Philadelphia University
Faculty of Science
Department of Biotechnology & Genetic Engineering

Course Syllabus

Course Title: Genetics	**Course code:** 0240231
Course Level: 2	**Course prerequisite (s):** 0240107
Lecture Time:	**Credit hours:** 3

Academic Staff Specifics

Name	Rank	Office #	Office Hours	E-mail Address
Tawfiq Froukh	Assis.Prof.			tfroukh@philadelphia.edu.jo

Course module description:
This module is a major requisite for the students of biotechnology and genetic engineering and it is presented in 16 weeks completing 40 lecturing hours. Its contents focus on an overview of basic genetics: an introduction to Mendelian and non-Mendelian inheritance, variation in chromosome structure and number, DNA recombination, DNA and chromosome structure, Mutations, and some quantitative and population genetics.

Course module objectives:
* Define the basic laws of Mendelian genetics
* Analyze genetic pedigrees & Compute Probabilities of different genotypes
* Define the basic structure of molecular molecule (DNA)
* Explain the variation in characteristics on genetic basis

Course/ module components
1. Books (title , author (s), publisher, year of publication)
-Principles of Genetics, Snustad & Simmons, John Wiley & sons, 2012 (TEXTBOOK)
2. Teaching methods:
Lectures,& problem solving in practice.
3. Learning outcomes:
-Knowledge and understanding: the students should be able to know the basic principles of inheritance and Mendelian genetics**.**
-Cognitive skills (Transferable Skills): The students will learn the ability to correlate between different problems and problem solving abilities such as biostatistics
4. Assessment instruments
- Quizzes & homework
- First, second & Final exams

Allocation of Marks	
Assessment Instruments	**Mark**
First examination	20%
Second examination	20%
Final examination: 50 marks	40%
Quizzes & Homework	20%
Total	100%

Course/module academic calendar

Week	Basic and support material to be covered	Pages
(1)	**Introduction and Orientation**	
(2, 3)	**Ch#3 Mendelism: The basic principles of Inheritance** **Mendel's study of heredity; Applications of Mendel's principles; Testing Genetic hypotheses; Mendelian principles in human genetics**	**41-56**
(4,5)	**Ch#4 Extensions of Mendelism** **Allelic variation and gene function; Gene Action: from Genotype to phenotype; Inbreeding**	**63-82**
(6)	**Ch#5 The chromosomal basis of Mendelism** **Chromosome; The chromosome theory of heredity; Sex linked genes in humans; sex chromosomes and sex determination; dosage compensation of X-linked genes**	**90-105**
1st exam		
(7)	**Ch#6 Variation in chromosome number and structure** **Cytological techniques; polyploidy; Aneuploidy; Rearrangement of chromosome structure**	**111-129**
(8,9)	**Ch#7 Linkage, crossing over and chromosome mapping** **Linkage, recombination and crossing over; chromosome mapping; cytogenetic mapping; linkage analysis in human**	**136-153**
(10,11)	**Ch#22 Inheritance of complex traits** **Complex traits; statistics of quantitative genetics; analysis of quantitative traits; correlation between relatives; Quantitative genetics of human behavioral traits**	**608-630**
2nd exam		
(12)	**Ch#24 Population genetics** **The theory of allele frequency**	**635-641**
(13)	**Ch#9 DNA and the Molecular structure of chromosome** **The structure of DNA and RNA; chromosome structure in prokaryotes, viruses and Eukaryotes**	**197-215**
(14)	***DNA replication, Transcription and Translation (in brief)***	**221-315**
(15)	**Ch#13 Mutation, DNA repair and Recombination**	**3321-358**
(16)	**Final Exam**	