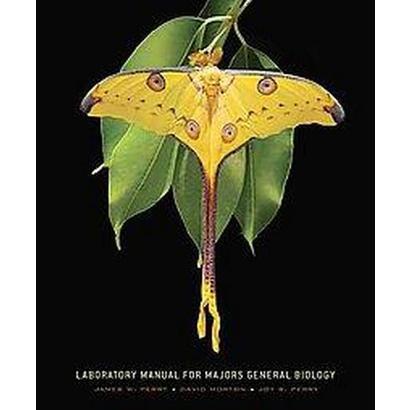
**Principles of Biology 1 Lab - BSC 2010L**

**Spring 2014**

Office 1365 Office Phone: (305) 237 6719

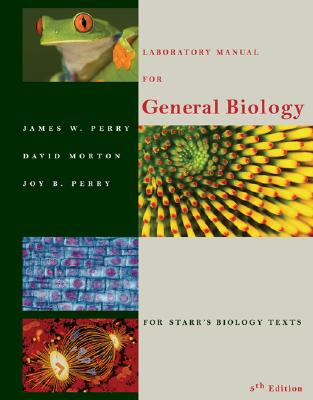
Office Hours: TBA (Faculty schedules at MDC student portal)

Dr. María A. Guerrero E-mail: [mguerrer@mdc.edu](mailto:mguerrer@mdc.edu)

[](http://www.target.com/OpenZoomLayer?template=scene7-image&image=Target/12866661_is&omniZoomPartNumber=12866661&swCellSpacing=10,10&swHighlightThickness=1&swBorderThickness=0&itemTitle=Laboratory+Manual+for+Majors+General+Biology+&#x28;Lab+Manual&#x29;+&#x28;Spiral&#x29;&omniImageCount=1)The laboratory portion of BSC 2010 is designed to complement the lecture material and provide the students with a more complete and comprehensive experience of the major theories and concepts that deal with the study of life. BSC 2010L is the first in a sequence of two courses that deal with the principles of modern biology. It covers microscopy, biologically important organic compounds, cell structure and function, transport mechanisms in cells, enzymes and metabolism, cell division, molecular and Mendelian genetics. It is expected that the laboratory exercises will enhance student’s knowledge from the lecture section by exploring and appreciating the phenomena of life.

**Lab Manual Textbook**

Laboratory Manual for Majors General Biology (spiral bound) by James W. Perry, David Morton and Joy B. Perry. ISBN-13: 978-0-495-11505-2. If you are planning to purchase the book in an MDC bookstore, **you can only acquire it at the IAC bookstore.**

**The previous version of the lab book can work as well.**

Laboratory Manual for General Biology (spiral bound) by James W. Perry, David Morton and Joy B. Perry. 5thEdition. ISBN-13: 978-0-534-38025-0

**Prerequisite/co-requisite**: BSC 2010

**Other Requirements:**

* Internet connection (DSL, LAN, or cable connection desirable)
* Access to ANGEL
* Lab coat

**Grading Policy:**

20 % Exam 1

20 % Exam 2

20 % Exam 3

15 % Lab reports

20 % online pre-lab quizzes or simulations

5% Attendance (no absences are required for full credit; in order to receive these points the student must remain in the laboratory for the entire duration of the class; there are no make ups for missed labs.)

**Grading Scale:**

A= 90-100 B=80-89 C=70-79 D=60-69 F=59 and below

**All tests will require the use of 2 scantrons**. The college/instructor will not provide you with such materials. Make sure you have a supply of scantrons available for all tests from the beginning of the semester to last you throughout the semester.

**Every student is responsible for bringing a scantron card 882-E, pencils (# 2)**

**and a good eraser on exam dates.**

I recommend you buy a package at the beginning of the semester and keep it in your notebook. Bookstore hours run different than class sessions, which is why you should never count on running to the bookstore before a test.

**Attendance:**

Attendance to all the laboratory sessions is **MANDATORY** as important information is presented during class sessions, which may NOT be found in textbook and biological materials will not be available for any type of makeup lab. Pre-lab quizzes, announcements and other pertinent notes are also given at the beginning of class and whether the student is present or not, he/she is responsible for these. There is no makeup for missed quizzes. For the laboratory sessions, 2 tardies are equivalent to one absence. To be marked present you need to be at the lab session for the entire period of the lab, not just at the beginning or at the end. REMEMBER: You can NOT make up a missed lab. **It is the instructor's prerogative to withdraw students with more than 2 absences.**

REMEMBER that the textbook and lecture material is but one of the aspects you will be tested on. The other aspect you will be tested on, deals with observing and recognizing morphologies/structures, as well interpreting results/outcomes dealt with at the time of each laboratory session.

This class will be **web-enhanced through ANGEL** (<http://mycourses.mdc.edu>).

Grades for all categories will be posted using the ANGEL gradebook feature. Tests will be reviewed typically within a week and all students are responsible for checking that the grades shown in class and the ones shown online are the same. Any mistakes should be brought to my attention in a timely fashion and not the week before finals. Checking for mistakes in the posting of grades is but another reason why students should constantly check the ANGEL coursepage. **Any mistakes reported after 2 weeks of me having posted the grades will not be changed (i.e. the grades expired!!)**

Note: When communicating through Email, **use the ANGEL Email feature**. Do not use your personal Email accounts (Gmail, Yahoo, Hotmail, etc.) since the College spam filter will not send these through. If you do not have access to ANGEL, a **temporary** alternative is to use your MDC email account. Here you need to identify yourselves in the subject line. For ex: RE: question – John Smith, BSC 2010L T,R.

You must IMMEDIATELY notify the instructor regarding an absence on the day of an exam (that day or the next day, by e-mail or by phone). DO NOT WAIT, until we meet again to provide me with an acceptable excuse (i.e. doctor’s or hospital’s documents). If given permission to make up a test (see below, under exam make-up conditions), this could be of a different format from the regular test and it must be completed within one week of the original test date or otherwise the test score will be a zero.

**Exam Make-Up, Incomplete and Withdrawals:**

Make up exams or incomplete grades will be given only when extenuating circumstances occur (WAR, family emergencies, hospitalization, automotive accidents, etc) and as agreed upon between student and teacher. The student must be in good standing (grade of C or better) and should complete the course in the TIME agreed upon. If not, the grade of FAIL will be given.

WITHDRAWALS and class DROP are the responsibility of the student and should be done within the given time as specified in the MDC academic calendar.

**Some important dates for the Fall 2013**

|  |  |
| --- | --- |
| *100% Refund Deadlines:* | F, August 30, 2013 |
| *Last day for students to withdraw and receive a grade of “W”:* | W, November 6, 2013 |

**Student Conduct**:

The InterAmerican Campus of Miami Dade College is an Academic Community committed to the values of Intellectual Integrity, Respect for Diversity, Environmental Stewardship, Social Responsibility, and Informed Participation in Civic Life. Students are expected to behave in a mature and professional manner. Academic dishonesty will be dealt with as set forth in the Students Rights and Responsibilities handbook. Anyone caught cheating on an exam will be assigned a grade of “F” for the exam and will be referred to the Dean of Students for disciplinary action. **Anyone caught copying on a quiz or plagiarizing any assignment, will obtain a double zero, one zero for the quiz or assignment in question and another zero for a past or future quiz or assignment.**

Classroom distractions are an annoyance to everyone and they interfere with the learning environment in the classroom. Chronic lateness, side conversations (when Guerrero speaks, the rest listens!!), eating meals are completely forbidden in a laboratory session, sleeping, unnecessary exits, cell phones or pagers, text messaging, doing other courses’ class work, etc. are all considered unwanted distractions. For any of the above, I will only call your attention ONCE, the next time you will be asked to leave the room with the subsequent absence mark for that lab session.

Cellular phones: Please remember to turn your pagers and cell phones OFF before coming to class. Use of cellular phones is strictly prohibited. All cellular phones must be stored in your purse, bookbag, or pocket during class sessions. Hands-free earpieces must also be stored and cannot be worn during class. In addition to phone conversations, the cellular phone may not be used for text messaging, picture messaging, web browsing, etc. during class. If a telephone rings during lecture or lab sections or I observe that you’re using the phone for any of the abovementioned activities, you will receive ONE warning. After you have completed your ONE warning quota, you will be asked to leave the class for the day with the abovementioned consequences. Personal computers are not permitted during the lecture unless specified. Students may not wear caps/hats during quizzes or tests. Your final grade can be affected by your attendance record and by your behavior in class especially when your grade is **borderline.**

**Cleanup:**

You are responsible for cleaning your lab station and all equipment used in the

exercise/experiment before you leave your laboratory section. The instructor will check your station before you leave the laboratory. All in the group need to make sure that instruments/glassware is clean before leaving the lab so that you do not affect the next group’s results and your grade.

# MDC’s Learning Outcomes

**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.

**Below find the competencies for this class and in italics their alignment with the above cited college learning outcome(s)**

**Course Competencies:**

Competency 1: The Nature of Scientific Investigation and Tools Biologists Use

Upon successful completion of this course, the student will be able to:

A. identify and be able to pose questions that can be answered through scientific investigation.

B. understand the meaning of the term hypothesis and describe the characteristics of a good scientific hypothesis.

C. list and describe, in order, the various components of a proper scientific

experiment.

D. be able to summarize and present results in tables and graphs.

E. discuss, interpret and communicate the results of a scientific experiment.

F. identify and understand the function of the various parts of a compound

microscope and demonstrate proficiency in its correct use.

G. identify and understand the function of the various parts of a dissecting

microscope and demonstrate proficiency in its correct use.

H. understand how an electron microscope functions and its applications in biology.

*MDC learning outcomes: 1, 2, 3, 4, 8*

Competency 2: The Chemistry of Life

Upon successful completion of this course, the student will be able to:

A. gain an understanding of the spatial relationships of atoms in biologically

important molecules.

B. describe the nature of covalent bonds and understand how they are broken and reformed to rearrange atoms into new molecules.

C. understand the nature of and be able to construct simple hydrocarbons and the six basic functional groups.

D. depict, in models, the spatial relationships of isomers.

E. construct simple biologically important molecules such as simple sugars, fatty acids, and amino acids.

F. describe the structure and function of enzymes.

G. distinguish between competitive and noncompetitive enzyme inhibition.

H. discuss the effects of varying pH, temperature and enzyme concentration on the rate of enzyme activity.

I. propose hypotheses about enzymes and make predictions based on these

hypotheses.

J. construct and interpret graphs of enzyme activity

*MDC learning outcomes: 1, 2, 3, 4, 8*

Competency 3: Cell Structure and Function

Upon successful completion of this course, the student will be able to:

A. identify cell structures and organelles using the light microscope and from

electron photomicrographs and state the functions of each.

B. describe the features of selected cell types and list the characteristics shared by certain types of cells.

C. discuss the evolutionary significance of increasing complexity from unicellular to multicellular organization and provide examples of the various stages.

D. describe the processes of diffusion and osmosis, the factors that influence them and their importance to cells.

E. explain the nature and importance of selectively permeable membranes in living cells.

F. define and correctly apply the terms: hypoosmotic, hyperosmotic and isoosmotic.

G. observe and understand the behavior of plant and animal cells when exposed to these media.

*MDC learning outcomes: 1, 2, 3, 4, 8*

Competency 4: Metabolism: The Nature of Cellular Respiration and Photosynthesis

Upon successful completion of this course, the student will be able to:

A. understand and be able to describe the processes of fermentation and cellular respiration.

B. explain the nature of redox reactions as they occur in cellular metabolism.

C.demonstrate understanding of spectrophotometry and the ability to effectively use a spectrophotometer.

D. explain how light and pigments interact in photosynthesis.

E. name and describe the several pigments that participate in photosynthesis.

F. explain the nature of and demonstrate proficiency in paper chromatography as it is used to separate the pigments of photosynthesis.

*MDC learning outcomes: 1, 2, 3, 4, 8*

Competency 5: The Continuity of Life

Upon successful completion of this course, the student will be able to:

A. describe the cell cycle and explain the events occurring in each stage.

B. identify the phases of mitosis in an onion root tip and in whitefish blastula cells.

C. compare and contrast mitosis and cytokinesis in plant and animal cells.

D. compare and contrast mitosis and meiosis.

E. recognize human chromosomes when presented with an appropriate preparation under the microscope and in a karyogram.

F. discuss the basic principles of Mendelian inheritance and compare allele

frequencies for selected human traits.

G. understand and apply the concepts involved in human blood typing.

H. apply the principles of Mendelian and non-Mendelian inheritance patterns to solve genetics problems.

I. describe the function of restriction enzymes and their relevance to biotechnology.

J. discuss the basic principles of gel electrophoresis.

K. explain the use of enzymes in DNA mapping and discuss the importance of DNA mapping.

*MDC learning outcomes: 1, 2, 3, 4, 8*

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| **Principles of Biology Lab 1 - BSC2010L** | | |
| **Term: Spring 2013-2** | | |
| **Instructor: Dr. Maria A. Guerrero** | | |
| **Tuesdays: 11:15 AM - 2:35 PM** | | |
|  |  |  |
| **Date** | **Chapter** | **Lab Title** |
| **7-Jan** |  | **Introduction, Safety** |
| **14-Jan** | **1** | **Microscopy** |
| **21-Jan** | **3** | **Structure and function of living cells** |
| **28-Jan** | **2** | **Macromolecules and you: food and diet analysis** |
| **4-Feb** | **4** | **Diffusion, osmosis, and the fuctional significance of biological membranes** |
| **11-Feb** |  | ***Test 1 (Chapters 1,2,3 &4)*** |
| **18-Feb** | **5** | **Enzymes: catalysts of life** |
| **25-Feb** | **7** | **Respiration: energy conversion** |
| **4-Mar** | **6** | **Photosynthesis: capture of light energy** |
| **11-Mar** | **8** | **Mitosis and cytokinesis: nuclear and cytoplasmic division.** |
| **18-Mar** | **8** | **Meiosis: basis of sexual reproduction** |
| **25-Mar** |  | ***Test 2 (Chapters 5,6, 7 & 8)*** |
| **1-Apr** | **9 & handout** | **Nucleic acids. Forensic DNA Fingerprinting** |
| **8-Apr** | **Handout** | **Biotechnology: bacterial transformation** |
| **15-Apr** | **9 & handout** | **Heredity** |
| **22-Apr** |  | ***Test 3 (Chapters 9 & handouts)*** |

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| **Principles of Biology Lab 1 - BSC2010L** | | |
| **Term: Spring 2013-2** | | |
| **Instructor: Dr. Maria A. Guerrero** | | |
| **Wednesdays: 5:40:9:00 PM** | | |
|  |  |  |
| **Date** | **Chapter** | **Lab Title** |
| **8-Jan** |  | **Introduction, Safety** |
| **15-Jan** | **1** | **Microscopy** |
| **22-Jan** | **3** | **Structure and function of living cells** |
| **29-Jan** | **2** | **Macromolecules and you: food and diet analysis** |
| **5-Feb** | **4** | **Diffusion, osmosis, and the fuctional significance of biological membranes** |
| **12-Feb** |  | ***Test 1 (Chapters 1,2,3 &4)*** |
| **19-Feb** | **5** | **Enzymes: catalysts of life** |
| **26-Feb** | **7** | **Respiration: energy conversion** |
| **5-Mar** | **6** | **Photosynthesis: capture of light energy** |
| **12-Mar** | **8** | **Mitosis and cytokinesis: nuclear and cytoplasmic division.** |
| **19-Mar** | **8** | **Meiosis: basis of sexual reproduction** |
| **26-Mar** |  | ***Test 2 (Chapters 5,6, 7 & 8)*** |
| **2-Apr** | **9 & handout** | **Nucleic acids. Forensic DNA Fingerprinting** |
| **9-Apr** | **Handout** | **Biotechnology: bacterial transformation** |
| **16-Apr** | **9 & handout** | **Heredity** |
| **23-Apr** |  | ***Test 3 (Chapters 9 & handouts)*** |

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| **Principles of Biology Lab 1 - BSC2010L** | | |
| **Term: Spring 2013-2** | | |
| **Instructor: Dr. M. A. Guerrero** | | |
| **Thursdays: 11:15 AM - 2:35 PM** | | |
|  |  |  |
| **Date** | **Chapter** | **Lab Title** |
| **9-Jan** |  | **Introduction, Safety** |
| **16-Jan** | **1** | **Microscopy** |
| **23-Jan** | **3** | **Structure and function of living cells** |
| **30-Jan** | **2** | **Macromolecules and you: food and diet analysis** |
| **6-Feb** | **4** | **Diffusion, osmosis, and the fuctional significance of biological membranes** |
| **13-Feb** |  | ***Test 1 (Chapters 1,2,3 &4)*** |
| **20-Feb** | **5** | **Enzymes: catalysts of life** |
| **27-Feb** | **7** | **Respiration: energy conversion** |
| **6-Mar** | **6** | **Photosynthesis: capture of light energy** |
| **13-Mar** | **8** | **Mitosis and cytokinesis: nuclear and cytoplasmic division.** |
| **20-Mar** | **8** | **Meiosis: basis of sexual reproduction** |
| **27-Mar** |  | ***Test 2 (Chapters 5,6, 7 & 8)*** |
| **3-Apr** | **9 & handout** | **Nucleic acids. Forensic DNA Fingerprinting** |
| **10-Apr** | **Handout** | **Biotechnology: bacterial transformation** |
| **17-Apr** | **9 & handout** | **Heredity** |
| **24-Apr** |  | ***Test 3 (Chapters 9 & handouts)*** |