Course Syllabus

<table>
<thead>
<tr>
<th>Course Title: Applied Molecular Biology</th>
<th>Course code: 240484</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course Level: 4th</td>
<td>Course prerequisite (s) and/or corequisite (s): Molecular Biology (240386)</td>
</tr>
<tr>
<td>Lecture Time: 11.15-12.45 pm Monday and Wednesday</td>
<td>Credit hours: 3</td>
</tr>
</tbody>
</table>

Academic Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Rank</th>
<th>Office Number and Location</th>
<th>Office Hours</th>
<th>E-Mail Address</th>
</tr>
</thead>
</table>
| Dr. Raida W. Khalil  | Assistant Professor | 906 Head of department office | 9-11 Sunday | r_khalil@philadelphia.edu.jo
|                      |              |                            |              | Biotechnology students  |
|                      |              |                            |              | stdbio@philadelphia.edu.jo|

Course module description:
This module is a major (Mandatory) Departmental course for the Fourth Year. The module starts with description the basic techniques essential to molecular biology and explained by putting them in the context of the impact which molecular Biology is having upon modern mainstream biology.

Course module objectives:
At the end of this module, student will be able to:

* Review critically the fundamental and key concepts of Molecular Biology and gene cloning
* Grasp a common and valuable techniques used by molecular Biologists
* Understand a broad range of experimental techniques used in molecular biology and how they are used to improve the concepts of replication, transcription and translation

Course/module components

Title:” Molecular Biology” the second edition, 2002
Author(s)/Editor(s): Robert Weaver et al
Publisher: Mc Graw Hill
ISBN:0-07-234517-9
Teaching methods:
The 45 hours in total will be mainly lectures with given as power point presentations, educational movies and white board. Student questions and student Discussion groups are encouraged.

Learning outcomes:

- **Cognitive skills (thinking and analysis).**

The lecturer will present the material in the textbook in an interactive way that stimulates the thinking side of students. Conducting the learning objectives for each module components in clear manner to ensure the material is digested by the students.

- **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 hours as appeared in first page.
- the students have the option to submit their module activities either by email or by hand
- the students are welcome to share open discussions through the net

- **Practical and subject specific skills (Transferable Skills).**

- Practical related session will be taken in the Applied Molecular Biology Practical/240485.

Assessment instruments

- Short reports and/or presentations, and/or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

<table>
<thead>
<tr>
<th>Assessment Instruments</th>
<th>Mark</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>First examination</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Second examination</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Final examination: 50 marks</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Reports, Quizzes, Home works and presentations</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>week</td>
<td>Basic and support material to be covered</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------------------</td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>Review: Flow of Genetic information---Central dogma, Recognition of DNA as genetic material. Review: DNA replication</td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>Molecular cloning, methods and tools for studying genes and gene activity *Introduction to gene manipulation: DNA cloning, restriction enzymes and maps</td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>Molecular cloning, methods and tools for studying genes and gene activity *PCR, Real time PCR, DNA sequencing. Directed mutagenesis</td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>Overview: Transcription &amp; posttranscriptional modification in prokaryotic cells *Northern Blot</td>
<td></td>
</tr>
<tr>
<td>(5)</td>
<td>Overview: Transcription &amp; posttranscriptional modification in prokaryotic cells Mapping transcripts:-Primer extension -S1 mapping</td>
<td></td>
</tr>
<tr>
<td>(6)</td>
<td>Overview: Transcription &amp; posttranscriptional modification in eukaryotic cells *Quantifying transcripts *Nuclear run off <strong>First Exam</strong></td>
<td></td>
</tr>
<tr>
<td>(7)</td>
<td>Overview: Transcription &amp; posttranscriptional modification in eukaryotic cells *Measuring transcription in vivo *Nuclear run on</td>
<td></td>
</tr>
<tr>
<td>(8)</td>
<td>-Overview: Translation *Western blot</td>
<td></td>
</tr>
<tr>
<td>(9)</td>
<td>Overview: Translation *Two- dimensional gel electrophoresis-Proteomics *Expression vectors</td>
<td></td>
</tr>
</tbody>
</table>
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

Book

Author(s)/Editor(s): Harvey Lodish et al.
Publisher: W.H. Freeman and company
ISBN:0-7167-3136-3

2-Title: "Molecular Biology-Understanding the Genetic revolution.", 2005
Author(s)/Editor(s): David P. Clark
3- Title: “Cell and Molecular Biology concepts and Experiments” the third edition, 2002
Author(s)/Editor(s): Gerald Karp,
Publisher: WILEY
ISBN: 0-471-38913-7

Author(s)/Editor(s): Turner et al
Publisher: BIOS Scientific Publishers Limited

5- Title: "Molecular Biology-Understanding the Genetic revolution.", 2005
Author(s)/Editor(s): David P. Clark
Publisher: Elsevier Academic Press
Website(s):

Journals

1. Biotechnology
   Publisher: the Asian Network for Scientific Information
   Start Year: 2002

2. Genetics & Molecular Biology
   Publisher: Brazilian Society for Genetics
   Start Year: 1998
   http://www.scielo.br/cgi-bin/fbsite?got=site & pid=1415-4757&lng=en

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

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

Websites
  http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/P/Promoter.html#Transcripton_start_site.
- http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/T/Translation.html