SYLLABUS

Intro to Biochemistry (BCH 3023, Section 842196)

"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 A102
Class Meeting time: M 5:40PM - 8:10PM

Professor: Dr. Félix E. Rivera-Mariani
Office: Room A102
Office Hours: M, W: 2:00PM – 4:00PM or by appointment

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

Required Textbook: Nelson, David L. and Michael M. Cox. 2012. Leghninger Principles of Biochemistry, 6th Ed. W.H. Freeman & Co, New York, NY.

e-book: http://www.macmillanhighered.com/launchpad/lehninger6e/683871

Pre-requisite: Organic Chemistry I (CHM 2210), Organic Chemistry I Lab (CHM2210L), Organic Chemistry II (CHM 2211), Organic Chemistry II Lab (2211L); or CHM 2200 and CHM2200L.

I. Rationale of the course

To broaden your knowledge and provide a firm foundation of the structure, function, and metabolic processes involved in the synthesis, transformation, and degradation of macromolecules (i.e. carbohydrates, nucleic acids, lipids, and proteins). In addition, real-life and scientific scenarios will be presented to learn biochemistry the way biochemistry is scientifically practiced.

II. Course Goals

- To understand and evaluate physicochemical properties that make water essential to life
- To understand, evaluate, and differentiate the structures, functions, and metabolism of:
  - Carbohydrates
  - Nucleic acids
  - Amino acids, proteins, and enzymes
  - Lipids
- To understand and evaluate the Electron Transport Chain and Photosynthesis
- To understand, evaluate, and synthesize into:
  - DNA replication, repair, and recombination
  - Transcription and RNA processing
  - Translation

III. Course Materials

Course materials, including syllabus, complete lectures, assignment instructions, and supplemental materials, will be available at the following websites:

- Miami-Dade Blackboard website:
  https://mdc.blackboard.com/webapps/portal/execute/tabs/tabAction?tab_tab_group_id=_1_1

- iTunesU courses website:
  https://itunesu.itunes.apple.com/enroll/HMY-VSR-DK5

- Book publisher's website
  http://www.macmillanhighered.com/launchpad/lehninger6e/683871

IV. Methods of Instructions

Lectures that will assist students understand and apply the different Biochemical macromolecules and processes, and real-life examples and scenarios in which Biochemistry is employed.

Discussions of topics, real-life examples and scenarios in which Biochemistry is employed will allow students to apply different levels of learning (understand, application, synthesis, creativity).

Exercises in-class and on-line, as reading assignments and homework will supplement and assess students' knowledge and learned skills of Biochemistry.

Case Studies will provide real-life and scientific Biochemistry scenarios that will allow students to apply, synthesize and create with your knowledge.

Reading assignments will aid your understanding, application, and synthesis of the topics learned in-class by answering critical thinking questions found at the end of each chapter.

Writing assignment to improve your communication skills in Biological Sciences and in future courses. In addition, you will learn to think thoroughly (before and after) your writing.

V. Technological 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, will occasionally be used to facilitate the discussion (e.g. problem-based, case studies) in the classroom.

Student Response Systems, also known as "**classroom clickers**," will be used to further contribute to the engagement and team-based learning in the classroom. From a smartphone app, students will be able to remotely answer questions presented by the professor. **This will be the only instance in which cellphones/smartphones will be allowed in the classrooms.**

VI. 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 or quizzes, 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. Biochemistry is known for its hard topics that often require integration of topics discussed in previous class sessions. 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.** It is the instructor's decision if the student is allowed to make up missed work. 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)

If absent during an exam, the student must make up the exam within 24hrs of the corresponding exam date except for any unusual circumstances (in accordance with MDC guidelines). **There is no make-up for quizzes.**

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 or the corresponding points (e.g. writing assignment) will be deducted from the late assignment.

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
Reading assignments (weekly)	70
Writing assignment	80
Quizzes (every 3-4 weeks)	40
Group work	40
Attendance	20
Midterm exam	100
Final exam	100
Total points	**450**
iClicker™ questions (bonus points)	*20*

Grade	Percentage	Points
A	100 – 90%	405
B	89 – 80%	360
C	79 – 70%	315
D	69 – 60%	270
F	Below 60%	Below 270

Reading assignments (weekly; 5 points each)

The purpose of the Reading Assignments is for the student to complement the knowledge/skills acquired in class with the text (e.g. textbook, online material, etc.). In addition, it will provide to student the opportunity to read with a purpose and critically think while reading. **Two critical thinking questions must be answered weekly and submit on the due date listed in the schedule.**

Quizzes (every 3-4 weeks; 10 points each):

Quizzes (refer to the schedule on this syllabus) will assess the student's skills and knowledge gained from the previous 3-4 class sessions. It will also serve to keep the student studying during the course, serve as a review for the Midterm and Final Exams, and writing practice for your Writing Assignment.

iClicker Questions (2 per week; 1.25 points each; 20 bonus points total)

The purpose of iClicker™ question is to assess a student's knowledge *in-class* and to contribute a scenario for Team-Based learning. Questions will be presented while in class and students will

answer through smartphone app. More importantly, students will have the opportunity to discuss the questions between peers before answering the question.

Group work report (8 group work activities; 5 points each report)

The purpose of the *In-class group work* is to put into practice, through case studies, experimental designs, and discussions, among others what you learned during the week, and, similar to the reading assignments, to practice writing. Your report must include,

1) Title of the group work
2) Purpose of the group work activity
3) What was performed (one paragraph, not less than 3 and not more than 5 sentences)
4) What you learned (one paragraph, not less than 3 and not more than 5 sentences)

Writing assignment

The purpose of the writing assignment is to assess your written communication skills to a non-expert audience: **an individual not expert in biochemistry.** With your writing assignment, **you must provide enough information for a non-expert individual to understand the importance of that particular biochemistry topic in our daily lives.**

- You must choose from **any of the topics to be discussed in the course.**
- The writing assignment has four different deadlines (refer to the schedule below): **selection of the topic**, **outline**, the **first draft**, and **final draft**.

Rubric (**70 pts total points**)

Submitting topic, outline, 1st draft on/before deadlines	15 points (3 deadlines x 5 points)
Submitting final draft on/before deadline	10 points
Correctly applying a particular MLA writing format	10 points
Having paragraphs with leading, supporting, and transition sentences	20 points
Discussing one idea per paragraph	10 points
Using less than 30 biochemistry terms	5 points
Following the page limits (not less than 3, not more than 5 pages)	10 points
Total points	**70 points**

Submitting assignments

Dropbox, Google Drive, *and* ***SkyDrive*** cloud folders will be set-up to turn in **reading assignments, group work reports, and writing assignment**. This will be the preferred method.

Assignments may also be submitted via email at friveram@mdc.edu

Printed material will be allowed, but digital files mentioned above would help save the environment.

Tentative Course Schedule

Date	Week	Topic	Readings	Assignments Due Dates
Aug-25	W1	-Course Introduction -Discussion of Syllabus -Foundations of Biochemistry -Water	*Chapter 1. 2*	

Sep-01	**W2**	**<u>Labor Day (No class)</u>**		
Sep-08	W3	- Amino Acids, Peptides and Proteins -Structure of Proteins -Protein Function -Enzymes	*Chapters 3, 4, 5, 6*	**-**Reading assignment #1 **-Select the writing assignment topic**
Sep-15	**W4**	-**Quiz 1** -Carbohydrates and Glycobiology	*Chapter 7*	-Reading assignment #2
Sep-22	W5	-Nucleic Acids -DNA-based Information Technologies	*Chapters 8, 9*	**-**Reading assignment #3
Sep-29	W6	-Lipids -Biological Membranes and Transport -Biosignaling	*Chapters 10, 11, and 12*	-Reading assignment #4
Oct-06	W7	-Bioenergetics and Biochemical Reactions -Glycolysis, Gluconeogenesis -Pentose Phosphate Pathway	*Chapters 13, 14*	**-**Reading assignment #5 **-Submit outline of the writing assignment**
Oct-13	**W8**	**-Quiz #2** -Metabolic Regulation	*Chapter 15*	-Reading assignment #6
Oct-20	**W9**	**-Mid-Term Exam (100 points)**		
Oct-27	W10	**-**The Citric Acid Cycle (TCA)	*Chapter 16*	-Reading assignment #7
Nov-03	W11	-Fatty Acid Metabolism -Oxidative Phosphorylation -Photosynthesis	*Chapters 17, 19, 20*	-Reading assignment #8 -**Submit First Draft of writing assignment**
Nov-10	**W12**	**-Quiz #3** -Lipid Biosynthesis -Amino Acids and Nucleotide Biosynthesis	*Chapters 21, 22*	-Reading assignment #9
Nov-17	W13	-Genes and Chromosomes	*Chapter 24*	-Reading assignment #10
Nov-24	W14	-DNA Metabolism -RNA Metabolism	*Chapters 25, 26*	-Reading assignment #11
Dec-01	W15	-Protein Metabolism -Regulation of Gene Expression	*Chapters 27, 28*	-Reading assignment #12 **-Submit Final Draft of writing assignment**
Dec-08	W16	**-Quiz #4**	*Chapter 28*	-Reading assignment #13

-Regulation of Gene Expression

Dec-15 W17 -Final Exam