



**Miami-Dade College (Wolfson Campus)  
School of Natural Sciences**

**Course Syllabus** General Education Biology  
**Reference** BSC1005  
**Term** 2007-01



**Instructor:** Juan M. Morata

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**Office Hours:** As posted in office door, and/or professor's website <http://faculty.mdc.edu/jmorata/>

### **MDC Mission Statement**

The mission of Miami Dade College is to provide accessible, affordable, high quality education by keeping the learner's needs at the center of decision-making and working in partnership with its dynamic, multi-cultural community.

### **Course Description**

This course introduces students to the applications in the area of bioscience. The MDC General Education Biology course will introduce the student to the many basic biological concepts that abound in our understanding of life. Focus will be on selected principles that help explain molecular biology, evolution, genetics, diseases and other problems that human face in the environment. This course was designed to stimulate interest and increase comprehension in the diversity of life that exists on our planet and help the students recognize the many factors that provide order and structure in our environment as we understand it. The student will be encouraged to develop skills in inquiry, observation and analysis of biological features that would enable them to intelligently interpret and evaluate life around them and determine the roles they play within. Emphasis will be given to real life examples and situations to better prepare the student in understanding the many wonders of life in the multitude of environments.

**Course Competencies:** Please go to page 7.

**General Education Outcomes:** Please go to page 9.

### **Goals and Objectives:**

The course will enable the student to be competent in the following categories:

1. Scientific method and the wonders of the BIOLOGICAL SCIENCES
2. Basic chemistry as it relates to life and the organisms
3. Structure, form, and function of the many organ systems within an organism
4. Genetics, reproduction and evolutionary development of life
5. Diversity, ecology and ecosystem dynamics within and between populations of organisms around our planet.

### **TEXTBOOK:**

## **ATTENDANCE:**

Attendance in all the lecture sessions is HIGHLY RECOMMENDED as many points and important information is presented during class session, which may NOT be found in the textbook. Announcements such as change of events and other pertinent notes are also given in class and every student is responsible to know these. In addition extra-credit work/quizzes will be given during class. REMEMBER that the textbook is only one source of information while the lecture is a compilation of as much information available on the topic as possible.

***If a student has missed class three times without a valid excuse or emergency, the instructor has the right to fail the student drop the grade or to withdraw the student from the course. If a student is late three times, the instructor has the right to assign a lower letter grade at the end of the semester.***

## **EXAMINATIONS and PROJECTS:**

There will be Five (5) major exams of 100 points each. Each exam will cover the topics discussed in class and given as extra reading assignments when needed. NO MAKE-UP exams will be given. Please plan accordingly and try NOT to be late or miss out during the examination session. Examinations will occupy the entire class period on the regular class schedule.

Students will be participating in a Learning Community which is an integration of biology and algebra and be able to comprehend real scientific current issues. In addition, will apply scientific and mathematical knowledge to learn and explain possible solutions to these issues. Students will choose an important topic which is important to this Learning Community course and form part of a group. The topic proposal must be approved by the instructor by the **third** week of class. This assignment is 25% of the final grade and it also integrates 20 hours with the Service Learning Community. Please refer to the project milestone and rubric section to analyze project's details further. ***The project must be complete and presented on the week before final exams.*** The paper must be at least 4 pages double spaced, and must include an oral presentation of the topic or topics addressed in the project. Project descriptions and details can be found at the following website: <http://faculty.mdc.edu/mmontane/lc.htm>

### **Grading Policy:**

_____	15 %	Exam 1
_____	15 %	Exam 2
_____	15 %	Exam 3
_____	15 %	Exam 4
_____	15%	Exam 5
_____	25%	Project

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

***The professor reserves the right to deny entry, require withdrawal or fail students who are constantly late or have had three undocumented absences during the semester. If a student is late three times, the instructor has the right to assign a lower letter grade (including F) at the end of the semester.***

**Service Learning** is highly encouraged in this course. Students who participate in Service Learning will be granted up to **10 points extra credit** towards their final grade. Service-learning and I require students to volunteer a minimum of **20 hours** (extra) with a nonprofit organization that works on issues related to the environment or science. The Center for Community

Involvement will provide you with a list of agencies and guide you through the service-learning process.

### **EXAM MAKES UP, INCOMPLETE AND WITHDRAWALS:**

Make Up exams or Incomplete grades will be given only when extenuating circumstances occur (WAR, family emergencies, 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.

You must **Immediately** notify the instructor regarding an absence on the day of an exam (that day or the next day, by phone or e-mail) Do not wait a full week until you attend class again before communicating with me, and providing to me an acceptable documents excusing the absence.

***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.***

### **CONDUCT AND DEMEANOR:**

Proper scholastic behavior is expected of the student. We are mature individuals and should follow the socially accepted norms of conduct and etiquette, especially within school grounds and during class sessions. Any type of misconduct or unwarranted activities (cheating, plagiarism, drug use, etc.) will be dealt with in the MDC approved manner.

Questions and other issues regarding the class can be discussed either during the given question and answer session per class time or by appointment during my office hours.

The use of electronic devices (cell phones, beepers, game boys, Walkman, DVD players, etc.) is **NOT** tolerated during lecture time. The following regulations concerning cellular phone usage will be ***strictly enforced*** in all classrooms and laboratories. ***STUDENTS WHO FAIL TO COMPLY WITH THE FOLLOWING RULES MAY BE ASKED TO LEAVE THE CLASS.***

- All cellular phones must be turned off or placed in silent mode ***prior to*** entering the classroom or laboratory.
- Use of cellular phones during lecture and lab is strictly prohibited. Student will be asked to leave the class if the cell phone rings or is used. In the laboratory, use of the cell phone will be considered a safety violation and the student will be asked to leave the lab immediately.
- All cellular phones must be stored in your purse, book-bag, or pocket during lecture or lab. Hands-free earpieces must also be stored and cannot be worn during lecture or lab.
- In addition to phone conversations, the cellular phone may not be used for text messaging, picture messaging, web browsing, etc. during lectures and labs.

Your professor gives you his/her undivided attention during class. Please have the courtesy to do the same in return.

### **TIPS FOR SUCCESS:**

#### **MAKE A COMMITMENT TO SUCCEED:**

Decide to do well in the course. Spend the time. Be responsible for your own learning. Expect to learn more than what is covered in class or textbook.

#### **GET HELP RIGHT AWAY:**

Do not wait for someone to ask if you need help. Talk with your professor, lab assistants, and your study group. The professor encourages frequent visits during office hours to clarify material covered in class. If you cannot make it to the professor's office hours, please make an appointment. Your success in this course depends on how well you understand the concepts

covered during the semester. Use the Study partner CD-ROM, and the Study Guide that accompanies the textbook, and the computer courtyard. Review your notes after each class.

**WORK WITH A STUDY GROUP:**

Meet regularly. Be sure everyone contributes and understands.

**TIE IDEAS AND CONCEPTS TOGETHER:**

Connect the material to what you already know. Look for the big picture, not just isolated details. Be able to apply information in a new situation.

**LEARN THE VOCABULARY:**

Look up any words you do not know. Make and use flash cards, carry them everywhere. Say the terms out loud. Use the new terms in sentences. Therefore, make every effort to learn the vocabulary and use the dictionary appropriately.

**PREPARE FOR LECTURE BEFORE CLASS:**

Read the text assignments. Read effectively. Use the study aids in the book. Answer the questions at the end of the chapter. Highlight sparingly. Write down questions to ask during the next lecture period. Make every effort to know the material before class begins.

**UTILIZE ADDITIONAL RESOURCES AVAILABLE TO YOU**

Additional help in form of sample exams and quizzes lecture notes and other didactic materials are available through the many links that could be accessed through the World Wide Web for this course. Please, feel free to use the available the equipment at the Computer Courtyards (Rooms 2201 and 2301) and the Science Resource/Tutoring Center (room 2221) for this purpose.

**PREPARE FOR LABS BEFORE CLASS:**

Read and highlight the handouts. Tie it to the lecture material. Write down questions to ask. Make notes of what to look for.

**COME TO CLASS:**

Attend every class. Remember that attendance is mandatory. Be on time. Bring your textbook and handouts. Be attentive and take notes.

**STUDY EVERY DAY:**

Follow a study schedule. Find times and places that allow you to concentrate. Review and rewrite your notes after class. Outline the material. Draw concept maps and/or use diagrams.

**ORGANIZE THE INFORMATION:**

Make outlines to summarize, organize, and relate key ideas. Know where your notes, handouts, etc. are.

***You Must Study to Understand...***

***You Must Understand,  
To Learn***

***Don't Always Memorize! Analyze.***

***Students are encouraged to approach the instructor regarding  
any and all  
conditions that may affect their equal opportunity to learn.***

**Students:** you must bring your own **scantron** form **882-E** and **No. 2** Pencils for the tests.

**Tentative Schedule of Classes:**

<i><u>Week of:</u></i>	TOPICS	BOOK CHAPTERS
August 29	Introduction to Biology/Scientific Method Chemistry <i>Graphing, Functions, Charts, Tables, Data Presentation</i>	1-2
September 3	Chemistry Biological molecules <i>Logarithms, Graphing, Charts, Tables, Data Presentation</i>	2-3
September 10	The cell and its components <i>Graphing, Tables, Data Presentation, Linear Modeling</i>	4
September 17	<b>EXAM 1</b>	<b>(chapters 1-4)</b>
	Energy Enzymes Cell Transport <i>Graphing, Functions, Charts, Tables, Data Presentation</i>	5
September 24	Cellular Respiration and Fermentation <i>Graphing, Charts, Tables, Data Presentation</i>	6
October 1	Photosynthesis <i>Graphing, Charts, Tables, Data Presentation</i>	7
October 8	<b>EXAM 2</b>	<b>(chapters 5-7)</b>
	Cellular Replication <i>Exponential Modeling (Growth/Decay)</i>	8
October 15	Genetics and Inheritance <i>Exponential Modeling (Growth/Decay)</i>	9
October 22	Molecular Genetics Biotechnology <i>Graphing, Functions, Charts, Tables, Data Presentation</i>	10-12

October 29	Molecular Genetics Biotechnology <i>Graphing, Functions, Charts, Tables, Data Presentation</i>	10-12
	<b>EXAM 3</b>	<b>(chapters 8-12)</b>
November 5  Last day to Drop with a Grade of "W" is <b>November 6th</b>	Evolution, Origin and Progress of life <i>Linear modeling, Rate of Change</i>	13-15, 19 (overview)
November 12	Evolution, Origin and Progress of life <i>Linear modeling, Rate of Change</i>	13-15, 19 (overview)
November 19	Kingdoms (invertebrates/vertebrates) and diversity <i>Linear modeling, Rate of Change</i>	16-18 (overview)
November 26	Kingdoms (invertebrates/vertebrates) and diversity <i>Linear modeling, Rate of Change</i>	16-18 (overview)
December 3	<b>EXAM 4</b>	<b>(chapters 13-19)</b>
	Populations, Ecology and what MAN does in life <i>Exponential Modeling (Growth/Decay)</i>	34, 37 (overview)
December 10	Populations, Ecology and what MAN does in life <i>Exponential Modeling (Growth/Decay)</i> <b>Project term paper and presentations</b>	34, 37 (overview)
December 17	<b>EXAM 5</b>	<b>(chapters 34, 37)</b>

**Be aware those exact lecture topics and tests schedules are subject to change.**

*ITALICS represent interdisciplinary College Algebra content.*

Holidays: September 3<sup>rd</sup>, November 22<sup>nd</sup> and 23<sup>rd</sup>.

**Major Milestones for Group Project:**

**Week 3: 10% of Project Grade**

- Group must have a written proposal. It must include:
  - Project Title and theme.
  - Summary of proposal stating the objective, hypothesis, service learning location, and deliverables/outputs.

**Week 9: 10% of Project Grade**

- Group must turn in a one-page summary of their project detailing progress. The summary must contain the following items:
  - Final Report Outline.
  - Volunteer Site overview and description.
  - Up-to-date data collection.

**Week 16: 80% of Project Grade**

- Each individual student must give their final term paper.
  - 4 pages of content (excluding graphs/tables and references).
- Each group will present their findings to the learning community and other guests.
  - 15-minute presentation.
  - 5-minute Questions and Answers session.
  - Group members must share their knowledge equally.
- Your final grade will be based on your paper and presentation (see rubric below).
  - 60% on the presentation and 40% on the term paper.

**Distribution Requirements Assignment Grading Rubric for Group Project:**

<b>Criterion/Trait</b>	<b>5 points</b>	<b>3 points</b>	<b>0 points</b>
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<b>Comprehension &amp; Knowledge</b>	Student identified and understood the mechanism and components of the assigned project, statistics, and other relevant information of the assigned topic.	Student partially identified and understood the mechanism and components of the assigned project, statistics, and other relevant information of the assigned topic.	Student failed to identify and understand the mechanism the mechanism and components of the assigned project, statistics, and other relevant information of the assigned topic.
<b>Evaluation &amp; Analysis</b>	The student assessed/review the significance of the mechanism and components of the assigned project, statistics, and other relevant information of the assigned topic. Student examined the details and explained the data component by showing tables, graphs, trends and correlations.	The student somewhat assessed/reviewed significance of the mechanism and components of the assigned project, statistics, and other relevant information of the assigned topic. Student partially examined the details and explained the data component by showing tables, graphs, trends and correlations.	The student failed to assessed/reviewed significance of the mechanism and components of the assigned project, statistics, and other relevant information of the assigned topic. Student failed to examine the details of the mechanism and components of the assigned project, and explain the data component by showing tables, graphs, trends and correlations.
<b>Synthesis</b>	Student was able to draw conclusions with the available sources of information on the assigned project.	Student to some extent was able to draw conclusions with the available sources of information on the assigned project.	Student failed to draw conclusions with the available sources of information on the assigned project.
<b>Format</b>	The student followed the scientific method style, used proper mathematical techniques and ensured that the document was free of spelling and grammatical errors. Paper included and listed references correctly.	The student to some extent followed the scientific method style, used proper mathematical techniques and ensured that the document was free of spelling and grammatical errors. References were not listed correctly.	The student failed to follow the scientific method style, used proper mathematical techniques and ensured that the document was free of spelling and grammatical errors. References were poor and/or not listed.
<b>Technology &amp; Presentation Skills</b>	<b>EACH</b> student had professional appearance and used proper presentation skills and technological resources.	The student to some extent used proper presentation skills and technological resources.	The student failed to use proper presentation skills and technological resources.

**Total Points = Sum of points of each individual trait**

**Project Grade = Sum of points of each individual trait X 4**

**Course Competencies:**

Competency 1: The student will understand the nature of science, the scientific method, and the field of biology.



Upon successful completion of this course, the student will demonstrate knowledge of the nature of science and the scientific process by:

- A. Describing and/or illustrating the scientific method as presented in the literature.
- B. Differentiating between science and biology.
- C. Comparing the characteristics of life common to a simple cell and multicellular organisms.

Competency 2: The student will become familiar with the basic principles of matter and energy, and understand how they relate to living organisms.

Upon successful completion of this course, the student will demonstrate knowledge of the nature of matter and energy and how they relate to living organisms by:

- A. Defining energy and matter, and their laws, and explaining how they are used in biological systems.
- B. Explaining the basic structure of atoms and molecules and recognizing examples of covalent, hydrogen, and ionic bonding.
- C. Explaining the importance of water to life and the concept of acidity as well as its expression as pH.
- D. Identifying the four major groups of organic compounds (carbohydrates, lipids, proteins, and nucleic acids) and understanding their functions in living systems.
- E. Describing the roles of enzymes in the synthesis and decomposition of biological compounds.
- F. Describing the processes of photosynthesis and cellular respiration.

Competency 3: The student will become familiar with cell structure and function and their interrelationships.

Upon successful completion of this course, the student will demonstrate knowledge of the nature of cell structure and function by:

- A. Describing the structure of a typical cell and explaining the function of the sub-cellular organelles.
- B. Differentiating between plant and animal cells with respect to structure and function.
- C. Identifying and explaining methods of cell transport such as diffusion, osmosis, and active transport.

Competency 4: The student will understand the processes of cellular and organismal proliferation.

Upon successful completion of this course, the student will demonstrate knowledge of the cellular and organismal processes of proliferation by:

- A. Explaining the function and significance of cell division and organismic reproduction.

- B. Comparing and contrasting mitosis and meiosis and describing the significant events that occur in each stage of these processes.
- C. Explaining the principles of heredity, as illustrated by the work of Gregor Mendel, and their application to humans.
- D. Describing the structure of DNA and understand how it functions to control a cell's activity and acts as the molecule of heredity.
- E. Explaining the processes of DNA replication, transcription and translation.

Competency 5: The Student will understand and appreciate the nature of evolutionary theory.

Upon successful completion of this course, the student will demonstrate knowledge of the nature of evolutionary theory by:

- A. Explaining the theory of evolution of life on Earth favored by modern scientists.
- B. Describing and explaining Darwin's basic concept of natural selection and how it relates to the theory of evolution.
- C. Listing and explaining the several categories of evidence that support the theory of evolution.
- D. Describing how scientists group living organisms into hierarchical groups based on their shared characteristics, and name and characterize the major systematic taxa.

Competency 6: The student will understand the relationship between organisms and the environment as well as how the environment is affected by population growth and consumption of resources.

Upon successful completion of this course, the student will demonstrate knowledge of interactions between organisms and the environment by:

- A. Identifying and explaining the ways in which the abiotic environment affects living systems.
- B. Describing the factors that control population growth and the mechanisms involved.
- C. Discussing the various relationships existing among individuals and populations in communities.
- D. Explaining the nature of ecosystems with particular reference to their sustainability.
- E. Listing and describe the major biomes of the world.
- F. Discussing the major impact humans have on their environment.

## General Education Outcomes in BSC 1005, General Education Biology:

**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.**  
*In this course, the communication outcome will be reinforced by at least one essay and project assignment related to a current topic article. In addition to content, essays will also be graded for correct use of grammar and spelling. Project presentation will be graded based on content and presentation skills.*
- 2. Use quantitative analytical skills to evaluate and process numerical data.**  
*Numbers are the language that can be integrated in Biology. In this class, you will have to be able to read and identify pertinent numerical scientific data. You will be required to manipulate the data using equations and dimensional analysis. Quantitative analysis is reinforced in this course.*
- 3. Solve problems using critical and creative thinking and scientific reasoning.**  
*In the allied health field, critical thinking is an essential skill. Solving numerical problems is not enough. You must be able to critically look at the problem and determine whether or not the answer makes sense. You must be able to determine a logical sequence of steps to solve problems, both qualitative and numerical. Critical thinking and scientific reasoning are heavily reinforced in this course.*
- 4. Formulate strategies to locate, evaluate, and apply information.**  
*At least one essay assignment related to a current topic project will be completed during the semester. In reviewing the article, you will need to find and reference supplementary information to support your viewpoint.*
- 5. Demonstrate knowledge of diverse cultures, including global and historical perspectives.**  
*This outcome is heavily touched upon in this course, in relation primarily to historical landmarks in biology, evolution and genetics.*
- 6. Create strategies that can be used to fulfill personal, civic, and social responsibilities.**  
*This outcome is reinforced in this course through your project assignment and testing, which requires you to develop and learn strategies in order to become better citizens and environmental conscious.*
- 7. Demonstrate knowledge of ethical thinking and its application to issues in society.**  
*Students will be required to discuss the actions that would lead to different ethical dilemmas, and the resulting consequences. Students will be asked to describe how they would have acted in a similar situation.*
- 8. Use computer and emerging technologies effectively.**  
*The majority of all homework assignments will be completed using CyberED, a computer based course tool. In addition, Course Compass is an online course tool that will be used to get lectures and other pertaining information. All course progress reports will be sent to you via email. Students must therefore be able to use a personal computer, navigate the internet, and retrieve email. In addition, any essay assignments must be completed using a word processing program.*
- 9. Demonstrate an appreciation for aesthetics and creative activities.**  
*This outcome is not reinforced in this course.*
- 10. Describe how natural systems function and recognize the impact of humans on the environment.**  
*The nature of biological molecules and their role in biological systems will be a major topic in this course. Students will be able to name, identify, and list biological, chemical and physical properties of inorganic and organic compounds, as well as biological macromolecules. Students will also be able to identify the role of biological molecules in living systems. The environmental and health impact of certain types of biological molecules and systems will be discussed.*

## ACKNOWLEDGEMENT

I, \_\_\_\_\_, student ID \_\_\_\_\_, understand and acknowledge that:

- (i) I read and understood the Syllabus.
  - (ii) I may obtain assistance from my instructor and from the Science Lab located in Room 2221.
  - (iii) If applicable, I will turn off my cell phone and put it away so that it is not visible to me or to the instructor.
  - (iv) Student will be asked to leave the class if the cell phone rings or is used.
  - (v) I MAY NOT use my cell phone calculator capabilities in class or in exams.
  - (vi) There are NO MAKE UP tests should I miss an exam.
  - (vii) NO EXTRA CREDIT will be considered.
  - (viii) I may not leave the classroom once the test begins.
  - (ix) Cheating and disruptive behavior may result in serious consequences such as course failure or dismissal from the college.
  - (x) The course schedule may change due to unforeseen circumstances.
  - (xi) The final exam will be given during date and time scheduled by the Registrar's office.
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\_\_\_\_\_  
Student's Name

JUAN MORATA  
Instructor's Name

\_\_\_\_\_  
Student's Signature

Date: \_\_\_\_\_

## ACKNOWLEDGEMENT

I, \_\_\_\_\_, student ID \_\_\_\_\_, understand and acknowledge that:

- (xii) I read and understood the Syllabus.
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  - (xiv) If applicable, I will turn off my cell phone and put it away so that it is not visible to me or to the instructor.
  - (xv) A quiz could be given if a cell phone goes off.
  - (xvi) I MAY NOT use my cell phone calculator capabilities in class or in exams.
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\_\_\_\_\_  
Student's Name

JUAN MORATA  
Instructor's Name

\_\_\_\_\_  
Student's Signature

Date: \_\_\_\_\_