



Philadelphia University
Faculty of Science
Department of Biotechnology and Genetics Engineering
1st semester, 2014/2015

<u>Course Syllabus</u>				
Course Title: Cytogenetic		Course code:240335		
Course Level: 3rd level		Course prerequisite (s) and/or corequisite (s): Human Genetics 240234		
Lecture Time: Sunday 13:10-14:00		Credit hours:1		
<u>Academic Staff</u>				
Name	Rank	Location	Office Hours	E-mail Address
Dr.Raida W.Khalil	Associate Professor	914	13-15.00	r_khalil@philadelphia.edu.jo

Tues

Course module description:

This module is a major (Mandatory) Departmental course for the third year. This course deals with the study of Chromosomes and provides the cytological explanation of different genetic disease. Chromosome studies (Cytogenetic and Molecular cytogenetics)are an important laboratory diagnostic procedure in prenatal diagnosis, in certain patients with mental retardation and multiple birth defects, in patients with abnormal sexual development, and in some cases of infertility or multiple miscarriages. Cytogenetic analysis is also useful in the study and treatment of patients with malignancies and hematologic disorders.

Course module objectives:

On completion of the course, students should be able to:

- Explain the organization and complexity of human genome at the Cytogenetic Level
- Explain the nature of chromosomal abnormalities in clinical syndromes associated with cytogenetic disorders
- Explain the nature of chromosomal abnormalities in the disorders of sexual differentiation
- Evaluate appropriately the family pedigree and the population and ethnic aspects of inherited disorders

Estimate the risk of recurrence of various inherited disorders in affected families
 Explain the essential elements of genetic counseling and indications for prenatal
 Diagnosis
 Understand the importance of genetics in personalized medicine

Learning outcomes:

This module gives the students the opportunity to utilize:

- Methods used to identify and analyze cytogenetic alteration.
- Cytogenetic mechanisms of disease expression.
- Cytogenetic alterations and relationship to specific clinical expression.
- Cytogenetic alteration related to development of leukemia

Course/ module components

Title: The Principles of Cytogenetics (2013&2005)

Author(s): S.Gersen et al.

Publishers: Totowa, New Jersey: Humana Press

ISBN: 978-1441916877 & 1-58829-300-9

Teaching methods:

The 16 hours in total will be mainly lectures will be given as power point presentations, educational movies and white board. Student questions and student Discussion groups are encouraged.

Learning outcomes:

On completion this module students will have

Knowledge and understanding

- Knowledge of basic cytogenetic laboratory techniques necessary to prepare tissue samples or cytogenetic diagnosis.
- Understood the principles of the cell cycle and how it relates to tissue culture
- Developed an understanding of the mechanisms which contribute to cytogenetic alterations and determine the possible gametes from cytogenetic alteration in a parent

Cognitive skills (thinking and analysis).

- Appreciated and understood the implications of the most cytogenetic report that differ from normal
- Recognized the most common cytogenetic Abnormalities encountered in the population

Communication skills (personal and academic).

- Learn the principle of Genetic Counseling encountered the local society.

Assessment instruments

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
Midterm Exam	30%
Final examination:	40%
Reports, Assignment, Quizzes, Home works and Presentation	30%
Total	100

Course/module academic calendar

Week	Basic and support material to be covered
(1)	Human Cytogenetic history
(2)	Gene expression and Cell cycle division
(3) and (4)	The organization and complexity of human genome at the Cytogenetic Level
(5)	The Era of Chromosomes- definition and groups
(6)	Cytogenetic laboratory techniques
(7)	Prenatal Diagnosis: CVS Blood Cord Amniotic Fluid
(8) and (9)	Chromosomal abnormalities in clinical syndromes associated with cytogenetic disorders.
(10)	Mid term Exam
(11) and (12)	The mechanisms which contribute to cytogenetic alterations and determine the possible gametes from cytogenetic alteration in a parent.
(13)	Molecular Cytogenetic: FISH and Comparative Genomic Hybridization
(14) and (15)	Principle of genetic Counseling
(16)	Final Examination

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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.

Module references

Title: Basics of Medical of Genetics, 2003

Author(s)/Editor(s): G.P. PAL

Publishers: Aitbs Publishers

ISBN: 81-7473-220-9

(Title: Chromosome Abnormalities and Genetic Counseling(2003

.Author: R.J. Gardner et al

Publisher: Oxford University Press, USA

ISBN: 0195149602

978-0195149609

Title: Cell Biology-A laboratory Handbook,2006
(.Author(s)/Editor(s):Celis,Julio E. (ed
Publisher: Amsterdam: Elsevier Academic Press
ISBN: 0-12-164731-5
0-12-164732-3
0-12-164733-1
X-0-12-164734

Title: Analyzing Chromosomes(basics from background to bench),2000
Author(s)/Editor(s): B. Czepulkowski
Publisher: Springer ISBN-13:
978-0387916095
0387916091

Title: Human Chromosomes(manual of basic techniques),1989
Author(s)/Editor(s): Ram S. Verma and Arvind Babu
Publisher: Pergamon press
ISBN: 0-08-035774-1

Websites http://www.ebookee.com/The-Principles-of-Clinical-Cytogenetics-2nd-edition_68135.html

<http://www.protocol-online.org/>

<http://www.accessexcellence.org/RC/VL/GG/>

http://www.ornl.gov/sci/techresources/human_Genome/launchpad/

<http://learn.genetics.utah.edu/units/disorders/karyotype/karyotype.cfm>