

# SYLLABUS

## Principles of Microbiology (MCB3023) (Web-Enhanced Course)

*“No one can make you feel inferior without your consent”*  
-Eleanor Roosevelt

**Term:** 2016-1

**Class Location:** Room 1221

**Class Meeting Days:** Thursdays; 5:40PM – 8:10PM

**Professor:** Dr. Félix E. Rivera-Mariani

**Office:** Room A202 or 1221

**Office Hours:** Tuesday (room A202) and Thursdays (room 1221) 3:00PM – 4:00PM

**Email:** [friveram@mdc.edu](mailto:friveram@mdc.edu)

**Phone:** TBA

**Note:** Syllabus may be subject to change at the professor's discretion.

### **Required Textbook (print or e-book):**

Madigan, M.T., J.M. Martinko, D.A. Stahl, D.P. Clark. 2015. *Brock Biology of Microorganisms*. 14<sup>th</sup> Ed. Pearson/Benjamin Cummings. San Francisco, CA. (ISBN 9780321897398 or 9780321957016).

**Pre-requisite:** BSC2010 and 20111, CHEM2210; **Co-Requisite:** MCB3023L

### **I. Course Materials**

- A. Syllabus, Professor's credentials, Reading and other Assignments, Lectures, Supplemental materials will be available at [mdc.blackboard.com](http://mdc.blackboard.com)
- B. **Required Textbook (print, rental, or e-book):** See above.
- C. **Reef-Polling™** account through one of the following:
  - 1. Smartphone app (available for iPhone and Android)
  - 2. Web-link (<https://app.reef-education.com/#/login>)

### **II. Rational of the course**

To provide an understanding of the taxonomical, biochemical, physiological, genomic, environmental, human health, and biotechnological aspects of historical and modern microbiology. In addition, we will apply our knowledge to understand and differentiate between microorganisms, learn about modern technologies to study microorganisms and diagnose diseases, and synthesize about the “back-and-forth” battle between the human immune system and microorganisms. Finally, and based on what we'll be learning in the course, we will propose strategies to address human health, biotechnological, and environmental real-life scenarios in which microorganisms are key participants.

**III. Learning Objectives...***By the end of this course, you should be able to:*

- A. Examine the thinking behind historical events and discoveries in microbiology
- B. Infer findings from data of historical events and discoveries in microbiology
- C. Familiarize with tools and technology used to study microorganisms
- D. Understand the structure and biochemistry (i.e. physiology) of microorganisms
- E. Describe the “omic” (i.e. high-throughput) approaches to study microorganisms
- F. Differentiate between microorganisms based on structure, physiology, and genetics
- G. Evaluate the utility of microorganisms in biotechnological advances
- H. Recognize and apply methods to quantify microorganisms in the environment
- I. Describe and compare the physical and chemical approaches to control microbial growth
- J. Describe the relationship between microorganisms and different environment
- K. Explain the different symbiotic relationships between microorganisms and humans
- L. Understand and apply the epidemiology of infectious diseases
- M. Summarize the immunology of humans during infectious diseases
- N. Discuss immunological approaches to study microorganisms and human diseases

**IV. Skills to be developed are:**

- A. Learning with technology: *we will use smartphone apps, and web-based approaches*
- B. Reading comprehension: *we will begin new topics outside of classroom*
- C. In-class discussion: *we will build from knowledge gained outside of the classroom*
- D. Applying the scientific method: *understand and apply the “real” the scientific method*
- E. Analyzing and interpreting data: *gaining knowledge from different forms of data*
- F. Implementing higher levels of learning: *apply, analyze, evaluate, and create*
- G. Exemplifying from learned information: *provide examples from gained knowledge*
- H. Proposing solutions to problems: *provide solutions to existing and prospective problems*

**V. Methods of Instructions**

- A. **Reading assignments:** Reading assignments will prepare us for class. In order to understand and start to familiarize with what we will be discussing in class, we must examine the corresponding topic in the textbook. A series of online questions to be completed in Blackboard will be posted weekly. These online questions will always be due **Wednesday by 5:40PM. These online questions count for a grade (see section XI (Grading Scales) and subsection XI.A (Reading Assignments)).**
- B. **In-class** discussion will build from completing the corresponding reading assignments before their corresponding deadlines. Given that **you’ll begin getting familiarized** with the topics that we’ll be covering in class beforehand, this will facilitate active learning through discussion, debates, peer-learning and peer-assessments, etc.
- C. **In-class Short quizzes at the beginning of class** will help us **reinforce** what we learn. These will provide an opportunity for you to showcase what you have learned, inform you the learning areas you need to reinforce, and inform me as a professor how and what you are learning, and any adjustment to makes to facilitate your learning. We may consider the smartphone app **Reef-Quizzing™**, which will allow us to take quizzes on our smartphones and receive instant feedback by the professor.

- D. **Group work** will facilitate the discussion and peer-teaching in the classroom. These will provide opportunities for you and your classmates to learning from each other, and develop group work skills.
- E. **Student Responses Systems** (“clicker”), through the **Reef-Polling™** app or web-based platform, will help discussion in the class when questions, biological data, and illustrations are discussed in class. More importantly, it will allow real-time feedback on your learning and facilitate in-class discussion.
- F. **Blogs and Discussions** concerning in-class and real-life topics will be established to carryout out-of-class discussions, get exposed to current science, and apply our microbiology knowledge. These opportunities will provide a scenario for you to practice your writing skills for the **writing project**.

## VI. Academic Integrity

- A. **Each student is expected to maintain a high level of integrity and abide by the procedure 4035 of the Miami-Dade College Student Rights and Responsibility Handbook.** Any work submitted by a student in the 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. Avoid at all costs copying and pasting information from your classmates' response or from any other sources.

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. **The 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 discussions are 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 unless needed for in-class discussions.**

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

## **VII. Attendance**

- A. Attendance at each class sessions parallels with your learning in the course. The Microbiology Lab course requires time and effort in order to learn and be proficient in the learning objectives stated earlier in the syllabus. In addition, **30 easy points for good attendance will provided towards your final grade. For each unexcused absence, unfortunately I'll have to deduct 1 point.** In the event of an absence, the student will be allowed to make up work if the absence results from one of the following:
1. Official campus activities (as designated by MDC)
  2. Family or personal emergencies (as designated by MDC)
  3. Medical reasons (discussed with the instructor)
  4. Work-related reasons (discuss with the instructor)
  5. **Important Note: With three unexcused absences, I won't be able to keep you in the class roster.**
- B. **Make-up for exams and quizzes**
1. **Make-up exams are allowed only** if your excuse meets any of the four requirements above, must discuss with the professor about the absence, and the exam must be made-up before the next class session.
  2. **Make-up for quizzes** are not allowed because they will be discussed *in-class*.

## **VIII. Late policy**

- A. 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), I won't be able to award full grade on assignment submitted late (**the final grade for any late assignment will be 30% less**).

## **IX. Accommodations for students with disabilities**

- A. 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.

## **X. Inclusivity Statement**

- A. 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:
1. share their unique beliefs, experiences, and values
  2. be open to the opinions and views of others
  3. honor your colleagues' uniqueness
  4. appreciate the unique opportunity we have to learn from each other
  5. value each other's opinions and communicate in a respectful manner
  6. keep confidential discussions of personal and professional nature
  7. take advantage of this opportunity to share ways in an inclusive environment
  8. must maintain at all times a respectful environment

## XI. Grading Scales:

Item	Points
Quizzes	60
Attendance	30
Reading Assignments	30
Writing Project	80
Exam 1	100
Exam 2 (Midterm)	100
Exam 3 (Final)	100
<b>Total points</b>	<b>500</b>

*Reef-Polling Questions = bonus points*

*Blogs and Discussions = bonus points*

Grade	Percentage	Points
A	100 – 90.0%	450
B	89.9 – 80.0%	400
C	79.9 – 70.0%	350
D	69.9 – 60.0%	300
F	Below 60.0%	Below 300

### A. Reading Assignments (30 total points):

1. Online Reading Assignments will be available in Blackboard (<http://mdc.blackboard.com>), and their **deadline will always be the day before class time: Wednesdays by 5:40PM, unless otherwise stated.** Keep in mind that these guide questions won't be available after their corresponding deadline. Similar to points for attendance, these questions will be 30 easy points towards your final grade. **To maintain these 30 easy points, answer 70% of the questions correct to avoid 0.5 point of deduction from the 30 points.**

### B. Exams (100 points each):

1. Three 100-points exams will evaluate your learning. Refer to the syllabus schedule to know the dates of the exams. Format of the exams will be determined based on what we practiced in class. No scantrons are needed: questions will be answered on the printed exam provided.
2. At the next class meeting sessions, the students will receive a scorecard of the exam and copy of the exam for students' to keep. Academic Dishonesty regulations, as stated in the MDC student handbook, will have to be strictly enforced. Any violations will lead to a zero on the exam.
3. **There are no make-ups for Exams unless the absence meets the requirements of the Attendance sections of this syllabus.**

### C. Quizzes (10 points each):

1. During the first 15 minutes of each class section, cumulative quizzes will be administered. These quizzes will rehearse your knowledge with effortful learning and open-ended questions. They will also provide valuable information on how and what you are learning.

### D. Writing Project (80 points)

1. This writing project will test our writing skills that you have practiced during the course in discussions and blogs. There are **four different deadlines:** 1) submitting the topic, 2) submit an outline of the project, 3) submit the 1<sup>st</sup> draft, and 4) submit the final draft. The rubric will be discussed in detail during 1<sup>st</sup>

two weeks of the course. Briefly, in the writing project you will select a public health problem related to microbes and will discuss the importance of the microbe's structure and function, ecology, and interaction with humans in the corresponding public health problem. Also, you will propose a solution for the corresponding public health problem.

## XII. Incomplete Grades and Withdrawals

- A. *Incomplete*** (I) grades will be posted only in consultation between the student and professor, and only when extenuating circumstances will prevent the student to complete the requirements of the course. At least one half of the course must have been completed with a C or better grades. It is important that the incomplete (I) be completed within the timeframe agreed between the student and the professor. Unfortunately, if not completed within the agreed time frame the incomplete must be submitted as an F.
- B. *Withdrawals*:** The professor is not entitled to withdraw a student from the course: it is the students' duty to evaluate and monitor how he/she is doing in the course. Knowing your status in the course will be important in the case you determine it is necessary to withdraw from the course. **The deadline to withdraw (W) from the course November 1<sup>st</sup>, 2016.** Keep in mind that a "W" grade will be permanent in your grade transcripts, and constitute an attempt for the course.

## XIII. Tentative Course Schedule (schedule may change due to unexpected events)

*(Note: Syllabus may be subject to change at the professor's discretion)*

Date	Week	Topic	Due Dates, Chapters to Read, Quizzes, and Exams
Aug 25	W1	-Course Introduction -Syllabus -Microorganisms and Microbiology	- <u>Chapter 1</u>
Sep 01	W2	-Microorganisms and Microbiology (cont.) -Microbial Cell Structure and Function	- <u>Chapter 2</u> -Quiz 1 (Wk1)
<b>Sep 08</b>	<b>W3</b>	-Microbial Cell Structure and Function (cont.) -Microbial Metabolism	- <u>Chapter 3</u> -Quiz 2 (Wk1 and 2) <b>-Topic of Writing Project</b>
Sep 15	W4	-Microbial Metabolism (cont.) -Microbial Growth and Control	- <u>Chapter 5</u> -Quiz 3 (Wk 1 to 3)
<b>Sep 22</b>	<b>W5</b>	<b>-No Class (White Coat Ceremony)</b>	
Sep 29	W6	<b>-Exam 1</b>	
<b>Oct 06</b>	<b>W7</b>	<del>-Microbial Genomics (canceled: Hurricane Mathews)</del>	<del>-<u>Chapter 6</u></del> <del><b>-Outline of Writing Project</b></del>

Oct 13	W8	<del>-Microbial Genomics</del> <del>-Microbial Regulation</del>	<del>-Chapter 7</del> <b><u>Outline of Writing Project</u></b>
Oct 20	W9	-Microbial Genomics -Metabolic Regulation	<u>-Chapter 6 and 7</u>
Oct 27	W10	<del>-Viruses and Virology</del> -Microbial Genomics, Metab. Reg (cont.) -Genetic Engineering and Biotechnology	<u>-Chapter 11</u> -Quiz 4 (Wk9)
<b>Nov 03</b>	<b>W11</b>	<b>-Exam 2</b>	<b>-Exam 2 (Midterm)</b> <b>(Weeks 1 to W10)</b>
Nov 10	W12	-Methods in Microbial Ecology (no chapter assigned) -Diversity of Microorganisms (no chapter assigned) -Microbial Interactions with Humans	<u>-Chapter 23</u> <b>-1<sup>st</sup> Draft of Writing Project</b>
Nov 17	W13	-Immunity and Host Defense -Diagnostic Microbiology	<u>-Chapters 24 and 27</u> -Quiz 5 (Wks 10 and 12)
<b>Nov 24</b>	<b>W14</b>	<b>Thanksgiving Holiday</b>	
<b>Dec 01</b>	<b>W15</b>	-Diagnostic Microbiology (cont.) -Epidemiology	<u>-Chapters 28</u> -Quiz 6 (Wks 10 to 13) <b>-Final Draft of Writing Project</b>
Dec 08	W16	-Person-to-Person and Vector-Born Diseases	<u>-Chapters 29 and 30</u> -Quiz 7 (Wks 10 to 15)
<b>Dec 15</b>	<b>W17</b>	<b>-Final Exam</b>	<b>-Final Exam</b> <b>(Weeks 9 to 16)</b>

***Note:** Syllabus may be subject to change at the professor's discretion.*