**Palestine Technical University-Kadoorie**

**Division of Applied Sciences**

**Department of Molecular and Applied Biology**

**Course Title:** Human Genetics

**Semester:** Summer semester 2023/2024

**Course Code:** 15030433

**Course Instructor:** Sabha Rabaya, MSc

**Overview:** This course provides an introduction to human genetics for undergraduate students majoring in molecular biology. This course is mainly divided into three major sections. The first part focuses on the major types of human genetic disorders with examples of each type, alongside with mechanisms of such disorders. Next, the second part provides an introduction to molecular diagnosis of human genetic disorders witha focus on some major methods used frequently in genetic diagnostics laboratories. After that, students will be introduced to some of the most recent molecular approaches used in the treatment of genetic disorders such gene therapy. Moreover, this course will also touch on some important concepts in human genetics such populationgenetics, genetic counseling and personalized medicine.

**Course Credits**: 3

**Status:** Elective

**Weekly Schedule**: Sunday, Monday and Tuesday 12:00-14:00

**Required textbook**: Specific chapters from the following textbook are required as references

Human Genetics: Concepts and Application - 12th edition- Ricki Lewis

Recommended textbook:

Thompson & Thompson Genetics in Medicine, 8th Edition- Robert Nussbaum, Roderick McInnes and Huntington Willard

**Couse objectives:**

1. Gain a broad knowledge of human geneticsand whatapproaches are used to expand our understanding.
2. Understand modes of inheritance and expression of traits ranging from Mendelian to multifactorial.
3. Learn about the human genome, from its organization into chromosomes to the DNA content.
4. Learn the major types of human genetic disorders and understand the mechanisms of major human genetic disorders
5. To appreciate how advances in biotechnology and genomics are personalizing all aspects of medicine including prevention, diagnostics, and treatment.
6. Acquire some basic skills in literature search and presentation.

**Main Topics to be covered:**

Overview of genetics and molecular biology: DNA and Chromosomes, central dogma, Mitosis and Meiosis, transmission of genetics (Mendelian Inheritance, Extension and Exceptions to Mendel’s Laws).

Human Genetic Disorders: Chromosomal disorders, Single gene disorders, mitochondrial disorders, Epigenetics related disorders, Complex (multifactorial disorders)

Introduction to cancer genetics

Genetic testing in the diagnostic laboratory

Diagnosis, management and therapy of genetic disease

Brief introduction to genomics

**Assessment criteria**

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| Midterm exam (week 5) | 40% |
| Assignment (before 28/8/2024) | 15% |
| Final exam (week 8) | 45% |

**Course Policies:**

Classroom Courtesy

Please turn off your cell phones and keep your side conversations to a minimum.

Preparation for Class

Please attend all classes, arrive on time and be ready to participate and learn.

It is encouraged to take notes during lectures

Quizzes, assignments and exams

You will have some assignments and lecture quizzes, please submit your assignments on time.

You are required to give a graded presentation.

There will be at least two exams. Exam material will be drawn from required readings, lecture material, and in-class activities.

Help & Resources

If you find yourself struggling, act quickly! Please contact me to set up an appointment.