



Philadelphia University
Faculty of Science
Department of Biotechnology
First semester, 2009/2010
Course Syllabus

Course code: 240322	Course Title: Plant Biotechnology
Course Level: 3 rd year	Course prerequisite (s): Introduction to Biotechnology (240281)
Lecture Time: 11:15-12:45 (Monday & Wednesday) Credit hours: 3 hours Lecture Hall: 902	and/or co requisite (s): Plant tissue culture practical (240323)

Academic Staff Specifics

Name	Rank	Office Number	Office Hours	Email Address
Dr. Lolita Qouta	Assistant Professor	816	10:0 – 11:0 Sun., Tue. & Thur.	lqouta@philadelphia.edu.jo

Course module description

This module is required for all the students at the department of "Biotechnology and Genetic Engineering". It is a 3 credit hour course in which 2 lectures each of 1:30 minutes will be given per a week. This module will present an overview of the different

techniques used in plant transformation and production of genetically manipulated plants. Students are expected to develop a better understanding of what plant biotechnology is along with the commercial applications, and issues/challenges in the area of plant biotechnology. Students are encouraged to take both of this module and the practical module # 240323 in the same term.

Course module objectives

This course was designed to allow the students to:

- Demonstrate knowledge of the basic principles in plant tissue culture and some selected applications that can be utilized later in the laboratory module "Plant Tissue Culture".
- Understand the basic principles of genetic variations, sources, conservation, analysis and utilizations in improving plants through breeding.
- Comprehend the different methods used for plant transformation and the use of transgenic plants in crop improvement or other biotechnological applications.
- Acquire a fundamental knowledge to serve as guidance in debating issues like global warming, world hunger, agricultural and environmental sustainability.

Course/ module components Text Books and Web Sites

Please note that many of the lectures will be prepared from the references below, the first one has been ordered but it is going to take a while till sufficient copies are available at the library. You will be directed to the assigned chapters and feel free to borrow my copy over the weekends. In some lectures, the students will be referred to the free online published Arabidopsis book

- Title: Plants, Genes, and Crop Biotechnology, Second Edition, 2003
Authors: Chrispeels, M.J. and Sadava, D.E.
Publisher: Jones and Bartlett
ISBN-13: 9780763715861
ISBN-10: 0763715867

- Title: Introduction to Plant Biotechnology
Author: Chawla, H. S.
Publisher: Science Publishers, USA. 2002
University Library Call Number: 631.5233 CHA

Title: The arabidopsis book (TAB)

Authors: It is a compilation of over 100 chapters, each written by a different scientist and is reviewing in detail an important and interesting aspect of the plant *Arabidopsis thaliana*, with reference to what is known in other plants and in other kingdoms.

Publisher: The American Society of Plant Biology

ISSN: 1543-8120

Free online access: <http://www.aspb.org/publications/arabidopsis/>

Learning outcomes

Upon completion of this course, the students should be able to :

- Understand the basic techniques and principles of genetic engineering.
- Discuss the benefits and the risks of plant DNA technology.
- Appreciate the significance and the vital role played by the plant species in the human food, feed, industry and pharmaceuticals.

Communication skills (personal and academic).

The students will be encouraged and trained to analyze data and interpret results through the discussions of some publications demonstrating successful examples of plant biotechnology.

Assessment instruments

Assessment Instruments	Mark
First quiz	10
First hour exam	15
Second quiz	10
Second hour examination	15
Participation in class and attendance	10
Final examination	40
Total	100

Course/module academic calendar

Date	Subject
12/10, 14/10, 19/10 & 21/10	Introduction: The molecular basis of genetic modification and improvement of crops
26/10, 28/10 & 2/11	Genetic basis of plant growth and development
4/11, 9/11 & 11/11	Plants in human nutrition and animal feed
16/11	Will be engaged in a conference
18/11 & 23/11	Seeds, biology, technology and role in agriculture
25/11/2009 الأربعاء	First hour exam
30/11, 2/12 & 7/12	From classical plant breeding to modern crop improvement
9/12	Eid
14/12, 16/12 & 21/12	Crop diseases and strategies for their control.
23/12, 28/12 & 30/12	Plants as chemical and pharmaceutical factories Note that 28/12 could be a holiday

4/1 & 6/1	Genomics of biofuels
11/1 & 13/1	Will transgenic plants adversely affect the environment
18/1	Real concerns of genetically modified crops

Attendance policy

Students are expected to attend all lectures. Absence from lectures should not exceed 15% (6 lectures). Students, who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the Faculty of Science will receive a mark of zero for the course.

Expected workload

The students are encouraged to attend all the lectures and keep good notes of every topic discussed in class. Reading the covered material in advance will definitely enrich the student's vocabulary and enable him/her to follow the items discussed in the lecture. Every student is expected to spend 4 hours per week to prepare and/or study the assigned material.

Module references

In addition to the texts listed above, the students are requested to read the following publications which will be sent as attachments to the students' email addresses.

- Velkov, V.V., Medvinsky, A.B., Sokolov, M.S. and Marchenko, A.I. 2005. Will transgenic plants adversely affect the environment? Journal of Bioscience. 30(4): 515–548.
- Rubin, E.M. 2008. Genomics of cellulosic biofuels. Nature. 454: 841- 845.