



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

Course Syllabus

Course Title: Molecular Biology	Course code: 240386
Course Level: Third Year	Course prerequisite (s): Cell Biology 240233
Lecture Time: 8.15-9.45 Monday and Wednesday Lecture hall: 2804	Credit hours: 3

Academic Staff

Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr. Raida W. Khalil	Assistant Professor	906 Head of Department Office	9.00-12.00 Tuesday 12:45.14.30 Monday	r_khalil@philadelphia.edu.jo (Biotechnology students): stdbio@philadelphia.edu.jo

Course module description:

This module is a major (Mandatory) Departmental course for the third Year. The course covers the central dogma of molecular biology including gene replication, transcription, translation and gene expression regulation in both prokaryotes and the future practical application for each process.

Course module objectives:

This module explores the followings concepts:

The physical and chemical nature of DNA and RNA

The individual events that accomplish the task of DNA replication

The gene and genetic code

The sequence events that take place in transcription of DNA to RNA

The mechanisms by which polypeptides are synthesized-translation

The need for regulation of gene expression in both prokaryotic and Eukaryotic

Course/ module components

• **Text Book:**

1-Title: Essential Molecular Biology, Fourth edition, 2003

Author(s)/Editor(s): George M. Malacinsk.

Publisher: Jones and Bartlett Publishers

ISBN: 0-7637-2133-6

2-Title: "Instant notes Molecular Biology", Second edition, 20012-

Author(s)/Editor(s): Turner et al

Publisher: BIOS Scientific Publishers Limited

ISBN: 1-85996-152-5.

Teaching methods:

Lectures and assignments

Learning outcomes:

Knowledge and understanding

Student will learn the essential concepts of molecular biology which include the structure and function of nucleic acids and the molecular mechanisms of DNA replication and gene expression.

Cognitive skills (thinking and analysis)

Students should be able to:

1. Deduce the structure of DNA and the mechanism of its replication.
2. Correlate the DNA structure to its function
3. Correlate the protein-DNA interaction to DNA replication and gene expression

Communication skills (personal and academic)

-Module language: English

-For every lecture the last five minutes will be open for discussion. For further discussion, the students are welcome at the lecturer's office hour as appeared in first page.

-the students have the option to submit their module activities either by email or by hand

Practical and subject specific skills (Transferable Skills)

This course provides the student with a good background in molecular biology which enables him to practice some molecular biology techniques in the practical part of this course (240346).

Assessment instruments

Allocation of Marks		
Assessment Instruments	Mark	Date
First examination	15	
Second examination	15	
Final examination: 50 marks	50	
Reports, Quizzes, Home works and presentations	20	
Total	100	

Course/module academic calendar

week	Basic and support material to be covered	Chapter(s)/text book: Malacinsk.
(1) and (2)	-System and analytical approaches molecular biology. -Macromolecules (proteins nature of DNA and other nucleic acids)	(1) and (3)
(3) and (4)	Replication of double stranded DNA	(7)
(5)	DNA repair Mechanisms	(13)
(6) First examination	Transcription: prokaryotes: Ribosome binding, initiation, RNA synthesis.	(8) First examination
(7)	Transcription: Eukaryotes:	(8)

	RNA polymerase II, promoter, general transcription) Splicing:snRNPs,spliceosome)	
(8) and (9)	Translation (RNA ribosomes, prokaryotes initiation, formal methionine, eukaryotic initiation, elongation, termination).	(9)
(10) and (11) Second examination	Control of gene activity in prokaryotes	(11)
(12)	Control of gene activity in prokaryotes.	(11)
(13) and (14)	Control of gene activity in eukaryotes *Eukaryotes gene structure and function	(12)
(15)	Recombinant DNA and Genetic Engineering: Molecular Tailoring of Genes	(15)
(16) Final Examination		

Expected workload:

On average students need to spend 3 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

- 1.Molecular Biology-Understanding the Genetic revolution. Clark, D.P. 2005. Elsevier Academic Press.
- 2.Cell and Molecular Biology, Karp, 2005 .John Wiley and Sons,.
3. Molecular Cell Biology, Lodish, A. Berk, S.L. Zipursky, P. Matsudaira, D. Baltimore, J. Darnell, W. H. Freeman and Company, 2005.

Journals

1. Biotechnology

Publisher: the Asian Network for Scientific Information
Start Year: 2002

http://www.ansinet.org/c4p.php?j_id=biotech

2. Genetics & Molecular Biology

Publisher: Brazilian Society for Genetics
Start Year: 1998

<http://www.scielo.br/cgi-bin/fbpe/fbsite?got=site &pid=1415-4757&lng=en>

3. **American Journal of Biochemistry & Biotechnology**
Publisher: the Asian Network for Scientific Information
Start Year: 2005

http://ansinet.org/sciencepub/c4p.php?j_id=ajbb

4. **Bioscene - Journal of College Biology Teaching**
Publisher: *the Association of College & University Biology Educators.*
Start Year: 1990

<http://papa.indstate.edu/amcbt/bioscene.html>

5. **International Journal of Biological Sciences**
Publisher: Ivyspring International Publisher
Start Year: 2005

<http://www.biolsci.org/index.htm>

Websites

- http://en.wikipedia.org/wiki/DNA_replication#DNA_structure
- http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/P/Promoter.html#Transcription_start_site.
- <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/T/Translation.html>