Philadelphia University
Faculty of Science
Department of Biotechnology & Genetic Engineering
Second semester, 2009/2010

Course Syllabus

Course Title: Basic Genetics.	**Course code:** 0240231
Course Level: 3	**Course prerequisite (s):** 0240107
Lecture Time: 08:15-09:45 Mon. & Wed.	**Credit hours:** 3

Academic Staff Specifics

Name	Rank	Office #	Office Hours	E-mail Address
Tawfiq Froukh	Assis.Prof.	918	10-11 Mon. & Wed. 14-15 Sun., Tue. & Thu.	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. DNA Structure, at the end of the course some quantitative genetics issues are discussed).

Course module objectives:
* Define the basic laws of Mendelian genetics
* Analyze genetic pedigrees & Compute Probabilities of different genotypes
* Define the basic structure of molecular molecules (DNA, RNA)
* 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, 2010 (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 & homeworks
- First, second & Final exams

Allocation of Marks	
Assessment Instruments	**Mark**
First examination	15%
Second examination	15%
Final examination: 50 marks	50%
Quizzes & Homeworks	20%
Total	100%

Documentation and academic honesty

-Documentation style (with illustrative examples)
-Protection by copyright
-Avoiding plagiarism.

Course/module academic calendar

Week	Basic and support material to be covered
(1)	**Ch#1 The science of Genetics** -Three great milestones of genetics (P. 2-5) -DNA as genetic material (P. 5-9) -Levels of genetic analysis (P. 10-11) -Genetics in the world (P. 11-14)
(2)	**Ch#2 Cellular reproduction & Model Genetic Organisms** - Cells & chromosomes (P. 19-24) ***- Mitosis & Meiosis (P. 24-33) in brief*** - Genetics in the laboratory: an introduction to some model research organisms (P. 33-40)
(3)	**Ch#3 Mendelism: The basic principles of inheritance** - Mendel's study of heredity (P.44-48) - Applications of Mendel's principles (P. 49-52) - Testing genetic hypotheses (P. 52-55)
(4)	**Ch#4 Extensions of Mendelism (P. 67-87)** -Allelic variation & gene function -Gene action: from genotype to phenotype -Inbreeding: another look at pedigrees
(5)	**Ch#5 The chromosomal basis of Mendelism (P. 93-113)** -Chromosomes -The chromosome theory of heredity -Sex linked genes in human beings -Sex chromosomes and sex determination
(6) **1st exam**	**Ch#6 Variation in chromosome number and structure** -Polyploidy (P. 119-123) -Aneuploidy (P. 123-129) -Rearrangement of Chromosome structure (P. 130-134)
(7)	**Ch#7 Linkage, crossing over and chromosome mapping** -Linkage, recombination & crossing over (P. 141-146)
(8)	**Ch#9 DNA & the Molecular structure of chromosome** -Chromosome structure in prokaryotes (P. 222-224) -Chromosome structure in Eukaryotes (P. 224-239)
(9), (10) **2nd exam**	**Ch#13 Mutation, DNA repair and recombination**
(11), (12)	**Ch#23 Inheritance of complex traits (P. 685-703)**
(13), (14)	**Ch#24 Population genetics (P. 710-723)**
(15)	**Ch#25 Evolutionary genetics (P. 731-758)**
(16)	**Final Exam**

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.