Course Description Form

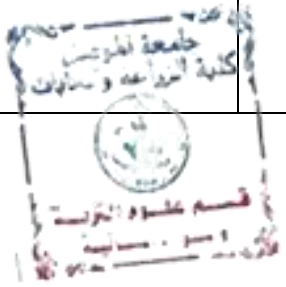
1. Course Name:
Plant Soil and Water analysis
2. Course Code:
PSWA235
3. Semester / Year:
Second course 2024-2025
4. Description Preparation Date:
1\ 2 \ 2025
5. Available Attendance Forms:
presence
6. Number of Credit Hours (Total) / Number of Units (Total)
2 theoretical + 3 practical / 3.5 units
7. Course administrator's name (mention all, if more than one name)
Name: mooatasim . D.S.Agha & Mohamad Ayad harbawi Email: mooatasim@uomosul.edu.iq Email: harbawee79@uomosul.edu.iq
8. Course Objectives

theoretical: - Enabling the student to understand and comprehend what is related to the equipment and tools present in the laboratory - Enabling the student to become familiar with how to take a soil sample - Enabling the student with the ability to estimate the dry weight of a soil sample - Enable the student to know what the chemical properties soil . - Enable the student to know the characteristics of irrigatio water. - Enable the student to take and analyze plant samples	**Practical** **– Enable the student to learn about collecting soil, pla and water samples** **The field and how to prepare it for laboratory analysis and conduct the most important basic analyses** **For soil, plant and water samples**

9. Teaching and Learning Strategies	
theoretical: - Interactive lectures - Brainstorming - Dialogue and discussion - Assigning tasks and reporting	**Practical** – Assigning group work to reveal leadership skills – Assigning tasks and reporting for each experiment

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theoretical	Theoretical: a1 The student explains what soil is, what is the foundation, the horizons, and the bedouin	Theoretical: Soil and soil sample subdivision	Theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: a9 The student learns about th most important basic rules of laboratory safety	Practical: Chemical and biological safety and security rules in the laboratory	practical Assigning tasks and reports	
2	2 Theoretical	Theoretical: b1 Estimate the moisture content of the soil, and know the weight of the dry soil sample for moist soil	Theoretical: Preparing the soil sample for analysis	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: b8 The student discovers soil, pla and water samples	Practical: How to collect soil, plant and water samples	practical Assigning tasks and report	
3	2 Theoretical	Theoretical: a2 The student is familiar with th classification of soil analysis methods	Theoretical: The student learns about the divisions of soil analysis methods and their purpose	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: c1 The student is familiar with preparing samples for laboratory pickling	Practical: Preparing soil, plant and water samples for laboratory analysis	practical Assigning tasks and report	
4	2 Theoretical	Theoretical: a3 The student is introduced to devices for determining elements, mechanical methods, and chemical methods for soil analysis	Theoretical Instrumental and chemical soil analysis methods	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: a10 The student learns the most important methods for estimating the acidity number	Practical: Methods for estimating the pH of soil, water and plant samples	practical Assigning tasks and report	
5	2 Theoretical	Theoretical a4 The student will be able to estimate soil analyzes descriptively using quantitative gravimetric and volumetric analysis methods	Theoretical: Analysis methods – chemical analysis methods - descriptive methods and quantitative methods	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: b9 The student detects salts in soil and water	Practical: Methods for estimating dissolved salts in soil and water	practical Assigning tasks and report	

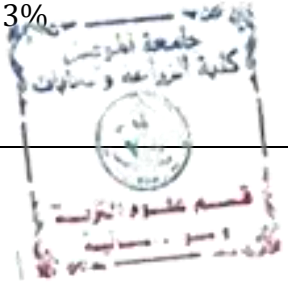


6	2 Theoretical	Theoretical: a5 The student learns what a standard solution is and what its specifications are	Theoretical: Standard solutions	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: c2 The student explains the most important methods estimating the moisture content of soil, water, and plant samples	Practical: Methods for estimating moisture content in soil, water and plant samples	practical Assigning tasks and report	
7	2 Theoretical	Theoretical: b2 The student is able to prepare an original standard solution and prepare standard solutions of different concentrations	Theoretical: The original standard solution and solutions of different concentrations	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: a11 The student learns what hardness is, how to measure it, and how to measure turbidity	Practical: Total hardness, a method of measuring hardness, turbidity, or turbidity	practical Assigning tasks and report	
8	2 Theoretical	Theoretical: a6 The student is able to identify t nutritional element and classify the nutritional element	Theoretical: Identify the nutritional element and nutritional element recipes	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: d1 The student determines the texture of the soil	Practical: Determine soil texture	practical Assigning tasks and report	
9	2 Theoretical	Theoretical: b3 The student is familiar with th properties of the element potassium, its benefits for plants, quality in the soil, and an idea of appreciation	Theoretical: Properties of the elen potassium	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: d2 The student measures a ratio Carbonates in soil and water	practical: Estimation of calcium carbonate i Soil and water	practical Assigning tasks and report	
10	2 Theoretical	Theoretical: b4 The student is familiar with estimating the concentration of a solution as a percentage and in molar and titer expressions	Theoretical: Expressing the concentration of solutions	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: d3 The student measures a ratio Carbonates and bicarbonates in soil	Practical: Determination of carbonates and bicarbonates In the soil	practical Assigning tasks and report	
11	2 Theoretical	Theoretical: a7 Dean of Mathematics is one of the most important organic materials in the soil, as well as lime, gypsum, and other problems in the soil	Theoretical: Estimation of soil carnivorous compounds	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: d4 The student measures the ratio of potassium and potassium	practical: Determination of sodium and potassium	practical Assigning tasks and report	

12	2 Theoretical	Theoretical: a5 Introducing the student to resistance to moisture interaction, special equations, and the importance of interaction	Theoretical: Degree of soil interaction	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: d5 The student measures organic matter	Practical: Estimation of soil organic matter	practical Assigning tasks and report	
13	2 Theoretical	Theoretical: b6 The student is present in knowing the effect and extent of moisture interaction on the readiness of nutrients and the beneficiary has good understanding	Theoretical: The effect of the degree of soil interaction on the readiness of nutrients	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: a12 The student learns how phosphorus absorbs indoor and plant moisture	Practical: Determination of phosphorus in s water and plants	practical Assigning tasks and report	
14	2 Theoretical	Theoretical: b7 The student is familiar with comprehensive examination measurements - tests that are performed in the laboratory and explain what hardness and hardness are	Theoretical: Water analysis and measurements	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: b10 The student reveals the cation exchange capacity in Persian soil	Practical: Methods for estimating cation exchange capacity in soil and water	practical Assigning tasks and report	
15	2 Theoretical	Theoretical: a8 The student will be able to understand the importance of analyzing a plant sample and what are the most important plant parts in the analysis	Theoretical: Plant sample analysis	theoretical audio methods, Writing on the board Direct dialogue style	Short exams, assignments, discussions
	3 practical	Practical: c3 The student explains the ready-made elements of soil, water, and plants	Practical: Extracting ready-made elements from soil, water and plants	practical Assigning tasks and report	

11. Course Evaluation

	Evaluation	Time of evalution	Degree	Relative weight
1	Theoretical final report + practical experience reports	Theoretical week 15. Practical week 1-15	7 Theoretical + 6 Practical	13%



2	Short test Quiz1	3 Week	4 Theoretical + 2 practical	6%
3	Midterm exam (theoretical and practical)	9 Week	10 theoretical + 5 practical	15%
4	Short test 2 Quiz	12 Week	4 Theoretical + 2 practical	6%
5	Final practical test	Practical exams week	20%	20%
6	Final theoretical test	The week of theoretical exams	40%	40%
Sum			100%	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Soil, plant, water and air analysis book (Prof. Dr. Muzaffar Ahmed Al-Mous
Main references (sources)	- Abbawi, Souad Abd and Muhammad Suleiman Hassan (1990): Scientific Engineering of the Environment. Water tests. Dar Al-Hekma and Publishing - University of Mosul. (book) - Al-Mawsili, Muzaffar Ahmed (2016). Soil, water, plant and air analysis. Al-Yazouri Scientific House for Publishing and Distribution. Oman. (book)
Recommended books and references (scientific journals, reports...)	Al-Rafidain Agriculture Journal and Al-Anbar Journal of Agricultural Sciences
Electronic References, Websites	The World Health Organization, and the US Food and Drug Administration.

A. P. Mooatasim Daood Sulayman
Theoretical subject teacher:

Dr. Mohammad Ayad Harbawi
Practical subject teacher

Dr. Khalid Anwar Khalid
Head of the Department of Soil Sciences and Water Resources

A. P. Dr. Abdul Qader Abash
Chairman of the Scientific Committee