Department of Soil and Water Sciences

College of Agricultural Engineering Sciences

Salahaddin University- Erbil

Subject: Principles of Soil Sciences

Course Book – Second Stage / Fall Semester

Lecturer's Theoretical name: Kamyar M. Mohammed

Lecturer's Practical name: Mr. Ammer Imad Kasra

Academic Year: 2022/2023

Course Book

1. Course name	**Principle of Soil Science**
2. Lecturer's in charge	**Dr Kamyar M. Mohammed** **Mr. Ammer Imad Kasra**
3. Department/ College	**Soil and Water\ Agricultural Engineering Sciences**
4. Contact	**Kamyar.mohammed@su.edu.krd** **Tel: 07504612509**
5. Time (in hours) per week	**Theoretical 2 hrs practical: 4 hrs**
6. Office hours	**Sunday and Monday 9.00a m to 1:00 pm**
7. Course code	
8. Teacher's academic profile	Dr. Kamyar Mutalib Mohammed My name is Kamyar M. Mohammed. I have B.Sc. in Soil and Water Science at Salahaddin University in 2006 and getting Master degree in Soil Physics at Salahaddin University in 2012. I am Ph. D. in Soil and Water Conservation branch.
9. Keywords	Soil, Soil Science, Soil chemical, physical and biological Properties

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:

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 behaviour, 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.

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

13. Forms of teaching

There are different forms of teaching:
1-Datashow and power point.
2- White board.
3-Lectures.

14. Assessment scheme

The course degree was divided as follow %50 of monthly exam, 15M for theoretical part 35M for practical part (15m for first test, 15m for second test and 5m for reports and activity) in theoretical part 5 marks for the first exam, % marks for second exam, 5 marks for daily quiz and preparing reports. Final exam takes %50, 50 marks for theory part only.

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.

16. Course Reading List and References:

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

6. Havlin, J. L., J. D. Beaton; Tisdale S. L., and W. L. Nelson. 2005. Soil fertility and fertilizers.7thED. Pearson Education Inc., New Jersey.

7. Nyle C. Brady and Ray R. Weil. 2002. The Nature and Properties of Soils, 14th Edition. Prentice Hall, Publisher.
8. Mark S. Coyne and James A. Thompson. 2006. Fundamental Soil Science, 1st Edition,

17. The Topics:	Lecturer's name
1st week Introduction of Soil Science. (Theory). How to take soil sample (Practical). **2nd week Soil Profile Description. (Theory).** Soil Profile description in the field (Practical). **3rd week Soil Formations Processes (Theory).** Determination of soil color by using munsell soil color charts (Practical). **4th week Physical Properties of Soil. (Theory).** Determination of soil moisture content (Practical). **5th week First Midterm Test (Theory).** (Practical). **6th week Continues Physical Properties of Soil. (Theory).** Determination of Soil saturation degree. (Practical). **7th week Soil Clay Minerals. (Theory).** Determination of Soil pH and EC (Practical). **8th week Chemical Properties of Soil. (Theory).** Determination of soil texture by hydrometer method (Practical). **9th week Soil Microbiology (Theory).** Determination of Bulk density by paraffin method (Practical). **10th week Second Midterm Test (Theory).** Determination of soil Real density by pycnometer. (Practical). **11th week Soil Survey and Classification. (Theory).** Determination of soil organic matter content (Practical). **10th week Soil Fertility and Fertilization (Theory).** Determination of calcium carbonate ($CaCO_3$) in the soil (Practical). **11th week Plant Nutrition (Theory).**	Lecturer's name **Dr. Kamyar Mohammed** **Mr. Ammer Kasra**

Fertilizer Calculation (Practical). **12th course review (Theoretical).** (Practical).	
18. Practical Topics (If there is any)	
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	Lecturer's name Dr. Kamyar Mohammed Ammer Kasra
19. Examinations: ***1. Compositional:*** A. 1-Definition? B. 2-give the reason of …..? C. 3- What are the differences between.. ? D. 4- Fill-in the blanks? E. Enumerate factors that affect..... ***2. True or false type of exams:*** ***3. Calculation:***	
20. Extra notes:	
21. Peer review Assist Prof. Dr. Tariq Faruq Sadiq **پێداچوونەوەی هاوەڵ**	

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