



**Philadelphia University**  
**Faculty of Science**  
**Department of Biotechnology and Genetic Engineering**  
**First semester, academic year (2011/2012)**

**Course syllabus**

<b>Course title:</b> Introduction to Biotechnology	<b>Course code:</b> 240281
<b>Course level:</b> Second Year	<b>Course prerequisite (s) and/or corequisite (s):</b> 240107 & 130102
<b>Lecture time:</b> 11:15-12:05 (M & W)	<b>Credit hours:</b> Two

**Academic Staff Specifics**

<b>Name</b>	<b>Rank</b>	<b>Office number</b>	<b>Office hours</b>	<b>E-mail address</b>
Dr. Sameer Masoud	Associate Professor	S817	<b>10-11 (S, Tu, Th)</b> <b>12-13 (M, W)</b>	smasoud@philadelphia.edu.jo

**Course module description:** This module is a mandatory course for the Biotechnology students. Biotechnology is defined as the use of living organisms or their products to enhance our lives and our environment. It is an introductory course and offers a broad view of biotechnology including an integration of historical and modern topics in biotechnology. The module describes the processes and methods used to manipulate living organisms or their products for applications in medicine, agriculture, marine biology, molecular forensics and industry. Basic biotechnology principles and different biotechnological applications will be discussed.

**Course module objectives:** This module explores the following objectives:

- .Understand what is Biotechnology and how it was developed.-
- .Appreciate the importance of biotechnology in our lives -
- .Introduce biotechnology techniques and their use -

**Course/ module components (Textbook)**

Title: Biotechnology An Introduction, 2005  
Author(s)/Editor(s): Susan R. Barnum  
Publisher: Thomson Books/Cole  
ISBN: 0-534-49296-7

**Teaching methods:** Each week two lectures (2 X 50-minutes). Student questions and .student participation in discussions are encouraged

**Learning outcomes:**

- Knowledge and understanding: At the end of this module, student should be able to understand the definition of biotechnology and its applications. Students should describe the principles of DNA recombination and transformation of different organisms. Students should recognize the different products of biotechnology and know their importance in different applications.
- Cognitive skills (thinking and analysis): The material in the text book will be presented in an interactive way that stimulates the thinking side of students. Conducting the learning

objectives for each module components in clear manner to insure the material is easily digested by the students.

- Communication skills (personal and academic): Open discussion of different biotechnological applications (from the textbook or newly developed applications in the media) is encouraged.

### Assessment instruments

<b>Allocation of Marks</b>	
<b>Assessment Instruments</b>	<b>Mark</b>
First examination	<b>20%</b>
Second examination	<b>20%</b>
Final examination: 50 marks	<b>40%</b>
Quizzes, homework, and short (3 minutes) presentation*.	<b>20%</b>
<b>Total</b>	<b>100%</b>

**\*Each student is required to select and discuss a biotechnological application from a recent media news. The grade (3 points) will be giving for the correct selection of a biotechnology related subject and for the good understanding of that subject.**

### Course/module academic calendar

<b>Week</b>	<b>Material to be covered</b>	<b>Textbook Chapter</b>	<b>Pages</b>
<b>(1)</b>	What is Biotechnology? (ancient, classical and modern)	<b>(1)</b>	<b>1-14</b>
<b>(2)</b>	Nature of genes, first cloning and recombinant DNA	<b>(1)</b>	<b>15-24</b>
<b>(3)</b>	Basic principles of recombinant DNA technology	<b>(3)</b>	<b>57-71</b>
<b>(4)</b>	Molecular Techniques: Constructing and screening of DNA libraries, reporter genes and blotting.	<b>(3)</b>	<b>72-79</b>
<b>(5)</b>	Molecular Techniques: PCR, DNA sequencing, Protein methods, Microarray ...	<b>(3)</b>	<b>79-92</b>
<b>(6)</b>	Continue and review the previous topics <b>First examination</b>		
<b>(7)</b>	Microbial Biotechnology	<b>(5)</b>	<b>123-146</b>
<b>(8)</b>	Plant Biotechnology	<b>(6)</b>	<b>147-168</b>
<b>(9)</b>	Animal Biotechnology	<b>(7)</b>	<b>169-190</b>
<b>(10)</b>	Marine Biotechnology	<b>(8)</b>	<b>191-214</b>
<b>(11)</b>	Genomics and Beyond	<b>(9)</b>	<b>215-242</b>
<b>(12)</b>	Continue and review the previous topics <b>Second examination</b>		
<b>(13)</b>	Medical Biotechnology	<b>(10)</b>	<b>243-262</b>
<b>(14)</b>	DNA Profiling and molecular Forensics	<b>(11)</b>	<b>263-286</b>
<b>(15)</b>	Regulation, Patent and Society	<b>(12)</b>	<b>287-303</b>
<b>(16)</b>	<b>Final Examination</b>		

**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**

#### **Books**

- 1- "A textbook of Biotechnology", 2002; Author(s)/Editor(s): **Dubey,R. C.**; Publisher: **Ramnagar, New Delhi: S. Chand and Company Ltd.**, ISBN: 660.6 DUB E017227
- 2- "Biotechnology from A to Z, **2004**; Author(s)/Editor(s): Bains; Publisher: Oxford university press; ISBN: **0-19-852498-6**
- 3- Basic biotechnology; 2001; Author(s): **Ratledge,Colin**; Publisher: **Cambridge: Cambridge University Press**; ISBN: **0-521-77917-0**

**Journals in** Biotechnology – several Periodicals are available on line and can be find by simple search

#### **Websites:**

[http://www.ansinet.org/c4p.php?j\\_id=biotech](http://www.ansinet.org/c4p.php?j_id=biotech)

<http://www.biomedcentral.com/bmcbiotechnol/>

<http://water.usgs.gov/wid/html/bioremed.html>

<http://www.nal.usda.gov/bic/BTTOX/bttox.htm>

<http://www.accessexcellence.org/AB/BA/>

[http://www.biology.arizona.edu/molecular\\_bio/problem\\_sets/Recombinant\\_DNA\\_Technology/recombinant\\_dna.html](http://www.biology.arizona.edu/molecular_bio/problem_sets/Recombinant_DNA_Technology/recombinant_dna.html)

<http://www.jmu.edu/biology/biofac/facfro/cloning/cloning.html>

[http://ansinet.org/sciencepub/c4p.php?j\\_id=ajbb](http://ansinet.org/sciencepub/c4p.php?j_id=ajbb)

<http://www.ejbiotechnology.info/>