

Principle of Soil Science

Second stage students of Horticulture Department

Dr. Tariq F. Sadiq -- PhD in Environmental Soil Chemistry

Course Book

1. Course name	Principle of Soil Science
2. Lecturer in charge	Dr Tariq F. Sadiq
3. Department/ College	Soil and Water\ Agriculture
4. Contact	ta.fa2008@yahoo.com tariq.sadiq@su.edu.krd Tel: 009647504699925 or 009647704355844
5. Time (in hours) per week	Thursday 12.30-14.30
6. Office hours	Daily from 8:30 to 14:00
7. Course code	
8. Teacher's academic profile	My Name is Tariq F. Sadiq, I have Bsc in Soil and Water Science (Salahaddin Uni. 2006), Msc. in Soil Chemistry and Fertility (Salahaddin Uni. 2010) and PhD. in Environmental Soil Chemistry (UPM, Malaysia 2016). I'm a lecturer at Soil and Water Dept. Agriculture college.
9. Keywords	Plant Protection, Principle of Soil Science
10. Course overview:	This course explores the fundamental principles of soil science and soils as a natural resource. Students will be introduced to the physics, chemistry, microbiology, morphology, fertility and management of soils, and to the processes driving soil formation. The major soil types of the world and their classification will be discussed, and the relation of major soil characteristics to soil productivity, conservation and sustainability will be addressed. Students will be introduced to the role of soils in food production.
11. Course objective:	To gain understanding of: <ol style="list-style-type: none"> 1. Fundamental concepts in environmental soil science by providing a comprehensive introduction to the basic properties of soils and their relationship with other components of the earth system. 2. Essential soil processes that determine soil behavior, and fertility and management needs. 3. Soil description and classification methods. Major natural and anthropogenic factors that can influence soil formation, development, and quality. 5. Role of soils in major contemporary environmental issues including global climate change, biogeochemical cycling of essential elements, land degradation, and chemical

pollution.	
<p>12. Student's obligation The student must have an important role: 1- Lecture and Lab attendance are compulsory. 2-The students must contribute in the scientific discussions in the class or teaching hall. 3-The students must know the importance of quizzes, homework, reports and exams. It is necessary to contribute the student in presenting a scientific subject</p>	
<p>13. Forms of teaching There are different forms of teaching: 1-Datashow and power point. 2- White board. 3-Lectures.</p>	
<p>14. Assessment scheme The course degree was divided as follow %50 of monthly exam, % 15 for theoretical part 35% for practical part in theoretical part 5 marks for the first exam, 5 marks for second exam, 5 marks for daily quiz and preparing reports. Final exam takes %50 marks for theory part only</p>	
<p>15. Student learning outcome: Upon completion of the course, students are expected to: 1-Be familiar with the Soils: their origin and formation. 2-Understand and define the physical, chemical, and biological processes that operate in soils. 3-Be familiar with the factors influencing soil fertility and nutrient availability.</p>	
<p>16. Course Reading List and References:</p> <ol style="list-style-type: none"> 1. Foth, H. D. (1991). Fundamentals of soil science (No. Ed. 8). John Wiley and Sons, Inc. 2. Lal, R., & Shukla, M. K. (2004). Principles of soil physics. CRC Press. 3. Tan, K. H. (2011). Principles of soil chemistry. (4th Edition). Taylor and Francis Group, LLC.CRC Press is an imprint of Taylor & Francis Group, an Informa business. 4. Paul, E. A. (2014). Soil microbiology, ecology and biochemistry. Academic press. 5. https://www.google.iq/?gfe_rd=cr&ei=Az-nWKeoIIfN8gfulq_IAQ#q=soil+science+society+of+america 	
17. The Topics:	Lecturer's name

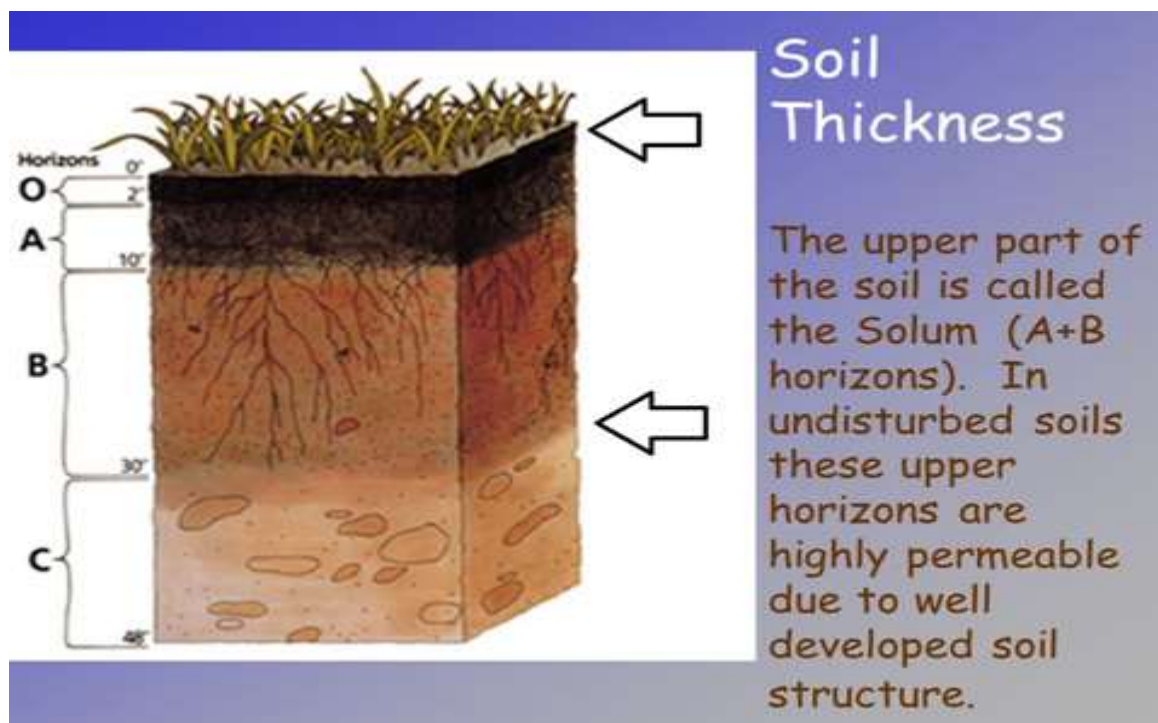
<p>1st week Introduction to Soil Science 2nd week Traditional and Modern Classification of Soil Science 3rd week Soil Formations and its Formation Processes 4th week Physical Properties of Soil 5th week First Test 6th week Factors effects on Physical Properties of Soil 7th week Soil Water Content 8th week Chemical Properties of Soil. 9th week Second Test 9th week Factors effects of Chemical Properties of Soil. 10th week Soil Fertility and Fertilization 11th week Soil Microbiology 12th course review</p>	<p>Lecturer's name Dr. Tariq F. Sadiq ex: (2 hrs)</p>
<p>18. Practical Topics (If there is any)</p>	
<p>There are three main and important skills the students should learn, which are M. PowerPoint , M. Excel and M. Word that led them dealing with computer and internet</p>	<p>Lecturer's name ex: (3-4 hrs)</p>
<p>19. Examinations: 1. Compositional: 1-Definition? 2-explanation? 3- What are the differences between A and B? 4- Fill-in the blanks? 2. True or false type of exams:</p>	
<p>20. Extra notes:</p>	
<p>21. Peer review</p>	<p>پیداچوونہوہی ہاوہل</p>

The Course schedule is tentative and may be subject to change

Introduction

What is Soil Science?

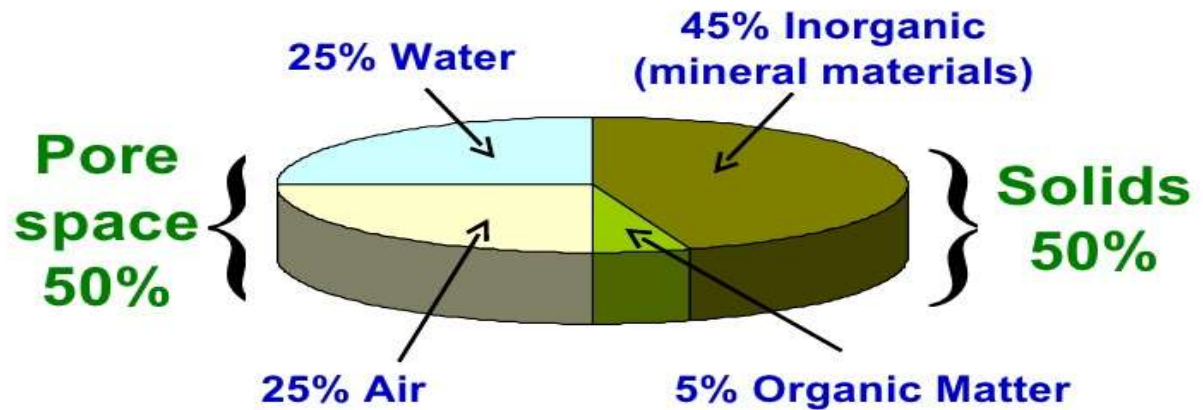
- “The science dealing with soil as a natural resource on the surface of the earth, including Pedology (soil genesis, classification and mapping), physical, chemical, biological and fertility properties of soil and these properties in relation to their management for crop production.”



- **An agricultural** definition of soil is a dynamic natural body on the surface of the earth in which plants grow, composed of mineral, organic materials and living organisms form.
- Or it is a mixture of mineral and organic material that is capable of supporting plant life
- **An engineering** definition of soil is a mixture of mineral material (sands, gravels and fines) used as a base for construction.

Composition of soil on volume basis (Soil components)

Average Soil Composition



Views on Soil

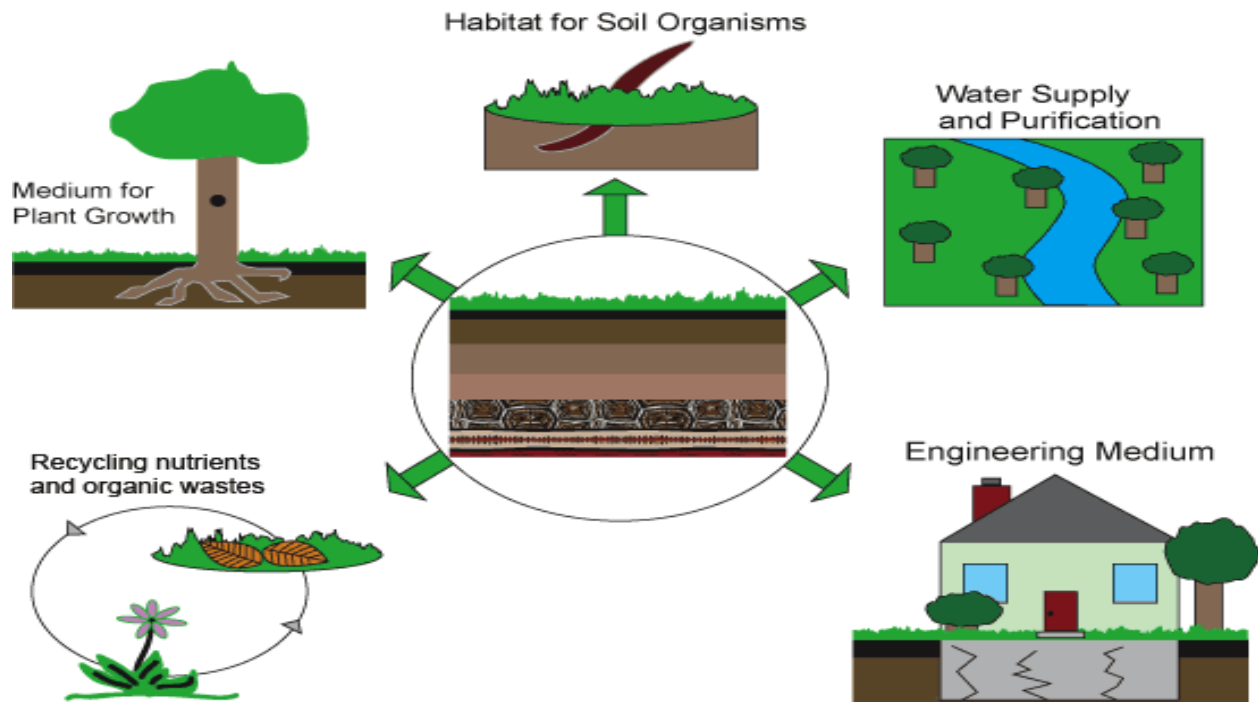
- ✓ For a House wife; soil is dirt that has to be cleaned.
- ✓ For an Agriculturist soil is a medium for plant growth vital for food production and human survival.
- ✓ For a Mining Engineer soil is a debris covering the Rocks
- ✓ For a Civil Engineer soil is a foundation for buildings and highway.
- ✓ City hall (municipal); soil is a site for dumping of waste

Functions of the soil

1. Support growth of higher plants
2. Primary factor controlling fate of water in hydrologic system
3. Nature's recycling system
4. Habitat for organisms
5. Engineering medium

FUNCTIONS OF SOIL IN OUR ECOSYSTEM

The Five Functions of Soil



Soils and Plant Growth

- Physical support of plants
- Provides water and air
- Provides essential elements



Supplying Plant Nutrients: Nutrients that plant

- Macro-nutrients = N,P,K,Ca,Mg,S
- Micro-nutrients = B,Fe,Mn,Cu,Zn,Mo,Co,Cl