UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
IMPH-123	Molecular Biology and Genetics/ Μοριακή Βιολογία και Γενετική	5
Prerequisites	**Department**	**Semester**
None	Health Sciences	Fall/Spring
Type of Course	**Field**	**Language of Instruction**
Compulsory	Pharmacy	Greek/ English
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr Evelina Charidemou	1st
Mode of Delivery	**Work Placement**	**Corequisites**
Face-to-face	N/A	N/A

Course Objectives:

The main objectives of the course are to:

1. Explain to students the basic principles of molecular biology and genetics and pose fundamental questions that will stimulate their interest in molecular biology and genetics and their importance in health sciences.
2. Give students an understanding of the basics of human genetics, as well as the central dogma of molecular biology (from DNA to proteins), DNA structure, replication, transcription, translation and gene regulation.
3. Give students an understanding of the different techniques used in molecular biology and biotechnology and get exposed to current topics relevant to pharmacy.
4. Expose students to literature search by assigning and studying a genetic disease or disorder and present their findings.

Learning Outcomes:

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

1. Understand the basic principles of mitosis, meiosis and reproduction
2. Describe Mendelian genetics, and the chromosomal basis of inheritance
3. Recognize the structure and function of DNA and be able to describe the basic steps involved in transcription and translation of genes as well as the mechanisms of

gene regulation and repair
4. Compare and contrast the mechanisms of bacterial and eukaryotic DNA replication, DNA repair, transcription, and translation
5. Describe the different biotechnology methods and recognize their use and importance in pharmacy
6. Define the basic principles of the molecular basis and genetics of cancer
7. Outline the basic principles of gene and stem cell therapy

Course Content:

1. Cellular division – mitosis and meiosis
2. Genetics: Mendelian Genetics, chromosomal basis of inheritance, and molecular basis of inheritance
3. DNA and chromosomes: structure and function of DNA, structure of eukaryotic chromosomes.
4. DNA replication and repair
5. From DNA to proteins: how cells read the genome. From DNA to RNA and proteins (transcription, translation)
6. Chromosomes and gene expression regulation - molecular switches
7. Biotechnology: Techniques for DNA analysis, methods for isolating and studying nucleic acids. Methods used for DNA and RNA. Gel electrophoresis, Southern and Northern blotting, Restriction enzymes and ligations, cloning of DNA). Polymerase chain reaction (PCR). Their application in the field of pharmacology
8. Cancer, Stem cells and gene therapy
   Major Assignment:
9. Study/ explore and present to class a genetic disease (inheritance, prevalence, etc.)

Learning Activities and Teaching Methods:

Lectures, class discussion, assignments

Assessment Methods:

Final exam, Midterm exam, assignment

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Biology	Campbell NA, Reece JB	Pearson, Benjamin, Cummings	2008	9780805368444
Molecular Biology of the Cell	Alberts B., Johnson A., Lewis J., Morgan D., Raff M., Roberts K., Walter P	W. W. Norton & Company	2014	9780815345244
Βασικές Αρχές Κυτταρικής Βιολογίας	Alberts B.,Bray D.,Hopkin K.,Johnson A.,Lewis J.,Raff M.,Roberts K.,Walter P	BROKEN HILL PUBLISHERS	2015	9789963258277

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Molecular Biology: Genes to Proteins (Biological Science) 4th Edition	Burton E. Tropp	Jones & Bartlett Publishers	2011	97808053 68444
Βασικές Αρχές Μοριακής Βιολογίας	Burton E. Tropp	Ακαδημαϊκές Εκδόσεις Ι. ΜΠΑΣΔΡΑ & ΣΙΑ Ο.Ε	2015	9786185135010