|  |
| --- |
| **Screen Shot 2014-04-28 at 6** **MICROBIOLOGY LABORATORY** |

# MCB2010L COURSE SYLLABUS SPRING 2021

MCB2010L, 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 & 20862086L) 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 1045/1045Lwith 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.

The microbiology laboratory presents varying degrees of risk for laboratory personnel (students, technicians, and faculty), individuals outside the laboratory, and the Environment. Consequently, this laboratory provides the minimum standards for laboratory practices, equipment, and microbe handling of Biosafety Level 2 (BSL-2), which includes microorganisms commonly encountered in the community and which present moderate environmental and or health hazards. These microbes are associated with human diseases of varying severity. Individuals may perform laboratory work, which is not prone to generating splashes or aerosols using standard laboratory practices. The microorganisms used include laboratory strains that do not pose the same threat of infection as primary isolates of the same organisms obtained from clinical specimens. Nevertheless, some of these are considered opportunistic pathogens and these should be handled by observing aseptic techniques and precautions. For those individuals with chronic disorders, immune-compromised disease and/or are undergoing extensive chemotherapy, you may consider taking this laboratory at a time when you are released by your primary care physician to work in a BSL-2 laboratory. Please consult with your professor or the chair of the department if necessary. Additionally, if you are in close contact with individuals who may be under these circumstances, or are taking anti-tissue rejection medications, you should discuss your lab attendance with their physician.

**Professor**: Larryn Farris, PharmD, MPH, MS

**Section(s) Reference No**: **8475**; Tuesdays: 5:40 – 9:00 pm; Blackboard Collaborate Ultra

Note: Labster is used as the online Labs platform and the purchase is required by students.

**Co-requisite Course:** Microbiology, MCB2010

**Office Hours:** Students may contact me during my office hours (listed below), by e-mail (allow up to 48 hours for a response/excluding holidays and weekends). Email is the best method to contact me.

|  |
| --- |
| **Tuesdays via Blackboard Collaborate**  |
|  5:00 – 6:00 pm  |

**Professor: Larryn Farris, PharmD, MPH, MS**

**Office:** RM 2221

**Office Phone:** (305) 237-2221

**Departmental Fax number:** (305) 237-7835

**E-mail:** lfarris@mdc.edu

**Required Textbooks:** Leboffe, M. J., and B. E. Pierce. 2015. Microbiology Laboratory Theory & Applications. Fourth Edition. Morton Publishing Company, Inc. Englewood, CO. (ISBN 978-1-61731-250-2)

**Note: Labster is used as the online Labs platform and the purchase is required by students. Labster can be accessed from the Blackboard course page.**

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.

**Link to Course Materials:** Students can find materials for this course including Power Point presentations (in PDF format), other handouts used in the course, guidelines to write each lab report, and other course relevant information through the following link: http://mdc.blackboard.com **This link will be updated frequently by the Professor; so keep a habit of checking it on a regular basis and download the necessary information for each lab.** You will need your MDC login name and password to be able to access the materials in the course link folder. Please take some time to navigate the course link so that you will be able to locate the course information that you will need.

**Link for weekly labs AND OFFICE HOURS**:

<https://us.bbcollab.com/guest/83ef338dff33410cb8eed5586bb0fa34>

This course is ASYNCHRONOUS. This means we will NOT meet each week, but you will be required to watch pre-recorded lectures and complete weekly assignments (a quiz OR a discussion post). We will use Blackboard Collaborate Ultra for all course meetings and office hours. We will NOT meet in person this semester! If a lab meeting is scheduled, attendance is mandatory and will be taken. Lectures will be pre-recorded and available on Blackboard. To prepare properly for class each week, you are expected to read the labs in the lab manual and watch the recordings PRIOR to completing the weekly assignment.

**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, she 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 must purchase each of the following:

 1. Sharpie® fine-tip marking pen

 2. 10 cm ruler

 3. **Long sleeve-knee-level** Lab coat to protect clothes and skin from spills. **Lab coat is required on first day of class**

 4. Safety glassware (goggles)

 5. Latex/nitrile gloves

 6. Masking Tape

 7. Slide Box (available from Carolina Biological Supply company <http://www.carolina.com>)

Temporary lockers are located inside the lab for students to place their backpacks and purses to prevent contamination of such items with microbes in the laboratory. The locker number will match your microscope cabinet number and you may only take out your laboratory manual and notebook, which will be the only items in contact with our BSL2 laboratory.

**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!! We will meet using Blackboard Collaborate Ultra.** 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 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 15 minutes after the lab session has started and students will not be allowed to enter the lab**. **You are considered late if you log into Blackboard Collaborate Ultra 5 minutes after the start of class (5:50pm**). You must attend 99% of online lab sessions to be considered present for that lab session. If you are more than 30 minutes late, you will be denied entry and marked absent for that week’s lab. You will not be allowed to make up any lab you were denied entry to due to tardiness. 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. If you are absent from lab, you will not be able to submit the homework for that corresponding week. 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 three points from the final attendance and participation grade for each late or missed laboratory session will penalize absences/tardiness to scheduled lab sessions. Students will not be allowed to make-up more than 3 missing laboratory exercises (see below). It is neither the professor’s responsibility nor the Prep Room Staff 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 are not participating. If you are disrupting the class or showing the same behavior among the members or your group, you are not participating.

**Laboratory Make-ups:** There are no lab make ups.

**Lab Exams:** There will be two exams during the semester. Each exam is worth 100 points. All exams will be administered ONLINE USING LOCKDOWN BROWSWER. **The midterm and final exams will be AVAILABLE for 48 hours. LATE SUBMISSIONS AND/OR MAKE UPS WILL NOT BE PERMITTED.** There are no make ups or retakes for any assignments due to technical issues.

**Link to download Lockdown Browser:**

**windows link:**[**http://www.respondus.com/lockdown/download.php?id=953813111**](http://www.respondus.com/lockdown/download.php?id=953813111)

**mac link:**[**https://download.respondus.com/lockdown/download.php?ostype=2&id=953813111**](https://download.respondus.com/lockdown/download.php?ostype=2&id=953813111)

**Lockdown Browser tutorial:** [**https://youtu.be/XuX8WoeAycs**](https://youtu.be/XuX8WoeAycs)

**Helpful Hints:**

1. **Download Lockdown Browser**
2. **OPEN Lockdown Browser**
3. **USING THE LOCKDOWN BROWSWER APPLICATION, NAVIGATE TO MDC.BLACKBOARD.COM**
4. **Enter MD username and password**
5. **Click the EXAM tab on the course homepage**
6. **Navigate to the exam you wish to take**

Please note: **THERE WILL BE NO MAKE-UP EXAMS.** Therefore, attendance to each exam (on time) is absolutely mandatory. LATE ENTRY IS NOT PERMITTED ONCE THE EXAM HAS BEGUN. **Each exam will begin promptly at 5:40 pm, if you are late, you will be denied entry**. 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 recitation 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. Students will not also be allowed to photograph the exams during exam discussions. 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.

Please also ensure that you obtain the **PARSCORE scantron** **form no.** **F-289-PAR-L** from the bookstore as this will be used to place your responses during examinations. This form is available for the Wolfson Campus bookstore. **No other scantron forms will be accepted and will not be graded.**

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 exam. In addition, you might also want to bring a #2 pencil, eraser, and calculators for the exams since the professor will not provide these materials. Neither cell phone calculators nor programmable calculators will be allowed during examinations.

**Technique, Attendance, and Participation:** Your professor will evaluate your technique at all times. Your participation will also be evaluated. Remember that 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! If you do not actively participate in lab and complete each lab INDIVIDUALLY, you will lose attendance points.

**Quizzes and Exams Format**

**Quizzes will be based on the experiments to be done that day or on the previous week’s Lab. Quizzes will be posted on Blackboard on TUESDAYS at 12:00am and close SUNDAYS at 11:59pm. Multiple choice, true or false, short answer questions. Content covered is indicated in the course schedule. Spelling of some names and a technique description may be part of a quiz. No open notes permitted. 15 minutes are allowed to answer up to 10 questions. There are NO makeups, EXEMPTIONS, OR LATE SUBMISSIONS for quizzes or discussion posts.**

**In the midterm and final exams, you have to identify what you are looking at from pictures. THE MIDTERM EXAM WILL BE POSTED ON BLACKBOARD ON March 16th AT 7:00PM. THE MIDTERM WILL BE OPEN FROM March 16th UNTIL March 18th AT 7:00PM. The midterm and final exams will be posted on Blackboard using Respondus Lockdown Browser. The FINAL EXAM WILL OPEN at 7:00pm on April 27th CLOSE 8:00PM ON April 29th. The exam will be contain at least 27 MULTIPLE CHOICE questions. You will have 60 minutes and ONE SITTING to complete the MIDTERM AND final exam. There will be NO MAKEUPS OR LATE SUBMISSIONS for the midterm and final exams. NO EXCEPTIONS FOR THE FINAL AND MIDTERM EXAMS. THE EXAMS MUST BE COMPLETED IN ONE SITTING. YOU WILL HAVE 60 MINUTES TO COMPLETE 27 QUESTIONS.**

**Discussion Posts**

**This course consists of 15 weeks covering different topics each week. Some weeks you will have mandatory postings (see schedule at the end of this document). Completion of all mandatory postings ON TIME will count as 50 points toward your grade. Five (5) of BONUS points are for posting your introduction at the beginning of the semester. (instructions can be found on the discussion board under INTRODUCTIONS)**

**Postings consist of a written discussion initiated by a question or case provided at the beginning of the assigned week. You are required to post a comment to a classmate. Your response will count for 5 points of the total for that week’s posting.**

**Postings are due within the week they are assigned. All discussion posts will be available beginning Tuesdays at 12:00am and due Sunday at 11:59pm during the week they are assigned. There will be five mandatory postings each worth 10 points each. Late postings will NOT be accepted. There are no Makeups or exemptions.**

**Introduction BONUS post**

**Include your name and where you are from, why you are taking this course, future career goals, one fun fact about yourself, and three hobbies you enjoy.**

**What is a good posting?**

**One that displays superior knowledge, understanding and insight through the frequent use of concepts, theories and terms learned in the course. High quality, very clearly presented with much creativity. Grammar and/or spelling are excellent. Appropriately referenced.**

**What is a good comment to a classmate’s posting?**

**One that engages the issues presented by offering a contrasting opinion, fact or knowledge obtained from a scientific source. It can also offer supporting facts and agreement to the information presented by providing additional knowledge. (Just saying “I agree with you” does not count)**

**(I will strongly encourage you not to wait until the last day to post your work. The quality of your learning decreases significantly when everybody posts at the last minute because it reduces the opportunities for interaction.).**

**Required 12 Labster Simulations:**

**Biosafety**

**Bacterial Isolation**

**Microscopy**

**Confocal Microscopy**

**The Gram Stain: Identify and differentiate bacteria**

**Identification of Unknown Bacteria: Help save baby Kuppelfangs from an epidemic**

**Bacterial Growth Curves: Experiment with Bacterial Growth**

**Bacterial Quantification by Culture: Count bacteria with serial dilution**

**Pipetting: Master the Technique**

**Gene Transfer in Bacteria: Prevent the rise of the superbugs!**

**Hematology: Introduction to Blood**

**Antibodies: Why are some blood types incompatible?**

**THERE ARE 12 REQUIRED LABSTER SIMULATIONS. THE DUE DATE FOR EACH SIMULATION IS APRIL 18TH AT 11:59 PM. THERE ARE NO LATE SUBMISSIONS, MAKE UPS, OR EXEMPTIONS. EACH LABSTER IS GRADED BASED ON COMPLETION!!! LABSTER SIMULATIONS COUNT 50 POINTS TOWARD YOUR FINAL GRADE**

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.

**Academic Dishonesty Policy:** If your are suspected of cheating, plagiarism, or any other type of academic dishonesty as outlined in MDC procedure 4074 of the [Students Rights and Responsibilities Handbook](http://www.mdc.edu/policy/student_rights_and_responsibilities.pdf), you will be subjected to procedural due process as outlined in procedure 4074 of the same handbook. Honors students should refer to the Honors College Code of Conduct.

**MCB2010L LAB SKILL EVALUATIONS**

Students will also be evaluated according to skill and dexterity on basic microbiology techniques related to establishing pure culture, microscopy, and staining techniques. There will be a 50 point quiz to evaluate the student’s basic understanding of the evaluations. The EXAM will open on February 1st at 12:00 AM and will close on March 14th at 11:59PM. Late submissions OR MAKE UPS will not be accepted! The EXAM will contain multiple choice, fill in the blank, or essay format and will utilize **Respondus Lockdown browser.**

|  |  |  |
| --- | --- | --- |
|  | Lab Skill Evaluations | Points |
| I | Aseptic transfer of microbes (Exercise 1-3)  |   |
| II | Streaking for isolation (Exercise 1-4) |   |
| III | Preparation of bacterial smears with Gram stain (Exercise 3-7) |  |

 Total 50

**Weekly Assignments:** It is understood that working all questions/problems at the end of each exercise 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.

**Unknown Lab:** The unknown lab is designed for the student to identify TWO unknown bacteria based on a series of tests. A dichotomous key and biochemical tests results are provided to ensure proper identification. The student must use the dichotomous key to identify their unknown. Several test results are provided, but all are not needed! Follow the dichotomous key to identify both unknowns! The unknown lab worksheet is due (posted on Blackboard) **April 11th at 11:59 pm.**

**Grading:** Grades for the laboratory portion will be determined as follows:

|  |  |  |
| --- | --- | --- |
| Quizzes |  | 50 points |
| Assignments/Discussion Posts |  | 50 points |
| Labster Simulations |  | 100 points |
| Lab Skill Evaluations |  | 50 points |
| Midterm Examination & Practicum |  | 100 points |
| Final Examination & Practicum |  | 100 points |
| Unknown Lab |  | 50 points |
| Total possible points |  | 500 points |

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:

|  |  |  |
| --- | --- | --- |
|  Grade  |  | Number of Points (Total of 500) |
|  A = 90-100 |  | 450 |
|  B = 80-89 |  | 400 |
|  C = 70-79 |  | 350 |
|  D = 60-69 |  | 300 |
|  F = 59 or below |  | ≤ 299 |

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 that 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 **March 17, 2021. Remember that a “W” grade will be a permanent record in your transcript and will count as one attempt for this course.**

**STUDENT RESPONSIBILITIES AND LABORATORY DECORUM**

Professional Students are responsible for taking charge of their own education by being prepared before every laboratory and conducting 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 smoking, eating, and drinking, which is prohibited in all MDC classrooms; unwarranted noises, talking among students while the professor explains important concepts or answers questions posed by another student, unacceptable gestures, leaving class early and the operation of electronic artifacts (beepers, cellular phones, earpieces; including text messaging) during regular 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.

**Religious Holidays:** MDC recognizes that students may be excused from class during observance of religious holidays; however, the student must notify the professor at least two weeks in advance and will be responsible for any material covered during the excused absence. Students will not be given extra time to study for the exam will take the examination(s) in-advance of the religious holiday at a time specified by the professor.

**Electronic Calculators:** Electronic calculators are essential for the successful completion of some homework assignments, as well as for some exams, and must be brought to class every time the class meets. You are required to bring a single line, non-programmable calculator (preferably solar powered) every time you attend class (especially important during some quizzes and exams).

***Programmable and graphing calculators are not allowed in this course. No two students are allowed to share a calculator, and you cannot use your cell phone as a calculator during an exam. Students who fail to comply with these regulations will be asked to leave the classroom and will earn a grade of zero (0) in that particular exam.***

**Emergencies:** In case of an emergency (hurricanes or inclement weather), contact the Miami Dade College emergency number that you can use to inquire about the status of the College during an emergency on a 24-hour basis. The number is 305- 237-7500.

**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****Adopted September 22, 2006** |

**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**

|  |  |  |
| --- | --- | --- |
| Week | Topics | Readings/assignments |
| 1 Jan 12 | Course Introduction, Laboratory Safety ProceduresMetric System, Microscopy: Bright-field Microscopy | **Exercises 2-1, 3-1, 3-2, 3-3, 3-4, 3-11, 3-12, 12-1, 12-3, 12-4**Introduction post |
| 2 Jan 19 | Microscopy  | **Exercises 2-1, 3-1, 3-4, 3-3** |
| 3 Jan 26 | Ubiquity and Diversity of Microorganism  | **Exercises 3-1, 3-2, 3-3, 3-4, 3-12, 12-1, 12-3, 12-4**Quiz 1 |
| 4Feb 2 | Cultural Characteristics of MicroorganismsAseptic Techniques, Pure Culture TechniquesPreparation of the Bacterial Smear, Simple Staining | **Exercises 1-3, 1-4, 2-2, 2-3, 2-4, 2-6, 3-5**Discussion Post 1 |
| 5Feb 9 | Differential Staining TechniquesGram Stain, Kinyoun Acid-Fast Stain | **Exercises 3-7, 3-8, 3-13, 4-5, 4-6, 5-31, 7-7, 7-8, 7-9**Quiz 2 |
| 6Feb 16 | Special Staining Techniques: Capsule, Negative, and Endospore StainingDifferential and Selective Media | **Exercises 3-9, 3-10, 3-13, 4-5, 4-6**Discussion Post 2 |
| 7Feb 23 | Physiological Characteristics of Bacteria:Oxidation and FermentationHydrolytic and Degradation ReactionsMultiple Test Media | **Exercises 4-4, 4-5, 4-6, 5-1, 5-2, 5-3, 5-4, 5-6, 5-7, 5-8, 5-11, 5-12, 5-13, 5-15, 5-16, 5-17, 5-18, 5-20, 5-21, 5-23, 5-27**Quiz 3 |
| 8Mar 2 | Miniaturized Multi-test System Demonstration | **Exercises 5-28, 5-29, 5-30** |
| 9Mar 9 | Cultivation of AnaerobesDetermination of Bacterial Motility**Lab Skill Evaluation Due March 14th at 11:59 pm** | **Exercises 2-7, 2-8, 3-11****Discussion Post 3** |
| 10Mar 16 | MIDTERM EXAM (OPENS March 16th AT 7:00 PM AND CLOSES ON March 18th AT 7:00 PM) |  |
| 11Mar 23 | Microbial Growth, Plate Counting, Spectrophotometer | **Exercises 1-5, 6-1, 6-4, 6-5**Quiz 4 |
| 12Mar 30 | Enumeration of Bacteria and Phages (Demonstration)The Bacterial Growth Curve (Handout)Cultivation of Anaerobes, Bacterial Motility (contd.) | **Exercises 1-5, 6-1, 6-4, 6-5**Discussion Post 4 |
| 13Apr 6 | Unknown Lab – Due April 11th at 11:59pm |  |
| 14Apr 13 | The Bacterial Growth Curve, Effects of Temperature, Ultra-Violet Radiation, Antiseptic/Disinfectants on Bacterial Growth, The Kirby-Bauer Antimicrobial Sensitivity Testing, Isolation of Staphylococci & Streptococci (handout), Bacteriological Examination of Food and Water  | **Exercises 4-2, 4-3, 4-4, 5-24, 5-25, 5-26, 5-27, 7-3, 7-7, 7-8, 7-9, 8-13**Quiz 5 |
| 15Apr 20 | ABO Blood Typing, Selective and Differential Media | **Exercises 11-4, 11-5**Discussion Post 5 |
| 16Apr 27 | FINAL EXAM (OPENS April 27th AT 7:00 PM AND CLOSES April 29th AT 7:00 PM) |  |

**1.** Exact laboratory topics are subject to change. In fact, all parts of this document (including policies and procedures) are subject to change at any time and at the discretion of the professor.

 **2.** Indicate reading assignments from the Leboffe & Pierce’s Lab Manual.

 **3.** Indicate reading assignments from textbook by Tortora, Funke, and Case (textbook used at the Wolfson Campus)*.*

 **4.** Final Grades will be available online by Thursday, April 29th at 11:00pm

**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.) |
| Quizzes | (50) |
| MIDTERM EXAM & PRACTICUM | (100) |
| FINAL EXAM & PRACTICUM | (100) |
| Discussion Posts/Assignments | (50) |
| Labster Simulations | (100) |
| Unknown Lab | (50) |
| Lab Skill Evaluations | (50) |
| TOTAL | (500) |
| GRADE |  |

**MCB2010L – MICROBIOLOGY LABORATORY COMPETENCIES**

**Competency 1**: The student will differentiate among groups of microorganisms employing microscopy techniques by:

1. Distinguishing the major characteristics of the various types of eukaryotic microorganisms.
2. Observing the major types of common protozoans including amoebae, flagellates, ciliates and sporozoans.
3. Identifying the morphology and structural components of fungi including asexual and sexual spores.

**Competency 2**: The student will demonstrate competence in staining and examining of microorganisms by:

1. Identifying the major parts and functions of the microscope.
2. Calculating total magnification for each of the lens of the microscope.
3. Demonstrating the correct and safe use of the microscope.
4. Demonstrating the correct use of the oil immersion objective.
5. Explaining resolving power, parfocal, working distance, size and depth of viewing field.
6. Explaining the various types of stains and their uses.
7. Demonstrating the correct procedures for the following stains: simple, Gram, acid-fast, endospore and negative stain.
8. Preparing slides for the studying living microorganisms and their motility.

**Competency 3**: The student will learn the techniques for isolating and culturing microorganisms by:

1. Demonstrating aseptic techniques for transferring bacterial cultures.
2. Demonstrating techniques for isolation of pure cultures.
3. Explaining methods for sterilizing materials.
4. Explaining procedures for making serial dilutions.
5. Performing serial dilution for plating and counting viable cells.
6. Demonstrating the use of a colony counter.
7. Demonstrating the use of spectrophotometer to measure bacterial growth.
8. Demonstrating the use of selective, differential and enrichment media.
9. Differentiating microorganisms based on their ability to use oxygen for growth.
10. Demonstrating the effects of temperature on bacterial growth.

**Competency 4**: The student will learn the basic physical and chemical methods for microbial growth control by:

1. Explaining the effect of heat on the control of bacterial growth.
2. Demonstrating the effect of ultraviolet irradiation on bacterial growth.
3. Evaluating the activity of various disinfectants and antiseptics on microbial growth.
4. Evaluating the effects of various antibiotics and chemotherapeutic agents on microbial growth.

**Competency 5**: The student will learn various biochemical test procedures for identification of bacteria by:

Identification by:

1. Demonstrating differences in carbohydrate metabolism of microorganisms.
2. Demonstrating the use of biochemical tests to assess the presence of enzymes and metabolic pathways in bacteria.
3. Explaining the use of different media to test metabolic activity of unknown bacteria.
4. Demonstrating the use of commercial rapid test tools for identification of unknown bacteria.
5. Demonstrating the use of selective media and procedures for testing microbial contamination of food or water.

**Competency 6**: The student will demonstrate the presence of microorganisms in the environment and in their use in industry by:

Identification by:

1. Demonstrating the presence of microorganism in various environments.
2. Demonstrating the usefulness of hand scrubbing to control bacterial concentration on skin surfaces.
3. Demonstrating the use of serial dilutions and standard plate count to enumerate viable bacteria in a food or soil samples.
4. Demonstrating the principle and practice of food production using microbial fermentation.

|  |
| --- |
| **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 closed heel shoes such as sneakers)** **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, 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.

1. 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, LATE SUBMISSIONS, EXEMPTIONS FOR EXAMS, QUIZZES, DISCUSSION POSTS, AND ALL OTHER ASSIGNMENTS.

 (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.

1. The final exam will be given during date and time scheduled by the Registrar’s office.
2. In the case of an emergency I will immediately notify the instructor.
3. There will be no provisions available for ACCESS students in the ACCESS department during midterm and final exams, as these require a practical component. Students will be encouraged to arrange time to perform the exam in the laboratory or under the supervision of the staff at the Natural Sciences Department. Exams will not be sent to the ACCESS department under any circumstances. Please consult your Professor ahead of time.

 LARRYN FARRIS

Student’s Name (please print) Instructor’s Name

Student’s Signature

Date: