



**Miami-Dade College (Wolfson Campus)  
School of Natural Sciences**

**Course Syllabus**      **Microbiology Laboratory**  
**Reference**      **MCB 2010L**  
**Term**      **2009-01**



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**The above course links to the following Learning Outcomes:**

- |  |  |
|--|--|
| <input type="checkbox"/> Communication                   | <input type="checkbox"/> Social Responsibility                   |
| <input checked="" type="checkbox"/> Numbers / Data       | <input type="checkbox"/> Ethical Issues                          |
| <input checked="" type="checkbox"/> Critical thinking    | <input checked="" type="checkbox"/> Computer / Technology Usage  |
| <input checked="" type="checkbox"/> Information Literacy | <input type="checkbox"/> Aesthetic / Creative Activities         |
| <input type="checkbox"/> Cultural / Global Perspective   | <input checked="" type="checkbox"/> Environmental Responsibility |

MCB 2010L, Microbiology Laboratory, provides a practical approach to the survey of the microorganisms, their environments and activities, and their interactions with multicellular organisms including man. The course concentrates on the laboratory techniques for the cultivation of the Prokaryotic cells and viruses. The course is primarily for Biology and Pre-professional Allied-Health career majors. Courses in Human Anatomy and Physiology with lab (BSC 2085/2085L & 2086/2086L) or Principles of Biology with Lab (BSC 2010/2010L) and Chemistry for the Health Sciences with Lab (CHM 1033/1033L) or General Chemistry with lab (CHM 1045/1045L) with a minimum grade of a C are required before taking this course. This course does not intend to remedy the deficiencies that students acquired in pre-requisite coursework. Therefore, it is the student's responsibility to review such material and be prepared for the fast-paced nature of this course.

**Sections:** 535130; Mondays – 12:00 – 3:20 P.M.; room 1663  
535128; Thursdays – 12:00 – 3:20 P.M.; room 1663  
535124; Thursdays – 5:40 – 9:00 P.M.; room 1663  
535126; Fridays – 12:00 – 3:20 P.M.; room 1663

**Co-requisite Course:** Microbiology, MCB 2010

**Required Textbooks:** Brown, A. E. 2009. Benson's Microbiological Applications: Laboratory Manual in General Microbiology. Eleventh Edition. McGraw-Hill Publishing Company, Inc. New York, NY. (ISBN 978-0-07-352255-5)

Tortora, G. J.; B. R. Funke; and C. L. Case. 2009. Microbiology: An Introduction. Ninth Edition. Benjamin/Cummings Publishing Company, Inc. San Francisco, CA.

You might want to bring the textbooks to class because the professor will constantly refer to them during labs. The Lab Manual is an essential component of your instruction in the General Microbiology Laboratory. Your textbook is equally important because complimentary reading assignments will

reinforce the instruction in this lab. It is very difficult to succeed in this course without them. Therefore, no one will be admitted to class after the second week of classes without the required textbooks and laboratory materials needed for this class.

The laboratory portion of the General Microbiology course is an important integral part of your education in Biology. The lab manual presents the basic techniques and procedures in a self-instructional manner. Instruction will also be supplemented with verbal directives and handouts. The purpose of this approach is to encourage you to THINK for yourself, DO for yourself, TAKE the INITIATIVE, and be RESPONSIBLE for your own learning. Planning ahead, reading the assigned material before lab, working efficiently, and thinking about what you are doing before you do it will pay great dividends. So do not be bashful, cooperate and do your share of the work when working in groups, do your own work on individual tasks, don't be afraid to ask questions, and HAVE FUN. This course can be a very enjoyable experience.

## **LABORATORY POLICY**

Students are expected to be prepared before a particular lab by completing all reading assignments for that particular lab date. At the beginning of the laboratory period the instructor will explain in sufficient detail what you are to do so that you can complete the exercise(s) on your own. Please pay attention and ask questions if you are confused. The instructor will not do the exercises for you. However, he will be there to help and guide you. It will be to your advantage, then, to be familiar with the exercise(s) assigned on a particular date. Not reading your laboratory manual/textbook will waste valuable time for you, your fellow students, and the professor. Do not waste time! The semester will be over before you know it!

Laboratory will begin on time. The instructor only has to be here during regularly scheduled laboratory hours. Students will also be responsible for cleaning after lab. Therefore, make sure your schedule permits for activities occurring outside regular lab periods because students are expected to make observations and start experiments outside regular lab periods. Please, make sure to accommodate your weekly schedule to perform these required learning activities

This laboratory requires extra time and effort on your part in order to make good progress. Be flexible and able and willing to go the extra mile to do well.

**On occasions students will be required to come to the lab to observe and complete ongoing experiments at times other than the regular scheduled lab. This time will be used to complete staining techniques and to establish pure cultures of selected bacteria. Please, make sure to accommodate your weekly schedule to perform these required learning activities. See the schedule by the door of the laboratory for open periods when you may come in and perform extra or other required work.**

## **Required Lab Materials**

Each student should purchase some of each of the following:

1. Sharpie<sup>®</sup> fine-tip marking pen
2. 10 cm ruler
3. Lab coat or and old long-sleeve shirt (preferably extra large) to protect clothes and skin from spills.
4. Safety glassware (goggles)
5. Latex/nitrile gloves
6. Combination lock

**Pre-Lab lecture/Labs:** The tentative schedule indicates the chapter reading assignments in the texts for each lab period. As mentioned, students are expected to read the assigned material **before** the schedule date. Presentation of lecture material will include traditional methods as well as more contemporary media technological applications and animations of different biological processes in cell and molecular biology. Occasionally, in order hear to online presentations of pedagogical materials using our lab computer interfaces, students must also bring their own set of headphones. Failure to do so will delay you and prevent you from utilizing this learning experience to the maximum.

**Attendance to the laboratory sessions is mandatory.** Any absence means that the student is not in the laboratory participating, practicing, and learning. You are responsible for all deadlines, directions, discussions, materials, activities, assignments, or announcements covered in lab, regardless of your reason for being absent. Attendance will be checked for every scheduled laboratory session. The professor reserves the right to deny entry, require withdrawal or fail students who are constantly late or have had three undocumented absences during the semester. If the student has an undocumented absence after the withdrawal deadline, the professor will assign a failing (F) grade regardless of the student's performance in the course at the time. The room will be locked out 15 minutes after the lab session has started and students will not be allowed to enter the lab. Therefore, make every effort to attend lab on time because the Professor will lock the room and you will receive a zero for the scheduled experiment otherwise. This will be enforced according to the rules and procedures established in the current Miami Dade College catalog and student handbook. Your performance in the course depends on your attendance to all lab sessions as scheduled. Students missing lab are not participating and therefore, not learning. Therefore, make every effort to attend and participate in labs because your performance in this course will be severely affected otherwise. Furthermore, we will use computer software that supports instruction for most labs; therefore, make sure that you provide your own set of headphones for all lab sessions. Any extenuating circumstances will be dealt on an individual basis.

Deducting two points from the final attendance and participation grade for each laboratory session missed will penalize undocumented absences. There will be no make-ups for missing laboratory exercises. It is not the professor's responsibility to prepare materials in order to make up an exercise. In addition, many laboratory exercises are done in large groups. Each student in the group is responsible to learn not only the lab activities assigned to him/her, but also those assigned to other members of the group as well. Therefore, students who show disrupting behavior, leave early or in any way penalize the group will be assessed negative points at the discretion of the Professor. Remember, if you are absent, you're not participating. If you're disrupting the class or showing the same behavior among the members or your group, you're not participating.

**Lab Exams (200 points):** There will be two exams during the semester. Each exam is worth 100 points. All exams will be administered during regular scheduled lab periods.

Please note: **THERE WILL BE NO MAKE-UP EXAMS.** Therefore, attendance to each exam (on time) is absolutely mandatory. Furthermore, if you leave the classroom early or immediately after the exam, the professor will consider you absent for that class period and your exam will be graded as 0. Extenuating situations that prevent students from attending a particular exam will be dealt on an individual basis. Make sure you contact your professor immediately in such circumstances.

The exams consist of multiple choice and short answer questions and will cover all material discussed in labs, pre-lab sessions, and in textbook reading assignments. Questions that involve applications of learned material, logical reasoning, and critical thinking will also be included in lab exams. Any extra credit points will be earned through additional exam questions added to each exam. The professor will keep all exams, and assignments. Students are welcome to review his/her assignments, however, the students will keep only the grade card, not the actual exam or assignment. For exams, students will be evaluated only based on the responses they write on the scantron sheet. Therefore, make sure you are very careful when transferring responses from the exam sheet to the scantron sheet. Actual copies of each

student's exam will be kept for three days, after which the professor will destroy the original copy of the student's exam along with any written marks placed on it.

Notice that receiving an exam and looking at it constitutes taking that exam. If you wish to use a calculator (when necessary) for any exam, you must bring your own. You will not be allowed to share calculators with your neighbor nor you will be allowed to use cell phones or cell phone calculators during the quiz/exam. In addition, you might also want to bring a #2 pencil and eraser for the exams since the professor will not provide these materials.

**Technique, Attendance, and Participation (50 points):** Your professor will evaluate your technique at all times. Your participation will also be evaluated. You will lose 3 points from your technique and participation grade for being absent, points at the discretion of the Professor for being late; leaving early (a behavior that disrupts group activity), to the different lab activities or not complying with safety regulations of the laboratory. No exceptions!

**Lab reports (50-100+ points):** Students are expected to complete the assigned lab reports for the previous lab and turn them in for grading during the next scheduled lab session. Late Lab Reports will not be accepted under any circumstances. Laboratory reports will consist either of formal reports (as it is the case for identification of unknown bacteria), or by submitting the worksheets where students collect data and completion of all the required evaluation questions for this particular section of the laboratory. Laboratory data will be collected using **black ink** only. Mistakes made while collecting data may be crossed out by drawing a single line over, initializing, and correcting the mistake with the accurate information (data).

Cheating will not be tolerated and will meet with the strongest disciplinary action possible. The instructor encourages interaction and discussion amongst students, however we have found that students/student teams who prepare their reports independently tend to learn more.

### Submission of Laboratory Reports

Submission of worksheets for laboratory exercises performed during the course of the semester will follow the schedule shown below:

<b>Laboratory exercises (10 points each)</b> (tentative)	<b>Deadline</b>
Metric System Exercises	9/1/09
Microscopy Exercises	9/8/09
Exercises 6-8	9/15/09
Exercises 9, 10, 40	9/29/09
Exercises 12, 14, 15, 16, 17	10/6/09
Exercises 18, 21	10/13/09
Morphological Unknown Report	10/13/09
Exercises 22-The Bacterial Growth Curve, 25	10/27/09
Exercises 29, 30, 33, 36, 37	11/10/09
Exercises 41-43	11/24/09
Exercises 45-48	11/17/09
Exercises 60, 61, 72, 73	12/1/09
Exercises 70, 71, 74, 75, 76, 77	12/1/09
	Total: 130 points

### MCB 2010L LAB SKILL EVALUATIONS

Students will also be evaluated according to skill and dexterity on basic microbiology techniques related to establishing pure culture, microscopy, staining techniques and the identification of unknown bacteria in mixed cultures. The point value attached to each skill is shown in the table below. For each laboratory skill evaluation, the professor will determine the points obtained by each student according to the level of skill and knowledge of the technique being evaluated.

Lab Skill Evaluations		Points
I	Aseptic transfer of microbes (Exercise 9)	10
II	Streaking for isolation (Exercise 10)	10
III	Preparation of bacterial smears with Gram stain & Unknown (Exercise 15)	20
IV	Morphological Unknown report (Exercise 39)	20
V	Physiological Unknown report	40
Total:		100

**Weekly Assignments:** It is understood that working all questions/problems at the end of each chapter will be excellent preparation for exams. The professor encourages this active learning behavior and considers these as weekly assignments. Some of these questions might be included in exams.

### Grading

Grades for the laboratory portion will be determined as follows:

Reports from the lab manual	130 points
Midterm Examination & Practicum	100 points
Lab Skill Evaluations	100 points
Final Examination & Practicum	100 points
Attendance and participation	50 points
<b>Total possible points</b>	<b>480 points</b>

The final Grade will be determined by the average of all scores obtained in these learning activities. Grades will be assigned according to the following scale:

$$A = 90-100, \quad B = 80-89, \quad C = 70-79, \quad D = 60-69, \quad F = 59 \text{ or below}$$

However, the performance of the class will be monitored during the semester and a curve may be applied to calculate the final grades if applicable and only at the discretion of the professor.

**Incomplete Grades:** Incomplete (I) grades will be given in consultation with the student and upon agreement with the professor only when extenuating circumstances have prevented the student from completing the course. In order to be considered for an "I" grade, a student must have successfully completed a **minimum** of one-half the work in the course with a minimum grade of C or better. Note the Incomplete (I) grades must be completed at time agreed upon between the professor and the student. If not completed by the agreed time, the incomplete (I) grade will become an F.

**Withdrawals:** The professor is not required to withdraw/drop students from the course. It is the student's responsibility to determine his/her status in the course at all times, and makes that decision, if necessary. The last day to drop this course is **November 3, 2009**.

### STUDENT RESPONSIBILITIES AND CONDUCT

Professional Students are responsible for taking charge of their own education by being prepared before every laboratory and conduct themselves appropriately during all learning activities. The professor will not tolerate class disruptions that prevent other students to benefit from the learning process. These include unwarranted noises, talking among students while the professor explains important concepts or answers questions posed by another student, unacceptable gestures, leaving class early, breaking laboratory safety guidelines, and the operation of electronic artifacts (beepers and cellular phones; including text messaging) during regular classroom and laboratory periods. The professor reserves the right to expel disrupting students from the classroom at any time, ask students to surrender their electronic devices and request disciplinary action from the Dean for Academic Affairs and even assign a failing grade to those who display such anti-pedagogic behavior.

## **STUDY TIPS AND GUIDELINES FOR SUCCESS**

### **MAKE A COMMITMENT TO SUCCEED:**

Decide to do well in the course. Spend the time. This course requires at least a minimum of 14 hours of study per week outside of class. Be responsible for your own learning. Expect to learn more than what is covered during lab or in the textbooks.

### **GET HELP RIGHT AWAY:**

Do not wait for someone to ask if you need help. Talk with your professor, lab assistants, and your study group. The professor encourages frequent visits during office hours to clarify material covered in class. If you cannot make it to the professor's office hours, please make an appointment. Your success in this course depends on how well you understand the concepts covered during the semester. Use the Study partner CD-ROM, and the Study Guide that accompanies the textbook, and the computer courtyard. Review your notes after each class.

### **WORK WITH A STUDY GROUP:**

Meet regularly. Be sure everyone contributes and understands.

### **TIE IDEAS AND CONCEPTS TOGETHER:**

Connect the material to what you already know. Look for the big picture, not just isolated details. Be able to apply information in a new situation.

### **LEARN THE VOCABULARY:**

Look up any words you do not know. Make and use flash cards, carry them everywhere. Say the terms out loud. Use the new terms in sentences. Therefore, make every effort to learn the vocabulary and use the dictionary appropriately.

### **UTILIZE ADDITIONAL RESOURCES AVAILABLE TO YOU**

Additional help in form of sample exams and quizzes, lecture notes and other didactic materials are available through the many links that could be accessed through the World Wide Web for this class. Please, feel free to use the available the equipment at the Computer Courtyards (Rooms 2201 and 2301) or the Science Resource Center (room 2221) for this purpose.

### **PREPARE FOR LABS BEFORE CLASS AND COME TO LAB SESSIONS:**

Read and highlight the handouts. Tie it to the lecture material. Write down questions to ask. Make notes of what to look for. Attend every lab session as scheduled. Remember that attendance is mandatory. Be on time. Bring your textbooks and handouts. Be attentive and take notes.

### **STUDY EVERY DAY:**

Follow a study schedule. Find times and places that allow you to concentrate. Review and rewrite your notes after class. Outline the material. Draw concept maps and/or use diagrams.

## ORGANIZE THE INFORMATION:

Make outlines to summarize, organize, and relate key ideas. Know where your notes, handouts, etc. are.

## MIAMI DADE COLLEGE LEARNING OUTCOMES

<p style="text-align: center;"><b>Miami Dade College Learning Outcomes</b> <b>Adopted September 22, 2006</b></p>
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**Purpose:** Through the academic disciplines and co-curricular activities, General Education provides multiple, varied, and intentional learning experiences to facilitate the acquisition of fundamental knowledge and skills and the development of attitudes that foster effective citizenship and life-long learning.

As graduates of Miami Dade College, students will be able to:

1. Communicate effectively using listening, speaking, reading, and writing skills.
- 2. Use quantitative analytical skills to evaluate and process numerical data.**
- 3. Solve problems using critical and creative thinking and scientific reasoning.**
- 4. Formulate strategies to locate, evaluate, and apply information.**
5. Demonstrate knowledge of diverse cultures, including global and historical perspectives.
6. Create strategies that can be used to fulfill personal, civic, and social responsibilities.
7. Demonstrate knowledge of ethical thinking and its application to issues in society.
- 8. Use computer and emerging technologies effectively.**
9. Demonstrate an appreciation for aesthetics and creative activities.
- 10. Describe how natural systems function and recognize the impact of humans on the environment.**

Note that the **Outcomes in bold** are specifically addressed in this course.

## TENTATIVE MICROBIOLOGY LABORATORY SCHEDULE<sup>1</sup> (Monday Section)

Week	Lab	Date	Topic	Text Chapter
1	1	Aug. 24	Course Introduction Laboratory Safety Procedures Metric System	Preface <sup>2</sup> Front Cover <sup>2</sup> Back Cover <sup>2</sup> Pp. vii-xv <sup>2</sup> Ch. 3; App.E <sup>3</sup>
2	2	Aug. 31	Microscopy: Brightfield Microscopy Microscopy Techniques Lab Skill Evaluation I (Microscopy) Survey of Microorganisms Ubiquity of Microorganisms Effectiveness of Hand-Scrubbing	Exercises 1 - 5 <sup>2</sup> Ch. 3 <sup>3</sup> Exercises 6 – 8 <sup>2</sup> Exercises 38 <sup>2</sup> Ch. 3 <sup>3</sup> , Handout
3	3	Sept. 7	<b>LABOR DAY</b> <b>NO CLASSES</b>	
4	4	14	Cultural Characteristics of Microorganisms Aseptic Techniques Pure Culture Techniques Preparation of a Bacterial Smear, Simple Staining	Exercises 40 <sup>2</sup> Exercises 9 - 12 <sup>2</sup> Ch. 6, 3 <sup>3</sup>
5	5	21	Differential Staining Techniques Gram Stain & Gram Stain Unknown Ziehl-Nielsen Acid-Fast Stain Morphological Unknown	Exercises 15,17 <sup>2</sup> Ch. 3 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
6	6	28	Special Staining Techniques Endospore Staining Negative Staining: Capsule Stain Metachromatic Granule Staining Morphological Unknown (continued)	Exercises 13, 14, and 17 <sup>2</sup> Ch. 3 <sup>3</sup> Handouts
7	7	Oct. 5	Cultivation of Anaerobes Determination of Bacterial Motility Complete Morphological Unknown	Exercise 18, 21 <sup>2</sup> Ch. 4, 6 <sup>3</sup>
8	8	12	Enumeration of Bacteria and Phages (Demonstration) The Bacterial Growth Curve	Exercises 22, 25 <sup>2</sup> Ch. 6 <sup>3</sup>
9	9	19	<b>EXAM I &amp; PRACTICUM</b> The Bacterial Growth Curve (continued)	
10	10	26	Effects of Temperature, and Ultra-Violet Radiation on Bacterial Growth	Exercises 29, 30, 33 <sup>2</sup> Ch. 7, 20 <sup>3</sup>

<u>Week</u>	<u>Lab</u>	<u>Date</u>	<u>Topic</u>	<u>Text Chapter</u>
11	11	Nov. 2	Evaluation of Antiseptics, Disinfectants on Bacterial Growth Antimicrobial Sensitivity Testing Physiological Unknown	Exercises 36, 37 <sup>2</sup> Ch. 7, 20 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
12	12	9	Physiological Characteristics: Oxidation and Fermentation Hydrolytic and Degradative Reactions Multiple Test Media Physiological Unknown (continued)	Exercises 41-43 <sup>2</sup> Ch. 5 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
13	13	16	Physiological Characteristics: Oxidation and Fermentation (continued) Hydrolytic and Degradative Reactions Miniaturized Multi-test System Demonstration Physiological Unknown (cont.)	Exercises 41-43 <sup>2</sup> Ch. 5 <sup>3</sup> Exercises 45-48 <sup>2</sup> Exercises 39, 44 <sup>2</sup>
14	14	23	Isolation of Staphylococci & Streptococci Bacteriological Examination of Food Bacteriological Examination of Water Complete Physiological Unknown	Exercises 45-48 <sup>2</sup> Exercises 70, 71 <sup>2</sup> Exercises 60, 61 <sup>2</sup> Ch. 5, 6, 10 <sup>3</sup>
15	15	30	Isolation of Staphylococci & Streptococci (continued) The Enterics, Serological Reactions Bacteriological Examination of Food (continued) Bacteriological Examination of Water (continued)	Exercises 70-75 <sup>2</sup> Exercises 77 <sup>2</sup> Exercises 60, 61 <sup>2</sup> Ch. 5, 6, 10, 18 <sup>3</sup>
16	16	Dec 7	<b>FINAL EXAM &amp; PRACTICUM - Lab Clean-up</b>	
17 <sup>4</sup>	18	14	<b>FINAL EXAM &amp; PRACTICUM - Lab Clean-up</b>	

1. Exact lecture topics are subject to change. In fact, all parts of this document (including policies and procedures) are subject to change at the discretion of the professor. 2. Indicate reading assignments from the Benson's Lab Manual. 3. Indicate reading assignments from text by Tortora, Funke, and Case. 4. The Professor reserves the right to use week 17 to schedule the Final Exam as part of the Final Examination Week. Final Grades will be available online by Sat., Dec. 19, 11:00 P. M.

## TENTATIVE MICROBIOLOGY LABORATORY SCHEDULE<sup>1</sup> (Thursday Section)

<u>Week</u>	<u>Lab</u>	<u>Date</u>	<u>Topic</u>	<u>Text Chapter</u>
1	1	Aug. 27	Course Introduction Laboratory Safety Procedures Metric System	Preface <sup>2</sup> Front Cover <sup>2</sup> Back Cover <sup>2</sup> Pp. vii-xv <sup>2</sup> Ch. 3; App.E <sup>3</sup>
2	2	Sept. 3	Microscopy: Brightfield Microscopy Microscopy Techniques Lab Skill Evaluation I (Microscopy)	Exercises 1 - 5 <sup>2</sup> Ch. 3 <sup>3</sup>
3	3	10	Survey of Microorganisms Ubiquity of Microorganisms Effectiveness of Hand-Scrubbing	Exercises 6 – 8 <sup>2</sup> Exercises 38 <sup>2</sup> Ch. 3 <sup>3</sup> , Handout
4	4	17	Cultural Characteristics of Microorganisms Aseptic Techniques Pure Culture Techniques Preparation of a Bacterial Smear, Simple Staining	Exercises 40 <sup>2</sup> Exercises 9 - 12 <sup>2</sup> Ch. 6, 3 <sup>3</sup>
5	5	24	Differential Staining Techniques Gram Stain & Gram Stain Unknown Ziehl-Nielsen Acid-Fast Stain Morphological Unknown	Exercises 15,17 <sup>2</sup> Ch. 3 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
6	6	Oct. 1	Special Staining Techniques Endospore Staining Negative Staining: Capsule Stain Metachromatic Granule Staining Morphological Unknown (continued)	Exercises 13, 14, and 17 <sup>2</sup> Ch. 3 <sup>3</sup> Handouts
7	7	8	Cultivation of Anaerobes Determination of Bacterial Motility Complete Morphological Unknown	Exercise 18, 21 <sup>2</sup> Ch. 4, 6 <sup>3</sup>
8	8	15	Enumeration of Bacteria and Phages (Demonstration) The Bacterial Growth Curve	Exercises 22, 25 <sup>2</sup> Ch. 6 <sup>3</sup>
9	9	22	<b>EXAM I &amp; PRACTICUM</b> The Bacterial Growth Curve (continued)	
10	10	29	Effects of Temperature, and Ultra-Violet Radiation on Bacterial Growth	Exercises 29, 30, 33 <sup>2</sup> Ch. 7, 20 <sup>3</sup>

<u>Week</u>	<u>Lab</u>	<u>Date</u>	<u>Topic</u>	<u>Text Chapter</u>
11	11	Nov. 5	Evaluation of Antiseptics, Disinfectants on Bacterial Growth Antimicrobial Sensitivity Testing Physiological Unknown	Exercises 36, 37 <sup>2</sup> Ch. 7, 20 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
12	12	12	Physiological Characteristics: Oxidation and Fermentation Hydrolytic and Degradative Reactions Multiple Test Media Physiological Unknown (continued)	Exercises 41-43 <sup>2</sup> Ch. 5 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
13	13	19	Physiological Characteristics: Oxidation and Fermentation (continued) Hydrolytic and Degradative Reactions Miniaturized Multi-test System Demonstration Physiological Unknown (cont.) Isolation of Staphylococci & Streptococci Bacteriological Examination of Food Bacteriological Examination of Water	Exercises 41-43 <sup>2</sup> Ch. 5 <sup>3</sup>  Exercises 45-48 <sup>2</sup> Exercises 39, 44 <sup>2</sup> Exercises 70, 71 <sup>2</sup> Exercises 60, 61 <sup>2</sup> Ch. 5, 6, 10 <sup>3</sup>
14	14	26	<b>THANKSGIVING HOLIDAY NO CLASS</b>	
15	15	Dec. 2	Complete Physiological Unknown Isolation of Staphylococci & Streptococci (continued) The Enterics, Serological Reactions Bacteriological Examination of Food (continued) Bacteriological Examination of Water (continued)	Exercises 45-48 <sup>2</sup> Exercises 70-75 <sup>2</sup> Exercises 77 <sup>2</sup> Exercises 60, 61 <sup>2</sup> Ch. 5, 6, 10, 18 <sup>3</sup>
16	16	9	<b>FINAL EXAM &amp; PRACTICUM - Lab Clean-up</b>	
17 <sup>4</sup>	18	16	<b>FINAL EXAM &amp; PRACTICUM - Lab Clean-up</b>	

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## TENTATIVE MICROBIOLOGY LABORATORY SCHEDULE<sup>1</sup> (Friday Section)

<u>Week</u>	<u>Lab</u>	<u>Date</u>	<u>Topic</u>	<u>Text Chapter</u>
1	1	Aug. 28	Course Introduction Laboratory Safety Procedures Metric System	Preface <sup>2</sup> Front Cover <sup>2</sup> Back Cover <sup>2</sup> Pp. vii-xv <sup>2</sup> Ch. 3; App.E <sup>3</sup>
2	2	Sept. 4	Microscopy: Brightfield Microscopy Microscopy Techniques Lab Skill Evaluation I (Microscopy)	Exercises 1 - 5 <sup>2</sup> Ch. 3 <sup>3</sup>
3	3	11	Survey of Microorganisms Ubiquity of Microorganisms Effectiveness of Hand-Scrubbing	Exercises 6 – 8 <sup>2</sup> Exercises 38 <sup>2</sup> Ch. 3 <sup>3</sup> , Handout
4	4	18	Cultural Characteristics of Microorganisms Aseptic Techniques Pure Culture Techniques Preparation of a Bacterial Smear, Simple Staining	Exercises 40 <sup>2</sup> Exercises 9 - 12 <sup>2</sup> Ch. 6, 3 <sup>3</sup>
5	5	25	Differential Staining Techniques Gram Stain & Gram Stain Unknown Ziehl-Nielsen Acid-Fast Stain Morphological Unknown	Exercises 15,17 <sup>2</sup> Ch. 3 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
6	6	Oct. 2	Special Staining Techniques Endospore Staining Negative Staining: Capsule Stain Metachromatic Granule Staining Morphological Unknown (continued)	Exercises 13, 14, and 17 <sup>2</sup> Ch. 3 <sup>3</sup> Handouts
7	7	9	Cultivation of Anaerobes Determination of Bacterial Motility Complete Morphological Unknown	Exercise 18, 21 <sup>2</sup> Ch. 4, 6 <sup>3</sup>
8	8	16	Enumeration of Bacteria and Phages (Demonstration) The Bacterial Growth Curve	Exercises 22, 25 <sup>2</sup> Ch. 6 <sup>3</sup>
9	9	23	<b>EXAM I &amp; PRACTICUM</b> The Bacterial Growth Curve (continued)	
10	10	30	Effects of Temperature, and Ultra-Violet Radiation on Bacterial Growth	Exercises 29, 30, 33 <sup>2</sup> Ch. 7, 20 <sup>3</sup>

<u>Week</u>	<u>Lab</u>	<u>Date</u>	<u>Topic</u>	<u>Text Chapter</u>
11	11	Nov. 6	Evaluation of Antiseptics, Disinfectants on Bacterial Growth Antimicrobial Sensitivity Testing Physiological Unknown	Exercises 36, 37 <sup>2</sup> Ch. 7, 20 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
12	12	13	Physiological Characteristics: Oxidation and Fermentation Hydrolytic and Degradative Reactions Multiple Test Media Physiological Unknown (continued)	Exercises 41-43 <sup>2</sup> Ch. 5 <sup>3</sup> Exercises 39, 44 <sup>2</sup>
13	13	20	Physiological Characteristics: Oxidation and Fermentation (continued) Hydrolytic and Degradative Reactions Miniaturized Multi-test System Demonstration Physiological Unknown (cont.) Isolation of Staphylococci & Streptococci Bacteriological Examination of Food Bacteriological Examination of Water	Exercises 41-43 <sup>2</sup> Ch. 5 <sup>3</sup>  Exercises 45-48 <sup>2</sup> Exercises 39, 44 <sup>2</sup> Exercises 70, 71 <sup>2</sup> Exercises 60, 61 <sup>2</sup> Ch. 5, 6, 10 <sup>3</sup>
14	14	27	<b>THANKSGIVING HOLIDAY NO CLASS</b>	
15	15	Dec. 3	Complete Physiological Unknown Isolation of Staphylococci & Streptococci (continued) The Enterics, Serological Reactions Bacteriological Examination of Food (continued) Bacteriological Examination of Water (continued)	Exercises 45-48 <sup>2</sup> Exercises 70-75 <sup>2</sup> Exercises 77 <sup>2</sup> Exercises 60, 61 <sup>2</sup> Ch. 5, 6, 10, 18 <sup>3</sup>
16	16	10	<b>FINAL EXAM &amp; PRACTICUM - Lab Clean-up</b>	
17 <sup>4</sup>	18	17	<b>FINAL EXAM &amp; PRACTICUM - Lab Clean-up</b>	

1. Exact lecture topics are subject to change. In fact, all parts of this document (including policies and procedures) are subject to change at the discretion of the professor. 2. Indicate reading assignments from the Benson's Lab Manual. 3. Indicate reading assignments from text by Tortora, Funke, and Case. 4. The Professor reserves the right to use week 17 to schedule the Final Exam as part of the Final Examination Week. Final Grades will be available online by Sat., Dec. 19, 11:00 P. M.

## RECORDING YOUR GRADES

Please, use the table below to record your performance in each of the evaluations administered during this semester. This will help you keep track of your performance at all times.

### STUDENT GRADE SHEET

Assessments	(Max.)
EXAM I & PRACTICUM	(100)
FINAL EXAM & PRACTICUM	(100)
Lab Reports	(130)
Attendance, Participation, Safety infringements	(50)
Lab Skill Evaluations	(100)
TOTAL	(480)
GRADE	

## MICROBIOLOGY LABORATORY RULES AND PROCEDURES

### READ CAREFULLY

1. No eating (this includes chewing gum, drinking, application of lip-gloss or lipstick, or smoking in the lab), do not bring food or beverages into the lab. You will be provided a locker outside the lab during the course of the semester where you will keep your laboratory gear and books during the course of the semester. You will be required to keep materials that you will **NOT** use in the lab (such as back packs and other books and didactic materials) **OUTSIDE** the Microbiology laboratory.
2. Always wear closed shoes (**closed toe and heel shoes**) and socks while attending lab as a precaution against any broken glass or roaming microorganisms. Heat, humidity, stench, and stains, dress casually (no shorts or clothing that exposes your skin is allowed) and bring a lab coat to protect your body and clothing. Make sure you keep the laboratory coat in a closed plastic bag while in the locker. Keep the habit of washing the laboratory coat every two weeks and bring it back in the closed plastic bag. Place the laboratory coat in a plastic bag, inside the locker while you're not in the laboratory.
3. Disinfect the lab table at the beginning and end of each laboratory period. Discard paper towels used for this purpose in the **BIOHAZARD** wastebasket or container. Always wash your hands before and after you complete your laboratory experiments (before exiting the Microbiology Lab.)
4. Always be prepared for lab; bring all lab equipment and read assigned lab modules thoroughly **before** each lab period.
5. Cover any spills with disinfectant and paper towels. Leave paper towels soaking in disinfectant for approximately 20-30 minutes before cleaning it up. Discard all contaminated materials in the **BIOHAZARD** wastebasket or container.
5. When using cultures from test tube rack labeled **LAB CULTURES ONLY**, always return the culture to this rack after use.
7. When inoculating cultures into **any** type of medium, remember to always use aseptic technique. Never lay test tubes on the laboratory bench top; always use a test tube rack.
8. When using the incubator, be careful not to slam the doors. Also, be sure that the latches are closed properly to aid in proper incubation temperature.
9. When doing any staining procedures, be careful to keep all stains, especially all types of alcohol, away from the Bunsen burners unless otherwise stated. Some staining procedures require heating by the Bunsen burner.
10. Be careful to **always** mark the Petri dishes with the date, type of medium, the name of the microorganism, your name, the appropriate temperature and sector numbers. Always incubate Petri dishes "bottom-side up" or "agar-side up", unless otherwise indicated. Make sure you always place labels on the outside walls of test tubes; not on the caps of the test tubes.

11. **DISPOSAL:** Dispose of pipettes and unwanted slides in disinfectant jars located on both end and middle table. Put used or contaminated Petri dishes, used gloves, and micro-centrifuge tubes with active bacterial cultures in the BIOHAZARD wastebasket. Placed used test tubes in racks in the container marked **TO BE AUTOCLAVED**. Put large tubes in large-hole racks, small tubes in small-hole racks. Always **remove** all labels on cultural tubes before disposal.
12. Always exercise care when handling and cleaning your microscope. This will aid in your observing of organisms. In addition, you and your partner will be responsible for maintaining assigned microscopes, as there will be periodic microscope checks.
13. **Wash hands thoroughly with soap before leaving the lab.**
14. Wear safety glassware (goggles) at all times during the laboratory period.
15. If there are any questions in your mind about any type of procedure, please ask before doing anything. This may save you some time and prevent any costly errors. Always be as cautious in this lab as you would expect a professional to be around you.

You will not be allowed in the laboratory if you do not wear the appropriate laboratory gear. Any lab you missed will have to be made up in any of the other scheduled laboratory sessions during the same week the particular exercises were scheduled at the Wolfson Campus.

## Microbiology Lab Contract

I, \_\_\_\_\_, Student ID \_\_\_\_\_, understand and acknowledge that:

- (i) I read and understood the Syllabus, all safety dispositions of the Microbiology Laboratory, will comply with all safety regulations at all times while in the Microbiology laboratory and or surroundings.
- (ii) I may obtain assistance from my instructor and from the Science Lab located in Room 2221.
- (iii) If applicable, I will turn off my cell phone and put it away so that it is not visible to me or to the instructor.
- (iv) I understand that points will be deducted from my attendance, technique and participation grade if I bring my cell phone into the Microbiology Laboratory.
- (v) I MAY NOT use my cell phone calculator capabilities in class or during exams.
- (vi) There are NO MAKE-UP exams.
- (vii) NO EXTRA CREDIT will be considered.
- (viii) I may not leave the classroom once the test begins.
- (ix) Cheating and disruptive behavior may result in serious consequences such as course failure or dismissal from the college.
- (x) The course schedule may change due to unforeseen circumstances.
- (xi) The final exam will be given during date and time scheduled by the Registrar's office.
- (xii) In the case of an emergency I will immediately notify the instructor.

\_\_\_\_\_  
Student's Name (please print)

JUAN M. MORATA  
Instructor's Name

\_\_\_\_\_  
Student's Signature

Date: \_\_\_\_\_