING THE PRESENTATION. IN ADDITION THE STUDENT MUST HAND IN COMPLETE COPIES OF THE ORIGINAL ARTICLE CHOSEN PLUS THE TWO ADDITIONAL ARTICLES USED TO PREPARE THE PRESENTATION. THE COPIES OF THE THREE ARTICLES MUST INCLUDE READABLE VERSIONS OF THE FIGURES AND TABLES.

**ADDITIONAL NOTE:** IF YOU WANT A GOOD SCORE ON YOUR PRESENTATION, YOU MUST FOLLOW THE GUIDELINES ON THE PROVIDED EVALUATION FORM (see course packet).

**Attendance, participation, and tardiness:** In accordance with VSU policy, attendance and participation will be checked both in class and in the laboratory. As stated in the VSU Undergraduate Catalog, "A student who misses more than 20% of the scheduled classes of a course will be subject to receiving a failing grade in the course." The remainder of this paragraph outlines the lab/oral report attendance policy. Attendance is required during ALL labs and oral report periods. A student who has perfect lab attendance or who misses only one laboratory/oral report period will receive 25 bonus points. A student who misses (or fails to complete) two to three laboratory/oral report periods will receive 10 bonus points. Missing (or failing to complete) additional laboratory/oral report periods will result in the **loss of points** as follows. Ten points will be deducted from the student's total points for the fourth missed (or incomplete) laboratory/oral report period; 20 additional points will be deducted for the fifth missed (or incomplete) laboratory/oral report period; 40 additional points will be deducted for the sixth missed/incomplete laboratory/oral presentation period, and 50 additional points will be deducted for each subsequent missed/incomplete period. Students who are habitually late for lab or oral report periods will be marked late. Coming late to lab or oral report periods three times will be counted as one absence. A student with more than 6 lab/oral report absences (or a student who fails to complete more than 6 laboratory or oral report periods) will not pass the course. **There will be no makeups for the laboratory exercises or student presentations.**

**Examinations given during class periods:**

1. Examinations 1-5 will cover material presented during both the class and laboratory portions of the course. Examinations will begin promptly on the times and dates indicated on the class schedule. The final examination will be comprehensive in that it will include material covered throughout the course. Exams 2, 3, and 4 will be comprehensive in that up to 25% of the questions on the exam may cover material presented before any earlier examination. Exams may include questions of the multiple-choice, matching, true-false, short-answer, and essay formats. A student who misses an examination should notify the instructor promptly. Arrangements for a make-up exam must be made within one week after the exam date; otherwise, a make-

up exam will not be given. Make-up examinations may consist entirely of questions of the short answer and essay formats. Make-up examinations for exams 1, 2, 3, and 4 will be worth 85% of the points allotted for the regularly scheduled exam.

2. STUDENTS ARE REQUIRED TO BRING TWO #2 PENCILS AND ERASERS TO ALL EXAMINATIONS. THE INSTRUCTOR WILL NOT PROVIDE PENCILS.

**Late assignments & failure to turn in assignments:**

Please make a calendar noting when assignments and reports are due. As stated on page 11, the student must submit complete copies of the following immediately after giving his or her lab oral presentation (**Please note that if these items are submitted late, little or no credit will be given for them:**

- (1) Complete copies of the three formal, peer-reviewed scientific articles, including readable versions of tables and figures
- (2) A printout of the PowerPoint presentation (6 slides per page is fine)
- (3) A copy of any notes used during the presentation

**For all other assignments and reports, the following late policy applies.** Turning in an assignment/report 1-4 days late will result in a deduction of 20% of the points for that assignment. Turning in an assignment 5-9 days late will result in a deduction of 50% of the points for that assignment. **No points will be awarded for an assignment that is late by more than 9 days.**

Students will not be notified by the instructor for failing to turn in course assignments. Late assignments must be given DIRECTLY to the instructor. They may NOT be placed in the instructor's mailbox. It is also NOT ACCEPTABLE to slide late assignments under the instructor's office door.

**Grading:** Points for the course are allocated as follows:

<u>EXAM 1 (Jan. 26)</u> .....	140	POINTS
<u>EXAM 2 (Feb. 16)</u> .....	140	POINTS
<u>EXAM 3 (Mar. 8)</u> .....	140	POINTS
<u>EXAM 4 (Apr. 12)</u> .....	140	POINTS
<u>EXAM 5 (FINAL EXAM-May 2)</u> .....	180	POINTS
<u>INFORMAL CLASS PRESENTATIONS</u> (see schedule) (course objectives 16-17)....	30	POINTS
<u>PARTICIPATION</u> (responses to questions in class; lab work & discussions) (course objectives 1-14).....	60	POINTS
<u>LAB REPORT</u> (Drawings, <b>Jan. 26</b> ) (course objective 9).....	15	POINTS
<u>LAB REPORT ON GENERAL UNKNOWN (Mar. 20)</u> (course objectives 8-12; 14)...	50	POINTS
<u>ORAL PRESENTATION IN LAB (Mar. 27-Apr. 26)</u> (course objectives 16-17).....	75	POINTS
<u>REFERENCES FOR LAB PRESENTATION</u> (course objective 15).....	30	POINTS
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TOTAL FOR COURSE	1000	POINTS

**There are FIVE REQUIREMENTS TO PASS the course:**

1. Do not miss more than 20% of the scheduled class periods.
2. Do not miss (or fail to complete) any more than 6 laboratories or oral report periods.
3. Complete all assignments and reports.
4. Obtain at least 30% of the points for **EACH** assignment and report (**including class & lab participation/recitations**).
5. Have a total of 600 or more points for the course.

The grade is "F" for a student who obtains less than 600 total points **or** fails to meet one of the other requirements for passing the course (see above list).

**GRADING SCALE:**    900-1000, A                      800-899, B                      700-799, C  
                                  600-699, D                      < 600, F