



**Jordan University of Science and Technology**  
**Faculty of Agriculture**  
**Natural Resources & Environment Department**

NR414 Soil Reclamation

Second Semester 2019-2020

**Course Catalog**

3 Credit Hours. This class is designed to provide students with knowledge about salt affected soils, distribution, classification, reactions, and characterization. In addition, student to distinguish hazard of salinity and sodicity and process and steps of soil reclamation and management.

**Text Book**

<b>Title</b>	Salt-Affected Soils: Their Reclamation and Management for Crop Production
<b>Author(s)</b>	Gupta, R.K. and Abrol, J.P.
<b>Edition</b>	11th Edition
<b>Short Name</b>	Ref 1
<b>Other Information</b>	Advances in soils science. Springer-Verlag New York

**Course References**

Short name	Book name	Author(s)	Edition	Other Information
Ref 2	Water quality for agriculture	Ayers, R.S., and Westcot, D.W	1st Edition	FAO irrigation and drainage paper # 29 rev
Ref 3	Methods of Soil Analysis. Part 3. Chemical methods	Sparks, D.L. , Page, A.L., Helmke, P.A. Loeppert, R.H. Soltanpour, P.N., Tabatabai, M.A., Johnston, C.T., Sumner	1st Edition	ASA-SSSA Inc. (Pub.). Madison, WI. USA.

**Instructor**

Name	Prof. Mamoun Gharaibeh
Office Location	C1L2

Office Hours	Sun : 12:30 - 13:30 Mon : 11:00 - 13:30 Tue : 10:30 - 11:30 Tue : 12:30 - 13:30 Thu : 12:30 - 13:30
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Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 13:30 - 14:30 Room: G2123

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introductory material: arid regions, problem soils and salt affected soils	<b>Chapter 1</b> From <b>Ref 1</b>
Weeks 2, 3, 4	Soil salts: types, chemical properties and reactions in soil (Carbonates, Sulfates, Chlorides, Nitrates, and others)	<b>Chapter 1, 2, 3</b> From <b>Ref 1</b>
Weeks 5, 6, 7, 8	Water quality for irrigation (EC <sub>w</sub> , SAR <sub>w</sub> , SAR <sub>adj</sub> , RSC, Calcium precipitation:Ca-x, EC-SAR relations)	<b>Pages 1-90</b> From <b>Ref 2</b>
Weeks 8, 9, 10	Salt crop tolerance and productivity (Leaching fraction (LF), Applied water (AW), Threshold salinity, Crop yield)	<b>Pages 1-90</b> From <b>Ref 2</b>
Weeks 11, 12	Salt affected soils: classification systems, chemical and physical properties (EC, pH, SAR, ESP concepts)	From <b>Ref 1</b>
Weeks 12, 13	Methods of chemical characterization of salt affected soils (EC, pH, SAR, CEC, and ESP)	<b>Selected methods</b> From <b>Ref 3</b>
Weeks 13, 14	Reclamation process (Gypsum requirements-GR, chemical-physical- and biological reclamation-Phytoremediation)	From <b>Ref 1</b>
Weeks 14, 15	Drain types and drainage of soils (surface and subsurface drainage, factors affecting design of drains)	From <b>Ref 1</b>
Weeks 15, 16	9. Management of reclaimed salt affected soils Soil surveying, spatial distribution of salts, fertility of reclaimed soils.	From <b>Ref 1</b>

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
recognize arid regions, problem soils and salt affected soils. [5PLO1, 5PLO2]	10%	
identify salt types, chemical properties and their reactions in soil. [15PLO1]	15%	
distinguish classification systems, and compare chemical and physical properties of salt affected. [4PLO1, 2PLO2, 4PLO7]	10%	

demonstrate an understanding water quality, and ability to calculate evaluated related quality parameters. [1PLO1, 1PLO2, 2PLO3, 3PLO4, 3PLO5, 2PLO6, 3PLO7]	15%	
practice laboratory methods of chemical characterization of salt affected soils [4PLO3, 4PLO4, 4PLO5, 4PLO7, 4PLO9]	20%	
identify and evaluate salt crop tolerance and productivity [1PLO3, 1PLO4, 1PLO5, 1PLO7, 1PLO9]	20%	
specify reclamation process and select best management options [3PLO2, 3PLO3, 3PLO4, 3PLO5, 4PLO7, 4PLO8]	20%	

Relationship to Program Student Outcomes (Out of 100%)								
PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9
25	11	13	14	14	2	19	4	8

Policy	
Exams	Closed book exams. Final exams include all covered materials and in case of absent; approved excuse is required from the department and deanship
Cheating	Prohibited and is subjected to punishment according to university regulations
Attendance	Students are expected to attend all class meeting regularly. A 20% absent rate (excused and unexcused) will prevent student from attending and taking exams and will be assigned an F (failure) grade
Participation	Participation is highly encouraged
Withdrawal	Student can withdraw from the course in accordance with the timeline defined by the university regulations

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