

**INTERAMERICAN UNIVERSITY OF PUERTO RICO
METROPOLITAN CAMPUS
FACULTY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF NATURAL SCIENCES**



Syllabus

I. GENERAL INFORMATION

Course Title	:	Basics Concepts of Biology
Code and Number	:	BIOL 1003
Credits	:	3 credits
Academic term	:	Trimester
Professor	:	Vivian Pereira Cardona
Office Hours	:	
Office Phone	:	787-250-1912, ext.2323
Email	:	vpereira@intermetro.edu

II. DESCRIPTION

Basic concepts of biology, such as cellular, genetic, physiological, developmental, and ecological aspects. This course is not valid as a requirement for the concentration in biology. It requires 30 hours of lecture and 30 hours of laboratory.

III. PROGRAM COMPETENCES AND COURSE OBJECTIVES

It is expected that, upon completion of the course, the student will be able to:

1. Apply the scientific method of the basic concepts of biology.
2. Describe the characteristics of living things.
3. Recognize the most important organic molecules in living things.
4. Describe the cell in terms of its structure and function.
5. Define the processes of cell metabolism and photosynthesis.
6. Mention the importance of nucleic acids and their relationship with protein synthesis.
7. Describe the cell cycle.
8. Know the basic aspects of Mendelian Genetics.
9. Identify the importance of hormones in plants.
10. Define animal behavior patterns.

IV. THEMATIC CONTENT

1. Introduction and Scientific Method
2. Definition of science and biology
 - a) The scientific method
 - b) Biology areas
 - c) Properties of living matter.
3. Basic Chemistry
 - a) Introduction.
 - b) Define atom, molecule, element, compound, etc.

- c) Types of chemical bonds.
- d) Reactivity of atoms
- e) Compounds and molecules, chemical reactions.
 - (1) Inorganic compounds
 - (2) Water and its properties
- f) Classification of chemical compounds (1) Acids
 - (2) Bases
 - (3) You go out
- g) PH concept
 - (1) Shock absorbers
- h) Organic Molecules Important for Life
 - (1) Carbohydrates
 - (a) Chemical composition
 - (b) Types of carbohydrates
 - (c) Features
 - (2) Lipids
 - (a) Chemical composition
 - (b) Types of lipids
 - (c) Features
 - (3) Protein
 - (a) Chemical composition
 - (b) Protein types
 - (c) Features
- 4. Cell Structure and Function
 - a) Cell theory
 - b) Cell structure and function
 - (1) Cellular membrane
 - (2) Membrane Permeability
 - (a) Chemical homeostasis
 - (b) Diffusion, osmosis and dialysis
 - (c) Transport of substance through the cell
 - (3) Cellular wall
 - (4) Cytoplasm
 - (5) Nucleus
 - (6) Mitochondria
 - (7) Plastids
 - (8) Ribosomes
 - (9) Endoplasmic reticulum and Golgi bodies
- 5. Cell Reproduction
 - a) Cellular cycle
 - b) Mitosis
- 6. Cellular metabolism
 - a) Second law of thermodynamics
 - b) Energy Concepts
 - (1) Types of energy
 - (2) Energy transformation
 - c) Food as fuel for energy
- 7. Cellular Respiration
 - a) Types of cellular respiration
 - (1) Anaerobic Respiration: Glycolysis, Fermentation
 - (2) Aerobic Respiration: Glycolysis, Krebs Cycle, Electron Transport System.
- 8. Photosynthesis

- a) Importance of Photosynthesis
- b) Types of Electromagnetic Waves
- c) Light absorption: Solar spectrum, visible light.
- d) Photosynthesis Process
- 9. Mendelian Genetics
 - a) Nucleic acids
 - (1) Chemical composition
 - (2) Types of Nucleic Acids (a) Ribonucleic Acid
 - (b) Deoxyribonucleic Acids
 - (c) Others
 - (3) Functions
 - b) Genetic code
 - c) Protein synthesis
 - (1) Translation
 - (2) Transcription
 - d) Monohybrid crosses
 - (1) Codominance
 - (2) Lethal Factors
 - (3) Multiple alleles
 - e) Dihybrid crosses
 - (1) Determination of Sex
 - f) Heredity linked, limited, and influenced by sex
- 10. Vegetable Hormones
 - a) Tropisms
 - b) Phytohormones
- 11. Animal behavior
 - a) Ethology
 - b) Animal behavior
 - c) Inheritance and learning
 - d) Trigger stimuli concept
 - e) Communication

V. ACTIVITIES

1. Conference
2. Individual or group work
3. Scientific news analysis
4. Use of audiovisual resources
5. Student Presentations
6. Laboratories

SAW. EVALUATION

CRITERION	POINTS	VALUE
Test I	100	20%
Test II	100	20%
Test III	100	20%
Final exam	100	20%

Laboratory	100	20%
TOTAL	500	100%

Attendance to class and laboratory is compulsory.

Two exams of 100 points each and a final oral presentation of 50 points.

Labs during the semester: 9 of 10 points each

Each student must deliver and / or present their work according to the criteria discussed by the professor: The works are delivered on the assigned date. No work is accepted outside of the classroom. The delivery of a work or laboratory out of date has a penalty of 20%.

VII. SPECIAL NOTES

Ancillary Services or Special Needs All students who require auxiliary services or special assistance must request them at the beginning of the course or as soon as they acquire knowledge of those they need, through the corresponding registry in the Office of the Professional Counselor, Mr. José Rodríguez, located in the Orientation Program University.

Honesty, fraud, and plagiarism (General Student Regulations, Chapter V) Dishonesty, fraud, plagiarism and any other inappropriate behavior in relation to academic work constitute major infractions sanctioned by the General Student Regulations. Major offenses, as provided in the General Student Regulations, may result in suspension from the University for a defined period of more than one year or permanent expulsion from the University, among other sanctions.

Use of electronic devices Cell phones and any other electronic device that could interrupt the teaching and learning processes or alter the environment conducive to academic excellence will be disabled. Urgent situations will be addressed, as appropriate. The handling of electronic devices that allow accessing, storing, or sending data during evaluations or exams is prohibited.

Compliance with the provisions of Title IX the Federal Higher Education Law, as amended, prohibits discrimination based on sex in any academic, educational, extracurricular, athletic activity or in any other program or employment, sponsored or controlled by an educational institution, superior regardless of whether it is carried out inside or outside the premises of the institution if the institution receives federal funds.

In accordance with current federal regulations, our academic unit has appointed an Assistant Title IX Coordinator who will aid and guidance in relation to any alleged incident that constitutes discrimination based on sex or gender, sexual harassment, or sexual assault. You can contact the Assistant Coordinator Mr. George Rivera, at 787-250-1912 extension 2262 or 2147, or by email griverar@metro.int er.edu.

The Normative Document entitled Norms and Procedures for Attending Alleged Violations of the Provisions of Title IX is the document that contains the institutional rules to channel any complaint that is presented based on this type

of allegation. This document is available on the website of the Inter American University of Puerto Rico (www.inter.edu).

VIII. EDUCATIONAL RESOURCES

Textbook

Starr C. and Taggart R. (2012). *Biology: The Unity and Diversity of Life*, 13 ed, Brooks Cole; ISBN-13: 978-1111425692 It is a requirement to have the text.

IX. BIBLIOGRAPHY

1. Audersik, T. & Gerald A. (2011). *Live on Erth*: Benjamin Cummings.
2. Campbell, NA (2010). *Biology*. 9 ma.ed., Benjamin Cummings.
3. Colleen MB (2012). *Biology: Science for life*. 4 Ta. Ed.: Benjamin Cummings.
4. Gunstream SE (2011). *Explorations in Basic Biology*. 12 ed: Benjamin Cummings.
5. Patton, KT & Thibodeau, GA (2012). *Anatomy & physiology* (8th ed.). St. Louis, MO: Mosby Elsevier.
6. Pruit, N. (2006). *Bio Inquiry: making connections in biology*. 3rd.ed. New York: John Wiley.

Electronic Resources

The Biology Project available at <http://www.biology.arizona.edu>

Evolution is a fact and a theory available at

<http://www.talkorigins.org/faqs/evolution-fact.html> Mendelian inheritance available at

http://www.virtual.unal.edu.co/cursos/ciencias/2000024/lecciones/cap03/03_05_01_02_03.htm

Mendel's Second Law available at

<http://www.rena.edu.ve/cuartaEtapa/Biologia/Tema2.html>

Karyotype activity. Available in

http://www.biologia.arizona.edu/human/act/karyotyping/patient_a/final_noform.html

Ecosystems of Puerto Rico available at

<http://www.prfrogu.com/geocities/ecosistemaintrod.htm> *Biology II Instruction*

Module Index available in <http://mseip.guayama.inter.edu>. *Biology Instruction*

Module Index available at <http://TVC.guayama.inter.edu>.

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