Jordan University of Science and Technology

Faculty of Agriculture

Natural Resources & Environment Department

NR202 Principles Of Soil Science

First Semester 2023-2024

Course Catalog
3 Credit Hours. This course is designed to provide students with basic concepts of all aspects of soil science including: composition and genesis, physical, chemical, and biological properties. Topics include the relationship between crops and soils, conservation of soil and water resources, and the use of fertilizer.

Text Book	
Title	The Nature and Properties of Soils
Author(s)	Brady, N. C., and R. R. Weil
Edition	15th Edition
Short Name	Main Reference
Other Information	

Instructor	
Name	**Dr. Ragheb Tahhan**
Office Location	C1L2
Office Hours	
Email	tahhan@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Mon, Wed : 11:30 - 13:00 Room: C5020

Tentative List of Topics Covered		
Weeks	**Topic**	**References**

Week 1	Introductory material: definition of soil, soil science branches, ecological functions, soil phases	**Chapter 1** From **Main Reference**
Weeks 2, 3, 4	Soil formation (Rocks and minerals: Origin and classification, Soil forming processes, Soil forming factors, soil profile)	**Chapter 2 & 3** From **Main Reference**
Weeks 5, 6, 7, 8	Soil physical properties (Color, texture, structure, density, pore-size, aggregation)	**Chapter 4** From **Main Reference**
Weeks 8, 9, 10, 11	Soil water (Water properties, water content, soil-water energy, capillary-potential, flow, measurements of soil water, soil moisture characteristic curve, evapotrasnpiration))	**Chapter 5 & 6** From **Main Reference**
Weeks 11, 12, 13	Soil chemical properties (Soil colloids: general properties, types, layer silicate, clay structure, ispmorphus substitution, mineralogical organization, genesis of colloids, source of colloidal charge, cation capacity and nutrient availability)	**Chapter 8** From **Main Reference**
Week 14	Soil reaction: soil acidity and alkalinity (Soil pH, reactions, determination of pH),	**Chapter 9** From **Main Reference**
Weeks 14, 15	Soil nutrients and nutrient cycling (Soil organic matter-SOM, productivity vs fertility, essential, plant nutrients, fertilizers, carbon cycle, nitrogen cycle, soil, phosphorus and potassium). Soil ecology and biology (Soil environment-bio, diversity of soil organism, roles of organisms-consumption production).	**Chapter 11-14** From **Main Reference**
Week 16	Environmental issues of soil (Soil salinity and sodicity, soil erosion, soil pollution and remediation).	**Chapter 10** From **Main Reference**

Mapping of Course Outcomes to Program Outcomes	**Course Outcome Weight (Out of 100%)**	**Assessment method**
be able to demonstrate an understanding of soil formation factors and processes and their effect on the distribution of soils on the landscape [7PLO1, 6PLO2, 2PLO3, 5PLO5, 5PLO7]	25%	
Identify major soil physical and chemical properties and their relation to soil quality and health [3PLO1, 2PLO2, 3PLO3, 2PLO4, 3PLO5, 3PLO6, 3PLO7, 3PLO8, 3PLO9]	25%	
Demonstrate an understanding for soil water, factors controlling movement of water in soil, and the capacity of soil to store and provide water for plant growth [2PLO1, 2PLO2, 2PLO3, 4PLO4, 4PLO5, 3PLO6, 4PLO7, 2PLO8, 2PLO9]	25%	
be able to demonstrate an understanding of the influencing factors contributing to nutrient supply from soils [2PLO1, 3PLO3, 3PLO6, 2PLO7, 2PLO8, 5PLO9]	17%	
be able to Identify major soil degradation process (acidity, and salinity and sodicity) and current solutions [1PLO1, 1PLO2, 2PLO3, 1PLO5, 3PLO6, 3PLO7, 3PLO8, 1PLO9]	8%	

Relationship to Program Student Outcomes (Out of 100%)								
PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9
14.53	10.53	11.07	6	12.53	10.6	15.6	8.6	10.53

Evaluation	
Assessment Tool	**Weight**
First Exam	25%
Second Exam	25%
Final Exam	50%

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

Date Printed: 2023-09-25