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

Course code: 240323	**Course Title:** Plant tissue culture
Course Level: 3rd year	**Course prerequisite (s) and/or corequisite (s):** Plant Biotechnology (240322)
Lecture Time: 13- 16 Tuesday & Thursday	**Credit hours:** one credit hour At Green House labs

Academic Staff Specifics

Name	Rank	Office Number	Office Hours	Email Address
Dr. Lolita Qouta	Assistant Professor	816	9:0- 10:0 Mon. & Wed.	lqouta@philadelphia.edu.jo

Course module description

This laboratory course in the first few weeks, aims to introduce the students to the principles and applications of plant tissue culture as well as the biology of cultured plant cells. Later through the course, Students will be exposed to some molecular techniques

using plant systems. The designed experiments will illustrate the principles and ideas discussed in the plant biotechnology module. Students are encouraged to enroll in this practical and affiliated theoretical course 240322 in the same semester. Lab sheets will be mailed or handed to the students a week before the scheduled lab. The students are expected to read and comprehend these sheets pre the lab session. A quiz will be given at the beginning of every lab session. The students are supposed to write reports discussing the obtained results and following a format explained by the instructor. Please note that there could be changes in the labs according to the availabilities of plants and chemicals. Always check with your instructor a week in advance.

Course module objectives

This course was designed to acquaint the students to:

- Work under aseptic conditions to cultivate different plant species and/or parts *in vitro*. Learn how to subculture and follow the growth pattern of the cultures.
- Practice scientific thinking in analyzing the experiments, keeping records, and presenting results.
- Practice and learn some techniques in plant biochemistry, molecular biology and microscopy.

Course/ module components
Text Books and Web Sites

The following books are available at the library and could give the student a wider view of the applications of tissue culture techniques in plant biotechnology. These books could help the student in answering questions and writing reports.

Title: Introduction to plant tissue culture
Author: Razdan, M.K.
Publisher: Science publisher. USA. 2003.
ISBN: 1-578008-237-4
Library call number: 571.5382

Title: Biotechnology of plant tissues
Authors: Yadav, P/R. and Tyagi, r.
Publisher: Discovery publishing house. India. 2006
ISBN: 81-8356-073-3
Library call number**:** 631.5233 YAD

Title: Plant cell and tissue culture
Author: Narayanaswamy, S.
Publisher: McGraw-Hill publishing company. 1994
ISBN: 0-07-460277-2
Library call number: 571.5382

Learning outcomes

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

- Master the basic principles and skills regarding techniques, practices and procedures of plant tissue culture (Micropropagation), asepsis, laboratory plan, equipment and facilities, and green house growing.
- Practice and develop skills in performing some techniques in plant biochemistry and molecular biology.
- Use the plant websites like the Tair www.arabidopsis.org and www.ncbi.nlm.nih.gov.

Communication skills (personal and academic).

The students will be encouraged and trained to do the necessary calculations, draw the related graphs, analyze data and interpret the results logically.

Assessment instruments

Assessment Instruments	Mark
Mid term exam	20
Reports	20
Lab work and attendance	10
Quizzes	10
Final	40
Total	100

Course/module academic calendar

Date	Subject
20/10 & 22/10	Introduction Media preparation, contamination tests, and sterilization.
27/10 & 29/10	Germinating seeds under aseptic conditions.
3/11 & 5/11	Initiation and maintenance of cultures using different explants. Effect of sucrose concentration on growth rate of callus cultures.
10/11 & 12/10	Suspension cultures, initiation and monitoring growth of cultures
17/11 & 19/11	Testing Viability of Plant seeds and suspension cultures
24/11 & 26/11	Production of plantlets from floral organs of cauliflower Culturing plants from embryonic plant tissue
1/12 & 3/12	Embryogenesis in callus cultures
8/12 & 10/12	***** Mid term exam 2009/12/8 الثلاثاء , Lecture Halls: 1001 + 805** There will be no plant tissue culture practical sessions all through the week

15/12 & 17/12	Protoplast cultures
22/12 & 24/12	Extraction of cellular macromolecules from Arabidopsis suspension cells
29/12 & 31/12	Isolation and Quantification of Genomic Plant DNA
5/1 & 7/1	Extraction of RNA from Arabidopsis suspension cells
12/1 & 14/1	Plant enzyme function: Nitrate reductase induction and assay

Attendance policy

Absence from lectures and/or tutorials should not exceed 15% (2 lab sessions). Students who exceed this 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. If the excuse is approved by the Dean.

Expected workload

The students are encouraged to attend all the lab sessions and to keep good notes of the obtained results. Reading the covered material in advance will definitely allow the student's to use their time efficiently in the lab enabling them to do all the experiments. Every student is expected to spend 1.5 hours per week to prepare and/or study the assigned material.