



University of Nicosia, Cyprus

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| Course Code BIOL-303 | Course Title Human Biological Variations | ECTS Credits 6 |
| Department Life and Health Sciences | Semester Spring | Prerequisites BIOL-231 Biostatistics, BIOL-232 Human Molecular Genetics |
| Type of Course Required | Field Genetics | Language of Instruction English |
| Level of Course 1 st Cycle | Year of Study 3 rd | Lecturer Dr. Evi Farazi |
| Mode of Delivery Face-to-face | Work Placement N/A | Co-requisites None |

Objectives of the Course:

The aim of this course is to teach students the range of biological variations and the nature and basic components (genetic and environmental) which have contributed to these variation in modern humans. The main objectives of the course are to:

- Discuss in depth the genetic basis of human variations and review the processes and sources of variation that contribute to the complexity of human adaptive responses to the environment.
- Demonstrate how population genetics contributes to the understanding of human biological variation within and between populations and over time.
- Demonstrate the methods of measurements and analysis of simple and complex traits using biological variation examples of such traits.
- Use examples to discuss how human behavior and culture in response to the environment has influenced biological variation and to debate the concept of racism and the eugenics movement.
- Make students aware of the impact of modern technologies on the latest scientific discoveries regarding human biological variations.

Learning Outcomes:

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

1. Calculate allelic, genotypic, and phenotypic frequencies based on population data in cases of Hardy-Weinberg equilibrium and of deviations from it.
2. Identify and discuss the origin of specific genetic variations in the blood group system, plasma and blood cell proteins, and explain how they relate to disease.

3. Define and discuss quantitative and anthropometric variation and interpret data from anthropometric variation studies.
4. Describe and discuss how genetic tools allow the documentation of evolutionary changes and selection in human populations, and compute genetic distance.
5. Discuss and compare population genetic studies with information on population structure, history and human behaviour to draw conclusions on biological variations.
6. Design simple experimental studies using molecular methods to study human genetic variations.
7. Report on new developments in the field of human variation from literature searches.

Course Contents:

1. Introduction to the history and science of human biological diversity.
2. Genetic basis of human variation: review of cell division, structure of chromosomes, DNA structure and replication, Mendelian genetics.
3. Population genetics: Hardy-Weinberg equilibrium and evolutionary forces affecting it.
4. Human variation in genes, simple genetic traits, and DNA markers: blood group system, plasma proteins and red cell enzymes, hemoglobin, human leukocyte antigen, and DNA markers.
5. Human variation in complex traits: quantitative and anthropometric variation, adaptations to nutritional influences and cold or hot environments.
6. Human variation and behavior: behavioral genetics, racial classifications and racism, the eugenics movement

Learning Activities and Teaching Methods:

Lectures; literature reading, cooperative learning, oral presentations

Assessment Methods:

Assignments, Tests and Mid-term Exam; Final Exam

Required Textbooks/Reading:

| Authors | Title | Publisher | Year | ISBN |
|----------------|--|-----------------------|-------------------------------|---------------|
| Molnar | Human Variation: Races, Types, and Ethnic Groups | Pearson Prentice Hall | 2006, 6 th Edition | 0-13-192765-5 |

Recommended Textbooks/Reading:

| Authors | Title | Publisher | Year | ISBN |
|--------------------------------|----------------------------|-------------------------|-------------|---------------|
| Mielke, Konigsberg, Relethford | Human Biological Variation | Oxford University Press | 2006 | 0-19-518871-3 |