SYLLABUS

Microbiology Laboratory (MCB2010L, Section 807340)
(Web-Enhanced Course)

"The ultimate measure of a man is not where he stands in moments of comfort and convenience, but where he stands at times of challenge and controversy"
—Dr. Martin Luther King, Jr

Term: Fall 2014-1
Class location: Room 1663
Class Meeting time: Tuesdays, 5:40PM – 9:00PM

Professor: Dr. Félix E. Rivera-Mariani
Office: Room 1663
Office Hours: Tuesday: 3:00PM – 5:00PM or by appointment
Thursday: 3:00PM – 5:00PM or by appointment

Email: friveram@mdc.edu
Phone: 800-319-4380

Required Textbook: Leboffe, M.J. and B. E. Pierce. 2010. Microbiology Laboratory Theory & Applications. 3rd Ed. Morton Publishing Company, Inc. Englewood, CO. (ISBN 978-0-86582-830-9).

e-book: **http://www.coursesmart.com/IR/7362944/9780895828309?__hdv=6.8**

Co-requisite: Microbiology (MCB2010)

I. Rationale of the course

To provide a hands-on learning experience of the different approaches used in the laboratory to study and identify microorganisms based on their morphological (i.e. size, appearance) and physiological properties.

II. Course Materials (Web-Enhanced Course)

Course materials, including syllabus, Flipped classroom lectures, Lab worksheets, and supplemental materials, will be available at the following websites:

- Miami-Dade Blackboard website:
  https://mdc.blackboard.com

III. Required Materials

- **a.** Sharpie fine-tip pen
- **b.** 10 cm ruler
- **c.** Long sleeve Lab coat
- **d.** Safety glassware
- **e.** Latex/nitrile gloves
- **f.** Masking tape
- **g.** Combination (**no key lock**) for the hall lockers
- **h.** Slide blox (available from Carolina Biological Supply company http://www.carolina.com)

IV. Methods of Instructions

Flipped classrooms, in which digital formats of lectures and course materials will be made available to the students online prior to meeting in class.

Pre-lab reading assignments will aid your preparation for the lab meeting, and in understanding the topics and methods to be covered in the lab. A series of online questions designed by the professor, and they must be answered prior to the lab meeting.

Laboratory Exercises will be performed during each lab meeting, and a corresponding report must be turned in according to the syllabus schedule.

Group work to facilitate the discussion of laboratory methods, and examination and interpretations of laboratory results.

V. Academic Integrity

Each student is expected to maintain a high level of integrity and abide by the procedure 4070 of the Miami-Dade College Student Rights and Responsibility Handbook. Any work submitted by a student in this course for academic credit will be the student's own work. For the purpose of this course, collaboration is allowed in the following instances: in-class group work, case studies discussions, or when stated by the professor. Nevertheless, each student must submit their individual work unless stated otherwise by the instructor.

As part of a collaborative and encouraging classroom, you are encouraged to study together and to discuss topics and concepts covered in class with other students. You can obtain "consulting" help from students as well as provide "consulting" help to other students. However, this allowed form of cooperation should never involve one student having possession of a copy of all or part of the work done by another student or someone else, in the form digital files or hard copy documents.

In the case that copying occur, both the student who copied work from another student and the student who contributed to this behavior will both automatically receive a zero for the corresponding assignment. Penalty for violation of this Code can include failure of the course and/or notifying the corresponding University authorities for disciplinary action.

During exams (i.e. quizzes and exams), you must do your own work. Talking or discussion is not allowed during the examinations. In addition, you cannot compare papers, copy from others, or collaborate in any way. Any form of the behaviors mentioned above will result in failure of the exam and can include notifying the corresponding University authorities for disciplinary action. **Cell phones cannot leave the classroom during exams, and must be turned off during class.**

Any form of Academic Dishonesty listed in the Miami-Dade College Student Rights and Responsibility Handbook will not be accepted during in the course.

Attendance

Attendance to each class sessions is essential for your learning. The Microbiology Lab course requires time and effort in order to learn and accomplish your goals in the course. In addition, **attendance will count 20 points of your final grade**. For each unexcused absence, **1 point will be deducted**; **for each unexcused tardiness, 0.5 point will be deducted.** In the event of an absence, the student will be allowed to make up work if the absence results from one of the following:

- Official campus activities (as designated by MDC)
- Family or personal emergencies (as designated by MDC)
- Medical reasons (discussed with the instructor)
- Work-related reasons (discuss with the instructor)

There are no make-up Exams!

Laboratory Make-ups: In case you miss a lab meeting, the student **can only make up the lab** during the week of the lab. It will be the student's responsibility to make the lab in another lab session during the corresponding week. In order to be allowed to make up the lab, the student must bring a note signed by the professor in charge of your lab section before being allowed to make up a lab. **There are no exceptions**

Late policy

Unless arrangement have been made prior to the due date or have a valid absence excuse (as stated in the Attendance section of this syllabus), half the grade will be deducted for Lab Reports, and 20% will be deduced for the Unknown Writing Assignment (refer to the Lab Skills Evaluations section).

Accommodations for students with disabilities

In compliance with the Miami-Dade College and the Student Rights and Responsibility Handbook policy and equal access laws, I more than available to discuss any necessary academic accommodations that may be required for the student with disabilities. Requests for academic accommodations are to be made during the first week of the term, except for unusual circumstances, so arrangements can be made. Students are encouraged to contact the Student Services to verify their eligibility for appropriate accommodations.

Inclusivity Statement

Members (student, faculty, administrators) of the Miami-Dade College community represent a diversity of backgrounds and perspectives. In this course, and as a member of this community, I am a strong supporter of diversity and its benefits. Therefore, to maintain an adequate learning and diverse environment students in this course are strongly encouraged to:

- share their unique beliefs, experiences, and values
- be open to the opinions and views of others
- honor your colleagues' uniqueness
- appreciate the unique opportunity we have to learn from each other
- value each other's opinions and communicate in a respectful manner

- keep confidential discussions that the community has of a personal (or professional) nature
- take advantage of this opportunity to share ways in which an inclusive environment can be create in this course and across the Miami-Dade College community

Grading Scales:

Item	Points
Lab Report	100
Attendance	20
Participation	30
Lab Skill Evaluations	100
Midterm Exam/Practicum	100
Final Exam/Practicum	100
Total points	**450**

Grade	Percentage	Points
A	100 – 90%	392
B	89 – 80%	347
C	79 – 70%	302
D	69 – 60%	248
F	Below 60%	Below 248

Lab Reports (10 points each)

For each lab exercise, there is a lab report that must be completed and turned in. Due dates for each lab report are listed on the syllabus schedule as well as on the Blackboard website of the course. Answers must be in complete sentences and **binomial scientific names must be underlined when handwritten or italicized when word processed (*e.g. Escherichia coli*)**. If mistakes are made on the lab reports, the students must cross the mistake with a single line, initialize the crossed mistake, and write the correct answer or data. Points will be deducted for the following:

- **1 point** for not underlining binomial scientific names
- **0.5 point** for answering in incomplete sentences
- **0.5 point** for unanswered questions in the lab report
- **0.5 point** for incorrectly answering a question in the lab report
- **0.5 point** for not properly crossing a mistake on the lab report

Lab reports can be submitted in hard copy, or as a digital file into a Dropbox™ folder to be assigned for each corresponding lab report.

Points for Attendance (20 total points)

As stated earlier in the syllabus, attendance counts for a grade. Points will be deducted as follows:

- **1 point** for unexcused absence
- **0.5 point** for unexcused tardiness
- **0.5 point** for leaving early the lab without notice and/or reasons (refer to the Attendance section of the syllabus)

Participation (F*lipped Classroom and Online Guide Questions*; 30 total points)

Flipped Classroom lectures, in addition to greatly contributing to your learning, will count as a grade. Therefore, the student must access the Flipped Classroom session in the MDC Blackboard Learn™ website. Each Flipped Classroom video or session will have short quizzes to help you learn the material. In addition, **online Guide Reading Questions** related to the lab exercise to be performed in the lab for that week will be sent via email, and the student must returned the answered questions. The professor will received an email notification for both, when the student access

the Flipped Classroom section and after the student completes the **online Guide Reading Questions** questions. Points will be deduced as follows:

- **1 point** for not accessing the Flipped Classroom session
- **0.1 point** for incorrect answers in the Flipped Classroom quizzes
- **1 point** for not answering the online Guide Questions
- **0.1 point** for incorrect answers of the online Guide Questions

Due Dates for Flipped Classroom and Online Guide Questions will be posted on the MDC Blackboard Learn™ website.

Exams

Two 100 points exams (Midterm and Final) will be administrated during regular laboratory periods. Refer to the syllabus schedule to know the dates of the exams. Each of the exams will be multiple choice questions. No scantrons are needed: questions will be answered on the printed exam provided. In case a calculator is needed for a given question, each student must bring their own calculator: **no shared calculators will be allowed and cellphones will not be allowed to be used as calculators**.

At the next lab sessions, the students will received a Scorecard of the exam and copy of the exam: **exams must be returned to the professor and cannot be photographed**. Academic Dishonesty regulations, as stated in the MDC student handbook, will be strictly enforced. Any violations will result in a zero on the exam.

There are no make-ups for Exams.

Lab Skills Evaluation

	Lab Skill Evaluations	Points
I	Aseptic transfer of microbes (Exercise 1-3)	10
II	Streaking for isolation (Exercise 1-4)	10
III	Preparation of bacterial smears with Gram stain & Unknown (Exercise 3-7)	10
IV	Morphological and Physiological Unknown (Multiple Exercises)	70

Source: Dr. Edwin Guines-Candelaria

Optional Service Learning Activity (Extra Credit): The purpose of this project is to give you, the opportunity to learn course objectives while performing volunteer service within the local community, especially the MDC Wolfson Campus Microbiology Preparatory Room (Room 1664). Coordinate the hours of service and remaining paper work with the MDC Institute for Civic Engagement and Democracy (ICED) headed by Ms. Tamica Ramos (Office 3410 at the Wolfson Campus). The web address for ICED is: http://www.mdc.edu/iced/

Students may complete 50 hours of service learning at the MDC Wolfson Campus Microbiology Preparatory Room (Room 1664) to be eligible to earn a maximum of 15 extra credit points that will be added to the total number of points that you will accumulate during the semester. You must contact the Microbiology Lab Prep room Manager, Ms. Arelys Zamora-Fuentes to coordinate a mutually agreeable working schedule that will fit the needs of the Microbiology Laboratory Prep room and then set up your service learning account at ICED. You will be on a tentative trial period of two weeks under the supervision of the lab manager and technicians. During this trial period, you must ensure that you follow all instructions and guidelines and demonstrate an excellent laboratory etiquette and performance; otherwise you will be recommended for termination of your service learning experience. For those students that excel in their laboratory performance, you must obtain a composition notebook to maintain a journal of your daily activities and detailed procedures in the Microbiology Laboratory Preparatory Room as you are expected to accumulate a variety of observations and experiences. The format used to maintain your laboratory notebook will be provided to you in a separate handout. Because the preparatory room personnel will be training 3-5 students at a time, additional students will be placed on a waiting list and will be called subsequently according to how they fit into the training schedule. No one will be admitted for service learning after the midterm examination. At the end of your service learning experience you will also be required to provide a reflection/review paper must

have a title page and a cited reference page, in addition to a maximum of 3 pages of content where you will describe and reflect of selected experiences in the Microbiology Preparatory room.

The Professor, laboratory manager and technicians will evaluate your performance and term paper at the end of your service and will recommend a score for your service learning activity based on an approved rubric. The score you obtain for this service learning experience will be added to the total number of points you will accumulate during the semester. You must use ICED to monitor your paperwork and due dates to complete surveys before the completion of the service learning experience. **The deadline for completing and submitting these materials is November 26, 2014.**

Source: Dr. Edwin Guines-Candelaria

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 **November 4, 2014. Remember that a "W" grade will be a permanent record in your transcript and will count as one attempt for this course.**

Source: Dr. Edwin Guines-Candelaria

Laboratory exercises
Metric System Exercises
Microscopy Exercises 3-1, 3-2, Handout
Exercises 3-3, 3-4, 12-1, 12-3, 12-4, 2-1, 3-12 – Ubiquity and Diversity of Microorganisms
Exercises 1-3, 1-4, 2-2, 2-3, 2-4 – Pure Culture Techniques
Exercises 3-5, 3-7, 3-8, 3-9, 3-10 – Preparation of Bacterial Smear and Staining Techniques
Dichotomous Key deadline
Exercises 5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-10, 5-11, 5-12, 5-13, 5-14, 5-15, 5-17, 5-20, 5-21, 5-23, Handout – The Biochemical and Physiological Characteristics of Bacteria
Exercises 5-29, 5-30, Handouts – Miniaturized Multi-test Systems: API, Enterotube II, Oxi/Ferm Tube II
Exercises 2-7, 2-8, 3-12, 5-28 – Examining Bacterial Motility and Cultivation of Anaerobes
Exercises 6-5 – The Bacterial Growth Curve and Bacteriophage Assay
Exercises 6-1, 6-4 – Mathematics of Bacterial Growth
Exercises 2-9, 2-13 – Control of Microbial Growth: Physical Methods
Exercises 2-14, 7-3 – Control of Microbial Growth: Chemical Methods
Morphological and Physiological Unknown Term Paper
Exercises 7-8, 5-25, 5-26, 5-27, 5-16, Handouts – Identification of Gram Positive Cocci
Exercises 8-13, Handouts – Bacteriological Examination of Water
Handout Exercise – Bacteriological Examination of Food
Exercises 11-4, 11-5, Handouts – Serology

Source: Dr. Edwin Guines-Candelaria

Tentative Course Schedule (schedule may change due to unexpected events)
(Due dates for Flipped Classroom/Online Guide Questions are posted on Blackboar Learn™)

Date	Week	Topic	-Lab Reports Due Dates -Unknown paper Due Date
Aug-26	W1	-Course Introduction -Discussion of Syllabus -Metric System	
Sep-02	W2	-Microscopy: Bright Field Microscopy	-Metric System Lab Reports
Sep-09	W3	-Microscopy (continue) -Ubiquity and Diversity of Microorganisms	
Sep-16	W4	-Cultural Characteristics of Microorganisms -Aseptic Techniques -Pure Culture Techniques -Preparation of a Bacterial Smear -Simple Staining	-Microscopy Lab Reports
Sep-23	**W5**	-Differential Staining -Gram Stain -Kinyoun Acid-Fast Stain -Gram Stain unknown **-Morphological and Physiological Unknown (begin and discussion)**	-Ubiquity Lab Reports
Sep-30	W6	-Special Staining Techniques -Endospore Stain -Capsule Stain	-Pure Culture Techniques Lab Reports

		-Morphological and Physiological Unknown	
Oct-07	**W7**	-Physiological Characteristics: Oxidation and Fermentation -Hydrolytic and Degradation Reactions -Multiple Test Media -Morphological and Physiological Unknown	-Preparation of Smear -Staining Techniques **-Dichotomous Key**
Oct-14	W8	-Physiological Characteristics (cont) -Miniaturized Multi-test -Morphological and Physiological Unknown	
Oct-21	**W9**	**-Mid-Term Exam (100 points)** -Morphological and Physiological Unknown	-Physiological Characteristics -Miniaturized Multiple Tests
Oct-28	W10	**-**Cultivation of Anaerobes -Bacterial Motility -Morphological and Physiological Unknown	
Nov-04	W11	-Enumeration of Bacteria -Bacterial Growth Curve -Cultivation of Anaerobes (cont) -Morphological and Physiological Unknown	-Bacterial Motility -Cultivation of Anaerobes
Nov-11	W12	-Effects of Temperature and UV -Antiseptics/Disinfectants -Kirby-Bauer Antimicrobial Test -Isolation of Staphylococci -Isolation of Streptococci -Bacterial Examination of Food -Bacterial Examination of Water -Morphological and Physiological Unknown	
Nov-18	W13	-Effects of Temperature and UV -Antiseptics/Disinfectants -Kirby-Bauer Antimicrobial Test -Isolation of Staphylococci -Isolation of Streptococci -Bacterial Examination of Food -Bacterial Examination of Water -Morphological and Physiological Unknown	-Bacterial Growth Curve
Nov-25	**W14**	-Kirby-Bauer Antimicrobial Test -Isolation of Staphylococci -Isolation of Streptococci -Bacterial Examination of Food -Bacterial Examination of Water **-Morphological and Physiological Unknown Deadline**	-Effects of Temperature and UV -Antiseptics/Disinfectants -Kirby Bauer Antimicrobial Test

Dec-02	W15	-Isolation of Streptococci -Bacterial Examination of Food -Bacterial Examination of Water -Isolation of Coliforms	-Identification of Staphylococci -Identification of Staphylococci -Bacterial Examination of Water -Bacterial Examination of Food
Dec-09	W16	-Isolation of Streptococci -Bacterial Examination of Food -Bacterial Examination of Water -Isolation of Coliforms -The Enterics – Serological Reactions -ABO blood type	
Dec-16	W17	**-Final Exam and Practicum** **-Lab Clean-up**	