Course Description Form of Soil Physics

1. Course Name:	
Soil Physics	
2. Course Code:	
SOIP304	
3. Semester / Year:	
First semester/ 2024-2025	
4. Description Preparation Date:	
15/1/2025	
5. Available Attendance Forms:	
Full time (theoretical lecture and practical lecture) weekly	
6. Number of Credit Hours (Total) / Number of Units (Total)	
5 hours (2 hours theoretical and 3 hours practical per week) for 14 weeks, number of units 3.5 units	
7. Course Administrator's Name (Mention All, If More Than One Name)	
Name: Phd. Ibraheem Ahmad Hdraes Email: ibraheeahmad@uodiyala.edu.iq	
8. Course Objectives	
Course Objectives: Graduating students who are able to:	1 -The student's knowledge of methods for analyzing soil particles 2 -Knowing the physical characteristics of the soil and the extent of their impact on plant production 3- Methods of water transport between soil particles
9. Teaching and Learning Strategies	

Strategy	In-person lectures for 14 weeks, including two monthly exams, daily exams, and scientific reports

10. Course Structure

Theoretical part

Week	Hours	Required learning outcomes	Unit or Subject	Learning Method	Evaluation Method
1	**2**	Introduction and definition of soil science, the location of soil physics in it, and some related relationships	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
2	**2**	Soil texture and particle size distribution: methods for finding particle sizes, texture triangle, Stokes' law	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
3	**2**	The specific area of soil and methods for determining it physically and chemically	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
4	**2**	Soil construction: its definition, importance, and how to study it	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
5	**2**	Methods of studying soil construction and evidence of soil construction	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
6	**2**	Stability of soil aggregates, methods of studying them, and factors affecting the formation of aggregates	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
7	**2**	Soil water and general water properties	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
8	**2**	Properties of water related to porous media (soil)	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
9	**2**	Soil water energy and methods of expressing and measuring it	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
10	**2**	Water flow in saturated soil	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports

11	**2**	Water flow in unsaturated soils	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
12	**2**	Water flow in the soil: methods for measuring it and equations	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
13	**2**	Soil air, air capacity and gas exchange in soil	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
14	**2**	Soil temperature, soil temperature, and heat flow in the soil	**Soil Physics**	**Lecture Dialogue & discussion Brainstorming**	Daily, monthly and final exams and daily reports
Practical part					
Week	**Hours**	**Required learning outcomes**	**Unit or Subject Name**	**Learning Method**	**Evaluation Method**
1	**3**	The effect of different soil textures on water retention and methods for expressing and measuring soil water content	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
2	**3**	Analysis of soil particle sizes using sieves, hydrometers and pipettes	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
3	**3**	Analysis of soil particle sizes using sieves, hydrometers and pipettes	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
4	**3**	Measuring the apparent and actual soil density and calculating the total porosity	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
5	**3**	Measuring the apparent and actual soil density and calculating the total porosity	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
6	**3**	Measurement of saturated water conductivity in homogeneous soil columns	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
7	**3**	Measuring water flow in horizontal and vertical soil columns	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
8	**3**	Measuring water flow in horizontal and vertical soil columns	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
9	**3**	Measurement of saturated water conductivity in	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports

		homogeneous soil columns			
10	**3**	Measuring water flow in horizontal and vertical soil columns	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
11	**3**	Measurement of the specific area of soil material	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
12	**3**	Methods for measuring moisture tension and moisture contents in soil	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
13	**3**	Measuring soil temperature	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports
14	**3**	Measure soil aeration	**Soil Physics**	**Observation Dialogue & discussion**	Daily, monthly and final exams and daily reports

11. Course Evaluation

Examination Monthly & daily exams with discussion questions inside the lecture.
The degree of participation in the questions related to the subject.

12. Learning and Teaching Sources

Required Textbooks (Curricular Books, If Any)	1- Basics of soil physics. Written by Hillel, Daniel. Translated by Dr. Mahdi Ibrahim Odeh. 1990. 2- Fundamental of soil physics. D. Hillel. 1980.
Main References (Sources)	1- Principles of Soil Physics. Lal ana Shukla. 2004. USA. 2- Environment of Soil Physics. D. Hillel. 2004. USA.
Recommended Books and References (Scientific Journals, Reports...)	Iraqi academic scientific journals
Electronic References, Websites	