

**BSC 2010**  
**Principles of Biology I**  
**Monday and Wednesday 1:25 to 2:40 pm**  
**Reference 471503**  
**Policy Fall 2008-1**

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<http://faculty.mdc.edu/mdelcamp>

**Introduction:**

Biology is the study of life. All life should be respected and sustained. Biology, the study of life, is the science that ties all other natural sciences together. Moreover, it bridges with the social sciences. This unity helps to make the vital connections that will enable the sustainability of mankind and life on our Earth. Advances in biotechnology, health science, biochemistry, and other pertinent areas make biology a very exciting and necessary field.

BSC 2010 is a rigorous academic course that will equip students with a solid background for handling upper division biology courses. It is meant for biology majors, or those seeking a science related degree/career. Furthermore, rigorous information, found on exams for entrance into professional programs and schools, such as the MCAT, is addressed in this course. The areas of biochemistry and molecular biology are emphasized, as these provide the basic concepts for understanding the intricacies of how organisms work. Due to the large volume of information that must be addressed in this course, the pace of the course moves swiftly. Skills and knowledge needed to address biological issues that are important and relevant to your lives and the society in which you live will be addressed.

To insure a successful outcome, this course will require: attendance to class, writing and studying lecture notes, reading and studying of the text book and class notes, completing supplemental readings, completing class and home assignments, passing quizzes tests with a C or better, surveying the literature and current events in the field of biology, application of the material to your own life and that of others, a Service-Learning Action Project, and communication with class peers and instructor. Professor del Campo's faculty page at <http://faculty.mdc.edu/mdelcamp> has course notes and other important ancillaries, which should be carefully studied. ***You will receive web casts or I Pods as teaching-learning ancillaries during this course.*** Of course, passing grades on assessments and the Service-Learning Action Project will ensure passing the class. The completion of an acceptable Service-Learning Action Project is mandatory to pass the class. The time and effort that students invest in learning and applying the information in this course will be very rewarding.

As a science major, you will find that the information covered in BSC 2010 will serve as the foundation for future science course work, entrance examinations to professional science and health related programs, as well as most work in science fields. Enjoy and cherish this opportunity to learn, what may well be, the most vital information in your entire college years. Best wishes for your success in this very important and fascinating course.

**Pre/Co-Requisites:**

- BSC 2010 Lab is a co-requisite of BSC 2010 Lecture.

- CHM 1045 lecture is a preferred and highly recommended pre-requisite for the BSC 2010 lecture, but with some seldom exceptions it may be taken as a co-requisite. A strong chemistry background is essential to comprehend the course competencies of BSC 2010.
- CHM 1045 Lab is a co-requisite of CHM 1045 Lecture and a preferred pre-requisite for BSC 2010 Lab.

**Textbook:**

**Title:** *Biology Eighth Edition*

**Authors:** Campbell, Reece, Urry, Cain, Wasserman, Minorsky, Jackson.

**Publisher:** Pearson Benjamin Cummings.

**ISBN: 0321588975**

This package includes: the 8<sup>th</sup> edition *Biology* textbook with the *MasteringBiology* website, a Biology Study Card and Scientific American Volume #5.

**Attendance:**

**Roll** will be taken at the start of each class. Students are expected to attend class, arrive on time and stay to the closure. Participation in the class activities is mandatory. Students are responsible for all material covered in class, assignments issued, and all chapters assigned from the text. A student is responsible for any work missed due to an absence, tardy or early exit. Attendance will be taken each class period; you must be present for the full duration of class to get credit for attending. If you need to leave early, come late or miss a class, please let me know in advance. You may leave a message on my phone mail: **305-237-0956** or with the Kendall Biology Department: 305-237-2136.

Attendance to the **Service-Learning** agency for at least 15 hour of Service-Learning is mandatory and a service-learning project is required and will count for a grade.

The last day to withdraw from the class for the fall term 2008-1 with a 100% tuition refund is Wednesday, **September 3, 2008**. The last day to withdraw from the BSC 2010 class with a "W" for the fall term 2008-1 is on Tuesday, **November 4, 2008**; all students whose names are listed on the final grade roll will receive a grade. **Final Grades** will be available through the Student Portal <https://mymdc.mdc.edu> after 11 PM, on Saturday, **December 20, 2008**.

**Grading Policy:**

**Tests:**

Each student is provided with a copy of the course competencies (which are listed at the end of this course policy document) and a syllabus (schedule) for the class. Based on this material there will be four examinations. Tests I, II, III, will be from 25-50 multiple choice questions and will count 100 points each. The final test (Test IV) is a cumulative test that will count 100 points as well. The final exam, test IV, will be given during final exam week, on Wednesday, **December 17, 2008**. Students who miss a test are in danger of failing the class. Make up tests will only be given prior to the class test date, for security reasons, NO make up exams unless previously arranged.

**Service-Learning Action Project: :**

Service-learning (s-l) is a very valuable and effective teaching-learning pedagogy. The s-l method allows BSC 2010 students to apply information, which is being learned during the biology course, in a real-life situation. It is also an opportunity to learn biology-related information from an external source, a CCI approved partner agency. Moreover, it is an opportunity for students to

explore biology topics of special interest in depth, through a scientific literature search and a hands-on experience, at a CCI Community Partner site. **A Service-Learning Action Project that demonstrates the application of the material learned in class through a community service action is required in order to pass this course.** This project will be conducted at the USDA, Fairchild Gardens, Medical Examiner office, Biscayne National Park, Everglades National Park, DERM, or another CCI approved site. The s-l project is worth 100 points. Students who do not submit a Service-Learning Action Project will NOT pass this biology class. The S-L Action Project should be turned in no later than Monday, **December 1, 2008**. During the first week of the term, you will receive a document, the “Service-Learning Action Project Workshops” with very clear instructions, which will be further explained during class presentations. For further information, please browse through the Center for Community Involvement (CCI) web site <http://www.mdc.edu/ccli/> Service-learning is the main opportunity for BSC 2010 students to carry out hands-on, scientific work, an opportunity usually reserved for students attending universities in the senior year.

Students may also go to my Faculty Webpage to download the Service-Learning Action Project documents: <http://faculty.mdc.edu/mdelcamp> these documents will also be distributed and explained during class and include all of the instructions to successfully complete the s-l assignment.

**The Service-Learning project requires the following:**

1. **Research** of a specific topic within the “Biology” discipline. This is a scientific literature research about your chosen s-l topic.
2. **Community Service-Learning is an action** in the community that applies your s-l research topic to people, animals, plants, the environment etc. It must be conducted at an approved MDC Community Partner Agency. Further information on partner agencies and possible Action Project topics, as well as the s-l project’s requirements mentioned above, may be found at the CCI website, Professor del Campo’s Faculty Web Page, or by stopping by my office, room 3265 # 12, to discuss this assignment.
3. **Reflection** as to the value of the action for the community and to the student. Please refer to the Service-Learning Action Project Workshops, which are instructional handouts, that contain the specific instructions and requirements of the Service-Learning project, plus resources that are available to support the service-learning endeavors.

## Grade Charts

% Score Tests/ Project	Grade
90% - 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
50% - 59%	F

Test/ Project	Point Value	My Scores, ie. Points Earned	
Test I	100 points		
Test II	100 points		
Test III	100 points		
Test IV	100 points		
S-L Action Project	100 points		
Total Points	500 points		

### **Final Grade and Other Information:**

To access your final class grade, please go to the Student Portal <https://mymdc.mdc.edu/> website. From here you may also access all of your records, including your course grades, class schedule, degree audit, order transcripts, register for classes, etc. For the 2008-1 term, grades will be available on Saturday, **December 20, 2008**.

### **Academic Dishonesty:**

Students' dishonest actions on examinations and/or the Action Project will be penalized by receiving a grade of "F" for the test or project. Upon the discretion of the instructor further action may be sought, through the Dean of Students, which could culminate in failure for the class and/or suspension from the College. The work that a student submits on the S-L Action Project should be his/her original work. During tests: books, notes, or any other sources of information, such as electronic resources, are **NOT allowed** for reference.

### **Use of Electronic Devices:**

**Please silence phones, pagers, and any other electronic device during class.** It is disruptive to have cell phones sounding off during class and worse yet to have a conversation while class is being conducted. **Communication devices ARE NOT allowed during tests.**

### **Required Materials:**

1. *Biology 8e*
2. *MasterinBiology* Website
3. BSC 2010 class notebook

### **Science Study Centers**

1. Science Multimedia Lab: Computer Courtyard
2. Science Tutoring Center: **Room 3326**
3. Prentice-Hall Online tutoring Center

### **Important Dates for Fall 2008-1 Term:**

- September 3, Wednesday - Last day to drop classes with 100% refund
- September 1, Monday – Labor Day Holiday, MDC closed
- November 4, Tuesday – Last day to drop a class with a "W"
- November 27 & 28, Thursday & Friday - Thanksgiving Holiday, MDC closed
- December 1, Monday - Service-Learning Project due
- December 12, Friday – Last day of classes
- December 19, Friday – Last day of final exams (BSC 2010 Final Exam is on Wednesday, 12/17/08)
- December 20, Saturday - Final class grades become available in the evening

### **BSC 2010 Course Competencies and Objectives:**

The following is a list of the course competencies for BSC 2010 Principles of Biology I. These competencies deal with the scientific process, the nature of biology, the chemistry of life, cell structure and function, metabolism, genetics, and the structure and function of DNA. The competencies form the six units of study found in this course. The objectives for each of these units are listed below. Mastery of the course objectives must be demonstrated by students through passing scores on the four class tests and the through the Service-Learning Action Project.

#### **Competency 1**

#### **The Scientific Process and the Nature of Biology:**

The student will demonstrate his/her mastery of this competency, through successfully accomplishing the following objectives during tests, by being able to:

1. explain the components of the scientific process and recognize that testable hypotheses form the basis for all scientific inquiry.
2. demonstrate an understanding of the hierarchical nature of life, from atoms to ecosystems and of the idea that each level of life has emergent properties.
3. recognize the cell as the basic unit of all life and that DNA is the molecule responsible for the continuity of life.
4. comprehend that structure and function are correlated at all levels of biological organization.
5. understand that all living things interact both with the living and the non-living components of their environment.
6. recognize that dynamic balance is maintained in living systems through regulatory mechanisms.

### **Competency 2**

#### **The Chemistry of Life**

The student will demonstrate his/her mastery of this competency, through successfully accomplishing the following objectives during tests, by being able to:

1. identify the components of matter (such as atoms, elements, compounds and molecules), recognize that atoms are the fundamental unit of matter, and understand basic atomic structure.
2. compare and contrast the basic types of bonds that occur within and between molecules and describe how bonds are made and broken in chemical reactions.
3. describe the polar nature of water and understand how water's properties play a role in the evolution and continuity of life on Earth.
4. explain the nature of organic compounds, including the basic functional groups and the relationship between monomers and polymers.
5. analyze the component structure of carbohydrates, lipids, proteins, and nucleic acids and understand how these molecules function in living systems.

### **Competency 3**

#### **Cell Structure and Function**

The student will demonstrate his/her mastery of this competency, through successfully accomplishing the following objectives during tests, by being able to:

1. differentiate between the two basic cell types, describe their differences and similarities and understand their evolutionary relationship
2. understand the importance of subcellular compartmentalization and multicellularity in the evolution of life on Earth.
3. identify the subcellular organelles and describe their structure and functions.
4. demonstrate an understanding of the fluid mosaic nature of membrane structure and the basic processes responsible for transport across membranes.
5. explain the function of cell division and identify and describe the major steps in the cell cycle including the processes of mitosis and cytokinesis.
6. demonstrate an understanding of how cell cycles are regulated at the molecular level.

### **Competency 4**

#### **Energy Management: The Nature of Metabolism**

The student will demonstrate his/her mastery of this competency, through successfully accomplishing the following objectives during tests, by being able to:

1. describe the nature of metabolism, the types of energy available to living systems, and the basic laws that govern the transformations of energy.
2. analyze the relationship between entropy and free energy and explain how life affects both.
3. describe the structure of ATP and how it functions in cells to link exergonic and endergonic pathways.
4. explain the structure and function of enzymes as well as how they are regulated
5. demonstrate comprehension of the nature of cellular respiration and how it relocates electrons to yield ATP.
6. analyze the steps of cellular respiration and describe its component processes including glycolysis, the Krebs cycle, the electron transport chain, and chemiosmosis.
7. compare and contrast the component chemical processes and efficiencies of cellular respiration and fermentation.
8. understand the function of photosynthesis, its evolutionary significance and its importance to the continuation of life on our planet.
9. describe the structure and function of the cellular components required for the process of photosynthesis
10. analyze the steps of photosynthesis, including the light dependent reactions and the Calvin cycle in order to understand how organic molecules are assembled from inorganic ones.

### **Competency 5**

#### **Continuity of Life: Part I -Genetics**

The student will demonstrate his/her mastery of this competency, through successfully accomplishing the following objectives during tests, by being able to:

1. comprehend the nature of heredity and how it is governed by the structure and behavior of chromosomes.
2. compare and contrast sexual and asexual reproduction, describing the advantages and disadvantages of both.
3. identify and describe the steps of meiosis and understand that meiosis increases genetic variation, the raw material for evolution.
4. describe the work of Gregor Mendel and explain how he derived the basic principles of heredity.
5. demonstrate a basic understanding of probability and how it can be used to predict the outcome of genetic crosses.
6. recognize the difference between Mendelian and non-Mendelian inheritance and explain patterns resulting from both.
7. describe the work of T. H. Morgan and how it relates to the phenomenon of gene linkage and sex linkage.
8. understand the importance of genetic recombination and how it results from chromosomal crossing over.

### **Competency 6**

#### **Continuity of Life: Part 11- The Structure and Function of DNA**

The student will demonstrate his/her mastery of this competency, through successfully accomplishing the following objectives during tests, by being able to:

1. demonstrate an understanding of the structure of DNA and the processes by which it ensures continuity (replication) and governs the daily activities of all cells (transcription and translation).
2. explain the semi-conservative method of DNA replication and how nitrogen base pairing and the participation of various enzymes ensures the accuracy of this process.

3. describe the steps in the process of transcription (how DNA makes transfer RNA), as well as the structure and function of the molecules involved.
4. comprehend the nature of the genetic code and understand how it governs the process of translation (the making of proteins from transfer RNA).
5. describe the steps in the process of translation, as well as the structure and function of the molecules involved.
6. understand the nature and consequences of point and chromosomal mutations.
7. describe the genome of viruses and bacteria and relate these differences to the ways in which these organisms function.
8. compare and contrast gene expression in prokaryotes and eukaryotes and analyze the evolutionary significance of these differences and similarities.