



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

Course Syllabus

Course Title: Introduction to Biotechnology	Course code: 240281
Course Level: Second year	Course prerequisite (s) and/or corequisite (s): 240107+130102
Lecture Time: 12:10:13:00 Sunday and Tuesday	Credit hours: 2

Academic Staff

Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Fayez Hamam, PhD	Assistant Professor	823 (ext. 2345)	10:00-11:00 Sun and Tue Mon & Wed 10:00-11:15	fhamam@philadelphia.edu.jo

Course module description:

This module is a major (Mandatory) Departmental course for the Second Year. It is an introductory course of Biotechnology. This module offers a broad view of biotechnology, integrating historical and modern topics. The module describes the processes and methods used to manipulate living organisms or the substances and products from these organisms for medical, agricultural, and industrial purposes. Using case studies and examples, the module rounds out discussions by detailing the technology and how it is applied, including discussions on the implications of biotechnology in such areas as gene therapy, medicine, agriculture, marine biology, and forensics.

Course module objectives:

This module explores the followings:

- Fundamental issues of biotechnology.
- What is Biotechnology and how did it come about?
- How is biotechnology done and how is it being used today?

- What are the consequences of biotechnology applications to the lives of humans and other animals, plants, and to the environment?
- Finally, what are some of the issues that Biotechnology raises about the role of Science and technology in Society?

Course/ module components

- **Books**

Title: Biotechnology An Introduction, 2005

Author(s)/Editor(s): Susan R. Barnum

Publisher: Thomson Books/Cole

ISBN: 0-534-49296-7

Teaching methods:

The 29 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:

- **Knowledge and understanding**

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

- Grasp knowledge and understanding the definition of Biotechnology by using the living organisms to produce goods and services for practical and industrial purposes
- Describe the means by which cells are transformed by Genetic Engineering
- Give examples of Biotechnology products and Biotechnology techniques
- Discuss the importance of Transgenic Plant, Bacteria and Animals

- **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 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 hour as appeared in first page.

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

- the students will take tour for all instruments and devices, which related to the module/within the department.
- Practical related session will be taken in the advance module.

Assessment instruments

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
First examination	15
Second examination	15
Final examination	50
Quizzes and Home works	20
Total	100

Course/module academic calendar

week	Basic and support material to be covered	Chapter(s)	Pages
(1)	What is Biotechnology?	(1)	2
(1), (2), (3) and (4)	Basic principles of recombinant DNA technology	(1) and (3)	58-90
(5), (6) and (7) First examination	Application of DNA biotechnology: *Microbial Biotechnology (Bacterial engineering)	(5)	123-144
(7), (8), and (9)	Application of DNA biotechnology: *Plant Biotechnology (Agriculture applications)	(6)	147-167
(10), (11) and (12) Second examination	Application of DNA biotechnology: *Animal Biotechnology Why Animal Biotechnology Microinjection Embryonic Stem Cell Gene Transfer Gene Targeting Animal Propagation Artificial Insemination Cloning of Dolly Cloning of Mice	(7)	170 171-172 172-174 174 181 181-184 185
(13) and (14)	Application of DNA biotechnology: * marine Biotechnology	(8)	191-212
(16) Final Examination			

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- Title: "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- Title: "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

1- Biotechnology -- Periodicals Biochemical engineering -- Periodicals

2- American Journal of Biochemistry & Biotechnology

Publisher: the Asian Network for Scientific Information

Start Year: 2005

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

3- Biotechnology

Publisher: the Asian Network for Scientific Information

Start Year: 2002

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

4- BMC Biotechnology

Publisher: BioMed Central

Start Year: 2000

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

5- Electronic Journal of Biotechnology

Publisher: Pontificia Universidad Católica de Valparaíso

Language: English

Start Year: 1998

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

- Websites:

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

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

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

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>