



Jordan University of Science and Technology
Faculty of Science & Arts
Biotechnology & Genetic Engineering Department

BT421 Plant Biotechnology
First Semester 2021-2022

Course Catalog
<p>3 Credit Hours. This course will include lectures and labs that will introduce you to the field of plant biotechnology, modifications and use of plants for agriculture. You will learn basic techniques of recombinant DNA technology, modern protocols of plant transgenesis including transformation and regeneration, Plant genetics, selection and crossing of <i>Arabidopsis thaliana</i> as well as plant anatomy and development, plant hormones, recent plant molecular technology, plant stress physiology, plant pathology and pest interactions. Since plant biotechnology is a broad subject, you will be provided with Chapters from various books and review articles by the instructor covering the course materials. You are obligated to read those materials and everything in their contents will be open for the exams during the semester.</p>

Text Book	
Title	Plant Biotechnology
Author(s)	Ricroch et al.
Edition	1st Edition
Short Name	Ref 1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref 2	Biology	Campbell and Reece	11th Edition	
Ref 3	3- Plants, Genes and Crop Biotechnology	Chrispeels and Sadava	2nd Edition	
Ref 4	Review articles from various Plant Biology international Journals	Review Articles	1st Edition	

Instructor	
Name	Dr. Nisreen Al-Quraan

Office Location	PH1-L0
Office Hours	Sun : 11:30 - 12:30 Mon : 13:00 - 14:00 Tue : 09:30 - 10:30 Wed : 10:00 - 11:00 Thu : 12:30 - 14:30
Email	naquraan@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun : 13:00 - 14:00 Room: NF38 Section 2: Lecture Time: Tue : 13:00 - 14:00 Room: NF38

Prerequisites		
Line Number	Course Name	Prerequisite Type
962300	BT230 Basic Biotechnology	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	Topic	References
Weeks 1, 2	Plant Tissue culture media components	Handut From Ref 1
Weeks 3, 4	Plant structure, growth and development	Chapter 35 From Ref 2
Week 5	Plant Hormones	Chapter 39-Concept 2 From Ref 2
Week 6	Photosynthesis	Chapter 11 From Ref 2
Weeks 7, 8	Agrobacterium tumefaciens and gene transfer	Review Article1 From Ref 4
Week 9	Plasmid as a vector in plant transformation and Direct DNA transfer	Review Article2 From Ref 4
Week 10	Transposable elements: Plant Overview	Review Article3 From Ref 4
Week 11	RNAi for revealing and engineering plant gene functions	Review Article4 From Ref 4
Week 12	Plant as Chemical and Pharmacological Factories	Chapter 19 From Ref 3
Week 13	Plant and Stress Physiology	Chapter 39-Concept 4+5 From Ref 2
Week 14	Plant Molecular Mechanism of Disease and pest resistance	Review Article5 From Ref 4

Week 15	Model organisms: Arabidopsis thaliana	Review Article6 From Ref 4
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Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Know and describe the Plant Tissue culture media components, Plant structure, growth and development and Plant hormones. [1A]	20%	Midterm Exam
Describe and discuss the process of Photosynthesis, Agrobacterium tumefaciens and gene transfer, Plasmid as a vector in plant transformation and Direct DNA transfer, and Plant Transposable elements. [1A, 1D]	20%	Midterm Exam, Final Exam
Describe and explain the plant RNAi gene function, Plant as Chemical and Pharmacological Factories, Plant and Stress Physiology, Plant Molecular Mechanism of Disease and pest resistance and Plant Model organism (Arabidopsis thaliana). [1A, 1D]	30%	Final Exam
Provide knowledge and understanding of basic principles and application of plant tissue culture methodology, plants cell and protoplast culture, plants recombinant DNA technology and genetic transformation techniques and their application to plant improvement. [1A, 1B, 1C]	30%	Lab Quizzes, Lab Midterm Exam, Lab Final Exam

Relationship to Program Student Outcomes (Out of 100%)					
A	B	C	D	E	F
55	10	10	25		

Evaluation	
Assessment Tool	Weight
Lab Quizzes	10%
Lab Midterm Exam	10%
Lab Final Exam	10%
Midterm Exam	30%
Final Exam	40%

Policy	
Attendance	Students are expected to attend classes. Consequently, students are responsible for ALL material presented or assigned during the scheduled class period and are expected to obtain such information on their own should a class period be missed. Whenever possible, absences will be discussed with the instructor in advance. Class attendance will be taken in lecture and during laboratory exercises. Students will be allowed three absences between every mid-term exam, and a total of six absences before the final. Absences in excess of that stated above will result in the student failing in the course.

Policy on academic dishonesty and Make-up examinations	JUST regulations and rules will be strictly implemented. Refer to University's student information book for more details about exams, exam make up and absence rules
Absolutely Required	Instructor handouts including: Chapters from listed below books and comprehensive Review papers. Since attendance is Mandatory according to JUST rules and regulation, class notes and material discussions will be required by the students.
Evaluation	Midterm Exam 30% Laboratory practical 30% Final Exam 40 % Total 100%

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