



# UNIVERSITY OF NICOSIA

## ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

University of Nicosia, Cyprus

<b>Course Code</b> BIOL-101	<b>Course Title</b> General Biology I	<b>ECTS Credits</b> 6
<b>Department</b> Life and Health Sciences	<b>Semester</b> Fall	<b>Prerequisites</b> High-School Biology or a Biology Foundation Course
<b>Type of Course</b> Required	<b>Field</b> Biology	<b>Language of Instruction</b> English
<b>Level of Course</b> 1 <sup>st</sup> Cycle	<b>Year of Study</b> 1 <sup>st</sup>	<b>Lecturer</b> Dr. Evdokia Kassini-Kastanos/ Dr. George Krashias
<b>Mode of Delivery</b> Face-to-face	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

### Objectives of the Course:

This course is the first part of a two parts course in General Biology. The aim of this course is to demonstrate the complexity and diversity of life processes and to teach students the scientific method and how to contact and report an investigation. The main objectives of the course are to:

- Make students aware of the diversity/complexity of organisms, the major categories of biological molecules and their basic functions.
- Describe the structure-function of cell organelles and demonstrate the differences between prokaryotic and eukaryotic cells.
- Demonstrate the energy requirements of organisms through the study of energy pathways such as photosynthesis and respiration.
- Make students aware of the biological processes of cell division, reproduction and genetic inheritance.
- Provide students the opportunity to study the scientific method through experiments and to practice problem solving techniques.
- Provide students the opportunity to practice on basic laboratory equipment, to collect metric measurement, report data and interpret results accurately.

### Learning Outcomes:

After completion of the course students are expected to be able to:

- Identify basic biological macromolecules from their chemical structure and name their basic function.
- Define the basic structure and function of cell membranes and organelles and

- compare prokaryotic and eukaryotic cells.
- Explain how organisms derive and utilize energy through photosynthesis and cellular respiration.
- Explain cell division and identify the basis of genetic inheritance.
- Apply the scientific method to collect and interpret experimental data, propose scientific conclusions and write a formal laboratory report.
- Use basic laboratory equipment and work with others.

**Course Contents:**

1. Introduction to the Science of Life, Levels of Organization  
**LAB: Introduction and Laboratory Safety Issues**
2. The chemical basis of life  
**LAB: The process of Scientific Inquiry: The elements of an experiment**
3. Properties of Water, pH, pKa, Acid/bases  
**LAB: Use of the Microscope**
4. Structure function of macromolecules in the living cell  
**LAB: Biomolecules: Qualitative determination of Sugars, Lipids, Proteins and DNA.**
5. Prokaryotic vs. Eukaryotic cells: cellular organelles: structure vs. function.
6. Membrane structure and function; cell communication.  
**LAB: Cell structure and Function: Osmosis**
7. Laws of Thermodynamics, ATP regeneration, Enzyme Activity, Feedback Inhibition  
**LAB: Cell metabolism: Effect of pH on the enzyme activity**  
**LAB: Cell metabolism: Effect of temperature on the enzyme activity**
8. Cellular respiration, electron transport and oxidative phosphorylation.  
**LAB: Respiration: Alcohol fermentation**
9. Photosynthesis; the light and dark reactions.  
**LAB: Photosynthesis: Isolation of leaf pigments; Absorption spectra of leaf pigments**
10. Cell Reproduction: Cell Cycle.
11. Mitosis vs Meiosis.  
**LAB: Mitosis**

**Learning Activities and Teaching Methods:**

Lectures; Laboratory Sessions; Group learning, discussions.

**Assessment Methods:**

Laboratory reports/exams; Mid-term Exams; Final Exam

**Required Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
1. N.A. Campbell	Biology (with Student CD-ROM), 8/e	Benjamin/Cummings	2008	ISBN: 978-0-321-53616-7

and Jane B. Reece				
3. Koptides M. and Kastanos E.	Biology Laboratory Manual	University of Nicosia	2009	

**Recommended Textbooks/Reading:**

<b>Authors</b>	<b>Title</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
1. N.A. Campbell, N.E. Ervin	“Biology: Concepts and Connections”	Benjamin/Cummings	2002, 4th Edition	<b>ISBN:</b> 080536627 X
2. A. Jones, R. Reed and J. Weyers	“Practical skills in Biology”	Benjamin/Cummings	2003, 3 <sup>rd</sup> Edition	ISBN: 0-130-45141