



**Jordan University of Science and Technology**  
**Faculty of Agriculture**  
**Plant Production Department**

PP316 Soil-Plant-Water Relationships

First Semester 2022-2023

**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.

**Text Book**

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

**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	<b>Prof. Maher Tadros</b>
Office Location	C4L2
Office Hours	Sun : 09:00 - 10:00 Mon : 08:00 - 10:00 Wed : 08:00 - 10:00 Thu : 08:00 - 09:00

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Class Schedule & Room
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Section 1:  
Lecture Time: Wed : 11:30 - 13:00  
Room: M3304

Prerequisites
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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
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Weeks	Topic	References
Week 1	Course Introduction	From <b>REF#1</b> , From <b>REF#2</b> , From <b>REF#3</b>
Weeks 1, 2	Functions and Properties of Water	From <b>REF#1</b> , From <b>REF#3</b>
Weeks 2, 3	Soil and Water	From <b>REF#1</b> , From <b>REF#2</b> , From <b>REF#3</b>
Week 4	Plants : Root and Root System	From <b>REF#1</b> , From <b>REF#2</b>
Weeks 5, 6	Cell Water Relations	From <b>REF#1</b> , From <b>REF#2</b> , From <b>REF#3</b>
Weeks 7, 8	The absorption of water, root & Stem pressures	From <b>REF#1</b> , From <b>REF#3</b>
Weeks 9, 10	Transpiration and the Ascent of Sap	From <b>REF#1</b> , From <b>REF#3</b>
Weeks 11, 12	Stomata and Gas Exchange	From <b>REF#1</b> , From <b>REF#2</b> , From <b>REF#3</b>
Weeks 13, 14	Water Use Efficiency and its application in crop water management	From <b>REF#1</b> , From <b>REF#2</b> , From <b>REF#3</b>
Weeks 15, 16	Response of plants to environmental stresses	From <b>REF#1</b> , From <b>REF#2</b> , From <b>REF#3</b>

<b>Mapping of Course Outcomes to Program Student Outcomes</b>	<b>Course Outcome Weight (Out of 100%)</b>	<b>Assessment method</b>
The students will be able to fully understand how soil solution (water and solutes) moves through the soil. [1PLO1, 1PLO2, 1PLO4]	10%	Midterm
The students will learn about the factors affecting water movement in the soil. [1PLO1, 1PLO2, 1PLO6]	20%	Midterm
The students will be able to understand the mechanisms of water movement from the soil to the plant through the root system. [1PLO1, 1PLO2, 1PLO7]	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. [1PLO1, 1PLO2, 1PLO6, 1PLO7]	15%	Final
Students are taught the physiological processes such as transpiration through the plant. [1PLO1, 1PLO2, 1PLO7]	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. [1PLO1, 1PLO2, 1PLO6, 1PLO7]	15%	Final

<b>Relationship to Program Student Outcomes (Out of 100%)</b>						
PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
30.83	30.83		3.33		14.17	20.83

<b>Evaluation</b>	
<b>Assessment Tool</b>	<b>Weight</b>
Midterm	45%
Final	50%
Homeworks	5%

<b>Policy</b>	
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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