



**Special Notes to Students (continued from preceding page):**

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@valdosta.edu](mailto:titleix@valdosta.edu), 1208 N. Patterson St., Valdosta State University, Valdosta, Georgia 31608, 229-333-5463.

5. Cell phones, music players, and other electronic devices may not be used at any time in class or lab. Students are cautioned to be certain that cell phones and specialty watches are silenced and put away during examinations. In addition, calculators may not be used during examinations. Should a cell phone, specialty watch, calculator, or other electronic device be seen or heard during an examination, the student will be notified and the device will be confiscated. If the student does not have a cell phone, the student will be notified and the device will be confiscated. If the student does not have a specialty watch, the student will be notified and the device will be confiscated. If the student does not have a calculator, the student will be notified and the device will be confiscated. If the student does not have any other electronic device, the student will be notified and the device will be confiscated.

**Course Objectives (continued from preceding page):**

- R. Discuss the problem of antimicrobial drug resistance, and explain several ways in which the emergence of drug resistant bacteria can be minimized.
- S. Explain what is meant by the human microbiome. Discuss its importance and roles.
- T. Briefly describe the role of microorganisms in the cycling of nutrients, using examples from the carbon cycle, the nitrogen cycle, and the sulfur cycle.
- U. Describe in detail: (i) the innate defenses of humans and (ii) the adaptive immune response of a human to a foreign antigen.
- V. Explain how infectious diseases are transmitted, giving specific examples.
- W. List the major types of virulence factors observed in pathogenic bacteria, giving specific, detailed examples.
- X. List and describe several human diseases that are due to specific bacteria, viruses, protozoa, and fungi.
- Y.. Describe the general course of the disease caused by human immunodeficiency virus (HIV).
- Z. Properly handle microorganisms in a biosafety level 2 laboratory.
- ZA. Use a compound light microscope to examine various types of microorganisms.
- ZB. Keep accurate and complete records of microscopic observations, as well as other laboratory and field work.
- ZC. Use culture media to grow bacteria and fungi in the laboratory, and maintain stock cultures.
- ZD. Use staining techniques, physiological tests, and rRNA sequences as aids in bacterial identification.
- ZE. Use dilutions to solve problems such as determining the colony-forming units per milliliter in a bacterial suspension and the plaque-forming units per milliliter in a viral suspension.
- ZF. Work with others to: formulate an answerable question; develop a hypothesis; design and conduct an experiment; collect, organize and analyze data; and prepare a report with emphasis on the results and discussion.
- ZG. Use library and electronic resources to obtain formal scientific articles related to a particular topic in microbiology.
- ZH. Read a scientific article (a primary source) and give a brief oral presentation base2.1 a

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**BIOLOGY 3100/5100. Microbiology - 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</b>
Tues. Jan. 14	General course information Microorganisms and microbiology	<b>Chap. 1</b>
Tues. Jan. 14L	BRIEF INTRODUCTION TO LAB SAFETY SUPPL. EX., HANDWASHING (see information in handout) <b><u>Always wash your hands before leaving lab!</u></b>  <b><u>Be sure to read the lab exercises for each day before coming to lab.</u></b>	
Thurs. Jan. 16	Microorganisms and microbiology An overview of microbial life Cell structure/function	<b>Chap. 1</b> <b>Chap. 1</b>

Date	Topics/Lab Exercises (Additional notes for lab exercises)	Related material in text
Tues. Jan. 21L	(.....Continued from preceding page)	
	<ul style="list-style-type: none"> <li>• <i>Please note that, although you will need to cooperate with your lab group as you build the columns, <u>the remainder of the Winogradsky column project will be done individually.</u> This includes your observations and records for: (i) your own new Winogradsky column and (ii) the established column from last semester that will be assigned to you.</i></li> <li>• <i>Please bring any required materials for your column to lab on <b>Thursday, Jan. 30.</b></i></li> <li>• <i>Please note that you must record BOTH macroscopic and microscopic observations of your two columns during the project. <u>For each column, detailed notes about and drawings of the columns and the observed microorganisms are required.</u> Drawings must be made from the actual columns or microorganisms being observed in the microscope; they should not be made from photographs. You may take photographs but these are optional. Nevertheless, photographs can be very useful in documenting changes in a column over time. <u>You may be asked to turn in your drawings for the day at the end of any lab period during which the columns are being observed.</u> In addition, at the end of the project, you must turn in an individual report consisting of the following: (i) a title page that includes your name, (ii) a table of contents with page numbers, (iii) a one-page, double-spaced, typed summary of what you did and your findings, and (iv) your well-organized, completely-labeled, original observations, notes, drawings, and optional photographs for each column. <u>Most (~90%) of the one-page summary should focus on your findings and their interpretation.</u> All pages of the report must be numbered. For the typed summary, the margins must be set at 1 inch on all sides, and a 12-point font must be used. Please check your word processing program to be certain that extra space is not inserted below each line in the typed summary. The summary must refer to the original notes, drawings, and optional photographs, and it must interpret the observations.</i></li> </ul>	

Thurs. Jan. 23	Cell structure/function	Chap. 2, 3 (p. 75-77), & 6 (p. 184-186)
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Thurs. Jan. 23L	<p>&gt;LAB MANUAL EX., MICROSCOPY (green box p. 9); answer questions on green box p. 15-17.          &gt;MICROSCOPE CARE &amp; USE ; MICROSCOPE CHECKLIST (course pack)          EXAMINE PREPARED SLIDES OF <i>Plasmodium falciparum</i> in blood smear; <i>Trichomonas vaginalis</i>, <i>Trypanosoma cruzi</i> in blood smear, &amp; <i>Entamoeba histolytica</i>. Make drawings in your lab notebook.          Students should be able to describe these microorganisms and name the di.4 (i)2.566 0 k (s)5.5 e thues (i)2.9( n)8</p>	
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Date	Topics/Lab Exercises (Additional notes for lab exercises)	Related material in text
Thurs. Jan 30L	<p>(.....Continued from preceding page)</p> <p>&gt;SUPPL. EX., WINOGRADSKY COLUMN [WE WILL USE THE PROCEDURE IN THE SUPPL. EX., BUT PLEASE ALSO READ LAB MANUAL EX. (green box p. 203) &amp; ASSIGNED PAGES IN TEXT.]</p> <p><u>BE SURE TO RECORD YOUR INITIAL OBSERVATIONS OF YOUR COLUMN.</u></p> <p>*<b>LOCATE YOUR ASSIGNED COLUMN AND ADD 4 SLIDES TO IT.</b></p>	<b>TEXT, P. 585-588</b>
Tues. Feb. 4	<p>Eukaryotic microorganisms</p> <p>Nutrition, culture, &amp; metabolism of microorganisms</p>	<p><b>Chap. 18 &amp; Chap. 33</b></p> <p><b>Chap. 3, 14, 15, 16 &amp; 17</b> (selectd[()D.01 T3w 0.254 0 T</p>



Date	Topics/Lab Exercises (Additional notes for lab exercises)	Related material in text
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Tues. Feb. 18L	(.....Continued from preceding page)	
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>DISTRIBUTION OF UNKNOWN IA BACTERIAL CULTURES (UNKNOWN IA)-----**First, prepare subcultures (stock cultures) of the unknown IA. Please label your unknown IA stock cultures with the following: Unk IA, the date, your lab section (3100A or 3100B), and the seat numbers of your group members.**

>LAB MANUAL EX., GRAM STAINING (green box p. 99), (KNOWN & UNKNOWN IA CULTURES)

Prepare smears from nutrient agar slant cultures as described in the lab manual Ex. (1)-AL Ear tCcr Ex. (1)-n1.48T



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**Date**

**Topics/Lab Exercises**  
(Additional notes for lab exercises)

**Related material in text**

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Tues. Mar. 3L

>HAND IN SUPPL. EX., RIBOSOMAL RNA SEQUENCES

> **Prepare new stock cultures of your unknown IA. Please label your unknown IA stock cultures with the following: Unk IA, the date, your lab section (3100A or 3100B), and the seat numbers of your group members.**

>LAB MANUAL EX., CULTURAL CHARACTERISTICS,

Date	Topics/Lab Exercises (Additional notes for lab exercises)	Related material in text
Tues. Mar. 10L	>ADDITIONAL TESTS, UNKNOWN IA >LAB MANUAL EX., OXIDATION AND FERMENTATION TESTS (green box p. 167) >LAB MANUAL EX., MULTIPLE TEST MEDIA (green box P. 185) (We will do <u>ONLY</u> the test for hydrogen sulfide production using SIM medium.) >LAB MANUAL EX., HYDROLYTIC/DEGRADATIVE REACTIONS (green box p. 179) (Modification: we will use tributyrin agar rather than spirit blue agar for the lipid hydrolysis test. On tributyrin agar, a clear zone around the bacterial growth indicates a positive test for lipid hydrolysis.)  >DISCUSSION ABOUT DETERMINING THE GENUS (OR GENUS AND SPECIES) OF YOUR UNKNOWN IA. SEE HANDOUT PROVIDED BY INSTRUCTOR.	

>MONITOR WINOGRADSKY COLUMNS

Thurs. Mar. 12	Viruses	<b>Chap. 8 &amp; 10</b>
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Thurs. Mar. 12L	>Finish LAB MANUAL EX., OXIDATION/FERMENTATION TESTS >Finish LAB MANUAL EX., MULTIPLE TEST MEDIA (test for hydrogen sulfide production only) >Finish LAB MANUAL EX., HYDROLYTIC/DEGRADATIVE REACTIONS (Recall that on tributyrin agar, a clear zone around the bacterial growth indicates a positive test for lipid hydrolysis.) Record results in lab notebook, and on descriptive chart. TH0 9.96 3p8.4 (I)20.5 (A)JTJ0 Tc /P ÅMCID 20 m[S6.1 (t)2.9 (eb)-4 (-)-7 (r)-5.3 ( ITBA04 262.89.88 Tm(T)Tj0 (N)-8.4 (TA)6.(ar(e.89.88 T	
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<b>Date</b>	<b>Topics/Lab Exercises</b> (Additional notes for lab exercises)	<b>Related material in text</b>
Tues. Mar. 31L	>BEGIN SUPPL. EX., <i>Staphylococcus aureus</i> (broth) >SUPPL. EX., PLAQUE ASSAY OF A PHAGE SUSPENSION – WORK IN GROUPS OF 2 >ASK QUESTIONS ON DILUTION PROBLEMS  >MONITOR WINOGRADSKY COLUMNS (LAST WEEK)	
Thurs. Apr. 2	Microbial growth control ( <u>Assigned reading will be given.</u> )	<b>Chap. 5, 28, &amp; 7</b>
Thurs. Apr. 2L	>CONTINUE SUPPL. EX., <i>Staphylococcus aureus</i> (mannitol salt agar) >FINISH SUPPL. EX., PLAQUE ASSAY OF A PHAGE SUSPENSION – Record results on board. <b><u>THERE WILL BE A WORK SESSION ON DILUTION PROBLEMS DURING LAB</u></b>  >MONITOR WINOGRADSKY COLUMNS (LAST WEEK)	
Tues. Apr. 7	Biofilms ( <u>Assigned reading will be given.</u> ) Human Microbiome Innate immunity	<b>Chap 5, 7 (7.9), &amp; 20 (20.4, 20.5)</b> <b>Chap. 24</b> <b>Chap. 26</b>
Tues. Apr. 7L	>CONTINUE SUPPL. EX., <i>Staphylococcus aureus</i> (TSA plates) >LAB MANUAL EX., ENTEROTUBE (ENTEROPLURI) SYSTEM, (green box p. 193) > <b>WORK ON LAB REPORT ON WINOGRADSKY COLUMNS</b>	
Thurs. Apr. 9	Innate immunity; adaptive immunity	<b>Chap. 26-28</b>
Thurs. Apr. 9L	>FINISH SUPPL. EX., <i>S. aureus</i> >SUPPL. EX., STAPHAUREX RAPID AGGLUTINATION TEST FOR <i>S. aureus</i> IDENTIFICATION Record results. >FINISH LAB MANUAL EX., ENTEROTUBE (ENTEROPLURI) SYSTEM (Record results on board.) > <b>HAND IN LAB REPORT ON WINOGRADSKY COLUMNS</b>	
Tues. Apr. 14	<b>EXAM 3 (will include both class and lab material)</b>	
Tues. Apr. 14L	>LAB MANUAL EX., KIRBY-BAUER METHOD (ANTIMICROBIAL AGENTS) (green box p. 139)  Practical applications of immunology > <b>WORK ELISA AND IMMUNOFLUORESCENCE PROBLEMS (SEE COURSE PACK)</b>	<b>Chap. 26-28</b>
Thurs. Apr. 16	Adaptive immunity Practical applications of immunology	<b>Chap. 26-28</b> <b>Chap. 26-28</b>



5. Each student must record the results of the lab exercises and answer the related questions, as noted in the syllabus. In

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**Examinations Given During Class Periods:**

1. Examinations 1-4 will cover material presented during both the class and laboratory portions of the course. Examinations will begin promptly at the times and dates indicated on the class schedule. The final examination (Exam 4) will be comprehensive in that it will include material covered throughout the course. Exams 2 and 3 will be comprehensive in that up to 25% of the points 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 and will be worth fewer points than the regularly-scheduled exams.
2. Students must bring **two #2 pencils and erasers** to all examinations. The instructor will not provide pencils. Also, please bring a pen that has dark ink (black or dark blue). The pen will be used for completing short-answer questions, diagrams, and essay questions. **Unless otherwise noted, students may NOT use calculators during examinations.**
3. Please read items 5, 6, and 7 on page 2 nBT/P .-3.8 (a Tm(3.)Tj3 Tw 2.8rP )4.2 (na)-8 (m)23atBT (m)18 3v (e)4.t4(s)9.4 (1s(d)-1.7

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