Jordan University of Science and Technology

Faculty of Agriculture

Plant Production Department

PP316 Soil-Plant-Water Relationships - JNQF Level: 7

First Semester 2024-2025

Course Catalog
3 Credit Hours. Water flow in soil-plant-atmosphere continuum with emphasis on soil-root interface. Effect of soil physical and biological properties on growth and function of plant root systems. Transpiration and factors affecting water transport in plant. Dynamic properties of soil affecting water flow and soil water management.
Teaching Method: Blended

Text Book	
Title	Water Relations of Plants and Soils
Author(s)	Kramer, P. J. and J. Boyer
Edition	2nd Edition
Short Name	REF#1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
REF#2	Plant Physiological Ecology.	Lambers, H., Chapin III, F.S, and Pons, T.L.	2nd Edition	
REF#3	Plant physiology and Development.	Taiz, L, Zeiger E, Moller, I.M and Murphy A.	6th Edition	

Instructor	
Name	**Prof. Maher Tadros**
Office Location	C4L2
Office Hours	
Email	mtadros@just.edu.jo

Class Schedule & Room
Section 2: Lecture Time: Wed : 11:30 - 13:00 Room: C2007

Prerequisites

Line Number	Course Name	Prerequisite Type
622021	PP202 Principles Of Plant Science	Prerequisite / Study
672020	NR202 Principles Of Soil Science	Prerequisite / Study

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Course Introduction	From **REF#1**, From **REF#2**, From **REF#3**
Weeks 1, 2	Functions and Properties of Water	From **REF#1**, From **REF#3**
Weeks 2, 3	Soil and Water	From **REF#1**, From **REF#2**, From **REF#3**
Week 4	Plants : Root and Root System	From **REF#1**, From **REF#2**

Weeks 5, 6	Cell Water Relations	From **REF#1**, From **REF#2**, From **REF#3**
Weeks 7, 8	The absorption of water, root & Stem pressures	From **REF#1**, From **REF#3**
Weeks 9, 10	Transpiration and the Ascent of Sap	From **REF#1**, From **REF#3**
Weeks 11, 12	Stomata and Gas Exchange	From **REF#1**, From **REF#2**, From **REF#3**
Weeks 13, 14	Water Use Efficiency and its application in crop water management	From **REF#1**, From **REF#2**, From **REF#3**
Weeks 15, 16	Response of plants to environmental stresses	From **REF#1**, From **REF#2**, From **REF#3**

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
The students will be able to fully understand how soil solution (water and solutes) moves through the soil. [5PLO1, 3PLO2, 2PLO4] [5L7K1, 3L7S3, 2L7C1]	10%	Midterm, Homeworks
The students will learn about the factors affecting water movement in the soil. [5PLO1, 5PLO2, 10PLO6] [5L7K1, 5L7S3, 10L7C1]	20%	Midterm, Homeworks
The students will be able to understand the mechanisms of water movement from the soil to the plant through the root system. [5PLO1, 5PLO2, 10PLO7] [10L7K1, 5L7S3, 3L7C3, 2L7C4]	20%	Midterm, Homeworks
The course will provide student with the knowledge on the mechanisms of water movement through the shoot up the stem throughout the leaves. [3PLO1, 4PLO2, 3PLO6, 5PLO7] [4L7K1, 3L7S3, 3L7C1, 2L7C3]	15%	Midterm, Final, Homeworks
Students are taught the physiological processes such as transpiration through the plant. [5PLO1, 5PLO2, 5PLO6, 5PLO7] [5L7S1, 5L7S3, 5L7C1, 5L7C4]	20%	Final
In addition, students will be introduced to the concept of water use efficiency and the environmental stresses (water, nutrient, radiation, temperature stresses, and plant competition) affecting plant soil water relationship. [3PLO1, 4PLO2, 3PLO6, 6PLO7] [5L7K1, 5L7S3, 5L7C1]	15%	Final

Relationship to Program Student Outcomes (Out of 100%)															
PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	MSc_PLO1	MSc_PLO2	MSc_PLO3	MSc_PLO4	MSc_PLO5	MSc_PLO6	MSc_PLO7	MSc_PLO8	MSc_PLO9
25.81	25.75		2		20.81	25.63									

Relationship to NQF Outcomes (Out of 100%)					
L7K1	L7S1	L7S3	L7C1	L7C3	L7C4
30	5	26.75	25.75	5.5	7

Evaluation	
Assessment Tool	**Weight**
Midterm	40%
Final	50%
Homeworks	10%

Policy	
Exams	All exams are closed book and notes. The final exam is comprehensive (covering all teaching materials). Incomplete exams need approval from the department chair and the faculty dean.
Cheating	Prohibited; and in case of cheating the student will be subject to punishment in according with the university regulations
Attendance	Students are expected to attend all class meetings regularly. If the student is absent for more than 20% of the course, the student will be prevented from taking all subsequent exams and assigned an F (Failure) grade in the course (deprived by absence). This maximum includes both excused and unexcused absences.
Participation	Participation is highly encouraged
Withdraw	The student can withdraw from the course in accordance with the timeline defined by the university regulations

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