UNIVERSITY of NICOSIA

University of Nicosia, Cyprus

Course Code	Course Title	ECTS Credits
BIOL-102	General Biology II	6
Department	**Semester**	**Prerequisites**
Life and Health Sciences	Spring	BIOL-101 General Biol.I
Type of Course	**Field**	**Language of Instruction**
Required	Biology	English
Level of Course	**Year of Study**	**Lecturer**
1st Cycle	1st	Dr. Paraskevi Farazi
		Dr. Evdokia Kassini-Kastanos
Mode of Delivery	**Work Placement**	**Co-requisites**
face-to-face	N/A	None

Objectives of the Course:

This course complements the 1st course in General Biology and aims to teach students the complexity of life at the protein and gene level, and about genetic inheritance. The course also aims to provide students with the opportunity to develop further laboratory skills through practice. The main objectives of the course are to:

- Explain the molecular basis of cell cycle growth and division in unicellular and multicellular organisms, and how genetic information is decoded and inherited.
- Discuss the principle of Mendelian genetics and employ punit square to demonstrate genotypic and phenotypic inheritance.
- Introduce students to Darwin's theory of natural selection, and to the evolution of the human genome.
- Provide students with the opportunity to work with others and introduce them to the use of biotechnology applications in proteomics and genomics.

Learning Outcomes:

After completion of the course students are expected to be able to:
1. Define the relationships between molecular and cellular functions during mitosis, and meiosis.
2. State the basis of Mendelian genetics, explain the chromosomal basis of inheritance and calculate simple genotype/phenotype frequencies.
3. Diagram the structure and state the functions of DNA/RNA and identify the steps and molecules involved in gene transcription and translation.
4. Compare gene expression in prokaryotes and eukaryotes and describe uses of

bacterial genetics in biotechnology.
5. Explain the association between genetic mutations and human diseases.
6. Demonstrate basic laboratory skills in the study of genes and proteins and writing skills in scientific reporting.

Course Contents:

1. Cell Division: Mitosis and Meiosis
   LAB: Biostatistics: Introduction to probabilities
2. Mendelian Inheritance
   LAB: Mendelian Genetics and Genetic Problems
3. Human Genetics: Karyotypes and Pedigrees
   LAB: Microbial culture and growth
4. Chromosomes structure function
   LAB: Antibiotic resistance selection
5. The Molecular Basis of Inheritance: Watson and Crick Model of DNA.
   LAB: Effect of UV on Bacterial Viability
6. DNA Replication
   LAB: Genetics of Bacteria: Transformation of E. coli
7. Connection between Genes and Proteins: The Genetic Code
   LAB: Isolation of plasmid DNA. Isolation of DNA from Human blood samples
8. RNA Transcription, Translation
   LAB: DNA gel electrophoresis, and mapping of recombinant plasmids
9. Post Translational Modifications and protein function
   LAB: Quantitative determination of proteins
10. Introduction to Genetics of viruses and Bacteria
    LAB: Protein gel electrophoresis: Determination of the molecular weight of Proteins
11. Organization, regulation and evolution of eukaryotic genomes
12. The Darwinian Theory of Evolution, Natural Selection and Adaptation

Learning Activities and Teaching Methods:

Lectures; Laboratory Practicals; Group learning, Discussions

Assessment Methods:

Laboratory reports; Quizzes and Mid-term Exam; Final Exam

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
1. N.A. Campbell and Jane B. Reece	Biology(with Student CD-ROM), 7/e	Benjamin/ Cummings	2005	0-8053-6624-5

				0805074376
2. Eric P. Widmaier	The Stuff of Life: Profiles of the Molecules That Make Us Tic, 2/e	Owl Books	2003	
3. Koptides M. and Soros I.	Biology Laboratory Manual	University of Nicosia	2006	

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
1. J. D. Watson, A. Berry	DNA: The Secret of Life	Knopf	2003	ISBN: 0375415467
2. Michael A. Palladino	Understanding the Human Genome Project	Benjamin/ Cummings	2003, 3rd Edition	ISBN: 0-8053-6774-8